

**Final Report of the Forty-second
Antarctic Treaty Consultative
Meeting**

ANTARCTIC TREATY
CONSULTATIVE MEETING

**Final Report
of the Forty-second
Antarctic Treaty
Consultative Meeting**

Prague, Czech Republic
1 - 11 July 2019

Volume I

Secretariat of the Antarctic Treaty
Buenos Aires
2019

Published by:



Secretariat of the Antarctic Treaty
Secrétariat du Traité sur l'Antarctique
Секретариат Договора об Антарктике
Secretaría del Tratado Antártico

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This book is available in digital form at www.ats.aq and hard copies can be purchased online.

ISSN 2346-9897
ISBN (vol. I): 978-987-4024-83-1
ISBN (complete work): 978-987-4024-81-7

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Antarctic Treaty Secretariat

Acronyms and Abbreviations

ACAP	Agreement on the Conservation of Albatrosses and Petrels
ACBR	Antarctic Conservation Biogeographic Region
ASMA	Antarctic Specially Managed Area
ASOC	Antarctic and Southern Ocean Coalition
ASPA	Antarctic Specially Protected Area
ATS	Antarctic Treaty System or Antarctic Treaty Secretariat
ATCM	Antarctic Treaty Consultative Meeting
ATCP	Antarctic Treaty Consultative Party
ATME	Antarctic Treaty Meeting of Experts
BP	Background Paper
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources and/or Commission for the Conservation of Antarctic Marine Living Resources
CCAS	Convention for the Conservation of Antarctic Seals
CCRWP	Climate Change Response Work Programme
CEE	Comprehensive Environmental Evaluation
CEP	Committee for Environmental Protection
COMNAP	Council of Managers of National Antarctic Programs
EIA	Environmental Impact Assessment
EIES	Electronic Information Exchange System
HCA	Hydrographic Committee on Antarctica
HSM	Historic Site and Monument
IAATO	International Association of Antarctica Tour Operators
IBA	Important Bird Area
ICAO	International Civil Aviation Organization
ICG	Intersessional Contact Group
IEE	Initial Environmental Evaluation
IGP&I Clubs	International Group of Protection and Indemnity Clubs
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IOPC Funds	International Oil Pollution Compensation Funds
IP	Information Paper
IPCC	Intergovernmental Panel on Climate Change

IUCN	International Union for Conservation of Nature
MPA	Marine Protected Area
NCA	National Competent Authority
RCC	Rescue Coordination Centre
SAR	Search and Rescue
SCAR	Scientific Committee on Antarctic Research
SC-CAMLR	Scientific Committee of CCAMLR
SGCCR	Subsidiary Group on Climate Change Response
SGMP	Subsidiary Group on Management Plans
SOLAS	International Convention for the Safety of Life at Sea
SOOS	Southern Ocean Observing System
SP	Secretariat Paper
ToR	Term of Reference
UAV/RPAS	Unmanned Aerial Vehicle / Remotely Piloted Aircraft System
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VSSOS	Vessel-Supported Short Overnight Stay
WMO	World Meteorological Organization
WP	Working Paper
WTO	World Tourism Organization

PART I

Final Report

1. Final Report

Final Report of the Forty-second Antarctic Treaty Consultative Meeting

Prague, Czech Republic, 2–11 July 2019

- (1) Pursuant to Article IX of the Antarctic Treaty, Representatives of the Consultative Parties (Argentina, Australia, Belgium, Brazil, Bulgaria, Chile, China, the Czech Republic, Ecuador, Finland, France, Germany, India, Italy, Japan, the Republic of Korea, the Netherlands, New Zealand, Norway, Peru, Poland, the Russian Federation, South Africa, Spain, Sweden, Ukraine, the United Kingdom of Great Britain and Northern Ireland, the United States of America, and Uruguay) met in Prague from 2 to 11 July 2019, for the purpose of exchanging information, holding consultations, and considering and recommending to their Governments measures in furtherance of the principles and objectives of the Treaty.
- (2) The Meeting was also attended by delegations from the following Contracting Parties to the Antarctic Treaty which were not Consultative Parties: Belarus, Canada, Colombia, Estonia, Malaysia, Monaco, Portugal, Romania, the Slovak Republic, Switzerland, and Turkey.
- (3) In accordance with Rules 2 and 31 of the Rules of Procedure, Observers from the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Scientific Committee on Antarctic Research (SCAR), and the Council of Managers of National Antarctic Programs (COMNAP) attended the meeting.
- (4) In accordance with Rule 39 of the Rules of Procedure, Experts from the following international organisations and non-governmental organisations attended the Meeting: the Antarctic and Southern Ocean Coalition (ASOC), the International Association of Antarctica Tour Operators (IAATO), the International Group of Protection and Indemnity Clubs (IGP&I Clubs), the International Hydrographic Organization (IHO), the International Maritime Organisation (IMO), the International Oil Pollution Compensation Funds (IOPC Funds), and the World Meteorological Organization (WMO).

- (5) The Host Country, the Czech Republic, fulfilled its information requirements towards the Contracting Parties, Observers and Experts through Secretariat Circulars, letters and a dedicated website.

Item 1: Opening of the Meeting

- (6) The Meeting was officially opened on 2 July 2019. On behalf of the Host Government, in accordance with Rules 5 and 6 of the Rules of Procedure, the Head of the Host Country Secretariat, Dr Pavel Kapler, called the Meeting to order and proposed the candidacy of Mr Martin Smolek as Chair of ATCM XLII. The proposal was accepted.
- (7) The Chair warmly welcomed all Parties, Observers, and Experts to the Czech Republic and thanked them for their confidence in appointing him as Chair of the Meeting.
- (8) The Chair paid respects to the late Professor David Walton, who passed away on 12 February 2019. Professor Walton was known for his engagement with many areas of Antarctic science and policy, such as his work on environmental protection within SCAR. He was also Chief Editor for the Antarctic Treaty Secretariat during the past seven ATCMs. He will be sorely missed by the Antarctic community.
- (9) Delegates observed a minute of silence in honour of the passing of Professor Walton, as well as that of Dr Paul Kyllonen, who passed away at Palmer Station, and Carl Jeffrey Norris and Bobby Rae Pentacost, who passed away at McMurdo Station.
- (10) Mr Tomas Petricek, the Minister of Foreign Affairs of the Czech Republic, welcomed delegates and noted that this was the first time the Czech Republic had hosted the Meeting. He recalled the long history of Czech participation in Antarctic exploration and science, and highlighted that Czechoslovakia, to which the Czech Republic is a successor state, was one of the first States to accede to the Antarctic Treaty in 1962. He noted the establishment of the Johann Gregor Mendel Czech Antarctic station on James Ross Island which supported the Czech Republic to meet the requirements of Article IX, paragraph 2 of the Antarctic Treaty, and be granted Consultative status under the Antarctic Treaty effective from 1 April 2014. He emphasised that the Czech Republic remained committed to the principles and purposes of the Antarctic Treaty, and celebrated the Treaty's promotion of a spirit of peacefulness among States. He added that the Meeting showed that it was

also a centre for the harmonisation of activities in Antarctica, particularly in regards to international scientific cooperation.

- (11) Mr Petricek reiterated that Antarctica was a prime example that States were able to settle their disputes peacefully, and that the Antarctic Treaty had inspired cooperation in other international spaces. He expressed thanks to the other States who had assisted the Czech Republic with logistical support in Antarctica, and highlighted collaborative efforts between Czech scientists and foreign expeditions. Mr Petricek also stressed the importance of minimising the impact of activities in Antarctica to preserve its unique nature, highlighting his support for the strengthening of the management of tourism and non-governmental activities, and cooperation between competent national authorities towards this end. He reminded the delegates that this year marked the celebration of 60 years of the Antarctic Treaty, and that the Czech Republic had drafted the Prague Declaration together with other Consultative Parties, which encouraged Consultative Parties to reaffirm their commitment to the principles and purposes of the Treaty, including the protection and preservation of Antarctica. He concluded by expressing his hope that Antarctica's environment be preserved for future generations, and wished the delegates constructive sessions and a pleasant stay in the Czech Republic.
- (12) Mr Vladislav Smrž, the Deputy Minister for Policy and International Relations, on behalf of the Minister of the Environment of the Czech Republic, warmly welcomed the delegates to Prague. He highlighted the Czech Republic's commitment to protecting the Antarctic environment and its support of the principles of the Environment Protocol. He stated that protecting the Antarctic ecosystems was more critical than ever due to global environmental change. Mr Smrž reiterated the value of Antarctica as a stabiliser of the Earth's climate and a unique area for scientific study. He emphasised the need to continue building international cooperation in scientific research, as well as in the regulation of Antarctic activities to minimise impacts on the environment. He added that the Czech Republic had been working on amending national law on Antarctica in order to ratify and implement Annex VI on Liability Arising from Environmental Emergencies.
- (13) Mr Smrž noted that the Czech Republic appreciated the work of the CEP, and that Czech representatives to the CEP would continue to support its work. Mr Smrž highlighted Czech scientists' contributions to a better understanding of environmental processes in Antarctica through a variety of scientific fields. He added that Czech scientists had been involved in important discussions on

developing the Antarctic protected area system and that it had been a pleasure and an honour to host the SCAR/CEP workshop on further developing the Antarctic protected area system prior to the ATCM. Mr Smrž emphasised the Czech Republic's commitment to minimise the environmental impact of its activities in the Antarctic, and stated that the Czech Antarctic Johann Gregor Mendel Station on James Ross Island used renewable energy sources and employed efficient environmental management to this end. Highlighting the importance of international collaboration, he extended an invitation to scientists to work at the Czech station. He concluded with wishing the delegates a successful meeting.

Item 2: Election of Officers and Creation of Working Groups

- (14) Ms Liisa Valjento, Head of the Delegation of Finland, Host Country of ATCM XLIII, was elected Vice Chair. In accordance with Rule 7 of the Rules of Procedure, Mr Albert Lluberas Bonaba, Executive Secretary of the Antarctic Treaty Secretariat, acted as Secretary to the Meeting. Dr Pavel Kapler, head of the Host Country Secretariat, acted as Deputy Secretary. Ms Birgit Njåstad of Norway acted as Chair of the Committee for Environmental Protection.
- (15) Two Working Groups were established:
- Working Group 1: Policy, Legal and Institutional Issues;
 - Working Group 2: Operations, Science and Tourism.
- (16) The following Chairs of the Working Groups were elected:
- Working Group 1: Ms Therese Johansen from Norway;
 - Working Group 2: Professor Dame Jane Francis from the United Kingdom and Mr Máximo Gowland from Argentina.
- (17) The Meeting noted that the Chairs of both Working Groups would not be able to continue to act as Chairs at ATCM XLIII, and resolved to elect new Chairs at the end of the Meeting.

Item 3: Adoption of the Agenda, Allocation of Items to Working Groups and Consideration of the Multi-year Strategic Work Plan

- (18) The following Agenda was adopted:

1. Opening of the Meeting
 2. Election of Officers and Creation of Working Groups
 3. Adoption of the Agenda, Allocation of Items to Working Groups and Consideration of the Multi-year Strategic Work Plan
 4. Operation of the Antarctic Treaty System: Reports by Parties, Observers and Experts
 5. Report of the Committee for Environmental Protection
 6. Operation of the Antarctic Treaty System: General matters
 7. Operation of the Antarctic Treaty System: Matters related to the Secretariat
 8. Liability
 9. Biological Prospecting in Antarctica
 10. Exchange of Information
 11. Education Issues
 12. Multi-year Strategic Work Plan
 13. Safety and Operations in Antarctica
 14. Inspections under the Antarctic Treaty and Environment Protocol
 15. Science Issues, Future Science Challenges, Scientific Cooperation and Facilitation
 16. Implications of Climate Change for Management of the Antarctic Treaty Area
 17. Tourism and Non-Governmental Activities in the Antarctic Treaty Area, including Competent Authorities Issues
 18. Preparation of the 43rd Meeting
 19. Any other Business
 - a) Declaration on the 60th Anniversary of the Antarctic Treaty
 20. Adoption of the Final Report
 21. Close of the Meeting
- (19) The Meeting adopted the following allocation of agenda items:
- Plenary: Items 1, 2, 3, 4, 5, 18, 19, 20, 21
 - Working Group 1: Items 6, 7, 8, 9, 10, 11, 12
 - Working Group 2: Items 13, 14, 15, 16, 17

- (20) The Meeting decided that under Agenda Item 13 there would be a seminar on the status and impact of hydrography in Antarctic Waters, co-chaired by Professor Dame Jane Francis (United Kingdom) and Dr Mathias Jonas (IHO).
- (21) The Meeting also decided to allocate draft instruments arising out of the work of the Committee for Environmental Protection and the Working Groups to a legal drafting group for consideration of their legal and institutional aspects.

Item 4: Operation of the Antarctic Treaty System: Reports by Parties, Observers and Experts

- (22) Pursuant to Recommendation XIII-2, the Meeting noted reports from depositary governments and secretariats.
- (23) The United States, in its capacity as Depositary Government for the Antarctic Treaty and its Environment Protocol, reported on the status of the Antarctic Treaty and the Protocol on Environmental Protection to the Antarctic Treaty (IP 21). In the past year there had been one accession to the Treaty. Slovenia had deposited its instrument of accession to the Treaty on 22 April 2019, and the Treaty entered into force for Slovenia on that date. There had been no accessions to the Protocol in the past year. The United States noted that there were currently 54 Parties to the Treaty and 40 Parties to the Protocol as of 2 July 2019. The United States observed that the growing number of Parties demonstrated the inclusiveness of the Treaty to countries with a sustained interest in Antarctica.
- (24) Australia, in its capacity as Depositary for the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), reported that there had been no new accessions to the Convention since ATCM XLI. It noted that there were currently 36 Parties to the Convention (IP 90).
- (25) The United Kingdom, in its capacity as Depositary for the Convention for the Conservation of Antarctic Seals (CCAS), noted Ukraine's intention to accede to the Convention, as set out in WP 69. Given that the consent of all Contracting Parties was required for new accessions, the United Kingdom requested that Parties respond expeditiously to this request. The United Kingdom thanked all Parties who had completed reporting for this year and encouraged all Contracting Parties to submit their reports on time (IP 1 rev. 1).
- (26) Australia, in its capacity as Depositary for the Agreement on the Conservation of Albatrosses and Petrels (ACAP), reported that there had been no new

accessions to the Agreement since ATCM XLI and that there were 13 Parties to the Agreement (IP 91). Australia noted that ACAP shared conservation objectives with the Antarctic Treaty System, namely the protection of seabirds in the Antarctic Treaty area, and encouraged those who were not members to consider joining the ACAP agreement.

- (27) CCAMLR presented IP 9 *Report by the CCAMLR Observer to the Forty Second Antarctic Treaty Consultative Meeting*. This included a summary of outcomes of the Thirty-seventh Annual Meeting of CCAMLR (CCAMLR-XXXVII) which was held in Hobart, Australia, from 22 October to 2 November 2018. Twenty-three Members, including two Acceding States, four State Observers, and 15 Observers from other organisations participated. CCAMLR highlighted its catch document scheme, which was established in 2000 to control and track the trade of toothfish, and informed the Meeting that the catch of krill in CCAMLR waters had exceeded 300,000 tonnes for the first time since the early 1980s. CCAMLR reported that the Commission had discussed two existing MPAs. It further noted that the Scientific Committee had encouraged the preparation of a draft Research and Monitoring Plan for the 2019 review of the South Orkney Islands MPA, and had conducted further discussions on the Ross Sea region Marine Protected Area (MPA) research and monitoring plan. CCAMLR also reported that its ICG on Capacity Building had held a capacity building workshop in Cape Town on 8 April 2019. CCAMLR noted that the next CCAMLR meeting would be held in Hobart, Australia, from 21 October to 1 November 2019, and would be chaired by Spain.
- (28) SCAR presented IP 28 *The Scientific Committee on Antarctic Research Annual Report 2019 to the Antarctic Treaty Consultative Meeting XLII* and noted that SCAR had a long history of providing independent scientific advice to decision makers. SCAR informed the Meeting that it had celebrated its 60th anniversary in 2018, and that this milestone was marked during the 8th SCAR Open Science Conference. The conference was held in Davos, Switzerland from 19 June to 23 June 2018, and attended by over 2,500 scientists. SCAR reported that three new Scientific Research Programmes were in development, and noted that the XXXVI SCAR Meetings and Open Science Conference would take place from 31 July to 11 August 2020 in Hobart, concurrently with the COMNAP Annual General Meeting. Recognising the significance of the scientific connections between Antarctica and the global system, SCAR highlighted that the theme 'Antarctic Science: Global Connections' reflected the importance of collaboration in Antarctic science.

- (29) The Meeting thanked SCAR for IP 28 and noted the continued importance of SCAR's work in advancing Antarctic research and providing independent and scientific advice to the CEP and ATCM. Noting the significance of SCAR's 60th anniversary, the Meeting drew attention to SCAR's substantial achievements across the past six decades and congratulated SCAR on its strong track record.
- (30) COMNAP presented IP 8 *Annual Report for 2018/19 of the Council of Managers of National Antarctic Programs (COMNAP)*, which reported on work related to air operations (WP 8, IP 2), and on continuing work related to understanding and reducing the risk of introducing non-native species (WP 50). It also noted that it had held the COMNAP Antarctic Search and Rescue (SAR) Workshop IV 2019 (IP 88), the fourth in the series of triennial COMNAP SAR Workshops. COMNAP formally thanked all participants and thanked New Zealand for hosting the workshop. COMNAP also thanked Germany for hosting COMNAP AGM XXXI and Symposium (2018). COMNAP also reported on the early career fellowships it supported and welcomed IAATO's support of an inaugural fellowship for this year. Finally, COMNAP noted that COMNAP products such as the Antarctic Telecommunications Operators Manual (ATOM), the Antarctic Flight Information Manual (e-AFIM), and the COMNAP Asset Tracking System (CATS) were all available on the COMNAP Members' webpage.
- (31) The Meeting thanked COMNAP for IP 8, and underscored the importance of COMNAP's recent work in the realms of safety, environmental protection, and science facilitation. As the host of the 2019 Search and Rescue Workshop, New Zealand reiterated its commitment to reducing risks throughout Antarctic operations.
- (32) In relation to Article III-2 of the Antarctic Treaty, the Meeting received reports from other international organisations.
- (33) WMO presented IP 92 *WMO Annual Report 2018-2019*. WMO stated that it had 193 member States and Territories, and that it had submitted six papers to the ATCM covering a variety of issues, including The Year of Polar Prediction (YOPP) 2017-2019 (IP 94), the International Programme for Antarctic Buoys (IP 93), and the Antarctic Regional Climate Centre Network (IP 164). WMO reaffirmed its commitment to maintaining positive, mutually-beneficial engagement with Parties and other interested organisations.
- (34) ASOC presented IP 129 *ASOC Report to the ATCM*, which outlined work relevant to the ATCM that it had undertaken in the past year. ASOC also

highlighted its key priorities for the ATCM, including: adopting proactive management measures for tourism; implementing a systematic conservation planning process to expand the protected areas system; adopting management measures that could promote ecosystem resilience in an era of climate change; exploring methods of reducing microplastic pollution; taking steps to mitigate the impacts of shipping on the Antarctic environment and on cetaceans; and supporting efforts to increase marine protection in the Southern Ocean. Noting that 2019 was the 60th anniversary of the Antarctic Treaty, ASOC stressed that this was a critical time for the ATCM, which must address both increased human activity and greater climate change impacts. ASOC urged the Parties to take immediate action to implement stricter environmental protections.

- (35) IAATO introduced IP 139 *Annual Report of the International Association of Antarctica Tour Operators*. IAATO noted that its membership currently comprised 116 Operators and Associates representing businesses based in 16 different Antarctic Treaty Party countries. Reflecting on the 2018/19 Antarctic season, IAATO observed that its Operators had carried nationals from nearly all Parties in addition to nationals from a further 54 non-Treaty Party countries. It highlighted that the season had run smoothly with no incidents to report. The total number of visitors traveling with IAATO Operators was 56,168, which represented an increase of 8.6% compared to the previous season. While this growth represented a new high, IAATO underlined that this was in line with expectations. Finally, IAATO highlighted many of its initiatives that supported its mission of safe and environmentally responsible private sector travel to Antarctica.

Item 5: Report of the Committee for Environmental Protection

- (36) Ms Birgit Njåstad (Norway), Chair of the Committee for Environmental Protection, introduced the report of CEP XXII. The CEP had been attended by representatives of 37 of its 40 Members (Parties to the Environment Protocol). CEP XXII had considered 48 Working Papers and 75 Information Papers as well as a number of Secretariat Papers and Background Papers, making this a record year in terms of numbers of papers considered. The Chair of the CEP noted that she would highlight items where the matters discussed in the CEP had also been scheduled for discussion in the ATCM, the matters related to priorities and tasks in the ATCM, and matters on which the CEP had agreed specific advice to the ATCM, but encouraged Parties to review all parts of the CEP Report.

- (37) The Meeting congratulated the CEP on its work and noted the ongoing significance of the Committee's role in advising the ATCM on the implementation of the Protocol and protection of the Antarctic environment. In this regard the Meeting emphasised the importance of the dialogue between the Committee and the ATCM.

Strategic Discussions on the Future Work of the CEP (CEP Agenda Item 3)

- (38) The Chair of the CEP advised that the Committee had considered the report on the outcomes of the Antarctic Tourism Workshop held from 3 to 5 April 2019 in Rotterdam, which had brought forward a number of relevant recommendations for the CEP to consider. The CEP had agreed to progress the recommendations by: inviting SCAR, in collaboration with others, to offer advice regarding the design of an environmental monitoring programme on the impacts of tourism; by including in its Five-year Work Plan the development of a framework for pre-assessments of new or particularly concerning activities; and by establishing an ICG to address the existing guidance for all visitors to the continent, with a view to strengthening that guidance.
- (39) The Meeting commended the CEP for its work over the previous week, and expressed its thanks and congratulations to the Netherlands for having organised the highly successful workshop. Several Parties shared their support for the recommendations, and stressed in particular the importance of creating a general framework for Antarctic visitors that could apply to all visitors to the continent, regardless of whether they were tourists or other actors. The Meeting also warmly welcomed the offer of Germany to convene and lead the new CEP ICG, and looked forward to receiving further advice from the Committee.
- (40) Noting the CEP's invitation to SCAR to offer advice, the United States hoped that SCAR would take into account information included in the 2012 CEP Tourism Study, and past SCAR-COMNAP workshops on environmental monitoring.
- (41) The Chair of the CEP noted that the Committee had updated its Five-year Work Plan to incorporate actions that had arisen during the meeting.

Cooperation with other organisations (CEP Agenda Item 5)

- (42) The Meeting welcomed the valuable contribution from SCAR and other Observers and Experts to support the work of the Committee.

Repair and Remediation of Environment Damage (CEP Agenda Item 6)

- (43) The Chair of the CEP noted that the Committee had considered the outcomes of a review of the Antarctic Clean-Up Manual (Resolution 2 [2013]), which had been conducted under the leadership of Australia. The Committee had endorsed the revised Clean-Up Manual and agreed to forward to the ATCM for approval a draft Resolution encouraging its dissemination and use. In addition, the Committee requested that the ATCM note the ICG's summary of developments and advances in clean-up since 2013 (held in Attachment C to WP 46), which showed that a substantial body of clean-up related scientific literature had become available, and clean-up activities and experiences had been reported to the CEP by Parties in this period.
- (44) The Meeting thanked the CEP for its work and its recommendations, as well as Australia for its leadership in this matter. Several Parties noted the timeliness of this revision in light of the 2020 deadline to establish a time frame for the resumption of negotiations on liability as agreed in Decision 5 (2015). Some Parties noted the importance and usefulness of the manual being kept up-to-date and accessible.
- (45) The Meeting adopted Resolution 1 (2019) *Revised Antarctic Clean-Up Manual*.

Climate Change Implications for the Environment (CEP Agenda Item 7)

7a. Strategic Approach

- (46) The Chair of the CEP reported that the Committee had considered several papers that discussed the scientific information on how a 1.5°C global average temperature increase scenario could impact the Antarctic Peninsula.
- (47) The CEP Chair remarked that the Committee had noted that it was important for the CEP to remain informed about climate change and to take a leadership role in considering the implications of a climate change for the Antarctic environment, including the implications of warming beyond a 1.5°C scenario.
- (48) The Committee had further: called for additional climate change research and monitoring to improve the basis for decision making; observed that it had to act in a precautionary manner and take action on the information already available; encouraged scenario studies of other areas of Antarctica; noted the importance of taking anticipated changes into account in management tools and guidance material; emphasised the considerable regional variations in climate change and its implications, both for management actions and

long-term monitoring and research; and highlighted the need for a better understanding of the impact of combined pressures of human activities and climate change in Antarctica. The Committee had further called for the work of the Subsidiary Group on Climate Change Response (SGCCR) to be prioritised, for continued progress on the Climate Change Response Work Programme (CCRWP), and for more Members to participate in their work.

7b. Implementation and Review of the Climate Change Response Work Programme

- (49) The CEP Chair recalled Resolution 4 (2015), which encouraged the CEP to begin implementing its CCRWP as a matter of priority, and to provide annual progress reports to the ATCM on its implementation. On this basis, the Committee had considered the report and recommendations of the SGCCR, which was mandated to facilitate the coordination and communication of the CCRWP and to suggest updates to it. Most Members had expressed general support for the recommendations from the SGCCR, but one Member had expressed doubts regarding their adoption at this time.
- (50) The Committee had agreed that the SGCCR could apply the suggested new format for the CCRWP to relevant climate issues within the work programme. The CEP Chair noted that the SGCCR would continue its work under the existing terms of reference as adopted through Decision 1 (2017), and that the Committee had encouraged active participation from all interested Members, Observers, and Experts.
- (51) The Meeting emphasised the fundamental importance of understanding the implications of climate change in Antarctica and the necessity of acting on the basis of the existing science. Most Parties expressed their regret that consensus could not be reached on all the recommendations put forward by the SGCCR, and urged Parties to actively support the continuation of this work as a priority.
- (52) While noting the importance of addressing climate change within the framework of the ATCM, China commented that more research and monitoring efforts were required in order to understand the impacts of climate change on the Antarctic. China expressed its willingness to continue working with other Parties in this regard.

Environmental Impact Assessment (EIA) (CEP Agenda Item 8)

8a. Draft Comprehensive Environmental Evaluations

- (53) The Chair of the CEP reported that the Committee had discussed in detail the draft Comprehensive Environmental Evaluation (CEE) prepared by the United States for the 'Continuation and Modernization of McMurdo Station Area Activities'. The Committee had also discussed the report of the ICG established to consider the draft CEE in accordance with the Procedures for Intersessional CEP Consideration of Draft CEEs. The CEP advised the ATCM: that the draft CEE generally conformed to the requirements of Article 3 of Annex I to the Protocol on Environmental Protection to the Antarctic Treaty; that there were some aspects for which additional information or clarification could be provided in the final CEE to enhance its comprehensiveness; that information provided in the CEE supported the conclusion that the impacts of some activities within the project would have a greater than minor or transitory impact; and that this level of EIA had been appropriate for this project. The CEP Chair reported that the Committee had welcomed the United States' commitment to respond to issues raised and had encouraged the United States to take into account the Committee's advice when preparing the required final CEE.
- (54) The United States expressed its gratitude to the Committee for its suggestions and, in particular, the Republic of Korea for its efforts in convening the ICG. It noted that the ICG's input would assist the United States in preparing its final CEE.
- (55) Noting the time-scale and scope of this project, the United Kingdom highlighted that Annex I was now dated compared to modern EIA requirements and urged the CEP to consider how to make the EIA process more adaptable to a modern context, while keeping extremely high standards of environmental assessment.
- (56) The Meeting thanked the United States and the Republic of Korea for their work and agreed to the advice from the CEP. Many Parties noted that the final CEE could appropriately set a high standard to inform other ongoing and planned modernisation projects.

Area Protection and Management Plans (CEP Agenda Item 9)

9a. Management Plans

- (57) The CEP Chair reported that the Committee had considered nine revised management plans for Antarctic Specially Protected Areas (ASPAs) and two revised management plans for Antarctic Specially Managed Areas (ASMAs), and had agreed to forward each of the revised management plans to the ATCM for approval by means of a Measure.
- (58) Accepting the CEP's advice, the Meeting adopted the following Measures on ASPAs and ASMAs:
- Measure 1 (2019) *Antarctic Specially Protected Area No 123 (Barwick and Balham Valleys, Southern Victoria Land): Revised Management Plan*
 - Measure 2 (2019) *Antarctic Specially Protected Area No 128 (Western Shore of Admiralty Bay, King George Island, South Shetland Islands): Revised Management Plan*
 - Measure 3 (2019) *Antarctic Specially Protected Area No 141 (Yukidori Valley, Langhovde, Lützow-Holm Bay): Revised Management Plan*
 - Measure 4 (2019) *Antarctic Specially Protected Area No 142 (Svarthamaren): Revised Management Plan*
 - Measure 5 (2019) *Antarctic Specially Protected Area No 151 (Lions Rump, King George Island, South Shetland Islands): Revised Management Plan*
 - Measure 6 (2019) *Antarctic Specially Protected Area No 154 (Botany Bay, Cape Geology, Victoria Land): Revised Management Plan*
 - Measure 7 (2019) *Antarctic Specially Protected Area No 161 (Terra Nova Bay, Ross Sea): Revised Management Plan*
 - Measure 8 (2019) *Antarctic Specially Protected Area No 171 (Narębski Point, Barton Peninsula, King George Island): Revised Management Plan*
 - Measure 9 (2019) *Antarctic Specially Protected Area No 173 (Cape Washington and Silverfish Bay, Terra Nova Bay, Ross Sea): Revised Management Plan*
 - Measure 10 (2019) *Antarctic Specially Managed Area No 4 (Deception Island): Revised Management Plan*
 - Measure 11 (2019) *Antarctic Specially Managed Area No 7 (Southwest Anvers Island and Palmer Basin): Revised Management Plan*

- (59) The CEP Chair noted that the Committee had also considered seven current management plans that had been reviewed and where no changes were suggested. For the following management plans, the Committee had agreed that existing management plans remained in force with the next reviews to be initiated in 2024 at the latest:
- ASPA 135 North-East Bailey Peninsula, Budd Coast, Wilkes Land
 - ASPA 136 Clark Peninsula, Budd Coast, Wilkes Land, East Antarctica
 - ASPA 143 Marine Plain, Mule Peninsula, Vestfold Hills, Princess Elizabeth Land
 - ASPA 160 Frazier Islands, Windmill Islands, Wilkes Land, East Antarctica
 - ASPA 162 Mawson's Huts, Cape Denison, Commonwealth Bay, George V Land, East Antarctica
 - ASPA 169 Amanda Bay, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica
 - ASPA 175 High Altitude Geothermal sites of the Ross Sea region
- (60) The CEP Chair also noted that the Committee had considered draft management plans for three proposed new ASPAs and had decided to forward the following three draft management plans for the following new protected areas to the SGMP for review:
- Antarctic Specially Protected Area at the Rosenthal Islands, Anvers Island, Palmer Archipelago
 - Antarctic Specially Protected Area at Léonie Islands and south-east Adelaide Island, Antarctic Peninsula
 - Antarctic Specially Protected Area at Inexpressible Island and Seaview Bay, Ross Sea
- (61) Noting recent examples of management plan reviews conducted remotely, Spain highlighted that the *in situ* monitoring of ASMAs and ASPAs was not always necessary and that remote monitoring, where appropriate, could minimise environmental impact.
- (62) China thanked the Committee for supporting its proposal for a new ASPA at Inexpressible Island, jointly proposed with Italy and the Republic of Korea. It stated that it would take seriously feedback it had received from CEP Members and looked forward to discussions in the SGMP to further develop the management plan.

9b. *Historic Sites and Monuments*

- (63) The CEP Chair reported that the Committee had considered two proposals for additions to the List of Historic Sites and Monuments.
- (64) Accepting the CEP's advice, the Meeting adopted the Measure 12 (2019) *Revised List of Antarctic Historic Sites and Monuments: Wreck of Sir Ernest Shackleton's vessel Endurance and C.A. Larsen Multiexpedition cairn.*
- (65) The CEP Chair reported that the Committee had considered two heritage issues under the terms of Resolution 5 (2001) regarding interim protection. The Committee had agreed that interim protection afforded to pre-1958 sites in accordance with Resolution 5 (2011) would apply to the historical remains at Camp Lake, Vestfold Hills, East Antarctica and, if its location were discovered, to the *San Telmo* wreck.
- (66) The Committee had also agreed to a new format of the list of Historic Sites and Monuments, incorporating eight new fields of information in addition to the current fields (as identified in Measure 9 [2016]). Those fields would be: Name, Type, Conservation Status, Description of the historical context, Applicable criteria in accordance with Resolution 3 (2009), Management tools, Photos, and Physical features of the environment and cultural and local context.
- (67) In agreeing to a new format for the HSM list, the Committee had also agreed a process that would allow merging of the existing HSM list into the new format in a transparent manner, and suggested that the new format of the list should not come into effect until that process had been completed.
- (68) The Meeting considered and approved a new format for the HSM list by adopting Decision 1 (2019) *Redesign of the Format of the List of Historic Sites and Monuments.*
- (69) The Meeting thanked the Committee for its work on HSMs, including its work to improve the content and format of the HSM list.

9c. *Site Guidelines*

- (70) Regarding the Committee's work on Site Guidelines, the CEP Chair noted that site guidelines for four sites had been revised: Torgersen Island, Arthur Harbor; Yankee Harbour; Half Moon Island; and Snow Hill Hut. The CEP had forwarded the revised Site Guidelines to the ATCM for adoption.

- (71) The Meeting considered and approved four revised Site Guidelines by adopting Resolution 2 (2019) *Site Guidelines for Visitors*.
- (72) The CEP Chair reported that the Committee had also endorsed the Site Guidelines for Visitors checklist. To encourage Parties to make use of the checklist, the CEP had asked the Secretariat to make the checklist available on the website and agreed to forward the checklist to the ATCM to encourage the use of the list by means of a Resolution.
- (73) Accepting the CEP's advice, the Meeting adopted Resolution 3 (2019) *Visitor Site Guidelines Assessment and Review Checklist*.

9d. Marine Spatial Protection and Management

- (74) The CEP Chair reported that the Committee had considered a report on informal discussions held by interested Parties to develop a response to the ATCM request in Resolution 5 (2017) "to consider any appropriate actions within the Antarctic Treaty Consultative Meeting's competence to contribute to the achievement of the specific objectives set forth in CCAMLR Conservation Measure 91-05" (WP 48). Most Members underlined the importance of responding to the request from the ATCM through Resolution 5 (2017) in a timely and responsive manner. The Committee had not been able to agree to initiate formalised discussions on this matter. The Committee had welcomed New Zealand's offer to continue to facilitate informal discussions during the coming intersessional period.
- (75) Many Parties expressed concern that work on marine harmonisation had not progressed as required by Resolution 5 (2017). The United States expressed its concern that in its view some Parties felt that this work could not proceed without CCAMLR approval of the Ross Sea region Marine Protected Area's Research and Monitoring Plan. The United States disagreed with any such rationale and noted that, if the ATCM was prevented from assisting with implementation of the MPA, the impacts on the MPA project would become the clear responsibility of those who were preventing progress.
- (76) Noting that the CEP was considering an ASPA proposal including a marine area within the CCAMLR Ross Sea MPA, the United Kingdom encouraged the CEP to consider this in the context of ongoing discussions on harmonisation.
- (77) The Russian Federation noted that discussions on harmonisation could also be enriched by relying on the discussions of the CEP-SCAR workshop on further developing the Antarctic protected area system.

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- (78) Some Parties observed that the harmonisation of spatial protection between CCAMLR and the ATCM was very complex and urged continued discussions to progress this important issue.
- (79) ASOC expressed its support for the current MPAs under discussion, as well as for discussion about a land, coast and sea connection when protecting areas. ASOC encouraged all Parties to support consultations on a wide network of MPAs.

9e. Other Annex V Matters

- (80) The CEP Chair noted that the Committee had also discussed issues relating to coastal camping coordination. The Committee had agreed to: encourage Parties and invited Experts with an interest in vessel-supported short overnight stays (VSSOSs) to participate in the ICG reviewing visitor site guidelines to ensure it considered short overnight stays in the updating of the guidelines; invite IAATO to work with member-operators to review the list of current camping locations and update the Committee as appropriate; invite SCAR and other relevant experts to develop criteria, with reference to IAATO's camp site selection criteria, that could be used in considering new camping areas for consideration by CEP XXIII; and add an item to the Five-year Work Plan to develop guidelines for short overnight stays, to ensure consistent application of best practices and minimise impacts to the Antarctic environment.
- (81) Spain thanked the United States and Canada for WP 67 noting the current lack of regulations on coastal camping activities. It highlighted that any new regulations, while important, should not impede the scientific productivity of National Antarctic Programmes.
- (82) The CEP chair reported that the Committee had considered the recommendations arising from the Joint SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System, held in Prague, Czech Republic from 27 to 28 June 2019. The joint SCAR/CEP Workshop had been hosted by the Czech Ministry of the Environment at the Masaryk College in Prague and had been very productive and successful. The CEP Chair reported that the Committee had agreed to a number of actions based on the outcomes from the workshop and placed these on the Committee's Five-year Work Plan for further progress in the coming years. In accordance with its role to provide advice on the operation and further elaboration of the Antarctic Treaty System, the CEP Chair reported that the Committee

had agreed to advise the ATCM that it had considered a draft report on the State of the Antarctic Protected Area System (held in WP 70 Attachment A), which was an objective report and not an evaluation or assessment. The CEP Chair reported that the Committee had agreed to forward the report to the ATCM. The CEP Chair also noted that the Committee had agreed that further discussion on the de-designation of ASPAs was required and welcomed the offer from Norway to lead further intersessional work and report back to CEP XXIII.

- (83) The Meeting thanked the CEP for the report of the Joint SCAR/CEP Workshop and noted its contents. Several Parties highlighted the need for a systematic and integrated approach to the ASPA system, and reiterated the need to ensure that the development of the protected area system was informed by the best available science. Recognising the substantial efforts of all those involved in organising the SCAR/CEP Workshop, several Parties reiterated the importance of international collaboration, and close and continuing engagement by SCAR, in furthering work to align the protected area system with the objectives of the Protocol.

Conservation of Antarctic Flora and Fauna (CEP Agenda Item 10)

10a. Quarantine and Non-native Species

- (84) The CEP Chair reported that the Committee had considered and agreed to a *Non-native Species Response Protocol* and had noted that responding to non-native species invasion had high importance. The Committee had agreed that the Protocol would be a useful tool for Parties, and furthermore had agreed to append it to the CEP Non-native Species Manual. The Committee had also agreed to request that the Secretariat add the Non-native Species Response Protocol to the CEP Non-native Species Manual, make it available on the ATS website, and encourage its broad use.
- (85) The CEP Chair also reported that the Committee had considered an update of the SCAR/COMNAP “*Checklists for supply chain managers of National Antarctic Programs for the reduction in risk of transfer of non-native species*” and that the Committee agreed that the updated checklists would replace the version currently found in the CEP Non-native Species Manual. The Committee had also agreed that Members would encourage their National Antarctic Programmes and other supply chain managers and operators in their countries to use the checklists on a voluntary basis.

10b. Specially Protected Species

- (86) Referring to information presented in IP 41, particularly concerning emperor penguins, Germany noted that Annex II could be more flexible than ASPAs with respect to species-related management options.
- (87) Germany also reported that it fully supported SCAR's work on improving knowledge on the impacts of underwater anthropogenic noise. It urged Parties to encourage their competent authorities to take the effects of anthropogenic noise into account, and provided information to the Meeting on a research project it had launched on the topic.

10c. Other Annex II Matters

- (88) The CEP Chair noted that the Committee had considered SCAR's Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica, as detailed in WP 17. The Committee had endorsed the Code of Conduct, and had agreed to forward it to the ATCM for approval by means of a Resolution.
- (89) The Meeting agreed to adopt Resolution 4 (2019) *Scientific Committee on Antarctic Research's Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica*.
- (90) The CEP Chair reported that the Committee had also considered the issue of anthropogenic noise in the Southern Ocean based on an update on the state of knowledge on this topic from SCAR. The Committee had emphasised the importance of understanding and addressing the effects of noise in marine environments. It had further encouraged research and other activities to address gaps in management-relevant knowledge regarding the impacts of noise on the Antarctic environment, and in particular, encouraged National Antarctic Programmes to follow up on this call.

Environmental Monitoring and Reporting (CEP Agenda Item 11)

- (91) The CEP Chair reported that the Committee had recognised that plastic pollution was a significant problem in Antarctica and the Southern Ocean that could have long-lasting environmental impacts. It had expressed wide support for taking steps to minimise impacts of microplastics and macroplastics in the region. The Committee had also agreed that there was scope for further work to progress actions and measures on this in future years.

- (92) The CEP Chair reported that the Committee had forwarded to the ATCM a draft Resolution recommending steps that could be undertaken to reduce plastic pollution in the Antarctic.
- (93) The Meeting thanked the CEP for raising this important topic, and many Parties reiterated their commitment to reducing plastics in the oceans.
- (94) The United Kingdom encouraged all those operating in Antarctica to consider the necessity of any plastic they use in the Treaty Area, particularly those that could explicitly or inadvertently add to microplastic pollution in Antarctica.
- (95) The Meeting noted that reducing the use of single-use plastics was key to this endeavour, and that macroplastic pollution should also be considered in the future.
- (96) The Meeting adopted Resolution 5 (2019) *Reducing Plastic Pollution in Antarctica and the Southern Ocean*.
- (97) The CEP Chair also noted that the Committee had discussed the Status and Monitoring of Antarctic Seal Species and that the Committee had agreed to urge SCAR and other scientists to increase research into Antarctic seal species. The CEP Chair noted that the Committee would undertake further work and discussions regarding the management of Antarctic seals.
- (98) New Zealand also drew the Meeting's attention to the Committee's discussion of the Antarctic Environments Portal. It noted that the Committee had reaffirmed the Portal's value as a key tool for providing objective summaries to decision-makers, welcomed SCAR's offer to assume management of the Portal in the coming year, and welcomed the contributions of some Parties to this end.

Inspection Reports (CEP Agenda Item 12)

- (99) The CEP Chair reported that the Committee had considered papers reporting on inspections conducted by Argentina and Chile between 17 February and 2 March of 2019.
- (100) The CEP Chair noted that the Committee had considered the three recommendations relevant for the Committee put forth by Argentina and Chile in WP 39 *General recommendations of the joint inspections between Argentina and Chile, in accordance with Article VII of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection*. The Committee had broadly supported these recommendations and had noted the usefulness

of follow-up reports on inspections by the Parties inspected, but had added that these reports, though useful, should not be mandatory.

General Matters (CEP Agenda Item 13)

- (101) The CEP Chair advised that the Committee had considered aspects of the French and Italian proposal for The Ice Memory Project. The Committee had recognised the scientific value of the project and had expressed broad support for the aims and underlying principles of the project. The Committee had agreed that further discussions on the implementation of the Ice Memory Project would be beneficial. It had called for further interaction and information in the planning process, particularly in relation to concerns raised regarding potential environmental risks.
- (102) Italy noted the complex logistics and technical challenges with this important project, and stated that it fully agreed that a CEE was required. Italy invited interested Parties to join the proponents of the project, referring to the need for strong international collaboration to achieve its strong scientific potential.
- (103) The Meeting thanked the Ice Memory Project's proponents for their excellent and comprehensive work, and expressed its support for the scientific value of the project. It noted the CEP's concerns regarding potential environmental risks and agreed that these should be addressed through further discussions by Parties on the implementation of the Ice Memory Project.
- (104) The CEP Chair reported to the Meeting that the Committee had received notice from Colombia that it was in the process of finalising the ratification of the Protocol. It had noted that Colombia would potentially become a CEP Member at CEP XXIII.
- (105) Colombia re-affirmed that it had completed the internal process of implementing the Environment Protocol and that it expected to deposit the necessary documents to complete the ratification process by the end of 2019. Colombia reiterated its commitment to contributing to efforts to protect the Antarctic environment.
- (106) China informed the Meeting that, following discussions in the CEP, it had shifted its efforts away from an ASMA proposal and would continue pursuing the development of a Code of Conduct for the Dome A area, as a self-regulatory effort to protect and manage the area. China expressed its hope that CEP Members and ATCM Parties would provide comments on the preparation of the Code of Conduct in the future.

Election of Officers (CEP Agenda Item 14)

- (107) The CEP Chair noted that the Committee had agreed to re-elect Dr Kevin Hughes from the United Kingdom to serve a second two-year period as CEP Vice-chair.
- (108) The Meeting warmly thanked Dr Hughes for his excellent work and contributions as CEP Vice-chair and congratulated him on his re-election.

Preparation for Next Meeting (CEP Agenda Item 15)

- (109) The Chair of the CEP noted that the Committee had adopted a Preliminary Agenda for CEP XXIII, reflecting the agenda for CEP XXII.
- (110) The Meeting acknowledged the CEP's immense efforts, especially in the face of an increased workload. Noting the continued increase in scientific and tourism activity across Antarctica, the Meeting suggested that a future priority for the CEP might be the re-assessment of its earlier work on cumulative impacts, and the inclusion of this in the EIA process.
- (111) The Meeting thanked Ms Njåstad for her comprehensive report on the work of the CEP, and for her wisdom and excellent leadership of the CEP. It also thanked the rapporteurs, interpreters and translators for their work.
- (112) The Meeting gave special thanks to Mr José María Acero of the Antarctic Treaty Secretariat for his long-standing service to the CEP. Recalling his previous work as a CEP delegate and his current role as the Secretariat's Assistant Executive Secretary, the Meeting acknowledged the importance of his work in supporting the CEP over many years.
- (113) The Meeting paid special tribute to the legacy of the former Prime Minister of Australia, the Honourable Bob Hawke AC, who passed away on 16 May 2019. The Meeting expressed appreciation for Mr Hawke's instrumental role in the creation of the Madrid Protocol with its indefinite ban on mining and recognised the importance he attached to protecting the environment of Antarctica. The Meeting expressed gratitude for the significant contribution Mr Hawke made to the Antarctic Treaty System.

Item 6: Operation of the Antarctic Treaty System: General matters

- (114) Argentina introduced WP 28 *Notification by the Consultative Parties of the list of Observers under Article VII of the Antarctic Treaty*, jointly prepared

with Chile. Argentina reminded the Meeting that Decision 7 (2013) provides for Antarctic Treaty Consultative Parties (ATCPs) to inform the Secretariat of the designation of observers under Article VII of the Antarctic Treaty, in addition to notification through diplomatic channels, and instructs the Secretariat to include only those observers notified through diplomatic channels in its contacts database. In practice, however, there had been a recent tendency for the Consultative Parties to forego the notification through diplomatic channels; instead, they have been using the Secretariat of the Antarctic Treaty as the sole information channel. Conscious of the fact that the current practice of only using the Secretariat as a means of notification is faster and more efficient, and with the aim of harmonising the ATCM procedures to such practice, Argentina proposed to amend Decision 7 (2013) accordingly.

- (115) The Meeting thanked Argentina for drawing its attention to the inconsistency between the official procedure and practice. The Meeting agreed that the communication of the names of designated observers and the notice of termination of their appointment through the Secretariat was a suitable and adequate means of communication in conformity with Article VII (1) of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection to the Antarctic Treaty.
- (116) The Meeting further agreed that Parties may still carry out such communication to each of the Consultative Parties via the traditional diplomatic channels, and also, that the list of appointed observers be kept on a restricted access section of the Secretariat website.
- (117) Following further discussions, the Meeting adopted Decision 2 (2019) *Notification by the Consultative Parties of the list of Observers under Article VII of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection to the Antarctic Treaty through the Secretariat of the Antarctic Treaty.*
- (118) Argentina introduced WP 42 *Report of the ICG on Organisational Aspects of the ATCM.* It recalled that Ecuador had been unable to host ATCM XLI as previously planned and that the Meeting took place successfully in Argentina, but with a particularly tight schedule, a reduced agenda and also having had to resort to the ATS budget. The ICG had been established to examine the implications and lessons learned from the organisation of ATCM XLI and CEP XXI, and to consider options for how best to manage a similar scenario in the future. Argentina reported that there was general agreement among ICG participants that future Host Countries should be encouraged to

submit regular informal progress reports on preparation for the next ATCM, setting out their plans and any specific arrangements made to date. Argentina reported that there had not been agreement among ICG participants on the idea of additional payments either to create a forward-looking guarantee fund or a backward-looking fee. Likewise, ICG participants had not supported the idea of an automatic loss of rights or penalties for a Party unable to host a future ATCM.

- (119) The Meeting thanked Argentina for WP 42, and ICG participants for sharing their comments and suggestions. The Meeting encouraged all upcoming ATCM Host Countries to submit a progress report to the ATCM in the form of an IP a year in advance, and for upcoming Host Countries to provide regular progress reports to the Secretariat. It also agreed that this suggestion should be included in the Organisational Manual that the Secretariat routinely provided to upcoming Host Countries. France noted that it would present such a paper at ATCM XLIII in Finland in 2020, where it would outline its plans for ATCM XLIV, which would be held in Paris in 2021.
- (120) The Executive Secretary presented SP 3 *List of measures with status “not yet effective”*, and reported that, according to the ATS database, there were several Measures that were not yet effective. These related to Measures adopted at ATCM XVI (Bonn, 1991), ATCM XXVII – CEP VII (Cape Town, 2004), ATCM XXVIII – CEP (Stockholm, 2005) and ATCM XXXII-CEP XII (Baltimore, 2009). Several Parties provided updates on their domestic implementation of Measures and Recommendations that were not yet effective:
- Japan reported that it had completed domestic procedures to approve Measure 1 (1991) *Exchange of Information* and Measure 12 (1991) *Seismic Data Library System*.
 - The Republic of Korea reported that it had approved Recommendation XV-5 (1989) *Human Impact on the Antarctic Environment: Environmental Monitoring in Antarctica* (Paris, 1989). With this approval, Recommendation XV-5 had entered into force. The Republic of Korea also reported that it had approved Measure 12 (1991) *Seismic Data Library System*, and noted that it was working to approve Measure 15 (2009) *Landing of Persons from Passenger Vessels*.
 - Argentina reported that it had almost completed the process of an Executive Decree towards approving Measure 15 (2009) *Landing of Persons from Passenger Vessels*.

- (121) Ukraine introduced WP 69 *Intention of Ukraine to accede to the Convention for the Conservation of Antarctic Seals (CCAS)*. Ukraine reported that it would like to request the United Kingdom, as the Depositary Government of the CCAS, to initiate the procedure for receiving notifications of the consent of all the Contracting Parties to the Convention to invite Ukraine to accede to CCAS. The Meeting thanked Ukraine for this paper.
- (122) Australia presented IP 153 *Strengthening Support for the Protocol on Environmental Protection to the Antarctic Treaty*, jointly prepared with France and Spain. Australia paid tribute to former Australian Prime Minister the Honourable Bob Hawke AC, who passed away on 16 May 2019. Australia recalled that Mr. Hawke, together with former French Prime Minister Michel Rocard and former Spanish President of the Government Felipe González, was instrumental in the negotiation and entry into force of the Environment Protocol. In accordance with Resolution 1 (2012) *Strengthening Support for the Protocol on Environmental Protection to the Antarctic Treaty and the 2016 Santiago Declaration on the 25th Anniversary of the signing of the Protocol*, the proponents of the paper worked with 13 other Consultative Parties in delivering démarches to eight Non-consultative Parties encouraging them to become a party to the Protocol on Environmental Protection.
- (123) The Meeting expressed its condolences to Australia on the passing of Mr. Hawke. The Meeting agreed that the ATCM should continue to encourage all Non-consultative Parties to adopt the Protocol, and several Parties expressed their willingness to join future démarches. The Meeting welcomed the efforts made by Colombia, which was in an advanced stage of the ratification process, and congratulated Colombia on its hard work.
- (124) The Russian Federation introduced WP 57 *The Antarctic Treaty in a Changing World*. Noting that 2019 marked the 60th anniversary of the Antarctic Treaty, the Russian Federation recommended enhancing cooperation between the Consultative Parties in identifying and addressing current and future trends that may affect the Antarctic Treaty System. The Russian Federation encouraged Parties to discuss these issues and to reflect the outcomes of those discussions in the Multi-year Strategic Work Plan.
- (125) The Meeting thanked the Russian Federation for its paper, which provided an important reflection on issues and challenges related to the protection and conservation of Antarctica. Parties affirmed that, over the past 60 years, the Antarctic Treaty System had endured and peacefully resolved a variety of challenges, and expressed their confidence in its ability to continue doing so.

- (126) The Meeting reaffirmed its commitment to the fundamental principles of the Antarctic Treaty, especially Article IV, which the Meeting saw as its indispensable cornerstone, noting that it had further affirmed this commitment through the Prague Declaration.
- (127) Following further discussion, the Meeting agreed to include a new item on the Multi-year Strategic Work Plan and to conduct informal consultations identifying relevant issues and trends which could include, *inter alia*, an overview of the application of Article IX (2) of the Antarctic Treaty; a general analysis of the relationship between the ATS and other relevant international legal frameworks; and consideration of Antarctic-related activities by persons that were not under the jurisdiction of States Party to the Antarctic Treaty. The Meeting requested the Executive Secretary to open the ATCM Forum for this purpose and accepted an offer from the Russian Federation to moderate the consultations.
- (128) The Meeting further agreed to consider the outcomes of these informal consultations and to identify issues and trends for further consideration at ATCM XLIII.
- (129) Belarus presented IP 96 *On the intention of the Republic of Belarus to request for the recognition of the Consultative Party status*. The paper outlined the history of Belarus' exploratory and scientific expeditions to Antarctica, as well as its Antarctic activities since 2006, when it acceded to the Treaty. These activities included: drafting domestic legislation necessary to approve recommendations and Measures adopted by the ATCM and later approved by all the Consultative Parties; becoming an associate member of SCAR; becoming a Member of COMNAP; constructing a wintering station, with the intention of developing a year-round scientific programme; and developing Belarus' international collaborations. Belarus reiterated its commitment to strengthening the Antarctic Treaty System and notified the Meeting that it intended, in the near future, to submit a request for Consultative status to the ATCM.
- (130) The Meeting thanked Belarus for its paper and the information provided on its Antarctic activities and its intention to submit a request for Consultative status in the near future.
- (131) The following papers were also submitted under this agenda item, and taken as presented:
- IP 56 *The Harmonisation of Turkish Law to the Protocol on Environmental Protection to the Antarctic Treaty* (Turkey). The

paper provided a brief report on Turkey's work towards the domestic implementation of the Protocol on Environmental Protection to the Antarctic Treaty.

- IP 73 *Antarctic Parliamentarians Assembly 2-3 December 2019: London* (United Kingdom). The paper provided information about an Antarctic Parliamentarians Assembly, to be hosted by the United Kingdom Parliament's All-Party Parliamentary Group for the Polar Regions, on 2-3 December 2019.
- IP 158 *The Finnish Chairmanship of the Arctic Council 2017-2019 "Exploring common solutions"* (Finland). The paper reported that the overarching themes of the Finnish Chairmanship of the Arctic Council were the UN 2030 Agenda for Sustainable Development and climate change in the Arctic, and reported on the progress made on those themes.

(132) The following paper was also submitted under this item:

- BP 9 *National legislation to implement and enforce the Environmental Protocol* (New Zealand).

Item 7: Operation of the Antarctic Treaty System: Matters related to the Secretariat

(133) The Executive Secretary introduced SP 4 rev. 1 *Secretariat Report 2018/19*, detailing the Secretariat's activities in the Financial Year 2018/19 (1 April 2018 to 31 March 2019). The report updated the Meeting on the intersessional activities undertaken by the Secretariat, which included updating the ATS website; editing, printing and distributing the Final Report of ATCM XLI; updating the online CEP Handbook; technical support to intersessional discussions held through both the ATCM and CEP Discussion Forums; updating the ATCM and CEP Rules of Procedure; and updating the Manual for Delegates and the Manual for the Submission of Documents to the ATCM.

(134) The Executive Secretary reported on the Secretariat's work in meeting the additional logistical and technical challenges posed by the change of Host Country for ATCM XLI, as well as its support of the Host Country Secretariat for ATCM XLII. The Secretariat also assisted the work of ATCM ICGs and informal discussion groups in the 2018/19 intersessional period, as well as the intersessional work of the CEP, which included subsidiary groups, informal

discussions and the Joint SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System.

- (135) The Executive Secretary informed the meeting of the following changes to Secretariat personnel:
- Mr Diego Wydler, current Information Technology Officer of the Secretariat, was selected as the new Assistant Executive Secretary and would be taking over the position on 16 July 2019. He would replace Mr. José María Acero, who was retiring.
 - Ms Violeta Antinarelli, Librarian of the Secretariat, retired on 31 December 2018.
 - Mr Walter Papaserge was appointed as a part-time Information Technology Specialist from 1 February 2019, replacing some of the current Information Technology Officer functions.
- (136) Regarding financial matters, the Executive Secretary noted that the extra organisation costs for ATCM XLI were projected to have been USD 321,700. The actual expenditure totalled USD 230,925, resulting in a deficit of USD 18,811 for the past financial year, which was covered by the General Fund as agreed by the Parties. In accordance with Financial Regulation 6.3, the Parties were notified of the Secretariat's cash surplus which took into account unpaid contributions.
- (137) The Meeting thanked the Secretariat for its report and for its efficient and cautious use of funds, as well as for its work meeting the challenges posed by the organisation of ATCM XLI. The Meeting also expressed its gratitude for the significant improvement of the translation and interpretation at the Meetings, which it deemed crucial for the success of the CEP and ATCM.
- (138) The Executive Secretary introduced SP 5 rev. 2 *Secretariat Programme 2019/2020*, outlining the activities proposed for the Secretariat in the Financial Year 2019/20 (1 April 2019 to 31 March 2020).
- (139) The Executive Secretary noted that the needs of the CEP and ATCM had evolved since the Secretariat's establishment in 2004. Given this, the Executive Secretary considered it necessary to conduct an analysis of the organisational structure of the Secretariat. To this end, he requested authorisation to contract an internationally recognised consulting firm to provide support for this analysis. The Meeting approved the expenditure to hire an external consulting service to support this analysis, and agreed that

it could be extracted from the general fund without affecting the proposed annual budget.

- (140) The Executive Secretary also introduced SP 6 *Five Years Forward Budget profile 2020/21–2024/25*. He stated that the budget profile assumed no major changes in the years 2020 to 2025 and amounted to a zero-nominal increase in contributions until 2024/25. He mentioned that the Secretariat would be inviting bids for translation and interpretation services, as the current contract would be ending.
- (141) Several Parties expressed their support and appreciation for the Secretariat and its maintenance of zero nominal growth, which allowed for contributions to remain consistent until 2024/25.
- (142) The Secretariat's Information Officer introduced SP 8 *The Secretariat Website* and provided a demonstration of the beta-version of the new website. He highlighted the improved user interface, the addition of workspaces relevant to the ATCM and CEP, and database interfaces that delegates would find useful. He thanked France and Australia for their contribution of images to the historical picture databank and invited delegates to browse the beta-version of the website and send their feedback to the Secretariat. It was announced that the final version of the website would be released during the second half of this year.
- (143) Several Parties commended the Secretariat for the improvements made to the website, noted that it was much more accessible, and stated that they looked forward to its timely completion.
- (144) Following further discussion the Meeting adopted Decision 3 (2019) *Secretariat Report, Programme and Budget*.
- (145) The Meeting thanked the Executive Secretary and the Secretariat for the detailed reports and acknowledged the important work undertaken by the Secretariat.
- (146) Argentina introduced WP 38 *Report of the Informal Discussions on Human Resource Policy for ATS*. Argentina recalled that, at ATCM XL, after reviewing matters related to the functioning of the Secretariat, the Meeting requested the Executive Secretary to develop a paper on human resource policy for the Antarctic Treaty Secretariat staff. In response to this requirement, the Secretariat presented SP 7 to ATCM XLI, which briefly listed the human resource policy issues that, in the opinion of the Executive Secretary, would be useful for the ATCM to consider. After considering SP 7,

ATCM XLI requested that the Secretariat develop a more detailed proposal and consider whether the staff regulations already in place at the CCAMLR Secretariat could be taken as a model. In order to facilitate discussion on these matters, Argentina agreed to lead informal discussions in consultation with the Secretariat.

- (147) Argentina summarised the comments and suggestions of those Parties that participated in the informal discussions, noting that the discussion focussed on the main topics described in the Secretariat's proposal: seniority, special and compassionate leave, unpaid leave of absence, performance evaluation, and retirement age. The Parties also agreed that special and compassionate leave, as well as unpaid leave of absence, should follow local law and international best practice, and be formally included in the staff regulations. Participating Parties had also concluded that there was a need to establish a regulation to determine a retirement age that was in accordance with Argentine law.
- (148) As a result of the informal discussions, Argentina recommended that the Meeting consider amending the Annex to Decision 3 (2003) on Staff Regulations.
- (149) The Meeting thanked Argentina for leading the informal discussions. It reiterated that the policy should be in line with local law and take international best practices into account.
- (150) Upon request, the Secretariat informed the Meeting that the proposed amendment of Regulation 10.5 of the Staff Regulations regarding involuntary separation of service would not have any immediate budgetary implications. The amendment would, however, require the Secretariat to request authorisation to establish a new "Involuntary separation from service" fund to be filled to a suitable level from the General Fund. Following this explanation, the Meeting authorised the Secretariat to establish a new fund for these purposes.
- (151) With respect to leave entitlements, Argentina informed the meeting that a footnote was added to the Staff Regulations to clarify that point 7.10, 7.11, and 7.14 stem from Argentine Law. Some other Parties noted that the purpose of the footnote was to note the source of the benefits, not to prejudge decisions by future ATCMs and the Secretariat about those benefits.
- (152) The Meeting agreed to make two amendments to the staff regulations with respect to gender, to better align the regulations with international best practice. It agreed that, in the text of Staff Regulations, reference to staff

members in the masculine gender shall apply to staff members of both sexes, unless it was clearly inappropriate from the context to do so. The Meeting further agreed that, with respect to the composition of Secretariat staff, qualifications being equivalent, gender and geographic balance would be taken into account when selecting candidates.

- (153) In response to a query from some Parties, Argentina stated that matters pertaining to disciplinary procedures and legal recourse in the case of disputes had not been discussed intersessionally. The Meeting agreed that further discussion on these matters was required.
- (154) The Meeting also agreed to further consider the need for performance review mechanisms within the Secretariat. While some Parties preferred 360-degree and external feedback mechanisms, other Parties expressed the view that the choice of review mechanism should remain the responsibility of the executive staff of the Secretariat. Some Parties also suggested that discussions could be initiated to introduce a mechanism by which the Parties could provide feedback on the Executive Secretary's performance.
- (155) With respect to seniority and salary scale, Parties had requested the Secretariat to consider a new general staff salary scale. The Meeting considered four alternative amendments to the salary scale put forward by the Secretariat. It was agreed that there was a preference for those alternatives that would not have budgetary implications. To reach agreement on a revised salary scale, the Meeting requested the Secretariat to consider whether a more dynamic salary scale could be an additional option to avoid inequalities between new and existing staff, as well as significant budgetary implications.
- (156) The Meeting agreed to continue the considerations of these outstanding issues of the Staff Regulations at ATCM XLIII.
- (157) Following further discussion, the Meeting adopted Decision 4 (2019) *Staff Regulations for the Secretariat of the Antarctic Treaty*.
- (158) The following paper was also submitted under this item, and taken as presented:
- IP 125 *Pasantía en la Secretaría del Tratado Antártico* (Colombia). This paper reported on an internship undertaken by a representative of the *Ministerio de Relaciones Exteriores de Colombia* at the Antarctic Treaty Secretariat.

Item 8: Liability

- (159) As agreed at ATCM XLI, the Chair reported that the Secretariat, on behalf of the Parties, had renewed the invitation to the IOPC Funds, the IGP&I Clubs and the IMO to provide advice on issues relating to Annex VI to the Protocol. The Meeting welcomed the participation of these groups.
- (160) The IOPC Funds presented IP 155 *The International Oil Pollution Compensation Funds (IOPC Funds)*, which introduced the IOPC Funds' policy on claims for pollution damage. The IOPC Funds noted that its framework of liability and compensation for oil pollution damage was broad and well-established, as it had 40 years of experience in dealing with pollution accidents. It noted its considerable experience with dealing with oil spills, and drew Parties' attention to the fact that 116 States were Parties to the 1992 Fund Convention, including most Parties of the Antarctic Treaty.
- (161) Five types of pollution damage were highlighted by the IOPC Funds in IP 155: property damage; costs of clean-up operations at sea and on shore; economic losses by fishermen or those engaged in mariculture; economic losses in the tourism sector; and costs for reinstatement of the environment. The IOPC Funds observed that, while damage to property would be covered in the event of an accident in the Antarctic, the cost of reinstatement to environment was particularly important when considering the Antarctic environment. It suggested that international criteria, which had been codified in its Claims Manuals, could be applied in the Antarctic context.
- (162) The IOPC Funds noted that, with respect to claims for environmental damage, compensation was not paid based on an abstract quantification nor for damages of a punitive nature; instead, preference was given to Net Environmental Benefit Analysis (NEBA) and Spill Impact Mitigation Assessment (SIMA) methods, which compared options that offered an appreciable environmental and/or economic benefit with natural recovery alone. In concluding, the IOPC Funds offered its continuing expert assistance to the ATCM in the furtherance of the entry into force of Annex VI, and invited the ATCM to request an Observer status in the Meetings of the IOPC Funds' governing bodies, so as to better facilitate a sustained and informative interaction between the stakeholders.
- (163) The Meeting thanked the IOPC Funds for their presence and informative presentation, which it considered would prove helpful in the advancement of the adoption of Annex VI.

- (164) Many Parties highlighted the IOPC Funds' wealth of experience in addressing oil spills, and its conclusion that international criteria pertaining to oil spills would be applicable in the Antarctic context. The significance of the pre-existing knowledge and expertise on addressing oil spills that was available outside the ATS was underlined, and also the importance of many Parties already being engaged in the work of the IOPC Funds.
- (165) Some Parties noted the importance of harmonising international regulations regarding insurance with domestic legislation, as well as the importance of standardising regulations and of finding the equilibrium of limits of liability within different systems in order to eliminate legal uncertainty.
- (166) Noting that the number of both private and governmental ship-bound voyages to Antarctica was rapidly growing, Parties highlighted that the urgency of implementing Annex VI was higher than ever before, and that cooperation with insurance and liability expert bodies offered significant potential benefits.
- (167) The IGP&I Clubs presented IP 101 *Annex VI to the Protocol on Environmental Protection to the Antarctic Treaty: Financial Security* and thanked the Meeting for this opportunity to continue the discussion on Annex VI in which it had already participated at ATCM XL. As the IGP&I Clubs represented a consortium of 13 underwriting associations providing third party liability to approximately 90% of the world's ocean-going tonnage, it noted that most vessels in Antarctic waters would have insurance cover with one of their members. This insurance included cover for environmental damage from ship-sourced pollution damage and the preventive measures taken to reduce the risk of the occurrence of any such damage, and would in principle cover liabilities of ship-owners as prescribed under Article 6 of the Annex.
- (168) In IP 101, the IGP&I Clubs introduced its views on a number of specific issues following on from its earlier observations in ATCM XL - IP 87 (*Liability Annex: Financial Security*). IGP&I Clubs emphasised that, as global insurance companies, the Clubs supported robust international regulation of insurance as this provided harmonisation and legal certainty. It would therefore continue to do its best to assist the ATCM in its work wherever it could. The IGP&I Clubs drew the attention of the Meeting to the relationship between the limits of liability as enshrined in Annex VI Article 9 and the 1976 Convention on Limitation of Liability for Maritime Claims and its Protocol of 1996. Owing to developments in the Limitation of Liability for Maritime Claims (LLMC) regimes since 1996, it noted that

there were several different limits of liability in existence with a possibility that the disparity could increase in the future. Noting that Annex VI limits had fallen behind those updated in the 1996 Protocol, the IGP&I Clubs highlighted that this might create some uncertainty for Parties, especially since the Annex VI limits had originally been set at the levels of the LLMC and the original intent may have been to maintain a degree of equivalence between the regimes.

- (169) The IGP&I Clubs also identified certain jurisdictional issues. It noted that problems may arise in situations where a claim was initiated under Annex VI simultaneously with proceedings in a State party to the 1976 LLMC Convention but not to the Annex. The Paper observed that this would raise the question as to whether the courts in such a circumstance would stay proceedings in light of the other related proceedings if already commenced, and whether the courts would recognise any such related proceedings. It was also observed that the power of the ATCM to triennially review the limits of liability set in Articles 9(1)(a) and 9(1)(b) under Article 9(4) might not in and of itself change Article 9(2)(a), where the limits remained worded as such. The IGP&I Clubs instead noted a more dynamic manner of revision might be desirable.
- (170) For Parties that had not yet implemented Annex VI domestically, the IGP&I Clubs suggested referring to the legislation of the United Kingdom, which had sought to deal with these and other relevant insurance matters in its Antarctic Act 2013. Finally, the IGP&I Clubs offered its continuing assistance and cooperation to the ATCM in the furtherance of the implementation of Annex VI.
- (171) Recalling its previous contributions to ATCM discussions, the IMO provided an update on its liability and compensation regime for incidents of pollution from oil, ships' bunkers, wrecks and hazardous and noxious substances. The IMO noted that the Convention on Civil Liability for Oil Pollution Damage had 139 Contracting States; the Convention on Civil Liability for Bunker Oil Damage had 94 Contracting States; the Convention on the Limitation of Liability for Marine Claims had 58 Contracting States; the Convention on the Removal of Wrecks had 44 Contracting States; and the 1992 Oil Pollution Compensation Fund Convention had 116 Contracting States. Further, the IMO observed that the majority of Parties were also Parties to the 1992 Oil Pollution Compensation Fund Convention. Recognising that implementation was a challenge, the IMO highlighted that the existing regime for liability and compensation for pollution damage to the marine environment was

comprehensive but complex. The IMO also recommended its Integrated Technical Assistance Programme to the ATCM as a model for encouraging further ratifications of Annex VI. Considering their common interest in liability, the implementation of the Polar Code, and IMO safety, security, and environmental regimes, the IMO suggested establishing a memorandum of understanding between the Antarctic Treaty Secretariat and the IMO, and invited the Secretariat to apply for IMO consultative status.

- (172) The Meeting thanked the IGP&I Clubs, IOPC Funds and the IMO for their valuable insights, and decided to extend invitations to the experts to attend ATCM XLIII. Some Parties stated that these updates provided reassurance that insurance cover could be provided for oil spills at sea. It was, however, noted that there may be an issue with the provision of insurance with regards to land-based environmental emergencies. In order for the Meeting to consider issues regarding land-based environmental emergencies involving aircraft, the Meeting agreed to also extend an invitation to the International Civil Aviation Organisation (ICAO) to attend ATCM XLIII as an external expert.
- (173) Recalling Decision 5 (2015), the Meeting discussed the 2020 deadline for taking a decision on the establishment of a time frame for the resumption of negotiations on liability, in accordance with Article 16 of the Protocol. While stressing the distinction between the resumption of negotiations on liability in accordance with Article 16, and amending Annex VI, some Parties also suggested that it may be necessary to update Article 9(2) of Annex VI upon its entry into force, in order for it to be brought into line with recent developments in other relevant liability instruments. While some Parties pointed to the complexities of amending a provision that had yet to enter into force, others noted that ship owners under the LLMC already had to insure their vessels for environmental damage in Antarctica as in other parts of the world, and that reviewing Article 9(2) might ultimately assist the Parties that were yet to ratify it.
- (174) The Meeting agreed to request the Secretariat to prepare a report, summarising all relevant Measures and Resolutions and previous advice from the CEP relating to environmental remediation and liability matters, in the intersessional period. The Meeting also requested that the Secretariat prepare a report on the limits of liability in relevant international instruments, to inform the considerations at ATCM XLIII on the implications of liability limits, for the potential future amendment of the limits in Article 9(2) of Annex VI.

- (175) The Russian Federation presented IP 112 *Approximate list, scope and character of response actions in the Antarctic as identified by the Antarctic Treaty System bodies*, which provided a follow-up to ATCM XL - IP 145 *Approximate list, scope and character of response actions*. It highlighted the need for discussion on national response actions by exchanging relevant national practices prior to the entry into force of the Annex VI. Having done an overview of experience existing within the ATS, the Russian Federation drew the Meeting's attention to a number of useful products and tools relevant to identifying the scope and character of response actions including COMNAP and SCAR's Antarctic Environmental Monitoring Handbook, the CEP's updated *Clean-Up Manual*, and the ATCM's *Guidelines on Contingency Planning, Insurance and Other Matters for Tourist and Other Non-Governmental Activities in the Antarctic Treaty Area*. Recognising the desirability of the entry into force of Annex VI, the Russian Federation urged all Parties to continue to adopt common approaches while relying on the relevant instruments existing within the ATS.
- (176) Consultative Parties provided updated information on the status of their approval of Annex VI, and implementation of Annex VI in domestic legislation. Of the 17 Parties that had approved Annex VI (Australia, Ecuador, Finland, Germany, Italy, the Netherlands, New Zealand, Norway, Peru, Poland, the Russian Federation, South Africa, Spain, Sweden, Ukraine, the United Kingdom and Uruguay), five reported that they were applying domestic legislation implementing Annex VI pending the entry into force of Annex VI (Finland, the Netherlands, Norway, the Russian Federation and Sweden). Other Parties noted that their legislation would enter into force when Annex VI came into force. Among Non-consultative Parties, Turkey advised that it had ratified Annex VI on 14 February 2017. Parties who had not yet done so were encouraged to provide information to the Secretariat regarding their domestic legislation implementing Annex VI and other relevant instruments.
- (177) Several Parties noted that they stood ready to share their experiences and to provide assistance to other Parties if requested.
- (178) The Meeting agreed to continue to evaluate the progress made by Consultative Parties to ratify and adopt Annex VI on Liability Arising from Environmental Emergencies, and thus bring the Annex into effect in accordance with Article IX of the Antarctic Treaty.
- (179) Parties that had not yet approved Annex VI were encouraged to do so as a matter of priority. It was noted that, while over half of the Consultative

Parties had approved Annex VI, it had been 14 years since the Annex was adopted, and that progress towards entry into force was slow. However, the Meeting commended the efforts of Parties that had been working towards implementation, and welcomed further reports on progress at ATCM XLIII.

Item 9: Biological Prospecting in Antarctica

- (180) Argentina informed the Meeting of the results of a series of informal discussions it had convened on biological prospecting during the 2018/19 intersessional period.
- (181) The Meeting thanked Argentina for its efforts to facilitate these discussions during the intersessional period, and many Parties highlighted the importance of these informal discussions.
- (182) The Netherlands introduced WP 12 *Information Exchange on Biological Prospecting*, and stated that the paper was of an administrative nature and did not introduce any new obligations or guidelines for the Parties to exchange information. It stressed that the paper focussed on facilitating the sharing of information using the Electronic Information Exchange System (EIES), and referred to the recommendations of WP 12 as a follow-up of Resolution 7 (2005), Resolution 9 (2009) and Resolution 6 (2013). The Netherlands proposed that the Meeting amend Decision 5 (2016) *Exchange of Information*, and revise the EIES to include lists of Antarctic biological material collected in the Antarctic Treaty Area as well as information on such material included in *ex situ* collections.
- (183) The Meeting thanked the Netherlands and expressed general support for the importance of strengthening the exchange of information. While some Parties supported amending the EIES to include data on the collection of biological material, other Parties had concerns with the proposals, in particular concerns that adding additional data elements would add unnecessary burdens to Parties, researchers and the EIES. With reference to their National Antarctic Programmes, some Parties pointed out that their governments only funded basic science in Antarctica, and access to data related to these collections was already publically available according to their established scientific practice.
- (184) Responding to the concerns raised, some Parties suggested that, with respect to information exchange on this topic, utilising the EIES could be made voluntary. Many Parties supported this idea, noting that voluntary information exchange could present a first step towards gathering

information on collection and use of biological material in Antarctica to inform future discussions on this topic. It was noted that it would be easier to define the term “biological prospecting” after having gathered information on biological material collected in Antarctica, in order to understand the scope of these activities. One Party questioned the utility of a voluntary information exchange.

- (185) Many Parties recalled previous Resolutions of the ATCM reaffirming that the Antarctic Treaty System is the appropriate framework for managing the collection of biological material in the Antarctic Treaty area and for considering its use. Several Parties pointed out that the Meeting should also take into account discussions within other international fora on the matter, including the ongoing negotiations in the United Nations General Assembly on a new implementing agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, and the World Intellectual Property Organization (WIPO).
- (186) Many Parties expressed the view that the lack of consensus on the definition of biological prospecting and the collection and use of biological material had been impeding discussions, and that a common understanding of the scope of the issue at hand could be beneficial for discussions to move forward. Noting that the term “biological prospecting” carried commercial connotations, many Parties considered that it might be helpful to change the agenda item to more accurately reflect the topic under discussion. Some Parties cautioned that changing the term used to refer to biological prospecting in Antarctica would not be enough to address the substantial concerns they held.
- (187) The Meeting discussed several questions related to the longstanding discussions that have taken place at previous meetings of the ATCM on this agenda item. Among the issues raised, and while many Parties stated that the Antarctic Treaty System was the competent framework for managing this issue, the Meeting reflected on whether Antarctica could become the only area where no international instrument was applicable for the collection and use of biological material. It was also asked whether there was a risk that regulation of this issue would be left to other international forums if the ATCM failed to meet its responsibility to regulate the collection and use of biological material in Antarctica.
- (188) In response, many Parties answered both of these questions in the negative and reiterated the importance of taking affirmative and prompt action to ensure that the collection and use of biological material was adequately

regulated. Noting while progress was slow, these Parties expressed the hope that with the benefit of SCAR's survey results discussions at ATCM XLIII would prove productive. Other Parties reiterated the need for a clear understanding of the scope and the regulatory necessity for creating another database for the collection of biological data and specimens.

- (189) ASOC reflected that while there had been a number of Resolutions regarding information exchange on biological prospecting in the past, progress on this issue remained slow. It further noted that biological prospecting and the collection of biological material took place and that it had an impact on the environment. ASOC supported the recommendation made in WP 12, stating that adopting the Decision would ensure that research carried out in the Antarctic Treaty Area would comply with the purposes of the Treaty and the Protocol.
- (190) SCAR presented IP 53 *Biological prospecting in the Antarctic: An update on the review by SCAR*. Recalling a request from ATCM XXXI to prepare a paper to inform the on-going discussions of biological prospecting, it informed the Meeting that it intended to undertake a survey of its members concerning biological prospecting. SCAR suggested that Parties may wish to encourage their national SCAR representatives to respond to the survey so as to maximise the returns and the comprehensiveness of the results. In providing a progress update, SCAR highlighted a number of challenges in establishing an accurate assessment of bioprospecting activity in Antarctica. These included that bioprospecting in most cases was not identified as a goal in research activity, and that other terms were often used in place of bioprospecting.
- (191) SCAR reminded the Meeting that there were a number of databases that contained useful Antarctic data on species, collection localities, and collections, including the Antarctic Biodiversity Information Facility, which was linked to Global Biodiversity Information Facility (GBIF), as well as the GenBank genetic sequencing database and the International Barcode of Life Database. Due to advances in technology, data consisted not only of actual specimens, but also of digital records of the genetic sequence data, and images of the specimens concerned. SCAR indicated that it intended to submit a full report, based on survey results, consideration of research literature, and a critical review of the existing databases, to ATCM XLIII.
- (192) The Meeting thanked SCAR for its paper. It agreed that the outcomes of the survey would facilitate further discussion on biological prospecting, and looked forward to considering the outcomes at ATCM XLIII. The Meeting

encouraged Parties to participate in the survey, and several Parties indicated their intention to do so.

- (193) Following further discussion, the Meeting agreed to continue informal exchanges of information through the ATCM forum, and to report back to ATCM XLIII. It noted that the Executive Secretary would open the ATCM Forum for this purpose and accepted an offer from Argentina and United Kingdom to co-moderate the discussions.
- (194) The Meeting further agreed to continue focused discussion on the collection and use of biological material in Antarctica at ATCM XLIII. These discussions would, where relevant, build on discussions during ATCM XLII on a possible voluntary exchange of information under the EIES.
- (195) The following paper was also submitted under this agenda item, and taken as presented:
- IP 146 rev. 1 *Biological Prospecting in Antarctica by ROICE Team – Romania* (Romania). This paper presented the results of three scientific expeditions in West Antarctica, King George Island, and Barton Peninsula, conducted by the National Institute of Research & Development for Biological Sciences – ROICE Team together with the researchers of the Korean Polar Research Institute (KOPRI).

Item 10: Exchange of Information

- (196) No papers were submitted under this agenda item.
- (197) The Antarctic Treaty Secretariat and COMNAP informed the meeting of their cooperation during the intersessional period since ATCM XL to improve the EIES by reducing duplication and increase compatibility across their respective databases.
- (198) The Meeting asked the Antarctic Treaty Secretariat to continue to improve the EIES during the next intersessional period, and to include this as part of the Secretariat's work programme.

Item 11: Education Issues

- (199) The United Kingdom introduced WP 13 *Two Hundred Year Anniversaries of the discovery of the South Shetland Islands and the Antarctic Continent*, which highlighted its promotion of two forthcoming historical anniversaries.

While stressing the importance of relying on evidence that had been validated by historians in public, peer-reviewed journals, the United Kingdom encouraged Parties to use these historical anniversaries to promote Antarctica to a wider audience. The paper, which traced the evolution of Antarctic science and exploration over a 200-year period, focused on the need to preserve the continent's environment, and to encourage greater diversity and inclusivity in Antarctic science.

- (200) The United Kingdom encouraged Parties to use the Education and Outreach Forum to share their own experiences, and to consider how they could collectively encourage all Antarctic Treaty System states and genders to engage with Antarctic science and policy issues. The United Kingdom recommended that the ATCM:
- encourage Parties to promote the anniversary of the discovery of Antarctica as a significant event in world history, using the 200th anniversary as an opportunity to highlight how human activity in Antarctica had moved from exploitation to protection and study; and
 - urge Parties to share examples and best practices of such activities on the Education and Outreach forum.
- (201) The Meeting thanked the United Kingdom for WP 13. Conscious of the fact that the history of the first sightings of Antarctica were not commonly agreed upon, a number of Parties highlighted their own histories of Antarctic exploration, and reflected on the importance of celebrating and disseminating information about these events. The Meeting observed that 2019 also marked 60 years since the Antarctic Treaty was signed, and noted that this provided an ideal opportunity to promote wider understanding of Antarctica as a whole. Several Parties reiterated that there was no expiration date for either the Antarctic Treaty or the Environment Protocol and that the various events taking place can be used to dispel these myths. The Meeting congratulated all Parties that were undertaking public activities during the upcoming year.
- (202) In relation to WP 13, Argentina stated that it was important for historical anniversaries to consider historical facts in their entirety. In this respect and regarding documented visits and sightings of Antarctica, Argentina stated that, during 2019, it would also carry out commemorative events of the bicentennial of visits and sightings which took place between 1818 and 1820, including the first documented visit of an Argentine vessel to Antarctica.
- (203) ASOC thanked the United Kingdom for the initiative and supported the idea of taking advantage of this anniversary to conduct education and outreach

on the importance of Antarctica as a place for peaceful scientific endeavours and environmental protection. ASOC particularly appreciated the focus on diversity since Antarctic science and policy were largely white and male, and stressed that better representation of all Antarctic Treaty System countries and genders would only strengthen the field. Additionally, at a time when the world was facing many international environmental challenges, Antarctica served as a positive example of cooperating for the common good. ASOC and its member organisations looked forward to undertaking activities to commemorate the anniversary and promote Antarctic marine protected areas and other environmental conservation efforts, and expressed a desire to promote similar activities from Parties, Observers, and Experts.

- (204) SCAR drew the Meeting's attention to its plans to celebrate the 200th anniversary of humans reaching Antarctica during the 2020 SCAR Open Science Conference, which would be held in Hobart. SCAR indicated that this conference would include a focus on the knowledge gained for humankind from activities that had taken place in Antarctica and the Southern Ocean. Recognising the importance of engaging all Antarctic Treaty System countries and genders, SCAR noted that it was in the process of developing further programmes for scientists from groups and nations that were not typically represented in SCAR activities. SCAR also highlighted its commitment to broaden the range of scientists involved in SCAR activities.
- (205) Bulgaria introduced WP 33 *Third report of the Intersessional Contact Group on Education and Outreach*, jointly prepared with Belgium, Brazil, Chile, Portugal, Spain and the United Kingdom, which reviewed the Group's activities during the two previous intersessional periods. Bulgaria reported that during the 2018/19 intersessional period, engagement in the ICG forum continued to grow. A total of 22 posts and 381 views had been made, with contributions from more than nine Parties, Observers and Experts. Examples of activities included an APECS-EPB Webinar on the Antarctic Treaty and the protection of the environment; the 4th annual APECS International Online Conference; and a Workshop on Polar Education organised by the University of Coimbra. Bulgaria reported that international educational activities such as Antarctica Day and the APECS International Polar Weeks were gaining momentum as focal points, and continued to bring an increasing number of polar scientists together. Bulgaria called on the ATCM to recognise the usefulness of the Forum on Education and Outreach and to advise Parties to continue to promote Antarctica and Antarctic research in their education and public outreach.

- (206) The Meeting thanked Bulgaria and the ICG participants for this paper. Several Parties underlined their continued commitment to education and outreach as one of the core elements of Antarctic cooperation and shared brief synopses of their recent education and outreach initiatives. Many Parties that had not previously participated in the ICG indicated their intention to participate in the forum discussion in the future.
- (207) The Meeting emphasised that education and outreach programmes were important not only for the purposes of informing the public about scientific work, but also for communicating the meteorological, atmospheric and oceanographic changes in Antarctica due to climate change.
- (208) The Meeting agreed to continue the ICG on Education and Outreach for another intersessional period, and agreed to the following terms of reference:
- Foster collaboration at both the national and international level, on Education and Outreach;
 - Identify key international activities/events related to education and outreach for possible engagement by the Antarctic Treaty Parties;
 - Share results of education and outreach initiatives that demonstrate the work of Antarctic Treaty Parties in managing the Antarctic Treaty area;
 - Emphasise ongoing environmental protection initiatives that had been informed by scientific observations and results, in order to reinforce the importance of the Antarctic Treaty and its Protocol on Environmental Protection;
 - Promote related education and outreach activities by Experts and Observers, and encourage cooperation with these groups;
 - Discuss the possibility for the creation of an Antarctic Education and Outreach section on the ATS website.
- (209) It was further agreed that:
- Observers and Experts participating in the ATCM would be invited to provide input;
 - The Executive Secretary would open the ATCM forum for the ICG and provide assistance to the ICG; and
 - Bulgaria would act as convener and report to the next ATCM on progress made in the ICG.

- (210) WMO presented IP 49 *An update on the World Meteorological Organization-Scientific Committee on Antarctic Research Joint Fellowship Programme*, jointly prepared with SCAR. Building on the success of the SCAR Fellowship Programme, WMO announced the May 2019 launch of a joint SCAR/WMO early career researcher fellowship programme. WMO noted that the topic of the fellowship would be relevant to priority areas of WMO and SCAR, and would expose fellows to recent advances in Antarctic research and help them to develop long-term links and partnerships. Recognising the importance of fostering diversity and inclusivity, WMO highlighted that applications from researchers in non-SCAR nations, and from nations that did not have established polar programmes, were particularly encouraged.
- (211) The following papers were also submitted under this item and taken as presented:
- IP 69 *Evaluation of Antarctic educational activities* (Portugal, Germany, United Kingdom). The paper presented a report on how to evaluate Antarctic educational activities related to biodiversity.
 - IP 95 *Results of PEI International Workshop on Education and Outreach April 2017, Rovereto, Italy* (Italy, Germany, India, Portugal). This paper reported on a Polar Educators International workshop held in April 2017 in Rovereto, Italy, and attended by 76 participants from 12 countries.
 - IP 98 *Education & Outreach by IAATO – an update for 2019* (IAATO). This paper provided a brief summary of IAATO's 2018 education and outreach activities, and advocated the benefits of visiting Antarctica when it comes to engaging people in the global value and importance of the region.
 - IP 113 *The Monument to Faddey Bellingshausen, Leader of the Russian South Polar Expedition* (Russian Federation). This paper outlined a plan to celebrate the 200th anniversary of the first sightings of Antarctica by erecting a monument to Faddey Faddeevich Bellingshausen (Fabian Gottlieb von Bellingshausen) at the Bellingshausen station.
 - IP 159 *Two Hundred Year anniversary of the Discovery of the Antarctic Continent 2020* (Estonia). The paper described Estonia's plans to commemorate the 200th anniversary of the first sighting of the Antarctic continent, including an expedition retracing the route of Bellingshausen's voyage from Kronstadt to Antarctica.
 - IP 162 *Recent Romanian Antarctic Education and Outreach Activities* (Romania). This paper shared numerous recent education and outreach activities in Romania, including international collaborations.

(212) The following papers were also submitted under this agenda item:

- BP 2 *Javier Lopetegui Torres. Por su capacidad visionaria y aporte al desarrollo de las actuales capacidades de Chile en la Antártica* (Chile).
- BP 11 *Engaging students in science education through polar research* (Poland).
- BP 12 *Antarctica 2021. Global Youth Leaders Expedition* (Canada).
- BP 14 *Colombia sede del XIX Encuentro de Historiadores Antárticos Latinoamericanos* (Colombia).
- BP 26 *Aplicación de Redes Sociales en la Difusión de la Ciencia y Cultura Antártica en el Ecuador* (Ecuador).

Item 12: Multi-year Strategic Work Plan

(213) The Meeting considered the Multi-year Strategic Work Plan adopted at ATCM XLI (attached to SP 1 rev. 2). It considered how to take each priority item forward in the coming years, whether to delete current priorities and add new priorities, and how to best facilitate collaboration between the working groups.

(214) Following the discussion, the Meeting updated the Multi-year Strategic Work Plan and adopted Decision 5 (2019) *Multi-year Strategic Work Plan for the Antarctic Treaty Consultative Meeting*.

Item 13: Safety and Operations in Antarctica

Seminar on the status and impact of hydrography in Antarctic waters

(215) Parties recalled that previous ATCMs had stressed the importance of hydrographic surveys in Antarctica, and that ATCM XL had welcomed a proposal by the International Hydrographic Organisation (IHO) to give a seminar on the importance of hydrography in the Antarctic region to the ATCM. The Meeting welcomed representatives from the IHO, noting the IHO's important work in using new techniques to collect, collate and analyse hydrographic data.

(216) Dr Mathias Jonas, Secretary-General of the IHO, Rear Admiral Patricio Carrasco, and Rear Admiral Tim Lowe CBE, presented to the Meeting on the history, current status, and importance of hydrography, particularly in Antarctic waters.

- (217) Dr Jonas discussed the important role that hydrographic information played in supporting safety of navigation and the creation of marine knowledge. Dr Jonas gave an overview of the IHO, and reminded Parties that the IHO stood ready to assist Parties in all marine-related activities by providing them with fundamental hydrographic data. He stressed the importance of collaboration between the IHO and ATCM in this regard. Dr Jonas reflected on the current drivers of globalisation and their impacts on transportation and preservation of the environment, noting that these were central to the work of the IHO.
- (218) Dr Jonas stated that the IHO thought globally and acted locally, and drew the Meeting's attention to the IHO's Hydrographic Commission on Antarctica (HCA). He explained that the HCA worked on improving the quality, coverage and availability of charting in Antarctica, monitoring user requirements, proposing new applications, and coordinating subsequent actions. While acknowledging the well-established relationship between the ATCM and IHO, Dr Jonas remarked that there were no limits to improving upon this relationship, and that the HCA welcomed new applications for the use of hydrographic data by interested Parties. He concluded by stating that coverage of the Antarctic region was still sparse, and that the IHO looked forward to working with Parties to determine how best to improve this.
- (219) Rear Admiral Patricio Carrasco remarked that it was a privilege for the Chilean Navy's Hydrographic and Oceanographic Service to present its work on user requirements for crowdsourced bathymetry. Noting the increasing volume of ship activity in Antarctica, he highlighted the importance of improving the quality of hydrographic information in order to facilitate marine science and safe navigation. While acknowledging the value of small-scale data collection in Antarctica, Rear Admiral Carrasco stressed that data collection on a much larger scale was needed, especially in coastal areas. He highlighted the work of the Hydrographic Prioritisation Working Group at the HCA.
- (220) Rear Admiral Tim Lowe CBE noted that hydrographic data was about much more than the production of charts. He stated that most advances in ocean science were based on improved access to and making better use of hydrographic and geospatial data. In this regard, he highlighted the importance of data centricity and noted that effective data management held potential for great impact in terms of environmental protection, sustainability, prosperity and security. While hydrographic geospatial data was an integral part of ensuring the sustained use of oceans, data for the oceans around

Antarctica was sparse. With reference to increased shipping activity around Antarctica, he noted that hydrographic data was key in ensuring safety at sea and informing regulations of maritime activities to avoid negatively impacting Antarctica's fragile ecosystem. He explained how geospatial data and the accompanying technology and standards could provide easy access to emergent, dynamic information such as weather and tides. This in turn could assist in improving disaster planning and response strategies.

- (221) With respect to new technologies, Rear Admiral Lowe explained that, although autonomous vessels, satellite derived bathymetry and the use of machine learning technology could be utilised in remote areas, they could also have an environmental impact on these areas and needed to be utilised safely. He illustrated the advantages of collaboration in the Antarctic region using the United Kingdom Hydrographic Office (UKHO) collaboration with the Hydrographic Offices of Colombia and Turkey as an example. He concluded by reiterating that hydrographic information drove the production of new marine knowledge.
- (222) Dr Mathias Jonas concluded the presentations by expressing a hope that the Rear Admirals had conveyed the importance of hydrography in Antarctica. He emphasised that significant advancements had been made in the development of technology for collecting and processing bathymetric data and that this had led the IHO to adopt a data-centric approach to its responsibilities. For example, the IHO could ingest a wide range of data to amass the "best available" bathymetry. The IHO could also offer Parties information that went beyond bathymetric charting, such as the geological nature of the sea bed and ocean salinity.
- (223) On behalf of the IHO, Dr Jonas encouraged the ATCM to consider means and ways to implement Resolution 5 (2008) *Hydrographic Surveying and Charting* and Resolution 5 (2014) *Strengthening Cooperation in Hydrographic Surveying and Charting of Antarctic Waters*. He also appealed to Parties to further collaborate with the HCA to set key objectives for hydrographic research in line with ATCM strategic targets and to consider allowing the HCA to report periodically to the ATCM on its progress implementing and making data publicly available through open data GIS services.
- (224) The Meeting thanked the IHO for the presentations, noting that they were clear and informative, and offered practical approaches to improving hydrographic knowledge of Antarctica.

- (225) Argentina emphasised the importance of hydrographic data, particularly in the Antarctic Peninsula region where it has shared SAR responsibilities with Chile and where retreating sea-ice, commercial fisheries and growing tourism were contributing to increased vessel traffic. Argentina noted, however, that there may be economic limitations as to the hydrographic work required, and asked if the IHO had mechanisms to facilitate data collection. The IHO replied that it depended on national partnerships.
- (226) The United States suggested that the IHO should also approach CCAMLR, and referred to the need for data in the Ross Sea Marine Protected Area, where scientific research was a priority. The IHO welcomed the suggestion.
- (227) The Russian Federation noted that financial constraints could hamper the collection of quality-controlled hydrographic data; that most national institutions focussed on specific areas of interest in Antarctica; and that data from ships of opportunity may be of lower quality. The Russian Federation proceeded to elaborate on past and future hydrographic research including the one presented in IP 110. It urged Parties to continue with hydrographic research in the spirit of the Treaty. The IHO congratulated the Russian Federation on its work and reminded the Meeting that, due to sparse coverage of data and improved methodologies, poorer quality controlled data was better than no data.
- (228) The United Kingdom noted that the IHO mentioned collaboration with IAATO and COMNAP and asked if it was collaborating with SCAR in terms of scientific priorities. In response, the IHO confirmed that, while they were collaborating, engagement with IAATO, COMNAP and SCAR could be further enhanced.
- (229) SCAR noted that it had long recognised the importance of bathymetric data, as reflected in SCAR's Expert Group on an International Bathymetric Chart of the Southern Ocean (known less formally as IBSCO), and as endorsed by the IHO and the Intergovernmental Oceanographic Commission (IOC). In particular, SCAR reiterated that high resolution bathymetric data was fundamental for understanding ocean circulation, biogeochemical cycles, and the movement of heat and freshwater on and off the continental shelf. This data was also key for understanding how the ocean interacted with ice shelves, which in turn were crucial for understanding Antarctica's contribution to sea level rise.
- (230) IAATO informed the Meeting that 70% of its current fleet provided hydrographic data from Antarctic voyages. IAATO further noted that it would

continue to contribute data in order to broaden knowledge about Antarctica and to improve operational safety.

- (231) COMNAP noted that it had an established relationship with the IHO and that COMNAP representatives attended annual IHO meetings as observers, and IHO observers were invited to relevant COMNAP meetings. COMNAP reported that, with one exception, National Antarctic Programmes were not their countries' National Hydrographic Organisations so they were not the IHO Member. It stressed the importance of strategic relationships built at the national level to improve data collection, submission and charting. COMNAP recognised the rapid advancement in technologies as presented, and noted that the use of hydrographic research equipment on aircraft was important and hoped further information on such technologies could be shared among National Antarctic Programmes. COMNAP suggested that the 2018 IHO *Guidance on Crowdsourced Bathymetry* could be updated to include guidance for airborne bathymetric data collection. The IHO welcomed COMNAP's advice and suggested that this documentation be updated accordingly.
- (232) The IHO thanked the Meeting for the opportunity to present, and noted that it looked forward to further collaboration. It highlighted that the points raised and discussed during the seminar would inform its priorities for hydrographic activities in the Southern Ocean.
- (233) The Meeting reiterated the importance of maintaining a strong focus on collaboration, both through data sharing and logistical coordination. Recognising that pre-season planning, particularly of vessel transits, played an important role in minimising duplication and maximising the opportunities to fill data gaps, the Meeting encouraged Parties to share their priorities and operational plans. Australia noted that it welcomed opportunities to work with other Parties in the data-sparse East Antarctic region in order to increase data availability.
- (234) Recognising the importance of data sharing, the Meeting encouraged National Data Centres to closely link with National Hydrographic Institutes. It encouraged Parties to strengthen their domestic connections with their respective hydrographic offices, in order to facilitate the efficient exchange of data.
- (235) The Meeting acknowledged that as technology had developed, the standard of available data had also increased. Recognising the value of collecting bathymetric data wherever possible, in order to further human understanding

of the sea floor, the Meeting agreed to work with SCAR, COMNAP and IAATO in coordinating hydrographic and bathymetric data.

- (236) The Meeting thanked the IHO and looked forward to future collaborations to improve the state of hydrographic knowledge in Antarctica and the Southern Ocean. The seminar ended.
- (237) Norway introduced WP 61 *Hydrographic Surveying of Antarctic Waters*, jointly prepared with Italy, New Zealand and the United States. Norway drew the Meeting's attention to the lack of data supporting our understanding of the shape of the seafloor within the Antarctic region. In this context, it cited and stressed the importance of recent international efforts developed to obtain, collect, and make discoverable bathymetric data at a global scale such as IHO Data Centre for Digital Bathymetry (DCDB), IHO Crowdsourcing WG and GEBCO Seabed 2030. Norway argued that it was important to develop a global digital crowdsourcing infrastructure that could help obtain, archive and publish bathymetric data, and to which every vessel with depth-measuring equipment (echo sounder) and the means to record data could contribute. Norway highlighted a memorandum of understanding on the collection of data from vessels that was signed between the Institute for Marine Research and the Norwegian Hydrographic Service as an example of best practice. Norway also recalled ATCM Resolution 5 (2008) and Resolution 5 (2014), and noted that the topic continued to be of high importance.
- (238) The proponents of the paper called for a renewed and strengthened focus on the full implementation of the existing resolutions. They encouraged the ATCM and the IHO to agree on a best way forward to ensure that the research vessels, and all vessels operating in the Antarctic region, record depth data and make the data available for scientific and public use, increasing ocean knowledge, and securing sustainable development of our oceans. The proponents of the paper recommended that the Meeting adopt the Resolution attached to WP 61. They also urged Parties to support and encourage hydrographic and bathymetric data owners to review existing data holdings for submission to the IHO DCDB where possible; as well as vessel operators and managers to collect new hydrographic and bathymetric data for submission to the IHO DCDB where possible.
- (239) The Meeting thanked the proponents of the paper, and expressed broad support for WP 61 and the attached Resolution. It acknowledged the continued lack of data available about the seafloor south of 60° South, and noted that the paper presented some practical solutions to a complex problem. Highlighting the importance of collaboration and data-sharing, the Meeting

expressed its appreciation to the IHO and HCA for their efforts to improve the quality of coverage and availability of hydrographic data in Antarctica. It also agreed to work with SCAR, COMNAP, and IAATO in coordinating and enhancing the collection and use of hydrographic and bathymetric data. Parties supported the proposal for the IHO to return to the ATCM in two years to discuss actions taken by Parties on this issue.

- (240) The Meeting recognised challenges posed by anthropogenic noise in the Southern Ocean, and highlighted the importance of minimising the impacts of human activity while collecting bathymetric data. It agreed that effective coordination between Parties was an important way of minimising marine traffic and thus mitigating impacts. To clarify the current state of knowledge on the risks of anthropogenic noise to marine mammals in particular, SCAR drew the Meeting's attention to WP 68 *Anthropogenic Noise in the Southern Ocean: An Update paper* for further information on the state-of-knowledge in this area.
- (241) While acknowledging that crowdsourcing could play a role in the collection of bathymetric data, Parties remarked that this should in no way release hydrographic offices from their responsibilities to produce official nautical charts for safety of navigation.
- (242) Following further discussion, the Meeting adopted Resolution 6 (2019) *Hydrographic Mapping of Antarctic Waters*.
- (243) Italy presented IP 48 *Italian Hydrographic Institute 30-yrns of exploration in Antarctica*, which detailed three distinct phases in the 30-year collaboration between the Italian National Antarctic Programme and the Italian Hydrographic Institute (IIM). The paper provided an overview of Italy's contributions to seabed mapping, oceanography, geophysics, topography and cartography, and highlighted the IIM's unique capabilities working in remote environments. Italy emphasised the ways in which it had contributed data used in scientific research and ocean mapping navigation activities, in particular with the GEBCO International Bathymetric Chart of the Southern Ocean (IBCSO), and its long-term cooperation with the Argentinian, Chilean and Peruvian Navies. Looking forward, Italy announced the recent acquisition of a new research vessel, the *M/V Laura Bassi*, which was named for the famous 18th century physicist and first Italian woman to be appointed professor.
- (244) Turkey presented IP 64 *Bathymetric Survey Activities of the Turkish Navy Office of Navigation, Hydrography and Oceanography in the Antarctic*

Region. Turkey described the bathymetric survey activities of the Turkish Navy Office of Navigation, Hydrography and Oceanography (TN-ONHO) in the waters near Horseshoe Island, and noted that this was part of the Turkish Antarctic Expedition-III (2019). Recognising that surveying was difficult in Antarctic conditions, Turkey stated that it would continue to undertake reliable hydrographic and oceanographic surveys in Antarctica, in order to contribute to improvement of human safety, hydrographic mapping and logistic support in the region.

- (245) Colombia presented IP 123 *Contributions from Colombia in the Elaboration of Nautical Charts in the Antarctic Peninsula*. It detailed the cooperation of the Colombian Antarctic Programme with the programmes of other Parties in oceanographic and hydrographic projects. It stated that collaborations with Chile in 2014/15 and the United Kingdom in 2017/18 had produced a number of detailed maritime surveys and charts of Antarctic waters. It also highlighted that collaboration with Magellanes University in Chile had helped to enhance understanding of glacial morphology, and to calculate loss of depth and thickness of glaciers. Colombia noted that it would continue its work within the framework of the Antarctic Hydrographic Commission. Identifying hydrographic surveying as its strength, Colombia invited other Parties to collaborate with it on projects in the future.
- (246) The IHO thanked the Meeting for dedicating a session to hydrography, and noted that this demonstrated that Parties recognised the importance of the subject. It highlighted two pillars of its work, namely the safety of navigation and that hydrographic information was vital for scientific activity. Reflecting on the importance of cooperation and coordination, the IHO acknowledged the roles of SCAR, COMNAP, and IAATO in the charting of Antarctic waters. It nevertheless stressed the importance of coordination between national research and science domains, as well as national hydrographic organisations. Finally, the IHO urged the Meeting to continue to strive for the best measurements possible, but to continue to work with any available data in the meantime, and noted that it would be happy to return.
- (247) The Meeting thanked the IHO and all those who presented information during the seminar. It was generally observed that scientists were now using technology that collected vast volumes of oceanographic data, and that curating this data in an accessible manner was a high priority. All Parties were also strongly encouraged to ensure that their data collection was linked to their national Hydrographic Offices.

(248) The following papers were also submitted under this agenda item, and taken as presented:

- IP 80 *Report on the tasks of the Naval Hydrography Service in the Antarctic Continent 2018/19* (Argentina). This paper described the activities of Argentina's Naval Hydrography Service to increase nautical safety and the protection of the Antarctic coastal and marine environment.
- IP 81 *United Kingdom Hydrographic Charting* (United Kingdom). This paper summarised recent work by the United Kingdom Hydrographic Office (UKHO), British Antarctic Survey (BAS) and the Royal Navy in the provision and usage of hydrographic data for navigation. It reported that the United Kingdom had been meeting its commitments under the Hydrographic Commission on Antarctica (HCA) to complete the 25 charts around the Antarctic Peninsula.
- IP 110 *Russian hydrographic studies in the Antarctic in the season 2019–2020* (Russian Federation). This paper described hydrographic and oceanographic studies in the Southern Ocean to be conducted by the Russian Federation to commemorate the 200th anniversary of the first sighting of Antarctica.

(249) The following paper was also submitted under this agenda item:

- BP 4 *Cartographic plan and update of nautical charts on Antarctica edited and published by Spain* (Spain).

Safety and Operations: Aviation

(250) COMNAP introduced WP 8 *Challenges that might occur in relation to increased air operations in the Antarctic Treaty area: A national Antarctic program perspective*, and presented IP 2 *Overview of aviation activity to inform ATCM discussions*. While noting that air operations were critical in support of Antarctic science, and that the level of air operations in Antarctica was low compared to other parts of the world, COMNAP stressed the need to reduce or mitigate any safety and environmental risks associated with this activity. COMNAP reminded the Meeting that the Antarctic Flight Information Manual (AFIM) included data on Antarctic airfields, and encouraged all Parties to ensure that they regularly updated the AFIM to ensure currency of information. Other information exchange tools included the COMNAP Antarctic Telecommunications Operators Manual (ATOM)

and the ATS EIES. COMNAP noted that technology was playing a role in the global aviation industry to de-conflict airspace, and that it was timely to consider this technology for use in Antarctic air operations. In particular, COMNAP drew attention to Traffic Collision Avoidance Systems (TCAS), Autonomous Distress Tracking (ADT) and Automatic Dependent Surveillance Broadcast (ADS-B). COMNAP advocated for enhanced sharing of information between Parties and all air operators concerning flights and other aerial operations. COMNAP further encouraged Parties to cooperate in developing better procedures for situational awareness about the activities of all air operations, including suggesting changes to information sharing with the COMNAP Secretariat.

(251) COMNAP proposed eight recommendations in the paper for consideration by the ATCM:

- To request that Parties share information of all proposed air operations, in advance of those operations, in order to de-conflict active airspace;
- To improve the clarity and completeness of the EIES Pre-season Operational Information, especially in regards to both “National Expeditions” and “Non-Governmental Expeditions” in the category “vessels” and “vessel-based expeditions”, respectively, to explicitly include a data field requesting information on any/all rotary-wing aircraft that will be in operation or carried on-board the vessel, dates of operation and areas of deployment;
- To improve the clarity and completeness of the EIES Pre-season Operational Information, especially in regards to both “National Expeditions” and “Non-Governmental Expeditions” in the category “aircraft” and “aircraft activities”, respectively, to explicitly include a data field requesting information on any/all Remotely Piloted Aircraft Systems (RPAS) that will be in operation, dates of operation and areas of deployment;
- To broaden the request as proposed by ATCM Resolution 1 (2013), paragraph 3c, currently operative as recommending that “national Antarctic operators... provide information for the purpose of maintaining the AFIM” to be more inclusive of all air operators, governmental and non-governmental alike. So as to strongly encourage Parties through their National Antarctic Programmes, their military involved in support to Antarctic operations and to non-governmental actors that intend to operate airfields or run air operations in Antarctic, to actively maintain through COMNAP the currency of their information which informs

the AFIM and ATOM, and ensured consistency of information across the various data repositories within the ATS;

- To request that all Antarctic air operators, government and non-governmental alike, ensure that they are aware of safety requirements, and have identified alternative landing sites and communicated in advance with those associated with any alternative landing sites, to ensure they are aware that they may be requested to be used as a back-up in an emergency situation;
- That technology advances will continue to support safe and effective air operations in Antarctica. Innovative existing technology now allows for tracking of aircraft in real-time, and Traffic Collision Avoidance System (TCAS). Such technologies should be considered mandatory for inclusion and regular use in all aircraft operating in Antarctica. Parties are encouraged to continue to invest in technologies that will improve efficiency, communications, collaboration and safety in operations;
- That any increase in air activity brings with it increased risks that must be managed or mitigated, and in cases of SAR or emergency it is the National Antarctic Programmes that are often called upon to respond. This should be considered when Parties are made aware of non-governmental applications for air activities that are not in support of science;
- That COMNAP has good awareness only of governmental air operations. Parties' Competent Authorities that are contacted by non-governmental entities who are proposing to undertake air activities in the Antarctic Treaty area, are encouraged to register that contact with the COMNAP Secretariat for situational awareness of the proposed non-governmental activity and to ensure that if the proposed non-governmental activity is permitted/authorised by the Competent Authority, that the entity is given access to the current release of the AFIM and is aware of the SAR agency with SAR responsibilities over the proposed area of operation.

(252) The United States introduced WP 11 rev. 1 *Aircraft Autonomous Distress Tracking*, and acknowledged the fact that Parties had always taken safety seriously. The focus on safety was exemplified by the COMNAP SAR workshop, held in New Zealand in May 2019. The United States recalled that ICAO would, as of 1 January 2021, require new commercial aircraft greater than 27,000 kg to have Autonomous Distress Tracking (ADT) capabilities. Such a system would broadcast at least once every minute the location of an aircraft whenever it was considered to be in a distress condition. The

United States recalled that all Parties to the ATCM were also members of ICAO and noted that state aircraft such as those used by military, customs, and police services, were not required to follow the new ICAO requirements, although they were welcome to do so. The United States further recalled that ICAO had intentionally not specified a technology for the ADT device. Considering the harshness and remoteness of the Antarctic environment, the United States proposed that all aircraft operators in Antarctica consider installing the ADT capability even if not required under ICAO standards. It also proposed that all aircraft operators, air traffic services units and rescue coordination centres consider developing efficient procedures for reacting to ADT notifications before 1 January 2021.

- (253) The United Kingdom introduced WP 23 *Improving Safety of Air Operations in Antarctica*, which encouraged the Parties to consider whether the air safety measures in place within the Treaty Area were fit for purpose. The United Kingdom recommended that the Meeting should consider revising Resolution 1 (2013) *Air Safety in Antarctica*, which was already six years old, as it observed that significant developments had taken place in aviation technology during the intervening period. The United Kingdom underlined that the COMNAP Antarctic Flight Information Manual (AFIM) remained crucial in presenting a common set of guidelines for air operations in Antarctica, and that its recent updates and online publication had improved its usefulness further. It pointed out that Resolution 1 (2013), which currently recommended certain actions by Parties in relation to the AFIM but only on a voluntary basis, left some actors, in particular new operators, unaware of the best practices enshrined in the AFIM. The United Kingdom suggested that adherence to the AFIM could be improved if Parties made it mandatory for their operators, as was the case with similar manuals in many other parts of the world. Also, in view of the recent increase in the use of small, private aircraft for sightseeing and similar purposes in Antarctica, the United Kingdom suggested that it would be useful for competent authorities to be able to direct operators to specific guidelines about operating safely in the Antarctic. On these grounds, the United Kingdom recommended that the ATCM: 1) request COMNAP to review ATCM Resolution 1 (2013) and provide advice to ATCM XLIII on whether elements of the Resolution should be updated or strengthened; 2) urge COMNAP to continue work on its position reporting system including incorporating information from non-governmental operators; and 3) request COMNAP to produce a list of safety equipment to be carried by all personned-flight operators within the Treaty Area.

- (254) The United Kingdom introduced WP 24 *Separation of Air Operations in Antarctica*, which recommended that all aircraft be fitted with Automatic Dependent Surveillance – Broadcast (ADS-B) systems. The paper observed that such devices came in various shapes and forms that might be deployed in a wide range of vehicles, from aircraft to small balloons and RPAS systems. The United Kingdom noted that, although this was a different system to the ADT introduced by the United States in WP 11, the technologies could be complementary. The United Kingdom also mentioned a position reporting system developed by COMNAP that could include all governmental and non-governmental aircraft equipped with positioning technology, and to which National Antarctic Programmes had access. The United Kingdom recommended that the ATCM: require the use of ADS-B 'in and out' systems in manned aircraft and helicopters operating in Antarctica; require all RPAS capable of operating beyond the visual range of the operator and untethered balloons with a payload greater than 2 kg to be ADS-B 'out' capable; request COMNAP to consider how a system of runway de-confliction could be implemented; support the continued development of the COMNAP position reporting system; and request that COMNAP consider whether it would be possible for the system to be accessed and inputted into by all permitted/authorised non-governmental aircraft operators.
- (255) Norway introduced WP 60 *Air Operations in the Antarctic – challenges and possible way forward*, which followed up on ATCM XL - WP 46 *Non-governmental operators Infrastructure & Operations related to Air operations – Possible impact on National programs in Antarctica* (Norway, Australia, and the United Kingdom). Norway made two recommendations with a view to moving forward on meeting the challenges presented by the increase in aviation in the Antarctic. With regards to communication, Norway recommended that the Meeting consider tasking COMNAP and IAATO to survey existing communication and information exchange routines between non-governmental air operators, and report back to the Meeting on how this might be implemented for both governmental and non-governmental air operations. With regard to implementing cohesive codes and standards for Air Operators in Antarctica, it further recommended that Parties discuss the possibility of requiring Air Operators to have national authorisation from their relevant national aviation authorities to operate in the Antarctic. Norway referred the meeting to IP 151 *Norwegian Antarctic Aviation Operations* (Norway) for information on Norwegian Antarctic Aviation Operations.
- (256) IAATO presented IP 143 *Overview of IAATO Operators' Flight Activity*, in which it provided an overview of its Operators' air activities as requested

by ATCM XL. The paper described its Operators' flight activity, air traffic management, navigation, flight tracking, weather forecasting, search and rescue, and incident and near-miss reporting and investigation mechanisms. Observing that none of the IAATO Members were air operators, IAATO explained that it was common practice for operators to charter aircraft from specialised air operators that were registered with national authorities, and that these flights were duly reported to competent authorities. IAATO noted that tourist flights departed from Punta Arenas and Cape Town and landed on both blue ice and gravel runways. IAATO confirmed that operators were developing an emergency plan for mutual support between air operators. IAATO welcomed the technical improvements outlined by COMNAP and stressed the importance of the tracking of air assets and de-confliction through the adoption of new technologies. IAATO noted that operators shared their flight information with COMNAP Asset Tracking System (CATS), and that this information was available to Rescue Coordination Centres (RCCs) on request. Highlighting that there currently was no central database for aerial incidents and near-miss situations in Antarctica, IAATO noted that there was no real understanding of the state of air safety in the Antarctic. IAATO considered that analysis of such data, should it become available, might help identify risks to air activity and what might be done to mitigate the risks on a practical level.

- (257) The Meeting thanked the proponents of the papers under the agenda item. Noting the potential for increased air traffic in the future, several Parties highlighted the need to consider further means to ensure the protection of the Antarctic environment.
- (258) The Meeting considered the main points raised in discussion and concluded that there was broad support for many of the recommendations in the WPs, as summarised below.
- (259) The Meeting agreed that it would begin a process of reviewing and updating the operative paragraphs of ATCM Resolution 1 (2013).
- (260) The Meeting acknowledged that there was an expansion in the types of air activities being undertaken in the Antarctic, and recognised the safety implications associated with that expansion. In particular, the increase in rotary wing aircraft operating from vessels was identified as a concern. The Meeting identified that further information exchange on such activities was needed, particularly "real time" information.

- (261) The Meeting recognised the importance of the AFIM and the need for Parties to keep the information in the AFIM current. The Meeting agreed that further work was needed in order to effectively share and encourage use of the AFIM beyond COMNAP and IAATO members. With respect to the AFIM, the Meeting recommended that the Parties and COMNAP discuss how best to keep information current via the EIES or other mechanisms, and ensure that these do not duplicate other systems. Parties and Competent Authorities should also ensure that procedures related to the AFIM were both accessible and visible.
- (262) The Meeting reiterated the significance of information exchange and of strengthening communications and routines, and noted that it was vital to ensure there was ongoing communication with those in the field in Antarctica.
- (263) In general, the Meeting supported making use of innovative technologies in order to improve air operations safety. The Meeting requested that COMNAP report at ATCM XLIII on what these technologies might be and how they might be implemented, bearing in mind that improvements in technologies in the future should be taken into account. It noted that this report should also include a comparative review of relevant international regulations and recommended technologies that may be applicable in Antarctic air activity.
- (264) While mindful of the fact that government operated aircraft could not be subjected to the mandatory use of certain technologies such as positioning reporting systems, the Meeting agreed that the use of positioning reporting systems and technologies in aircraft operating in the Antarctic was generally desirable. The Meeting requested expert advice from COMNAP as to what these technologies might be, and for best practice as to the appropriate level of inclusion.
- (265) The Meeting suggested that Parties urge air operators to improve their preparedness for the case of incident, accident and emergency in Antarctica. The Meeting requested further information from COMNAP on tracking for SAR purposes, and for guidance on what minimal but non-mandatory survival equipment should be carried. It requested further information from Parties, COMNAP and IAATO as to whether a centralised Accident, Incident, Near-Miss list was needed in order to understand the level of risk.
- (266) The Meeting welcomed the idea of having discussions on the authorisation of aircraft and air operators in Antarctica.
- (267) The Meeting thanked COMNAP for its willingness to continue to work on issues related to air operations, and recognised that such issues went beyond

National Antarctic Programme operations. The Meeting agreed that further discussions should be inclusive of all those involved in air operations in the Antarctic Treaty area and as well as other experts.

- (268) The Meeting welcomed information from COMNAP that it intended to convene a workshop on the practical and technical aspects of safe air operations, which would be open to all interested Parties and operators. The Meeting acknowledged the offer by Australia to host this workshop on the margins of the COMNAP AGM 2020, to be held in Hobart, Australia, in August 2020.
- (269) The following papers were also submitted under this agenda item, and taken as presented:
- IP 46 *Benefits of intercontinental aviation cooperation in support of Antarctic science: Australia's experience in 2018-19* (Australia). The paper reported on the high degree of international collaboration in Australia's intercontinental aviation operations, including arrangements during the 2018/19 season with several National Antarctic Programmes.
 - IP 156 *Air traffic flight information arrangements for activities in the Australian Flight Information Region* (Australia). This paper outlined Australia's air traffic flight information responsibilities for activities in the Australian Flight Information Region that included Antarctic airspace, and for which Australia has responsibility under the Chicago Convention on International Civil Aviation.
- (270) The following paper was also submitted under this agenda item:
- IP 163 *Guidance for the Operation of Unmanned Aircraft Systems (UAS)* (ICAO). The paper presented a summary of the findings and recommendations of the Arctic Monitoring and Assessment Programme (AMAP) multinational Unmanned Aircraft Systems Expert Group (UASEG). It reported on challenges to UAS-based research in the Arctic.

Safety and Operations: Maritime

- (271) Chile presented IP 14 *Report on the XXth and XXIst editions of the Combined Naval Antarctic Patrol between Argentina and Chile*, jointly prepared with Argentina. Reminding the Meeting that Chile and Argentina were jointly responsible for SAR in the Peninsula Region, the paper reported on the Joint Antarctic Naval Patrol and its activities between 15 November 2017 and 31

March 2018 and during similar period during 2018/2019. Chile highlighted the facilities available in Punta Arenas, Ushuaia and Puerto Williams to assist SAR, logistics and resupply activities. Chile also reported on the monitoring of pollution in areas potentially impacted by shipwrecks, and provisions of medical assistance by the co-proponents. It added that those involved in the patrols were also certified CCAMLR inspectors, and that relevant inspections had been carried out by the patrol where appropriate.

- (272) Argentina stated that it valued the joint cooperative work undertaken together with Chile in these patrols, and noted that, with increasing vessel traffic in the area, both from government-funded as well as privately-owned vessels, the joint patrol provided increasingly useful assistance. It added that the joint patrols were a very useful tool for National Antarctic Programmes, to provide navigation assistance and protect the environment in the area. Argentina stressed that it was committed to continuing the joint patrols in the future.
- (273) Chile presented IP 15 *Search and Rescue cases in the Area of the Antarctic Peninsula, year 2018. MRCC Chile*. It noted the increased number of emergencies during 2018 in Antarctic waters, despite the similar number of scientific and tourist passage ships travelling to the Antarctic Peninsula. It also detailed an incident in which a non-IAATO yacht had run aground, noting that this incident had not produced any adverse environmental impacts.
- (274) Chile presented IP 16 *SAR Exercise modality Table Top Ex between the MRCC, Chile and the JRCC, New Zealand*, which described a desktop SAR exercise carried out in December 2018. During the exercise, procedures were checked and coordination experience was gained for potential SAR activities in the large maritime area surrounding Antarctica. Chile noted that the primary reason for this discussion had been to improve expertise and increase collaboration between neighbouring Parties. It addressed possible SAR activities that might require coordination between New Zealand and Chile, such as in the event of an accident occurring on aircraft travelling over the Antarctic between the two countries. In this regard, it supported the work done by COMNAP in supporting SAR activities in the region, and confirmed its support of further COMNAP activities.
- (275) China presented IP 85 *R/V Xuelong Collision with Iceberg during Marine Investigation in the Amundsen Sea, the Southern Ocean*, and elaborated on the incident during which the R/V Xuelong collided with an iceberg on 19 January 2019 in the Amundsen Sea at a speed of three knots (5.56 km/h).

No passengers aboard were injured. After inspection, it was concluded that the vessel was slightly damaged with no negative impact on navigation. China thanked the Republic of Korea, Chile and New Zealand for their involvement in the evacuation of those on board the vessel, and also extended its thanks to the COMNAP Secretariat. China added that the assistance it had received from other Parties offered was a good example of international collaboration, and symbolised the spirit of the Antarctic Treaty.

- (276) ASOC thanked China for the information it provided and noted that it was glad that no injuries or fatalities had occurred. ASOC noted that it was important that an analysis of the incident be made available to the IMO to assist in the further development of the Polar Code.
- (277) COMNAP presented IP 88 *Report from the COMNAP Antarctic Search and Rescue (SAR) Workshop IV*, which summarised the discussions at the triennial COMNAP Antarctic SAR Workshop IV hosted by New Zealand in May 2019 and co-hosted by the Joint Rescue Coordination Centre New Zealand (JRCCNZ), Maritime New Zealand and Antarctica New Zealand. Noting that Resolution 4 (2013) *Improved Collaboration on Search and Rescue (SAR) in Antarctica* recommended that Parties support COMNAP to hold these workshops, COMNAP thanked Parties and IAATO for their support and participation, as well as New Zealand for hosting the workshop. It also urged Parties to share the key messages in IP 88 in regards to safety and preserving human life in Antarctica.
- (278) IAATO presented IP 97 *New IAATO Procedures for Operating in the Vicinity of Whales*, which explained that its members had implemented procedures for operating in the vicinity of whales. These included a 10-knot speed restriction within defined geofenced time-areas or, for operators with a whale strike mitigation training programme, the requirement to have a trained watchman on the bridge for the sole purpose of sighting whales within the geofenced time-areas. IAATO noted it would continue to refine and revise its procedures based on the best available information. IAATO thanked ASOC and the United Kingdom for noting its efforts to mitigate whale strikes.
- (279) ASOC presented IP 131 *Emerging Issues for Southern Ocean Vessel Management*. It covered a number of issues related to the environmental impacts of vessels operating in the Southern Ocean including: enforcement of the Polar Code; the creation of the Arctic Council's Polar Code Best Practice Forum; the development of IMO safety measures for non-SOLAS ships *ie*, fishing vessels and pleasure craft; work by the IMO on underwater noise mitigation; the need for action through the IMO to address the threats from

ship-sourced plastics; and the importance of voyage planning to minimise marine mammal disturbance. ASOC recommended that the ATCM undertake further vessel management actions to improve protection of the Antarctic environment and its wildlife, including agreeing to collaborate meaningfully in the exchange of best practice with respect to the Polar Code, as well as engaging fully in further negotiations on measures for non-SOLAS vessels at the IMO.

- (280) The Meeting thanked Chile, China, COMNAP, IAATO and ASOC for their informative papers.
- (281) Several Parties supported the view that the ATCM should continue to attend to plastics pollution and underwater noise pollution. The United Kingdom encouraged participation in the Arctic Council's Polar Code Best Practice Forum, highlighting that several marine issues were bipolar in nature, and noted that the Secretariat annually circulated an invitation to the Parties. The United Kingdom also expressed its thanks to IAATO for its recent efforts to reduce potential for vessel collision with whales.
- (282) Drawing the Meeting's attention to negotiations for Phase 2 of the Polar Code, New Zealand thanked ASOC for its paper and noted the importance of seafarers enjoying the same level of safety regardless of the size of the vessel and that the environment should be protected from risks from all types of vessels. New Zealand encouraged Parties to be actively involved in Phase 2 of Polar Code negotiations. The United States noted its appreciation for the various measures proposed by the IMO to improve safety of vessels, and indicated that it can support in principle an IMO work plan that focuses on the development of voluntary guidelines for non-SOLAS vessels operating in Antarctic waters.
- (283) The following papers were also submitted under this agenda item, and taken as presented:
- IP 118 *Incident with a Brazilian container* (Brazil, Poland). This paper described circumstances surrounding a container that had fallen off the *MV Magnolia* in Admiralty Bay and outlined the ongoing efforts to clear debris associated with incident.
 - IP 124 *Advances of Colombia in the elaboration of an Environmental Sensitivity Index for oil spills for King George Island* (Colombia). This paper presented Colombia's ongoing development of an Environmental Sensitivity Index for oil spills in the area between Nelson Island and King George Island.

Safety and Operations: Stations

- (284) Chile presented IP 18 *Reconstruction of Fire Extinguishing Service (SEI) facilities at Aerodrome “Teniente Marsh” at Antarctic Air Base “Presidente Frei”*. This paper reported on the construction of new facilities that started in 2018, which will replace those damaged in a fire in February 2005.
- (285) Chile presented IP 19 *Master Plan for the Chilean State: Reconstruction of the Antarctic Air Base “Presidente Frei”, towards a new energy matrix and sustainable materials*. This paper also focused on changes implemented at Presidente Frei station to renovate the station, and bring it into line with higher environmental protection standards. Following an announcement from the Chilean President on 19 January 2019 regarding the improvements, preliminary environmental impact assessments had been carried out to ensure environmental impact was kept to a minimum. Chile also mentioned that the fire protection services in the Lieutenant Marsh Building had been renovated to improve operations and safety. Chile stressed that these renovations were crucial to the sector in which the base was located, as the Chilean programme was one of the few to operate aviation services around the year, and therefore these safety measures were of paramount importance.
- (286) Chile presented IP 22 *Bahia Fildes Maritime Station: Demolition and Installation Plan*, and provided the Meeting with details of the fire at Fildes Bay naval station on 12 July 2018. Chile noted that there had been no fatalities, but the scientific equipment had been seriously damaged and was in need of replacement. Chile noted that a high level of management had been required to recover and remove debris from the fire over a 1000m² area. Being already in the process of renovating of the Presidente Frei base, Chile had decided to also rebuild the base at Fildes Bay. It estimated that a new and optimised station would lead to a reduced overall environmental impact.
- (287) Spain presented IP 37 *Inauguration of the Remodelling of the Spanish Antarctic Base Juan Carlos I*, which detailed the end of renovation works at Juan Carlos I Base on Livingston Island during the 2017/18 season. Spain noted that the capacity for the base had been significantly increased for both living quarters and laboratory facilities, and its usability had been extended by ensuring that the base made use of renewable sources of energy. Spain invited other Parties to send their scientists to the base, and stated that it was happy to receive anyone wanting to work there.
- (288) Finland presented IP 54 *Summary of the 30 years of Finnish-Argentine collaboration in Antarctic climate research*, jointly prepared with Argentina.

It noted that during the past 30 years, Finnish and Argentine scientists had worked together to understand the Antarctic ozone depletion and the changes reflected in the surface ultraviolet (UV) radiation. Recalling that the first ozone sonde was launched in early 1988, Finland reported that the programme was still active today and that it provided one of the longest continuous vertical ozone data series from Antarctica. Finland noted that this data was available through the WMO database, and thanked Argentina for the excellent long-term collaboration.

- (289) Argentina thanked Finland for the longstanding collaboration on important climate related issues, and noted that combining logistical capabilities was beneficial to both Parties and reflected the spirit of the Antarctic Treaty.
- (290) Poland presented IP 149 *Initiation of renovation of the Henryk Arctowski Polish Antarctic Station on King George Island, South Shetland Islands*. Poland noted that the year-round station had originally been built in 1977, and that after 40 years of use, the main building and living spaces were in need of repair and reconstruction. The planned renovations would be carried out over the next six years, and would focus on reducing energy demand and increasing the safety of its logistical operation. Poland noted that the environmental impact of planned renovations was predicted to be minor or transitory.
- (291) The following papers were also submitted under this agenda item, and taken as presented:
- IP 17 *Replacement of the submarine pipeline with floating hoses* (Chile). This paper described the replacement of a submarine pipeline at the Presidente Frei station with a floating hose, which would decrease the base's impact on the marine environment.
 - IP 20 *Electrical interconnection system, towards the decrease of fossil fuel consumption* (Chile). This paper reported on the installation of an electrical grid interconnection system at the Presidente Frei station to improve energy efficiency.
 - IP 55 *Finnish Antarctic Research Station Aboa celebrates its 30th Anniversary* (Finland). This paper noted that, over the past 30 years, the Finnish Antarctic Research Program (FINNARP) had organised 27 expeditions to Aboa and also supported the research activities of other Parties.
 - IP 89 *Modernisation of Australia's Antarctic Program* (Australia). This paper summarised progress on key modernisation activities since the

launch of the Australian Antarctic Strategy and 20 Year Action Plan in 2016, and highlighted opportunities for international collaboration.

- IP 103 *Reconstruction works of the Comandante Ferraz Antarctic Station* (Brazil). This paper presented the current state of the reconstruction of the Comandante Ferraz Antarctic Station (EACF), which had begun in 2015 and was due for completion in the 2019/20 season.
- IP 104 *XXXVII Brazilian Antarctic Operation* (Brazil). This paper presented a summary of the activities carried out by Brazil during the country's XXXVII Antarctic Operation.
- IP 114 *Construction of the New Wintering Complex at Vostok station* (the Russian Federation). This paper provided information regarding a project conducted by the Russian Federation to improve logistics of scientific expeditions in central Antarctica by constructing a new wintering complex at Vostok Antarctic station.
- IP 121 *Artigas Scientific Antarctic Station renewable energy, energy efficiency and management plan* (Uruguay). The paper reported on progress on the renewable energy, energy efficiency and waste management plan that Uruguay was developing for the Artigas Scientific Antarctic Station.

(292) The following papers were also submitted under this agenda item:

- BP 21 *Implementation of a solar energy capture system in the “Pedro Vicente Maldonado” scientific station* (Ecuador).
- BP 22 *Development of facilities: Advances in the construction of the Command and Control module in Maldonado Station* (Ecuador).
- BP 25 *Implementation of new equipment for the treatment of solid-liquid waste at the “Pedro Vicente Maldonado” Station* (Ecuador).
- BP 27 *Strengthening the safety of navigation and decision-making in the waters adjacent to the “Pedro Vicente Maldonado” Ecuadorian Scientific Station* (Ecuador).

Item 14: Inspections under the Antarctic Treaty and the Environment Protocol

(293) Chile introduced WP 39 *General recommendations of the joint inspections between Argentina and Chile, in accordance with Article VII of the Antarctic*

Treaty and Article 14 of the Protocol on Environmental Protection, and referred to IP 83 *Report of the Joint Inspections' Program undertaken by Argentina and Chile under Article VII of the Antarctic Treaty and Article 14 of the Environmental Protocol*, jointly prepared with Argentina. Between 17 February and 2 March 2019, a multidisciplinary team of observers from Argentina and Chile conducted joint inspections of four foreign facilities – Palmer (United States), Akademik Vernadsky (Ukraine), Port Lockroy (United Kingdom) and St. Kliment Ohridski (Bulgaria) – on the west coast of the Antarctic Peninsula. Observers from Uruguay and the Republic of Korea were invited to join the inspection team. On behalf of the inspecting Parties, Chile thanked Ukraine, the United Kingdom, the United States, and Bulgaria for their warm welcome and cooperation during the inspections. It emphasised the mutual benefits of conducting Antarctic inspections, noting that they allowed for direct exchange of expertise and best practices between the experts of different nations.

- (294) As a result of these inspections, and of previous inspection experiences, Chile and Argentina made a series of recommendations focused on: communications; availability of information; information on medical equipment; the availability of personnel; a need for follow-ups from Parties with inspected stations at the following ATCM; and practicalities related to the conduct of the inspections. They emphasised the need for Parties to keep the Antarctic Telecommunications Operators Manual (ATOM) updated. They also noted that the *Checklist A: Antarctic Stations and Subsidiary Installations* (Resolution 3 [2010]) should be distributed to all stations, and that all Antarctic personnel be adequately informed on its contents. They noted that having the checklist filled out in advance and kept up to date would be of great benefit to inspectors, who were often limited in time due to logistic or climatic issues. Finally, Chile and Argentina recommended that the Meeting establish an ICG to improve the inspection system, including aspects pertaining to the follow-up of past recommendations made by the different inspection teams.
- (295) Bulgaria thanked Argentina and Chile for their detailed report and for their recommendations. Bulgaria underlined the importance of inspections in the Antarctic Treaty as a valuable tool for learning best practices from other stations. Bulgaria agreed with the recommendations and highlighted that, since its last inspection five years ago, the Bulgarian Antarctic Institute had carefully studied the recommendations it had been given. Bulgaria also informed the Meeting that the difficulties relating to the unusually high snow drift at St. Kliment Ohridski station had ceased, and much of the waste there was being removed in the coming season. It also highlighted HSM 91 *Lame*

Dog Hut, presently the oldest preserved building on Livingston Island, which had likewise been recovered from the snow. Bulgaria noted it was taking seriously all issues and recommendations from the inspection report and welcomed all cooperation to provide a safe and healthy environment for the teams on the base and to more broadly, preserve and protect the Antarctic environment and its wildlife.

- (296) Ukraine thanked Argentina and Chile for their inspections. Ukraine stated its intention to enhance its science programme by providing new scientific facilities, laboratories, waste management measures, and corresponding logistic support, depending on the available resources, in order to meet all recommendations of the inspections. Ukraine also referred to its IP 105 *Follow-up the Recommendations of the Inspections at Vernadsky station since 1999*, which thoroughly reviewed how Ukraine had followed up with recommendations from all the inspections of Vernadsky station since 1999.
- (297) The United Kingdom thanked Argentina and Chile for their paper and recommendations. It welcomed the recent inspection of Port Lockroy and thanked everyone involved. Having had the opportunity to comment on the draft report (IP 83) it was pleased to see its comments reflected in the outcome.
- (298) The United States thanked Argentina and Chile for undertaking the inspections and for their work on the summary and reports. The United States noted that it had been pleased to welcome the inspection team to Palmer station on February 21 and had responded positively to the draft with which it had been provided. The United States reaffirmed the value of inspections as a means of encouraging compliance with the Treaty.
- (299) Australia thanked Argentina and Chile for their papers and recommendations. Australia underlined the importance of inspections as a means of encouraging compliance with the Antarctic Treaty and noted the value provided to all Parties through the sharing of learnings. Australia reaffirmed its commitment to conducting regular inspections under the provisions of the Antarctic Treaty and its Environment Protocol.
- (300) COMNAP appreciated the general recommendation in the inspection report that advised Parties to maintain the information in the ATOM. COMNAP confirmed it would discuss greater accessibility of the ATOM with the Antarctic Treaty Secretariat. In regards to the general recommendation on information on medical facilities at stations, COMNAP informed the Meeting that such information was already included in COMNAP's Antarctic Station Catalogue and could be regularly updated by way of the COMNAP database.

- (301) IAATO also thanked Chile and Argentina for their constructive inspections and report. IAATO noted that its operators continued to welcome the inspections as an important learning exercise. Referring to its long history of working with relevant parties, IAATO agreed on the usefulness of prior coordination and stood ready to help facilitate the Antarctic inspections whenever needed.
- (302) Many Parties supported the recommendations, and in particular there was support for improving information sharing, including keeping Checklist A up-to-date as far as feasible, and improving medical facilities. A number of reservations were raised including: being cautious about making the contents of Checklist A public due to the presence of private information; that follow-up reports on inspection recommendations, although useful, were not mandatory; and developing systems for tracking inspections could restrict the responsive application of the inspection mechanism.
- (303) Whilst an ICG was not created, the Meeting noted that many Parties would informally intersessionally discuss matters related to inspections.
- (304) The following paper was also submitted under this item, and taken as presented:
- IP 105 *Follow-up the Recommendations of the Inspections at Vernadsky station since 1999* (Ukraine). This paper provided a summary of Ukraine's follow-up actions with respect to recommendations it had received from all the inspections of Vernadsky station since 1999.
- (305) The following papers were also submitted under this item:
- BP 7 *Follow-up to the Recommendations of the Inspection at the SANAP Summer Station* (South Africa).
 - BP 10 *Follow-up to the Recommendations of the Inspections at the Eco-Nelson Facility* (Czech Republic).
 - BP 19 *Follow-up to the Recommendations of the Inspection at the SANAE Station* (South Africa).

Item 15: Science Issues, Future Science Challenges, Scientific Cooperation and Facilitation

Science Issues and Future Science Challenges

- (306) Australia introduced WP 32 *Future Antarctic Science Challenges. Outcomes of Intersessional Discussions on future Antarctic science challenges*. It

also presented IP 87 rev. 1 *Compilation of input from Parties to informal intersessional discussions*, prepared jointly with Finland, India, Spain, Turkey and the United Kingdom. Australia noted that the informal discussions were intended to assist the ATCM in its further consideration of the Multi-year Strategic Work Plan priority item to “Consider outcomes of intersessional discussions on strategic science priorities”. The proponents recommended that Parties make their strategic science plans available to other Parties; explore opportunities for geographic focused collaborations; and share information and experiences about access and sharing of facilities and platforms.

- (307) Australia reported that participants in the discussions had seen value in sharing information about their science priorities and science plans. To take this forward, Australia suggested that it would be useful to find a way to make it possible for Parties to provide such information, on a non-mandatory basis, in a readily accessible place, such as the Secretariat website, to support understanding of science priorities and science plans, and promote opportunities for cooperation and capacity building.
- (308) The Meeting thanked Australia for these papers and for convening the intersessional discussions. It also thanked those Parties that had contributed information to IP 87. The Meeting reaffirmed the importance of cooperation and collaboration for delivering scientific results, and commended those Parties who had made the sharing of knowledge to serve the needs of the CEP and ATCM a high priority in their strategic plans. Several Parties expressed their support for the idea of establishing a dedicated platform for sharing national research priorities on the Secretariat website, and appreciated the Secretariat’s demonstration of where on its website this might be facilitated. While expressing in-principle support for this idea, other Parties reminded the Meeting that several online tools already existed, such as those hosted by SCAR and COMNAP, and that it might be wise to avoid duplication of their tools.
- (309) SCAR thanked Australia for WP 32 and noted that the discussions regarding future science priorities and challenges were timely given that the current Scientific Research Programmes (SRPs) were coming to a close and would soon be producing syntheses of their work. SCAR also drew attention to its Horizon Scan activities, and noted that a review was underway to assess how well the priorities identified through that avenue were being addressed. SCAR reaffirmed its readiness to collaborate and share information when requested.

- (310) COMNAP informed the Meeting that it shared details of its members' science programmes. It offered to update this information, with the support of Parties, and share these updated details by way of the COMNAP website.
- (311) The Meeting agreed to support the inclusion of a section on the Secretariat website to highlight the key science priorities of National Antarctic Programmes, thus making these easily accessible to all Parties and the general public.
- (312) SCAR introduced WP 37 *Sixty Years of Treaty-Supported Antarctic Science*, which provided an overview of the key themes of Antarctic science in the last 60 years. SCAR highlighted ten milestone achievements relating to: ozone depletion; reducing uncertainty about sea level rise; understanding climate history through ice core investigations; the discovery of subglacial lakes; understanding the life history of the emperor penguin; the discovery of the subglacial Gamburtsev mountains; discoveries related to microbial life in the McMurdo Dry Valleys; the use of the Earth as a camera to study space; discoveries regarding how speciation in the Antarctic was a driver of global biodiversity; and the importance of the Paris Climate Agreement. SCAR encouraged Parties to: 1) Promote to their nations the extraordinary benefit to humankind from science in, from and about Antarctica and the Southern Ocean; 2) Reaffirm their support for scientific investigations in the region, including through the development of an appropriately-resourced scientific workforce for the future; 3) Continue to encourage, facilitate and support scientific exchanges and open access to scientific outcomes and data; and 4) Enhance collaborations with SCAR in its role as the preeminent facilitator of Antarctic and Southern Ocean science, and provider of policy-ready, objective advice to the Antarctic Treaty System and other international agreements.
- (313) The Meeting thanked SCAR and emphasised the high quality of the content, which succinctly summarised key milestones in Antarctic research. Parties noted that SCAR continued to grow and had engaged with scientists, social scientists, and the wider community in a positive way, and reaffirmed the important role SCAR had played in facilitating both scientific research and international cooperation, and providing independent and objective scientific advice. Recognising the importance of disseminating this information to the wider community, the Meeting encouraged SCAR to keep facilitating engagement between Antarctic scientists and other international meetings or fora. It also encouraged SCAR to consider turning WP 37 into an online or print publication for distribution to decision makers and the public.

- (314) The ATCM congratulated SCAR on the occasion of its 60th anniversary and recalled the importance of scientific research to support the work of the ATCM and CEP and adopted the recommendations from SCAR's paper by means of Resolution 7 (2019) *SCAR's Sixtieth Anniversary and the Role of SCAR in Providing Scientific Advice to Support the Work of the Antarctic Treaty System*. The Meeting also warmly congratulated SCAR and Professor Steven Chown on the science lecture, which is summarised in IP 135.
- (315) The United States introduced WP 5 rev. 1 *Antarctica as a platform for exploring the universe: Successful international collaborations and recent achievements*. This paper reported on astrophysical research undertaken in Antarctica and outlined the several advantages provided by the high Antarctic plateau for state-of-the-art observations of the universe and its composition. The United States drew attention to several key studies conducted in the Antarctic on cosmic microwave background radiation and the observation of neutrinos and black holes, and highlighted the role that equipment at South Pole Station, including the IceCube Observatory, had played in both observing neutrinos and creating the first image of a black hole. It referred to IP 4, IP 5, IP 7 and IP 72 as examples of the wide-ranging research that the United States had undertaken in Antarctica.
- (316) In light of exciting recent breakthroughs in astrophysics, and the promise for new discoveries about the mysterious dark energy and dark matter that make up more than 95% of our universe, the United States recommended that the Parties: recognise the achievements of collective efforts to understand the structure and history of the universe and the energy and matter contained within, in particular through research based in Antarctica, and encourage ongoing efforts and increase international collaboration to advance astrophysical research efforts taking advantage of the Antarctic continent as a unique platform for observations. The United States also reiterated the importance of minimising the human footprint in Antarctica, and noted that the United States Antarctic Programme would only support work that was best done or could only be done in Antarctica.
- (317) The Meeting thanked the United States and highlighted the importance of Antarctica as a distinct platform for exploration of the universe. Sweden congratulated the United States and the National Science Foundation on a track record of almost 30 years researching this area, and noted that both the IceCube Project and its predecessor, AMANDA, had been influential in shaping the field of astrophysics. Recognising that Antarctica was an ideal location for conducting astronomy research, China drew attention to the work

that had been undertaken at Kunlun Station since its establishment in 2009, and highlighted both supernova discoveries and the positive detection of gravitational wave sources as key achievements. China also acknowledged its collaborations with Australia in astronomy research, and reiterated the importance of ongoing international collaboration. France drew attention to the research that had been conducted out of the joint France-Italian Concordia Station, and underscored the importance of Parties working jointly to develop astronomy projects in Antarctica. The Russian Federation, while welcoming WP 5 rev. 1 presented by the United States, also highlighted the importance of more active use of space technologies in the context of Antarctic Treaty implementation.

- (318) SCAR mentioned that astronomy was identified as a priority in the 2014 SCAR Horizon Scan, and noted the progress that had been made with regards to astronomy in the previous five years. SCAR suggested that its current review of structure and programmes could be an ideal opportunity to highlight the importance of Antarctica as a platform for exploring the universe.
- (319) France introduced WP 41 *The Ice Memory Project*, jointly prepared with Italy. France explained that the overall goals of the Ice Memory project were to collect an ice core archive from the deep layers of key endangered glaciers before they lost their ability to preserve environmental history in optimal conditions, and to store those ice cores in Antarctica on a long-term basis for future generations of scientists and humanity in general. France reported that ice core drilling for this project had commenced in 2016, and the joint French and Italian Concordia Station had been identified as an ideal location for a repository, as it is located on the Antarctic plateau. The paper invited all Parties to participate in and/or support the project with advice or logistics, or through the identification of sites where future repositories could be established in the vicinity of other Antarctic stations. It recommended that the ATCM give its opinion on the project's importance and discuss the possibility of how to open up and coordinate international collaboration to all Parties interested in taking part in the storage of ice cores in Antarctica.
- (320) SCAR expressed support for the project on two grounds. First, it noted the value of ice cores in helping to understanding the Earth's systems, in particular its climate, and acknowledged the fast changes in mountain glaciers. Second, SCAR stressed the unknown future value of ice cores that might arise from new technological approaches, and stated that such advances could add tremendous value to these cores.

- (321) Several Parties indicated support for the project, and the intent to contribute through advice and logistics; however, some Parties expressed concerns about the implications that the Ice Memory Project may have for the introduction of non-native species to Antarctica and the logistical challenges related to the project. In particular, the Parties noted that the transfer of ice-cores from other regions could result in an invasive microbial species being introduced into the Antarctic environment in the event the ice cores melted. In light of the wealth of scientific research that had been published on glacier microbiomes, SCAR informed the Meeting that it would be able and willing to prepare an Information Paper on the subject for the following ATCM, so as to better inform the ongoing discussions.
- (322) The Meeting noted that while the Ice Memory project was of scientific importance and there was broad support for the scientific objectives, many Parties had reservations about practical elements of the proposal and it was important to pay close attention to any issues that could arise during the EIA process. Highlighting the importance of the project, the proponents noted their confidence that, with the support of the scientific community and by fulfilling the appropriate EIA processes, any issues could be appropriately addressed.
- (323) The following papers were also submitted under this agenda item, and taken as presented:
- IP 3 *The United States National Science Foundation International Advanced Training Program in Antarctic Biology for Early Career Scientists* (United States). This paper reported on a series of advanced training programmes for early career scientists, initiated by the U.S. National Science Foundation in 1994.
 - IP 4 *International Thwaites Glacier Collaboration: The Future of Thwaites Glacier and its Contribution to Sea-level Rise* (United States, United Kingdom). The paper described a joint research programme of the United States' National Science Foundation (NSF) and the United Kingdom's Natural Environment Research Council (NERC) which had been seeking to improve decadal and longer-term (century-to-multi-century) projections of ice loss and sea-level rise originating from Thwaites Glacier.
 - IP 5 *Surprising findings from the Southern Ocean Carbon and Climate Observations and (SOCCOM) Project* (United States). This paper reported novel findings from data collected using 150 robotic floats in the Southern Ocean, which implied that the Southern Ocean might

not have the potential to alleviate increasing global atmospheric CO₂ concentrations.

- IP 6 *The Reference Elevation Model of Antarctica: A New Tool for Supporting Research and Operations on the Continent* (United States). This paper reported the completion of a new high-resolution, publicly-available, time-stamped digital elevation model map of Antarctica, which had made Antarctica the most accurately mapped continent on the planet.
- IP 31 *Results from the international workshop “The Effects of Noise on Marine Mammals in Antarctica” held in November 2018 in Germany* (Germany). The paper reported on the discussions and recommendations of the international workshop on the effects of noise on marine mammals in Antarctica.
- IP 35 *In situ experiments and sampling of supraglacial environments in Larsemann Hills, East Antarctica* (India). This paper described a series of *in situ* experiments carried out in supraglacial environments in Larsemann Hills during the 2018/19 Antarctic season, as part of the XXXVIII Indian Scientific Expedition to Antarctica.
- IP 111 *Current Ice Core and Paleoclimate Research Activity in the Vicinity of Vostok Station* (Russian Federation). This paper reported on the continuation of international and collaborative paleoclimate research based on studies of ice cores obtained in the vicinity of the Russian Vostok Station.
- IP 135 *SCAR Science Lecture 2019: What Does the Paris Climate Agreement mean for Antarctic and Southern Ocean Environmental Protection?* (SCAR). This paper summarised the SCAR Science Lecture given by Professor Steven Chown (Monash University) at ATCM XLII on 2 July 2019.

Scientific Cooperation and Facilitation

- (324) WMO presented IP 93 *The International Programme for Antarctic Buoys*, prepared jointly with SCAR. It drew the Meeting’s attention to the international sea ice buoy network, highlighting its crucial role for forecasting weather and sea-ice conditions and validating satellite observations and numerical climate models, as well as for research on Antarctic climate and climate change. WMO noted that this community-driven programme was mainly funded through research projects, while receiving some support

from the Australian Antarctic Division and the Alfred Wegener Institute in Germany. WMO called on all Parties to encourage broad collaboration with the buoy network and to ensure that buoy data would be included in the network's resources.

- (325) WMO also presented IP 94 *The Year of Polar Prediction in the Southern Hemisphere: Consolidation Phase*. WMO reported that YOPP 2018/19 was currently in the consolidation phase, with a second winter period being planned for March-July 2021. WMO encouraged Parties to share information about the YOPP Data Portal to enable national research communities to make use of the portal and to contribute their own data via their national data centres in an effort to build a comprehensive polar meteorological database.
- (326) IAATO presented IP 141 *The International Association of Antarctica Tour Operators joins Fellowship Program*. IAATO in collaboration with COMNAP will provide a fellowship for early career researchers. COMNAP will assist IAATO to ensure support during the process of selecting an inaugural IAATO fellow. The research focus by the recipient of the IAATO fellowship will be aligned with the objectives of IAATO and add to the understanding of human presence in the Antarctic.
- (327) SCAR presented IP 75 *Update on activities of the Southern Ocean Observing System (SOOS)*, highlighting particular outputs of interest to the ATCM. These included: five regional networks to coordinate the collection of Southern Ocean observations, which the Parties were invited to use as a resource; the Database of upcoming expeditions to the Southern Ocean (DueSouth), a free online database for sharing plans for upcoming voyages, flights and field campaigns; SOOSmap, an online map system for obtaining well-curated and up-to-date datasets out of 24 aggregated data types; and a coordinated community paper on observational priorities for the coming decade. Acknowledging the potential collaborations outlined by the IHO in WP 61, SCAR encouraged Parties with vessels that had bathymetric mapping capability to consider sharing these data through the SCAR expert group on bathymetric charting.
- (328) The Meeting thanked WMO, IAATO and SCAR for their papers. Turkey noted that it saw SOOS (IP 75) as a promising tool for delivering Southern Ocean data to all interested stakeholders.
- (329) Chile presented IP 115 *Celebration of the 500th anniversary of the discovery of the Strait of Magellan and the 200 years of Antarctic exploration*. Chile reported that the celebrations were held in Punta Arenas to commemorate the

500th anniversary of Fernando de Magallanes' journey, in conjunction with similar celebrations in Spain and Portugal. Chile also noted that celebrations would be held in 2020 to commemorate 200 years of Chilean involvement in Antarctic exploration. It highlighted the historic importance of Punta Arenas as a gateway to Antarctica.

- (330) Spain thanked Chile for its celebration of the 500th anniversary of Fernando de Magallanes' journey, and noted that this journey was an early example of international cooperation. It stated that the Antarctic Treaty System was the modern equivalent of this journey, and that it embodied the same spirit of unity and international collaboration.
- (331) Romania presented IP 137 rev. 1 *Cooperation between Romania and Republic of Korea - Antarctic Scientific Researches and Logistics Facilities 2015-2018*, which highlighted the ongoing successful collaboration between Romania and Republic of Korea, following the signing of a memorandum of understanding in 2015.
- (332) Romania also presented IP 161 *Cooperation between Romania and Australia in Antarctica*, which reported that it had celebrated some Antarctic milestones, such as 50 years of diplomatic relations with Australia in the context of Emil Racovita Year 2018. It highlighted a documentary-scientific and artistic exhibition organised by the Romanian Ministry of Foreign Affairs with the support of the National Commission for Antarctic Research (NCAR) of the Romanian Academy. The exhibition recalled Romanian involvement in the joint management of ASMA 6 in the Larsemann Hills, where Romania worked alongside Australia, China, the Russian Federation and India, and noted that cooperation was based on the 2005-2015 memorandum of understanding with Australia on the Law-Racovita-Negoita Base.
- (333) The following papers were also submitted under this agenda item, and taken as presented:
- IP 7 *NASA Operation IceBridge: An airborne mission for Earth's polar ice* (United States). The paper described NASA's airborne mission to survey changing polar ice in both the Arctic and Antarctic from 2009 to late 2019 and invited international collaboration to continue this work.
 - IP 36 *A brief review of the activities of the Republic of Belarus in Antarctica in 2006-2018* (Belarus). This paper provided an overview of the Antarctic activities of Belarus in 2006-2018, covering matters of the creation of infrastructure, scientific activities, development of

national legislation concerning the Antarctic, and participation in the work of the Antarctic Treaty System organisations.

- IP 39 *Australian Antarctic Science Program: highlights of the 2018/19 season* (Australia). The paper described Australian scientific activities during the 2018/19 season and highlighted the contributions to the CEP, CCAMLR, and the IPCC.
- IP 44 *Malaysia's activities and achievements in Antarctic research and diplomacy* (Malaysia). This paper summarised Malaysia's investments and achievements in Antarctic science and diplomacy, and reported on its scientific cooperation with Chilean, Chinese, and other National Antarctic Programmes.
- IP 45 *Japan's Antarctic Research Highlights 2018-19* (Japan). The paper described Japan's research activities related to high-resolution observations of the Antarctic atmosphere, the search for an older ice core drilling site in the Dome Fuji area, and high-quality, wide-area, and long-term climate change observations.
- IP 57 *Bulgaria-Turkey Scientific Collaboration in Antarctica* (Bulgaria, Turkey). This paper reported on the international collaboration between the XXVII Bulgarian Antarctic Expedition and the III Turkish Antarctic Expedition near Livingston Island and Horseshoe Island.
- IP 58 *Colombia-Turkey Scientific Collaboration in Antarctica* (Colombia, Turkey). The paper highlighted the collaboration between the Istanbul Technical University Polar Research Center and the Colombian Antarctic Program in the context of the III Turkish and V Colombian scientific expeditions to Antarctica.
- IP 59 *Turkey-Chile Scientific Collaboration in Antarctica* (Turkey). This paper reported on the successful collaboration of the III Turkish scientific expedition to Antarctica with the Chilean Antarctic Institute and the Chilean navy.
- IP 60 *Turkey-Korea Scientific Collaboration in Antarctica* (Turkey). The paper reported on collaboration between the III Turkish Antarctic expedition and the Korean Polar Research Institute and highlighted that the Republic of Korea had hosted Turkish and international researchers at the King Sejong Station in late 2018 and early 2019.
- IP 61 *Turkish Antarctic Expedition (TAE - III) 2018-2019* (Turkey). This paper summarised Turkey's third expedition conducted under the National Polar Science Program during the 2018/19 season and listed the scientific and outreach projects carried out in its context.

- IP 62 *Turkish Scientific Projects at Belgium's Princess Elisabeth Station in Antarctica* (Turkey). The paper described the international collaboration between the III Turkish scientific expedition and Belgium's Princess Elisabeth Antarctica station during the 2018/19 Antarctic season.
- IP 63 *Antarctic Publications by Turkish Scientists* (Turkey). This paper highlighted scientific papers that had been published by Turkish Antarctic researchers and summarised polar education and outreach activities.
- IP 65 *Installation of Automatic Weather Station in Antarctica* (Turkey). This paper reported on the installation of an automatic weather station at the Turkish temporary station during the third Turkish Antarctic Expedition.
- IP 66 *Investigation of the Prospective Mapping Studies in Antarctic Peninsula* (Turkey). The paper reported on prospective mapping studies by Turkey during its third Antarctic science expedition, such as GPS measurements on Horseshoe Island.
- IP 67 *Signing of Memorandum of Understanding with Belarus* (Belarus, Turkey). This paper reported on the signing of a memorandum of understanding between the Republic of Turkey and Belarus on 16 April 2019, regarding the methods and priorities of scientific cooperation.
- IP 72 *The U.S. Antarctic Marine Living Resources (AMLR) Program leverages advanced technologies and international collaborations in a changing fiscal landscape* (United States). This paper described the core research activities of the U.S. AMLR Program which had conducted integrated ecosystem assessments around the Antarctic Peninsula since 1986.
- IP 79 *Report on activities of the Argentine Antarctic Institute - Year 2018* (Argentina). The paper summarised results of the work of the Argentine Antarctic Institute in 2018, focusing on scientific production, conferences, capacity building, the representation of Antarctic research in Argentina's research academy, scholarships, external funding, outreach activities and other aspects.
- IP 106 *The conception of the new State Research Program in Antarctica for 2021-2030* (Ukraine). This paper described the Ukraine's intentions to revise its current Antarctic research programme for the period 2021-2030 and invited colleagues to participate in collaborative and interdisciplinary research at Vernadsky station.

- IP 116 *Open Call to “Media coverage of the LV Antarctic Scientific Expedition (ECA 55)”* (Chile). The paper reported on Chile’s outreach project which had invited media professionals and audiovisual producers to travel to the Antarctic Peninsula to report on Chilean scientific and logistical activities during the Antarctic season 2018-2019.
- IP 126 *Scientific, logistical and operational collaborations in the framework of the V Colombian Antarctic Scientific Expedition. Austral summer 2018-2019* (Colombia). This paper introduced Colombia’s scientific, logistical, operative and technical collaborations with Chile, South Korea, Brazil, Bulgaria, Ecuador, Spain, Peru, Turkey and Uruguay that occurred during its V Scientific Expedition to Antarctica.
- IP 127 *2019/2020 PROANTAR Research Projects* (Brazil). The paper described seventeen projects planned for the 38th Brazilian Antarctic Expedition for 2019/20.
- IP 147 *Twenty-Sixth Scientific Campaign from Peru to Antarctica - ANTAR XXVI* (Peru). This paper noted that over 158 scientists from Peru, Argentina, Colombia, Portugal and Chile participated in 22 research projects during Peru’s 26th Antarctic campaign.
- IP 152 *International LAGO project: advances in astrophysics* (Peru). The paper reviewed progress made in particle astrophysics research through the advancing implementation of the international LAGO project (Latin American Giant Observatory), dedicated to studying, among other things, space weather and the impacts of cosmic radiation on the atmosphere.

(334) The following papers were also submitted under this agenda item:

- BP 1 *Scientific and Science-related Cooperation with the Consultative Parties and the Wider Antarctic Community* (Republic of Korea).
- BP 6 *South African National Antarctic Program (SANAP): Science Highlights 2018/9* (South Africa).
- BP 13 *V Scientific Expedition of Colombia, austral summer 2018-2019* (Colombia).
- BP 15 *Deployment of a Submarine Robot for biological, oceanographic and geological studies in Antarctica* (Ecuador).
- BP 16 *Obtaining aerial photography using UAV’s for cartographic generation 1: 10.000 of the Greenwich Island and the surrounding Islands* (Ecuador).

- BP 17 *Ukraine resumes complex marine expeditions in the Southern Ocean* (Ukraine).
- BP 23 *Scientific activities of International Cooperation during the ECUANTAR XXIII (2018-2019)* (Ecuador).
- BP 24 *XXIII Ecuadorian Antarctic Expedition (2018-2019) – ECUANTAR XXIII* (Ecuador).
- BP 28 *Collection of information on the diversity of bacterial communities in bays and channels of the Antarctic Peninsula with anthropogenic influence* (Ecuador).

Item 16: Implications of Climate Change for Management of the Antarctic Treaty Area

- (335) The United Kingdom introduced WP 1 rev. 1 *The Antarctic Peninsula under a 1.5°C global warming scenario*, which provided a synthesis of research and information examining possible changes to the Antarctic Peninsula region under a 1.5°C global warming scenario. The paper detailed a series of changes that had been observed in the region including: a greater degree of warming; an increase in temperature, with up to 130 days per year above 0°C; the acceleration of glacial melting, which was leading to an increase in iceberg production; and the increased threat non-native species posed to native biodiversity. The United Kingdom also mentioned other relevant papers had been submitted to the CEP, such as IP 136 *Antarctic Climate Change and the Environment – 2019 Update* (SCAR) and suggested that this might also be submitted to the ATCM in the future. The United Kingdom requested the Meeting to consider the changes detailed in the report, including with reference to threats to Antarctic infrastructures.
- (336) The Meeting commended the United Kingdom on the paper and reaffirmed that the implications of climate change were a major concern for all Parties. China highlighted the need to continuously strengthen support for scientific research on climate change. Reminding the Meeting of Resolution 4 (2015), New Zealand noted that the Committee for Environmental Protection's Climate Change Response Work Programme (CCRWP) should be treated as a matter of priority. New Zealand further expressed the view that the paper was a good example of a useful synthesis of science to support policy making.

- (337) In response to a query from the Russian Federation on the authorship of WP 1 and on whether or not it had been peer-reviewed, the United Kingdom explained that due to the nature of Working Papers, the lead authors were not mentioned. It specified that the work was led by Professor Martin Siegert of the Grantham Institute for Climate Change and Imperial College London. A peer-reviewed version was published in *Frontiers of Environmental Science* (published online on 28 June 2019).
- (338) WMO reminded the Meeting that the best-case scenario of 1.5°C was optimistic and that the Parties should also consider the implications of a greater degree of warming.
- (339) SCAR informed the Meeting that, during the intersessional period, it would be conducting a substantial decadal review of the original 2009 *Antarctic Climate Change and the Environment (ACCE)* report. Following up on a suggestion from the Russian Federation, SCAR confirmed that the updates would include regional as well as global components. SCAR also drew the Meeting's attention to a 2018 report co-authored by several scientists linked to SCAR and stated that it might be useful to inform further discussion. The report, "Choosing the future of Antarctica", was published in *Nature* (vol. 558, pp. 233-241).
- (340) The Meeting thanked SCAR and was looking forward to the substantial update of the ACCE.
- (341) Norway introduced WP 21 rev. 1 *Overview of outstanding ATME recommendations*, jointly prepared with the United Kingdom. It noted that the paper provided a response to a request by ATCM XLI to review the outstanding recommendations from the 2010 Antarctic Treaty Meeting of Experts (ATME) on the Implications of Climate Change for Antarctic Management and Governance. Norway detailed the eight remaining Recommendations and highlighted Recommendation 13, which suggested inviting relevant space agencies to attend future ATCMs in order to give a demonstration of the use of modern space-based technologies for observing Antarctica in the context of climate change.
- (342) The United States recalled that during the International Polar Year (IPY) 2007/08 a Polar Space Task Group had been put together by WMO. In response, WMO referred to ATCM XL - IP 114 (*The Polar Space Task Group: Coordinating Space Data in the Antarctic Region*) which detailed the group's activities. It also suggested that SCAR might be interested in delivering a lecture on the topic at ATCM XLIII. Referring to the work done

by its new Earth Observation Action Group (EOAG), SCAR noted that it would be happy to do so.

- (343) With reference to recommendations 2 and 5, IAATO stated that its Climate Change Working Group, established in 2009, had been working to implement these recommendations. COMNAP commented that it too considered that recommendation 5 had been satisfied.
- (344) The Meeting thanked Norway and the United Kingdom for their work on WP 21 rev. 1 and reflected on the progress that had been made on the ATME recommendations during the intervening years. The Meeting agreed that addressing the remaining priorities should be a priority for the ATCM, and included relevant amendments to its Multi-year Strategic Work Plan.
- (345) COMNAP presented IP 47 *Modernisation of Antarctic Stations: Survey results*, noting that the survey was undertaken following a request from the ATCM. COMNAP informed the Meeting that 73% of the 30 COMNAP member National Antarctic Programmes were planning to or were already modernising their Antarctic stations. The principal reason given for the modernisation was aging infrastructure that required modernisation to meet research needs and to improve environmental performance. COMNAP noted that climate change was given as the reason for modernisation in 22% of the responses.
- (346) The Meeting thanked COMNAP for its work on the survey and some Parties noted their ongoing modernisation efforts. Following a question of clarification from Argentina, COMNAP confirmed that all 30 COMNAP members had responded to the survey.
- (347) Chile pointed out that the modernisation work being carried out by National Antarctic Programmes were partly in response to the outcomes of the SCAR 2014 Horizon Scan, which was currently undergoing a five-year review. Chile suggested that COMNAP's Antarctic Roadmap Challenges document could also undergo review when appropriate. COMNAP replied that the review of the Antarctic Roadmap Challenges outcomes would be considered, and that COMNAP was involved in the review process for SCAR's Horizon Scan.
- (348) The Meeting noted that modernisation was being carried out across Antarctica, and that this presented Parties with a unique opportunity to examine how climate change might affect the process of modernisation and to share best practice in regards to modernisation work.

- (349) ASOC presented IP 132 *Limiting global warming to 1.5°: the Antarctic context*, noting that it summarised the *Special Report on Global Warming of 1.5°* released by the IPCC with specific reference to its relevance to Antarctica, and complemented WP 1. ASOC urged the Meeting to move from procedural discussions to climate action. It suggested that climate change and biodiversity be included in EIAs, and that plans be made for reference areas which allowed scientists to distinguish climate impacts from other impacts. ASOC further encouraged the Meeting to support action by 2023 at the IMO regarding reducing emissions from shipping.
- (350) WMO presented IP 164 *Scoping Workshop: Towards Implementing an Antarctic Regional Climate Centre Network*. It noted it was also relevant to the recommendations outlined in WP 21, given that it explored new systems for generating climate predictions and products (Recommendation 14). WMO stated that it had fostered the establishment of climate centres for the polar regions, noting that an Arctic centre was established in May 2018 and that WMO had encouraged the establishment of a similar centre for the Antarctic. WMO invited interested Parties to attend a scoping workshop in October 2019 in Bologna, Italy, to discuss this further.

Item 17: Tourism and Non-Governmental Activities in the Antarctic Treaty Area, including Competent Authorities Issues

Review of Tourism Policies

- (351) The United Kingdom introduced WP 19 *Antarctic Tourism Workshop, 3-5 April in Rotterdam, The Netherlands: Chair's Summary and Key Recommendations*. It also presented IP 11 *Antarctic Tourism Workshop, 3-5 April in Rotterdam, The Netherlands: Chair's Report*. Both papers were prepared jointly with the Netherlands. The United Kingdom informed the Meeting that the Antarctic Tourism Workshop was guided by work presented in IP 26 *Proactive Management of Antarctic Tourism: Time for a Fresh Approach* (Netherlands, New Zealand). The United Kingdom observed that the main impetus of the workshop was the very significant growth in the number of Polar Ships following the negotiations of the Polar Code and IAATO's projections that ship-borne tourism could so much as double in the next few years. Both the workshop and the papers were organised into three sections – growth in tourism, diversification, and compliance – and had resulted in recommendations to the ATCM.

(352) Specifically, on matters related to growth, the workshop recommended that the ATCM:

- strongly encourage those Parties that had yet to do so to expedite the approval of Antarctic Tourism regulations, notably Measure 4 (2004) and Measure 15 (2009);
- work with COMNAP, SCAR and IAATO, and on the basis of advice from the CEP, to ensure that guidelines relating to conduct of visitors ashore were in line with current best practice and presented in a format appropriate for all visitors, and that the guidelines were easily identifiable on the ATS website; and
- explore the idea of levying an administrative fee on tourism operators to support environmental monitoring work, including through considering parallels with the administrative fees levied by CCAMLR on fishing operators.

(353) The United Kingdom noted that the aim of these recommendations was: to advance work in order to be prepared for the significant growth that IAATO had projected for tourism; that all Antarctic visitor activities conducted either for tourism or recreational purposes of National Antarctic Programme personnel, follow the same rules of conduct; and that the Antarctic Treaty Secretariat had sufficient resources to provide oversight for all visitors as growth continues.

(354) IAATO informed the meeting that while significant growth was anticipated, all Member Operator activities were planned to have no more than a minor or transitory impact on the environment and were conducted in accordance with guidance provided by the ATCM, whether those instruments had been fully ratified by the Parties or not, and further recognised the importance of long-term monitoring programmes. Specifically, IAATO expressed the opinion that the potential for environmental impact depended less on the number of visitors at a site than how they behaved, and that education and good management practice were key. Lastly, IAATO offered its continued assistance to Parties in developing and reviewing Visitor Site Guidelines, recognising the importance of aligning these with current best practice and making them widely available.

(355) ASOC expressed its support for all recommendations related to tourism growth. It further encouraged Parties to consider establishing reference areas to which tourists would not be able to enter. ASOC noted that these areas could be compared with visited areas to better assess tourism impacts. ASOC

also encouraged Parties to consider the inclusion of seasonal limitations in specific site guidelines.

- (356) Parties noted the importance of ensuring that tourism activities had no more than a minor or transitory impact on the environment and that they did not negatively impact the activity of National Antarctic Programmes. Parties also highlighted the importance of continuing to contemplate and develop a monitoring programme concurrently with exploring funding options for that programme.
- (357) The Meeting thanked the United Kingdom and the Netherlands for their papers and for hosting a very productive workshop. In light of the significant growth projected for the tourism industry, it noted the urgency of discussing these topics.
- (358) The Meeting agreed to the first recommendation and urged Parties that have not done so, to expedite the approval of Antarctic Tourism regulations, notably Measure 4 (2004) and Measure 15 (2009). Argentina informed the meeting that it had made considerable progress towards approving Measure 15 (2009) that was in the final stage of signature of a Presidential decree.
- (359) The Meeting agreed to the second recommendation relating to ensuring the Site Guidelines for Visitors were in line with current best practice and presented in a format appropriate for all visitors. Parties recalled that the CEP had advised the ATCM that Germany had agreed to convene an ICG to progress recommendations arising from the Antarctic Tourism Workshop in Rotterdam, which included a task related to addressing the existing site guidance for visitors.
- (360) Several Parties expressed support for the introduction of an administrative fee on tourism operators, but noted the importance of agreeing the rationale for collecting such a fee. The Meeting agreed that further discussions were needed to develop a deeper understanding of how fees could be collected, administered, and used. Interested Parties were encouraged to have further informal intersessional consultation and to submit papers to ATCM XLIII containing concrete proposals describing possible systems for levying fees and administering resulting funds.
- (361) The Meeting welcomed information from CCAMLR describing how it administered fees collected as part of its fisheries notification system. CCAMLR informed the Meeting that it collected fees annually from Members that submitted notifications of fishing activity and that the monies collected were deposited into CCAMLR's General Fund. These monies

were used to support the costs of administering the notification system and CCAMLR Members directed how any remaining funds were spent.

- (362) The Meeting further welcomed information from Norway regarding the revenue from the visitor's fee that goes to the Svalbard Environmental Protection Fund. Norway offered to present an Information Paper on this topic to ATCM XLIII.
- (363) The United Kingdom introduced the second workshop discussion item – tourism diversification – which was concerned with new types of activities and activities happening in a new way or place. It noted that operators may propose new activities to be considered for permit or authorisation directly to a competent authority without first obtaining peer review through IAATO. It highlighted that such actions could result in inconsistent assessment of the new activity across competent authorities.
- (364) To address this issue, the workshop recommended that the ATCM:
- develop a framework to underpin greater consistency of standards between competent authorities in assessing the potential safety and environmental implications of new or novel activities.
- (365) IAATO informed the Meeting that in response to a request from the workshop to provide Parties with a better understanding of the range of activities IAATO operators currently undertake in Antarctica, it had submitted IP 145 *A Catalogue of IAATO Operator Activities*. These were activities from the 2018-2019 season, as reported to Treaty Parties through Post Visit Reports. With reference to the development of a framework for conducting pre-assessments, IAATO drew the Meeting's attention to its paper ATCM XXXIV - IP 118 *Assessing new activities checklist*, which was a framework for IAATO member operators considering any new activity. IAATO noted that Parties may also find ATCM XXXVII - IP 78 *Adventure Tourism Activities undertaken by IAATO Members* to be of interest.
- (366) Parties observed that there were existing frameworks for new activities in other wilderness areas, and suggested using these as examples to develop an Antarctic framework. They further observed that new activities could be productively assessed in relation to goals laid out in Resolution 7 (2009), specifically, that all activities focus on enhancing the experience of visitors and educating them about the environment and its protection.
- (367) The Meeting strongly supported the recommendation to develop a framework that would increase collaboration and the consistency of the evaluation

of new activities by competent authorities. It further recognised that the framework would be a tool that would improve understanding of safety and environmental protection issues associated with novel activities and thus assist competent authorities in identifying appropriate mitigation efforts. The Meeting noted that the CEP would undertake intersessional work on the framework and encouraged further informal intersessional consultations.

- (368) The United Kingdom introduced the third workshop discussion item – compliance – which focused on: the differences in implementation of existing rules, including surveillance and enforcement, and how to better harmonise standards; questions of jurisdiction over authorisations, including where multiple operators from different Parties were involved; and how to facilitate more effective engagement and dialogue between competent authorities. It noted that standards of vessel and aviation operations were also raised.
- (369) To address this issue of compliance the workshop recommended that the ATCM:
1. invite Parties to identify a working level competent authority contact, in addition to the senior responsible official;
 2. develop terms of reference for enhanced engagement between Competent Authorities and establish an ongoing subsidiary group;
 3. develop a proposal for an international tourism observer scheme, building on national experiences and IAATO's model;
 4. continue to reach out to Non-consultative Parties whose operators or nationals engaged in Antarctic tourism activities;
 5. continue to encourage all Parties to ensure they regularly updated the EIES on which tourism and non-governmental activities they have authorised and ask the Secretariat to ensure that this information was made clearer and more obviously locatable on their website;
 6. encourage Parties to include inspections of tourism activities within existing inspection regimes; and
 7. ask Working Group 1 to provide advice on how those operating in Antarctica could most effectively gather and share evidence of suspected non-compliance.
- (370) The Meeting thanked the United Kingdom and welcomed the workshop's discussions on issues related to compliance. The Meeting expressed overall support for the general principles reflected in the recommendations.

- (371) The Meeting expressed broad support for the first recommendation. Several Parties highlighted the importance of ensuring Parties identified a working level competent authority contact, noting that, in some cases, the available contacts could be difficult to reach or were not directly involved in daily activities.
- (372) The Meeting concluded that it would be helpful for national competent authorities to be able to hold discussions on the Secretariat website forum regarding their tourism regulatory activities, thus allowing them to exchange knowledge and experiences.
- (373) The Meeting asked the Secretariat to establish such a permanent forum, which would be convened by the Working Group Chair of the tourism agenda item. Participation would be limited to Parties. Issues that could be discussed included:
- a. identifying specific challenges and opportunities for enhanced cooperation in the implementation of the Protocol;
 - b. providing advice to the ATCM on emerging issues related to tourism regulation; and
 - c. formulating advice to the ATCM, via delegations, on specific relevant issues.
- (374) The forum participants may wish to establish a work plan to help its work progress. A further forum would also be provided where discussions could also involve Observers and Experts.
- (375) On the issue of communication among competent authorities, several Parties emphasised the importance of ensuring that national competent authorities were well-supported to do their work and encouraged increasing collaboration and information exchange amongst them.
- (376) The Meeting expressed support for recommendations 4 to 7 under this theme (paragraph 369). In relation to the EIES, the Meeting acknowledged the Secretariat's work on updating the website and recognised the benefits of making information clearer and easily locatable. Parties highlighted that the EIES was only truly efficient if adequately updated and encouraged Parties to submit updated information.
- (377) The Meeting noted several key issues raised by Parties in the course of the discussion, including: the importance of reaching out to Non-consultative Parties involved in tourism activities; that IAATO had relevant materials and resources that could provide a useful starting point for developing guidelines on issues of compliance; that engagement among national

competent authorities should be encouraged on a voluntary basis; and that adequate and timely information was the first step to address any potential issues of non-compliance.

- (378) IAATO highlighted that it had long supported enhanced engagement between national authorities and supported strengthening compliance. IAATO referred to IP 138 IAATO *Mandatory Observer Scheme*, which reported on the implementation of a scheme of periodic mandatory observations of all member operations, noting that it represented a significant strengthening of IAATO's efforts to assure itself and other stakeholders that its operators comply with all IAATO and Treaty policies and procedures. IAATO also noted that it welcomes Antarctic Treaty Inspections, concluding that it remained committed to working with the ATCM to ensure that visitor activities were safe and had no more than a minor or transitory impact in Antarctica.
- (379) ASOC noted that the workshop recommendations would help with increasing communication between competent authorities as well as with the process of collecting and analysing information about activities on the ground. ASOC encouraged, in particular, the use of tourism inspections within the current inspection regime, which could be complemented with a tourism observer scheme. It recommended that these and other compliance-related initiatives address all modalities of tourism, such as ship-borne tourism, fly-cruise tourism and land-based tourism infrastructure.
- (380) France introduced WP 43 *An on-board observer scheme for tourist vessels operating within the Antarctic Treaty area*, jointly prepared with Argentina and the United Kingdom. This paper called for the establishment of an open-ended ICG to consider the establishment of an on-board observer scheme for tourist vessels operating within the Antarctic Treaty area. France noted that the implementation of such a scheme had been a topic of consideration at the Meeting since 2003, and that the recent tourism workshop in Rotterdam had further drawn attention to the issue. France observed that the implementation of an on-board observer scheme could enable better monitoring of compliance of tourism activities with rules adopted under the Antarctic Treaty System. It noted that such a scheme would also support dialogue between competent authorities and the tourist operators and promote responsible tourism in accordance with the values of the Treaty. France explained that the aim of the ICG would be to present to ATCM XLIII a draft operational framework. The ICG would also consider the establishment of an international observation scheme for tourism activities in Antarctica. France noted a number of outstanding issues that

would need to be examined by the ICG, including financial and legal issues. It encouraged interested Parties, Observers, and Experts, in particular ASOC and IAATO, to contribute to the ICG.

- (381) The Meeting thanked France, Argentina, and the United Kingdom for preparing the paper. Acknowledging the growth and diversification of tourism activities in recent years, the Meeting expressed general consensus on the importance of the issues raised by the proponents in the paper. The Meeting further noted the value of a collaborative approach between Parties and IAATO as well as the value of learning from the past experiences of Parties and Observers.
- (382) Some Parties questioned the legal status for the proposed scheme and pointed out the need to clarify the distinction between the proposed scheme and the current inspection scheme within the Antarctic Treaty System. One Party also questioned whether the scheme would be implemented on vessels that do not disembark passengers in Antarctica, which in its view may present conflict with the freedom of navigation of the high seas.
- (383) The Meeting agreed to establish an open-ended ICG on the ATCM online discussion forum on the issue of a voluntary on-board observer operational framework for tourist vessels operating within the Antarctic Treaty area, to propose a draft operational framework that could be implemented, on a voluntary basis, to Parties willing to deploy observers on tourist vessels under their jurisdiction. It further agreed to the following terms of reference for the ICG:
1. To study existing frameworks in order to provide feedback;
 2. To share information and ideas on issues related to a voluntary on-board observer operational framework, as such:
 - The role of observers and the tasks potentially assigned to them;
 - The profile and qualifications required for observers;
 - The type of vessel concerned and the frequency of observations;
 - The potential financial issues involved.
 3. Depending on progress, to propose a draft voluntary on-board observer operational framework.
- (384) It was further agreed that:
- Observers and Experts participating in the ATCM would be invited to provide input, in particular ASOC and IAATO were encouraged to contribute; and

- France would act as convenor and report to ATCM XLIII on progress made in the ICG.
- (385) France introduced WP 51 *Compiling a manual on tourism and non-governmental activities in Antarctica*, jointly prepared with Argentina and the United States. France noted that guidelines, rules, and regulations related to tourism and non-governmental activities in Antarctica were currently dispersed across ATS and Party platforms. It explained that the manual proposed in the paper would bring together all current applicable provisions on tourism and non-governmental activities in the Antarctic Treaty area. It observed that a single, user-friendly manual would offer numerous benefits, including helping to make existing rules more widely known and more effective. It described the proposed structure and process for updating the manual and emphasised that no new provisions would be added to the manual. In particular, it highlighted that applicable law would not be modified. France requested that Parties give their opinion on the relevance of creating the manual described in the paper, including the draft Decision in the Annex. It explained that the Decision would give responsibility for drafting and producing the manual to the Secretariat, which would be supported by interested Parties through an informal contact group.
- (386) The Meeting thanked France, Argentina, and the United States for introducing the useful ideas outlined in the paper. Noting the difficulty of accessing disparate documents related to tourism and non-governmental activities in Antarctica, the Meeting expressed its support for the principle of creating a single manual. It noted that such a manual could support competent authorities, operators, and others in complying fully with all relevant rules and regulations. It emphasised the importance of ensuring that the manual would not include national legislation.
- (387) Following further discussion, the Meeting adopted Decision 6 (2019) *Manual of Regulations and Guidelines Relevant to Tourism and Non-Governmental Activities in Antarctica*.
- (388) The United States introduced WP 67 *Coastal Camping Coordination*, jointly prepared with Canada, which addressed the issue of vessel-supported overnight stays, an activity that some non-governmental operators offered to their clients. It noted that several national competent authorities were receiving requests from operators for increasing numbers of campers, including multiple requests related to single sites, and requests related to multiple locations, sometimes related to sites that had not previously been

used for coastal camping. The United States noted that the CEP had discussed the issue of coastal camping coordination and addressed some of the key issues and implications. It highlighted that the paper proposed a practical approach to ensure effective results.

(389) It recommended that the ATCM:

- Encourage Treaty Parties to reconsider including explicit guidance on camping in Site Guidelines for Visitors. For example, a statement could be added to the “Visitors” section as to whether camping was advisable and, if so, give the maximum number of campers and show a preferred camp site (or sites) on the map of the area.
- Promote discussions amongst national competent authorities that currently review coastal camping activities and other interested Parties and Observers to enhance harmonisation on issues such as numbers of campers and camping locations.
- Consider the development of coastal camping guidelines to help ensure consistent application of best practices and minimise impacts to the Antarctic environment.

(390) The Meeting thanked the United States and Canada for their paper and acknowledged that it related to a very important issue, particularly considering the increasing demand for these kinds of activities in Antarctica. The Meeting acknowledged that valuable discussions on coastal camping and its implications had been undertaken by the CEP and that it would address some of the associated environmental issues during the intersessional period.

(391) Several Parties reported that their national competent authorities issued permits for overnight stays in Antarctica and noted that further discussions on this issue could be very useful. General support was expressed for the idea of developing guidelines. Some Parties also mentioned that in dealing with coastal camping, communication among national competent authorities should be strengthened and that different approaches to permitting should be standardised.

(392) IAATO noted that it viewed its operators’ camping activities as fitting into one of three categories: deep-field camping, which was usually associated with long expeditions or crossings; coastal multiple-night camping, usually by small expedition groups from small vessels; and short overnight stays, which constituted the most common camping activity and usually involved larger groups remaining ashore for only a few hours. It reported that these

and all IAATO activities adhered to Measure 15 (2009). IAATO further noted it had submitted revised guidelines to ATCM XXXVI in IP 98 *IAATO Guidelines for Short Overnight Stays* and noted that these were the ones currently followed by IAATO. IAATO concluded that it remained committed to reporting its activities and to assisting the ATCM on this issue.

- (393) ASOC thanked the United States and Canada and noted its appreciation for the paper's focus on minimising the impact of camping activities on Antarctic values and on managing visitor footprint. ASOC noted that Parties needed to assess whether to allow camping activities at sites rather than only assessing how camping should be conducted. ASOC therefore supported the overall recommendation to better coordinate on a consistent approach to the management of camping.
- (394) Parties also noted: the benefits of privileging a site-by-site approach when dealing with camping requests; the usefulness of clarifying and defining different types of coastal camping; the possibility of developing guidelines to help national competent authorities evaluate these activities; the importance of ensuring that further developments related to coastal camping were not seen as an encouragement to these type of activities; and the need to properly assess if coastal camping permits should not be issued to particularly vulnerable sites.
- (395) In order to progress this issue further, and noting that the CEP would undertake significant intersessional work on coastal camping, the Meeting agreed to encourage further informal intersessional consultations. The Meeting suggested that Parties consider and bring forward information on matters related to coastal camping. It was agreed that this issue would be addressed again in ATCM XLIII.
- (396) ASOC introduced IP 128 *Antarctic tourism: Using lessons learned to inform effective, proactive management*, reviewed past tourism discussions and offered a number of lessons learned with respect to tourism growth. ASOC recommended that the ATCM take action on: the proactive identification of reference areas with representative habitat and biodiversity, where tourism was not a permitted activity; the development of frameworks for the assessment of new activities; and the establishment of precautionary guidelines for new sites. ASOC noted that although tourism discussions had often stalled in the past, decisions by the ATCM, such as Measure 15 (2009), which prohibited landings by ships with more than 500 passengers, demonstrated it was possible to agree to significant measures. ASOC encouraged the ATCM to adopt similarly targeted measures to prevent tourism from having more than a minor or transitory environmental impact.

(397) IAATO presented IP 138 *IAATO Mandatory Observer Scheme*, noting that IAATO maintained an effective system of checks on Operators' adherence to guidelines based on in-field observations conducted by qualified personnel. IAATO reported that currently an IAATO Operator's activities had to be observed during its first year of operation of a new/refurbished vessel or field camp, and at least once every five years subsequently. IAATO also noted that, as part of its general policy, it encouraged those who had witnessed a violation of IAATO or Treaty policies to come forward via a whistle-blower or care and concern system. IAATO expressed its willingness to work with Treaty Parties on developing an observation scheme to assist with safe and environmentally responsible tourism to Antarctica.

(398) The following papers were also submitted under this agenda item, and taken as presented:

- IP 24 *Systematic Conservation Plan for the Antarctic Peninsula Project Updates* (SCAR, IAATO), which reported that the joint SCAR-IAATO project aimed to inform the Antarctic community on how best to concurrently manage biodiversity and human activities in the region. It also reported on the establishment of a Liaison Group to provide advice, input, and data to the project and invited interested Parties to contribute by contacting SCAR at *scp@scar.org*.
- IP 26 *Proactive Management of Antarctic Tourism: Time for a Fresh Approach* (Netherlands, New Zealand). This summarised the key areas related to tourism identified by the Antarctic Tourism Workshop, held in Rotterdam in April 2019, namely: future tourism growth, diversification of tourism activities, and how to enhance compliance.

(399) The following paper was also submitted under this agenda item:

- BP 5 *Experience of an Observer Scheme for Antarctic Tourism in New Zealand* (New Zealand).
- BP 18 *'Arctic wilderness lessons' for regulating and managing tourism in Antarctica. Background Paper on a research project on the protection of Antarctic wilderness* (Netherlands).

Information Exchange and Reporting

(400) Norway introduced WP 59 *EIES – Improving availability of information on non-governmental aviation activity*. Norway recalled Decision 5 (2016), which had updated information exchange requirements to include

more detailed information on aircraft activities. Noting recent increases in aviation to and within the continent, Norway had undertaken a short study of the 2018/19 entries into the pre-season report as well as the 2018 annual report. It had observed gaps and inconsistencies in information entered by Parties regarding non-governmental aviation activity, which made it difficult to get a complete overview of air operations in Antarctica. Norway encouraged Parties to enter information for both non-governmental aviation activity and national expedition aviation activity into the EIES under the “Aircraft Activities” heading, and to detail individual flights to the greatest extent possible. Norway considered that this information would allow the Secretariat to make summarised reports for both non-governmental and national programme aviation activity, which in turn would give Parties a better overview of activities and developments in their work.

- (401) The Meeting thanked Norway for its paper. Several Parties and Observers reiterated the value of sharing more detailed information on non-governmental aviation activity through the EIES. Some Parties suggested that it might be more efficient to focus on technical solutions related to real-time exchange of information. The Meeting agreed on the importance of providing information on aerial activity through the EIES on a voluntary basis.
- (402) Argentina introduced WP 66 *Reviewing requirements for exchanging information on non-governmental expeditions*. Noting the need for improvements in the ATCMs current information exchange requirements, Argentina proposed a modification to Decision 5 (2016) to more accurately reflect the number of visitors and crew members per trip, and thus achieve more accuracy in the global number of visitors to Antarctica each season through non-governmental activities. Argentina noted that this would build upon the substantial work already undertaken by IAATO, in order to provide a more complete overview of current non-governmental activity in Antarctica. Argentina also noted the need to revise the format and content of Post-Visit Reports, which had not been updated since 2005 despite changes to the requirements for information exchange.
- (403) Argentina proposed that the ATCM: accept the proposed modifications of the information exchange requirements and modify Decision 5 (2016); request that the Antarctic Treaty Secretariat update the corresponding fields in the EIES; establish an ICG to review the compatibility between information exchange requirements and Post-Visit Reports; and encourage Parties to comply with the provision of information on tourism and non-governmental activities under their jurisdiction.

- (404) The Meeting thanked Argentina for its paper. Several Parties reiterated the importance of maintaining comprehensive and up-to-date information on non-governmental activities in order to support evidence-based decision making. Some Parties emphasised that it would be useful to harmonise the IAATO database and EIES to ensure consistency and avoid duplicating information.
- (405) The Meeting agreed to modify the Annex to Decision 5 (2016) by updating section 2.2.2. Non-Governmental Expeditions to include the following fields: the total amount of passengers transported in each journey and the total number of crew members on board of each journey. The Meeting adopted Decision 7 (2019) *Reviewing Requirements for Exchanging Information on Non-Governmental Expeditions*.
- (406) The Meeting agreed to establish an ICG on the Review of Post-Visit Reports, with the following terms of reference:
- To examine the content of the format of the Post-Visit Report contained in Resolution 6 (2005) relative to the information exchange requirements.
 - To propose modifications to the Post-Visit Report that would facilitate full compatibility between the information exchange requirements and these reports.
 - To submit the results of the analysis and the proposed changes to the ATCM XLIII, with the aim of updating Resolution 6 (2005).
- (407) It further agreed that:
- Observers and Experts participating in the ATCM would be invited to provide input;
 - the Executive Secretary would open the ATCM forum for the ICG and provide assistance to the ICG; and
 - Argentina would act as convener and report to ATCM XLIII on progress made in the ICG.
- (408) The Secretariat presented SP 7 rev. 1 *Visits to Sites and Protected Areas reporting and mapping developments*. The Secretariat recalled that, at ATCM XLI, Parties had noted the desirability of developing an interactive mapping tool on the Secretariat website (based on the Geographical Information tool demonstrated for the inspections database) that could help illustrate visitation over time for sites covered by Site Guidelines. The paper presented

developments on the Secretariat website related to the production of reports and geographical information on this matter. The Secretariat noted that the information reports lacked precision in terms of the actual number of people and vessels visiting each site and highlighted that for information on visitation to be accurate, reports to the EIES should include details on all visited sites for each voyage and the exact number of visitors who took part in each visit. The Secretariat reported that it was currently working with IAATO to achieve a better synchronisation between both databases. It further noted that geographic information of other summarised reports of the EIES and database contents hosted by the Secretariat could be integrated in the existing geographical information tool and was open for suggestions.

- (409) The Meeting acknowledged the work of the Secretariat in developing this useful tool and noted its relevance in working towards synchronisation of databases from different organisations. The Meeting highlighted that this paper provided a good example of how the Secretariat proactively worked to respond to the ATCM's needs, supporting it with useful information and spatial tools. It was further noted that, although efforts to enhance and fine tune the EIES system were always welcomed, the Meeting should not wait for enhancements in the EIES to take substantive and timely decisions, noting that abundant information was already currently available.
- (410) In response to a suggestion put forward by Italy, to include information on stations in the map on visits to sites, the Secretariat suggested that it could merge the new map with the map related to inspections based on information provided by COMNAP, which contained detailed information on the stations and their locations.
- (411) In response to a query by the Netherlands, concerning the possibility of including sites without associated visitor site guidelines, the Secretariat confirmed that it was technically able to include all sites, but that the specific request it had received from the ATCM was to only show sites subject to site guidelines. The Secretariat noted that information on sites without guidelines was less accurate than information on sites with guidelines. The Meeting agreed to include sites without associated visitor site guidelines.
- (412) ASOC highlighted the usefulness of this tool and emphasised that it would be relevant to include other sites not subject to guidelines. ASOC also suggested the incorporation, where possible, of the activities conducted at landing sites.

- (413) France presented IP 78 *A review of tourist activities authorized by France in the Antarctic Treaty area during the 2017–18 season*. France highlighted that the 2017/18 season had marked an increase in the number of visitors and trips authorised by the French competent authority. France explained that data had been obtained from Post-Visit Reports, which allowed France to clearly identify the area's most frequently visited by tourists and to better understand vessel-based activities, including landings. France also referred to SP 7 and linked its work to work done by the Secretariat to produce reports on visits to sites subject to site guidelines and visits to Antarctic Protected Areas through interactive maps. France informed Parties of its willingness to exchange information about its system to review tourist activities and its interest in discussing such a system with other competent authorities.

Trends and Patterns

- (414) The United Kingdom presented IP 107 rev. 1 *Data Collection and Reporting on Yachting Activity in Antarctica in 2018-19*, jointly prepared with Argentina, Chile and IAATO. The paper consolidated information relating to yachts that were either sighted in Antarctica, or indicating an intention to travel to Antarctica, during the 2018/19 season. It followed on from previous reports to the ATCM about the number of yachts sighted in the Antarctic during each previous season. It noted that the EIES had remained a useful tool for compiling information related to yachts permitted or authorised to travel to Antarctica. The United Kingdom further encouraged Parties to ensure that yacht records in the EIES were complete and up to date. It highlighted that there had been a growing number of non-IAATO yachts in the database and that the number of non-IAATO yachts had surpassed the number of IAATO yachts. The United Kingdom also drew Parties' attention to Table 3 of the paper which listed unauthorised vessels that had travelled to Antarctica and noted that some of the yachts in the listing were flagged to nations that were not Antarctic Treaty Parties.
- (415) IAATO expressed concern regarding certain activities of unauthorised vessels and their potential for more than minor or transitory environmental impact and that this sets a poor example to those responsible operators and their passengers.
- (416) The Meeting welcomed the analyses contained in IP 107 rev. 1 and thanked the co-authors for continuing to conduct these very useful analyses.
- (417) Argentina presented IP 84 *Report on Antarctic tourist flows and cruise ships operating in Ushuaia during the 2018/2019 Austral summer season*. This

paper provided information about the flows of passengers and vessels that had visited Antarctica during the 2018/19 Austral summer season, operating from the port of Ushuaia. It noted that the main source of data for this report had been statements from vessel captains. Argentina noted that there had been an increase in the number of vessels, voyages, and number of passengers compared to the 2017/18 season, reaching approximately a total number of 55,000 passengers. The paper updated the data that had been provided in similar papers presented by Argentina to the ATCM since 2009.

- (418) The Meeting thanked Argentina for its report on Antarctic tourism activities that had proceeded from Ushuaia and noted that such information was a very useful contribution to discussions regarding Antarctic tourism.
- (419) IAATO thanked France and Argentina for IP 78 and IP 84 respectively. IAATO said the alternative source of data is very useful for checking its own data and allows a broader analysis of the data.
- (420) IAATO presented IP 140 rev. 1 *IAATO Overview of Antarctic Tourism: 2018-19 Season and Preliminary Estimates for 2019-20 Season*. IAATO provided data compiled from Post Visit Reports for the 2018/19 season and noted that the numbers reported reflected only those travelling with IAATO Operator companies and did not include those individuals taking part in research projects that had been supported by IAATO Operators. IAATO observed that over 80% of passengers included in the PVRs were nationals of Antarctic Treaty Parties. IAATO reported that the overall number of visitors in 2018/19 was 56,168. IAATO's estimates for 2019/20 indicate that passenger numbers will rise to circa 78,504 individuals. Further analysis of these numbers estimates 60,084 will make landings, and 18,420 of these passengers will travel on cruise only vessels which do not make landings. IAATO emphasised that all IAATO member and operator activities were planned to have no more than a minor or transitory impact on the Antarctic environment and continued to be conducted safely.
- (421) The Netherlands noted that IAATO's estimate of a sharp increase for the 2019/20 season was unprecedented, and that it would be important to consider the cumulative impacts and the potential mismatch between such impacts and the existing guidelines.
- (422) The Meeting thanked IAATO for the annual report and noted that the discussion on the increased activity in the region was highly informative.
- (423) France noted that legal proceedings were under way regarding IP 14 *Notification of the presence of an unauthorized sailing vessel in the Antarctic*,

with a non-indigenous species on board (ATCM XLI), and that a follow-up IP would be presented on the topic at ATCM XLIII.

(424) The following paper was also submitted under this agenda item and taken as presented:

- IP 145 *A Catalogue of IAATO Operator Activities* (IAATO). This paper responded to a request by Parties in attendance at the 2019 Antarctic Tourism Workshop held in Rotterdam, and provided a catalogue, and brief description, of the Operator activities recorded by IAATO in the Post Visit Reports for the 2018/2019 season.

Sites

(425) IAATO presented IP 144 *IAATO Field Operations Manual (FOM)*. IAATO observed that it facilitated its Members and Operators in conducting safe and environmentally responsible Antarctic tourism by providing relevant information on Antarctic governance, best practices, and industry guidelines. It noted that the core method for delivering this information was the Field Operations Manual. IAATO highlighted that the Manual was updated and circulated annually to IAATO operators.

(426) The Meeting thanked IAATO for its useful presentation describing its Field Operations Manual.

(427) The Meeting recognised and welcomed the efforts of the CEP to provide the ATCM with revised Site Guidelines. It highlighted that the CEP's work in preparing and developing new and revised Site Guidelines was a very valuable part of the collective efforts to protect Antarctica.

(428) The following paper was also submitted under this agenda item, and taken as presented:

- IP 142 *Report on IAATO Operator Use of Antarctic Peninsula Landing Sites and ATCM Visitor Site Guidelines, 2018-19 Season* (IAATO). This paper described data collected by IAATO from IAATO Operator Post Visit Report Forms for the 2018/19 season. It reported that there was a 1.4% increase in the number of actual landings made from last season. The levels of visits were not uniform, with a few sites continuing to receive the majority of the increase, and others seeing a decrease in activity.

Item 18: Preparation of the 43rd Meeting

a. Date and place

(429) The Meeting welcomed the kind invitation of the Government of Finland to host ATCM XLIII in Helsinki, from 25 May to 4 June 2020.

(430) For future planning, the Meeting took note of the following scheduled timetable of upcoming ATCMs:

- 2021: France
- 2022: Germany

b. Invitation of International and Non-governmental Organisations

(431) In accordance with established practice, the Meeting agreed that the following organisations having scientific or technical interest in Antarctica should be invited to send experts to attend ATCM XLIII: ACAP, ASOC, IAATO, the International Civil Aviation Organization (ICAO), IGP&I Clubs, IHO, IMO, IOC, IOPC Funds, IPCC, the International Union for the Conservation of Nature (IUCN), UNEP, UNFCCC, WMO and the World Tourism Organization (WTO).

c. Preparation of the Agenda for ATCM XLIII

(432) The Meeting approved the Preliminary Agenda for ATCM XLIII (see Appendix 2).

d. Organisation of ATCM XLIII

(433) According to Rule 11 of the Rules of Procedure, the Meeting decided to propose the same Working Groups for ATCM XLIII as observed in this meeting. The Meeting agreed to appoint Theodore Kill from the United States as Chair for Working Group 1 for 2020. It also agreed to appoint Sonia Ramos García from Spain and Dr Phillip Tracey from Australia as Co-chairs for Working Group 2 in 2020.

e. The SCAR Lecture

- (434) Taking into account the valuable series of lectures given by SCAR at a number of ATCMs, the Meeting decided to invite SCAR to give another lecture on scientific issues relevant to ATCM XLIII.

Item 19: Any Other Business

a. Declaration on the 60th Anniversary of the Antarctic Treaty

- (435) The Meeting adopted the Prague Declaration on the Occasion of the Sixtieth Anniversary of the Antarctic Treaty, in which all Parties reaffirmed their commitment to the objectives, purposes and principles of the Antarctic Treaty, its Protocol on Environmental Protection, and all other instruments of the Antarctic Treaty System (Appendix 1).
- (436) The Meeting thanked the Czech Republic for its leadership and efforts in the drafting of the Declaration and expressed its warmest congratulations to the ATCM for its 60 years of achievements. The Parties expressed their satisfaction with the final wording of the Declaration, reiterated their deep commitment to its principles, and encouraged its communication and dissemination to as broad an audience as possible.

Item 20: Adoption of the Final Report

- (437) The Meeting adopted the Final Report of the 42nd Antarctic Treaty Consultative Meeting. The Chair of the Meeting, Mr Martin Smolek, made closing remarks.

Item 21: Close of the Meeting

- (438) The Meeting was closed on Thursday, 11 July 2019 at 13:17.

2. CEP XXII Report

Report of the Twenty-second Meeting of the Committee for Environmental Protection (CEP XXII)

Prague, Czech Republic, July 1–5, 2019

- (1) Pursuant to Article 11 of the Protocol on Environmental Protection to the Antarctic Treaty, Representatives from 37 of the 40 Parties to the Protocol (Argentina, Australia, Belarus, Belgium, Brazil, Bulgaria¹⁸, Canada, Chile, China, the Czech Republic, Ecuador, Finland, France, Germany, India, Italy, Japan, Malaysia, Monaco, the Netherlands, New Zealand, Norway, Peru, Poland, Portugal, the Republic of Korea, Romania, the Russian Federation, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, the United States, and Uruguay) met in Prague, the Czech Republic, from 1 to 5 July 2019, for the purpose of providing advice and formulating recommendations to the Parties in connection with the implementation of the Protocol.
- (2) In accordance with Rule 4 of the CEP Rules of Procedure, the meeting was also attended by representatives of the following Observers:
 - One Contracting Party to the Antarctic Treaty that is not a Party to the Protocol: Colombia;
 - the Scientific Committee on Antarctic Research (SCAR), the Scientific Committee for the Conservation of Antarctic Marine Living Resources (SC-CAMLR), and the Council of Managers of National Antarctic Programs (COMNAP); and
 - scientific, environmental and technical organisations: the Antarctic and Southern Ocean Coalition (ASOC), the International Association of Antarctica Tour Operators (IAATO), and the World Meteorological Organization (WMO).

Item 1: Opening of the Meeting

- (3) The CEP Chair, Ms Birgit Njåstad (Norway), opened the meeting on Monday 1 July 2019 and thanked the Czech Republic for organising and hosting the meeting in Prague.

- (4) The Committee paid its respects to the late Professor David Walton, who had worked with the CEP for many years and who had passed away suddenly on 12 February 2019. The Committee recognised Professor Walton's great personality and long involvement in Antarctic affairs, noting that he had worked as an ecologist at the British Antarctic Survey (BAS) for over 40 years. While his early research career focused on the ecology of Antarctic flora, his interests diversified into Antarctic science more broadly, including its conservation, policy and history. Professor Walton was head of terrestrial biology and head of environment and information at BAS, Chair of SCAR's Group of Specialists on Environmental Affairs and Conservation (GOSEAC), the SCAR representative to the CEP for many years, and was chosen as the first chief officer of the Standing Committee on the Antarctic Treaty System (SCATS). He also served as the first editor of the Antarctic Environments Portal and was an important member of the ATCM rapporteur team. The Committee noted that Professor Walton's absence would be deeply felt for many meetings to come.

Item 2: Adoption of the Agenda

- (5) The Committee adopted the following agenda and confirmed the allocation of 48 Working Papers (WP), 75 Information Papers (IP), 5 Secretariat Papers (SP) and 8 Background Papers (BP) to the agenda items:
1. Opening of the Meeting
 2. Adoption of the Agenda
 3. Strategic Discussions on the Future Work of the CEP
 4. Operation of the CEP
 5. Cooperation with other Organisations
 6. Repair and Remediation of Environment Damage
 7. Climate Change Implications for the Environment
 - a. Strategic Approach
 - b. Implementation and Review of the Climate Change Response Work Programme
 8. Environmental Impact Assessment (EIA)
 - a. Draft Comprehensive Environmental Evaluations
 - b. Other EIA Matters
 9. Area Protection and Management Plans

- a. Management Plans
 - b. Historic Sites and Monuments
 - c. Site Guidelines
 - d. Marine Spatial Protection and Management
 - e. Other Annex V Matters
10. Conservation of Antarctic Flora and Fauna
 - a. Quarantine and Non-native Species
 - b. Specially Protected Species
 - c. Other Annex II Matters
 11. Environmental Monitoring and Reporting
 12. Inspection Reports
 13. General Matters
 14. Election of Officers
 15. Preparation for the Next Meeting
 16. Adoption of the Report
 17. Closing of the Meeting

Item 3: Strategic Discussions on the Future Work of the CEP

- (6) The Netherlands introduced WP 19 *Antarctic Tourism Workshop, 3-5 April in Rotterdam, The Netherlands: Chair's Summary and Key Recommendations*, jointly prepared with the United Kingdom. It also presented IP 11 *Antarctic Tourism Workshop, 3-5 April in Rotterdam, The Netherlands: Chair's Report*, also jointly prepared with the United Kingdom, and IP 26 *Proactive Management of Antarctic Tourism: Time for a Fresh Approach*, jointly prepared with New Zealand. The Netherlands noted that many Members of the Committee participated, as well as ASOC, IAATO, SCAR and a number of invited Antarctic tourism experts. Arthur Eijs (The Netherlands) and Jane Rumble OBE (United Kingdom) co-chaired the workshop. The workshop considered recent trends in Antarctic tourism and focused on three key areas related to tourism management: future tourism growth, diversification of tourism activities, and how to enhance compliance. For each of these areas, the workshop participants had agreed that the co-chairs should make recommendations to put forward to the CEP and ATCM.
- (7) With regards to the matter of tourism growth, the workshop participants recommended that the CEP:

- work with SCAR to design and propose how to implement an environmental monitoring programme;
 - encourage all Parties to engage in the development of further site-specific visitor guidelines and the regular review of existing ones, with further consideration given to elaborating seasonal considerations in site guidelines; and
 - work with SCAR to further elaborate an understanding of the wilderness values with a view to their practical application and, in conjunction to that, support SCAR research into theoretical carrying capacity.
- (8) With regards to the matter of diversification, the workshop participants recommended that the CEP:
- develop a framework for conducting pre-assessments relating to new, novel or particularly concerning activities. Heli-skiing might provide for a useful case study;
 - ensure that site guidelines were as specific as possible in terms of which activities were permitted or not at each site; and
 - revise and strengthen the general guidelines for visitors (Resolution 3 [2011]).
- (9) IAATO extended its thanks to the workshop organisers and welcomed the opportunity to contribute to future and ongoing discussions. With respect to the workshop's recommendations on the matter of growth, IAATO highlighted its members' commitment to operate within the parameters of relevant provisions of the Antarctic Treaty System, including ATCM Measures, Decisions and Resolutions. It expressed support for the environmental monitoring programme to guide evidence-based decisions on the management of human activity. It referred to its history of supporting similar projects, and of developing and reviewing visitor site guidelines. Acknowledging that there were different perspectives on what constitutes wilderness, IAATO agreed that developing an understanding of wilderness values was important.
- (10) With respect to the workshop's recommendations on matters of diversification, IAATO noted that it had submitted a catalogue of IAATO Operator Activities (IP 145 *A Catalogue of IAATO Operator Activities*). IAATO had also referred to ATCM XXXVII - IP 34, where it summarised adventure tourism activities undertaken by IAATO members, and ATCM XXXIV - IP 118, where it submitted IAATO's framework for operators considering any new activity that encouraged proactive management within the parameters of the Antarctic Treaty System.

- (11) With respect to compliance activities, IAATO referred to its Mandatory Observer Scheme, reported to the ATCM XXII (IP 138 *IAATO Mandatory Observer Scheme*) and noted that it continued to welcome and encourage inspections under the Antarctic Treaty, reflecting on their value as a learning activity for member operators. IAATO concluded that it remained committed to working with Parties as required and to ensuring that its planned activities were safe and had no more than a minor or transitory impact on the environment.
- (12) ASOC also extended thanks to all participants in the workshop, and noted that its recommendations in IP 128 *Antarctic tourism: Using lessons learned to inform effective, proactive management* had relevance to the CEP. In relation to the workshop's recommendations on growth, ASOC recommended to: identify areas of representative biodiversity in the Antarctic Peninsula where tourism was not a permitted activity to serve as reference areas for comparison with visited areas; and take a precautionary approach to the expansion of new visited sites. In relation to diversification, ASOC agreed with the workshop recommendation to develop frameworks for the assessment of new activities.
- (13) Several Members emphasised the importance of creating an ongoing subsidiary group for enhanced engagement between National Competent Authorities, with a view to facilitate harmonisation in implementation of existing rules.
- (14) The Committee commended the workshop organisers and participants, and noted the timeliness and usefulness of the workshop and its recommendations. The Committee endorsed the recommendations addressed to the CEP in WP 19, and agreed, as a way forward:
 - To invite SCAR, in consultation with COMNAP, IAATO, ASOC and interested Parties, to design an environmental monitoring programme to assess the impacts of tourism, which includes a scoping assessment, having particular reference to the recommendations of the CEP tourism study relevant to monitoring and ongoing work, for consideration by CEP XXIII.
 - To invite SCAR, in consultation with interested Parties, to further elaborate an understanding of the wilderness values with a view to their practical application and to report to CEP XXIV.
 - To invite SCAR, in consultation with interested Parties, to undertake research into carrying capacity of sites, and to report to CEP XXIV.

- To encourage all Parties to engage in the development of additional site-specific visitor guidelines and in the regular review of existing ones, with further consideration given to elaborating seasonal considerations in site guidelines.
 - To develop a framework for conducting pre-assessments relating to new, novel or particularly concerning activities and to that end:
 - include this as a priority activity in the CEP Five-year Work Plan;
 - encourage CEP members and observers to work in the intersessional period on such a framework, focusing on the environmental aspects;
 - note particularly the importance of the framework for facilitating a harmonised consideration of activities by national competent authorities;
 - note that such a framework could appropriately also address issues within the scope of ATCM discussions, and indicate its willingness to participate in joint work.
- (15) The Committee also agreed to establish an ICG to address the existing guidance for visitors to the continent, with a view to strengthen that guidance and ensure that activities from visitors, including from tourism and non-governmental activities, singularly and cumulatively, have less than a minor or transitory impact. The Committee further agreed to the following ToRs:
1. To consider all relevant guidance for visitors to the continent;
 2. to revise and, where needed, strengthen the guidelines adopted through Resolution 3 (2011);
 3. to consider the coherence and relation between the general guidelines and site specific guidelines, as well as their systematic review methodology;
 4. to consider how to ensure that site specific guidelines are as specific as possible in terms of considerations for which activities are suitable or not at each site;
 5. to consider ways to improve planning, prioritisation and implementation of site specific guidelines development; and
 6. to report back to CEP XXIII.

- (16) The Committee welcomed the offer from Heike Herata, Germany to act as ICG convener.

CEP advice to the ATCM on the recommendations arising from the Antarctic Tourism Workshop

- (17) The Committee advised the ATCM that it had endorsed the CEP relevant recommendations arising from the Antarctic Tourism Workshop, and had agreed to progress the recommendation by:
- inviting SCAR, in collaboration with others, to provide advice regarding a potential design for an environmental monitoring programme to assess the impacts of tourism, to further elaborate an understanding of the wilderness values with a view to their practical application and to undertake research into carrying capacity of sites;
 - including as a priority action on its Five-year Work Plan the development of a framework for conducting pre-assessments relating to new, novel or particularly concerning activities; and
 - establishing an ICG to address the existing guidance for visitors to the continent, with a view to strengthen that guidance and ensure that activities from visitors, including from tourism and non-governmental activities, singularly and cumulatively, have less than a minor or transitory impact with the following terms of reference:
 - To consider all relevant guidance for visitors to the continent;
 - to revise and, where needed, strengthen the guidelines adopted through Resolution 3 (2011);
 - to consider the coherence and relation between the general guidelines and site specific guidelines, as well as their systematic review methodology;
 - to consider how to ensure that site specific guidelines are as specific as possible in terms of considerations for which activities are suitable or not at each site;
 - to consider ways to improve planning, prioritisation and implementation of site specific guidelines development; and
 - to report back to CEP XXIII.
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CEP Five-year Work Plan

- (18) The Committee briefly considered the Five-year Work Plan, adopted at CEP XXI (SP 2), as well as its Climate Change Response Work Programme (CCRWP), at the end of each agenda item.
- (19) The Committee revised and updated its Five-year Work Plan (Appendix 1).
- (20) The following Background Paper was also submitted under this agenda item:
 - BP 18 *'Arctic wilderness lessons' for regulating and managing tourism in Antarctica. Background Paper on a research project on the protection of Antarctic wilderness* (the Netherlands).

Item 4: Operation of the CEP

- (21) The Chair of the CEP referred to IP 157 *Committee for Environmental Protection (CEP): summary of activities during the 2018/19 intersessional period* (Norway), which summarised the work undertaken during the intersessional period based on the tasks set at CEP XXI, noting a substantial amount of intersessional work had taken place during the intersessional period responding to most of those tasks.

Item 5: Cooperation with other Organisations

- (22) COMNAP presented IP 8 *Annual Report for 2018/19 of the Council of Managers of National Antarctic Programs* (COMNAP), and reported on a successful COMNAP workshop held in June 2018 on “Understanding Sources of Plastics and Reducing Plastic Waste in the Antarctic Terrestrial and Marine Environments”. As a result of the workshop, COMNAP agreed four recommendations for all National Antarctic Programmes, which focused on taking action on microplastics, educating expeditioners on plastic sources, and banning expeditioners from taking personal care products that contain microplastics to the Antarctic Treaty area. The recommendations were available on the COMNAP website. COMNAP also continued its focused work on the prevention of introduction of non-native species with a joint update with SCAR on the *Checklists for Supply Chain Managers* (WP 50) and with understanding the extent of non-native fly infestations in sewage treatment facilities (IP 38).
- (23) CCAMLR presented IP 13 *Report by the SC-CAMLR Observer to CEP*. It covered the five issues of common interest to the CEP and SC-CAMLR as identified in the first joint CEP/SC-CAMLR workshop. With respect to

climate change and the Antarctic marine environment, CCAMLR reported in particular the important outcomes of the ICED-CCAMLR Projections Workshop which had considered the potential impacts of climate change on Antarctic krill in Area 48. With respect to spatial marine management and protected areas, CCAMLR noted that further development of spatial planning of MPAs in Domain 1 (Western Antarctic Peninsula–South Scotia Arc) had been undertaken by Argentina and Chile, and that Domains 3 and 4 (Weddell Sea) had been carried out by Germany. With respect to ecosystem and environmental monitoring, CCAMLR had noted the usefulness of fixed cameras for providing ecosystem monitoring data and also noted ongoing reviews of the CCAMLR Ecosystem Monitoring Programme (CEMP). CCAMLR also highlighted the importance of capacity building, noting that the CCAMLR Scientific Scholarships Scheme continued to be a successful mechanism for developing capacity in CCAMLR.

- (24) Norway presented IP 30 *Report by the CEP Observer to the XXXV SCAR Delegates' Meeting*. It reported that SCAR had begun developing new Scientific Research Programmes (SRPs), directed towards overarching issues and areas of concern for policy and management and the needs for the CEP: Integrated Conservation Planning for Antarctica and the Southern Ocean (Ant-ICON), which would aim to answer fundamental science questions (as identified by the SCAR Horizon Scan) relating to the conservation and management of Antarctica and the Southern Ocean; Near-term Variability and Prediction of the Antarctic Climate System (AntClim^{now}), which would aim to investigate prediction of near-term conditions in the Antarctic climate system; and Antarctic Ice Sheet Dynamics and Global Sea Level (AISSL), which would aim to quantify the Antarctic ice sheet contribution to past and future global sea-level change. The SCAR Action Groups' Input Pathways of persistent organic pollutants to AntarCTica (ImPACT) and Plastics in Polar Environments (PLASTIC-AG) were highlighted as new Action and Expert Groups with particular relevance for the CEP.
- (25) SCAR presented IP 75 *Update on activities of the Southern Ocean Observing System (SOOS)*. It highlighted four SOOS outputs that were of direct relevance to the CEP: the establishment of five regional networks for enhanced coordination of observational activities in the Southern Ocean; a new online tool "SOOSmap" that enabled discovery of Southern Ocean observational data; the field planning and coordination tool "DueSouth"; and a new community paper with observational priorities for the Southern Ocean. SCAR noted that SOOS invited engagement and input to ensure an

internationally coordinated system of observations to deliver an optimal suite of observations for all end-users.

- (26) SCAR also presented IP 49 *An update on the World Meteorological Organization-Scientific Committee on Antarctic Research Joint Fellowship Programme*, jointly prepared with WMO, and IP 74 *A Memorandum of Understanding between the Scientific Committee on Antarctic Research and the International Polar Heritage Committee*.
- (27) WMO presented IP 92 *WMO Annual Report 2018-2019*. It also referred to IP 93 *The International Programme for Antarctic Buoys*, jointly prepared with SCAR; IP 94 *The Year of Polar Prediction in the Southern Hemisphere: Consolidation Phase*; and IP 164 *Scoping Workshop: Towards Implementing an Antarctic Regional Climate Centre Network*. WMO drew particular attention to the ongoing Year of Polar Prediction (YOPP) of 2017–2019, which was entering its consolidation phase. Having endorsed the initiative to establish an Antarctic Regional Climate Change-Network (AntRCC-Network), WMO encouraged the support and engagement of the ATCM, CEP, SCAR, COMNAP, and other interested groups. Finally, WMO emphasised its cooperation with Antarctic and worldwide scientific and institutional actors in collaborations such as the World Climate Research Programme and the International Programme for Antarctic Buoys (IPAB).
- (28) The Committee thanked COMNAP, CCAMLR, Norway, SCAR and WMO for their reports, and drew particular attention to IP 75 noting the value of SOOS to the CEP and encouraged Members to provide input where reasonable and relevant. The value of COMNAP's work, particularly in relation to plastics and emissions reduction was noted. Recalling its request at CEP XIX, the Committee expressed appreciation for SCAR's continued work on heritage, as reported in IP 74. It also noted both WMO and SCAR's updates on climate science were essential for ongoing discussions on the implications of climate change for Antarctica, noting that further updates would be useful for the work of the CEP.

Nomination of CEP Representatives to other organisations

- (29) The Committee nominated:
- Dr Antonio Quesada (Spain) to represent the CEP at the 31st COMNAP Annual General Meeting, to be held in Plovdiv, Bulgaria, from 28 to 31 July 2019; and

- Dr Polly Penhale (United States) to represent the CEP at the 38th meeting of SC-CAMLR, to be held in Hobart, Australia, from 21 to 25 October 2019.
- (30) The following paper was also submitted under this agenda item and taken as presented:
- IP 141 *The International Association of Antarctica Tour Operators joint Fellowship Program* (IAATO). This paper reported on IAATO joining COMNAP in setting up an international fellowship focused on adding to the understanding of human presence in the Antarctic. The fellowship contributes to the broader work of CCAMLR, COMNAP, SCAR, and WMO in offering fellowship and scholarship opportunities.

Item 6: Repair and Remediation of Environment Damage

- (31) Australia introduced WP 46 *Report of the intersessional contact group established to review the Antarctic Clean-up Manual*. The ICG was convened by Dr Phillip Tracey from Australia and operated over two intersessional periods to collate information on relevant developments, review the Antarctic Clean Up-Manual, and suggest any modifications and additional guidance needed. The ICG had noted that clean-up continued to be a focus of research and action by Parties, with significant advances having been made since 2013. The ICG recommended that the CEP: consider forwarding the revised Antarctic Clean-Up Manual and draft Resolution attached to WP 46 for adoption by the ATCM; and note the summary of developments and advances in clean-up since 2013.
- (32) The Committee thanked Australia for its work in convening the ICG, and the ICG participants for their contributions. The Committee highlighted the value of this work as several Parties were planning to undertake modernisation work on Antarctic stations, and also noted the desire of developing further guidelines on relevant topics in due course, such as guidance for separation and recovery of fuel spills in snow and for other topics identified in Section 3 of the Manual. The Committee noted the potential utility of maintaining a register of abandoned sites. The Committee agreed on the importance of regularly updating the Manual, and included a related action in its Five-year Work Plan. The Committee agreed to forward the revised Clean-Up Manual to the ATCM for adoption through a Resolution and to convey the draft Resolution attached to WP 46 to the ATCM for that purpose. The Committee made note of the summary of developments and advances in clean-up since 2013 and agreed to draw it to the attention of the ATCM.

CEP advice to the ATCM on the review of the Antarctic Clean-Up Manual

- (33) The Committee endorsed the revised Antarctic Clean-Up Manual and agreed to forward to the ATCM for approval a draft Resolution encouraging its dissemination and use.
- (34) The Committee requested that the ATCM note the summary of developments and advances in clean-up since 2013 (Attachment C to WP 46).
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- (35) Brazil presented IP 118 *Incident with a Brazilian container*, jointly prepared with Poland. Brazil informed the Committee of the circumstances surrounding a container that had fallen off the *MV Magnolia* in Admiralty Bay. It noted that debris had spread throughout the area including the shoreline of ASPA 128 Western shore of Admiralty Bay, King George Island, South Shetland Islands. It further reported ongoing efforts by Brazil, supported by a Chinese construction company, and Poland to clear debris resulting from the incident. Although no dangerous contaminants had been inside the container, precautionary actions have been taken, including continuous monitoring of the area by Brazil and Poland. Brazil emphasised that widespread dissemination of knowledge of incidents of this sort might contribute to avoidance of incidents in the future. It informed the Committee that an update would be provided at CEP XXIII.
- (36) The Committee thanked Brazil and Poland for the paper and their strong responses to the incident.

Item 7: Climate Change Implications for the Environment

7a) Strategic Approach

- (37) The Committee thanked SCAR and Professor Steven Chown for presenting the *SCAR Science Lecture 2019: What Does the Paris Climate Agreement mean for Antarctic and Southern Ocean Environmental Protection?* (IP 135), which outlined the implications of the 2015 Paris Climate Agreement for biodiversity and its protection in the broader Antarctic region, and for biodiversity conservation globally. The Committee noted that the lecture was impactful, widely attended, and provided useful and detailed context for its discussions.
- (38) The United Kingdom introduced WP 1 rev. 1 *The Antarctic Peninsula under a 1.5°C global warming scenario*. This paper synthesised scientific information on how a 1.5°C global average temperature increase scenario could impact the

Antarctic Peninsula. The United Kingdom noted that the 1.5°C warming scenario identified by the UN Paris agreement was inevitable, with larger increases possible. It highlighted nine key findings outlined in WP 1 rev. 1 related to the nature, extent, and implications of warming in the Antarctic Peninsula area. It further noted that the Antarctic Peninsula had already experienced rapid change in atmospheric climate, ocean and ice conditions, and human activities. It reported that the implications were likely to be significant, requiring substantial research efforts and continued international collaboration. The United Kingdom encouraged the Committee to clearly factor climate impacts into all of its work.

- (39) The Committee thanked the United Kingdom for its report and for bringing this important and timely topic to its attention. It noted that it was important for the CEP to remain informed about climate change, to take a leadership role in considering the implications of a climate change for the Antarctic environment, including the implications of possible warming beyond a 1.5°C scenario. It reflected that future warming could likely be worse than the 1.5°C scenario. The Committee encouraged its Members through their National Antarctic Programmes to develop scenario studies for other areas of Antarctica, as had been done for the Antarctic Peninsula. While calling for additional climate change research and monitoring to improve the basis for decision making, the Committee observed that it also must act in a precautionary manner and take action on the information already available. The Committee noted that it would be important to take the anticipated changes into account as it continued to develop its management tools and guidance material such as the CCRWP, the ASPA system and Non-Native Species Manual. The Committee emphasised the importance of considering regional variations in climate change, both for management actions and for research and long-term monitoring, and highlighted the need for a better understanding of the impacts of the combined pressures of human activities and climate change in Antarctica. It also called for the work of the Subsidiary Group on Climate Change Response (SGCCR) to be prioritised, for continued progress on the CCRWP, and for more Members to participate in their work during the coming intersessional period.
- (40) China also thanked the United Kingdom for submitting the report. China noted it held the opinion that the CEP should focus on Antarctica's role in the earth system and how change in other parts of the world would impact the Antarctic area. It highlighted a lot of scientific work would be required to achieve this goal. It noted that currently the research conducted in the Antarctic and the achievements are far from enough and should be strengthened. China suggested that the work of CEP and ATCM could

- provide more support and create more favourable conditions for scientific activities by the Parties and do more to promote international cooperation.
- (41) While expressing their thanks to the United Kingdom, WMO and the Czech Republic cautioned Members that limiting warming to 1.5°C, although desirable, was unlikely, and stressed that the CEP should consider the impacts of an even greater degree of warming on the Antarctic Peninsula.
 - (42) ASOC expressed its appreciation to the United Kingdom for the paper, noting that the dramatic, climate-related changes to the Antarctic Peninsula described in the paper should give greater urgency to the discussions of the CEP and the ATCM on a variety of issues. In particular, ASOC hoped that the paper's conclusion, that non-native species introductions were the biggest threat to Antarctic biodiversity, would motivate accelerated work on the CCRWP, which had prioritised this issue.
 - (43) ASOC presented IP 132 *Limiting global warming to 1.5°: the Antarctic context*, which complemented WP 1 rev. 1 by summarising the Antarctic elements of the IPCC's Special Report on Limiting Warming to 1.5 degrees. As evidence from the IPCC report suggests, limiting warming to 1.5°C requires immediate action from all sectors. ASOC emphasised that the ATCM and CEP should take a number of steps to minimise climate impacts and promote ecological resilience, including: incorporating climate considerations into EIAs; creating a strategic plan for representative protected areas across the Antarctic Treaty Area to promote climate resilience; implementing the CCRWP; and supporting action by 2023 at the IMO regarding the reduction of emissions from shipping.
 - (44) SCAR presented IP 136 *Antarctic Climate Change and the Environment – 2019 Update*, which summarised updates from the SCAR Antarctic Climate Change and the Environment (ACCE) Expert Group as requested previously by the CEP. Highlights included: the increasing evidence of human-driven contribution to changes in the Antarctic atmosphere and the Southern Ocean; the increasing loss of ice from the Antarctic ice sheet as well as decreases in sea ice; and the demonstrated value of ice cores for understanding long-term changes. SCAR further provided updates on impacts related to the biological environment, highlighting impacts on seabirds and krill.
 - (45) The Committee thanked SCAR for its update on the ACCE Report, recognized the importance of it for the work of the CEP and looked forward to future updates.

- (46) Portugal presented IP 70 *Projected distribution of Southern Ocean seabirds and fisheries due to climate change*, jointly submitted with South Africa, Spain, and the United Kingdom. It noted that albatrosses and petrels covered huge areas of the Southern Ocean, including within the Antarctic Treaty area, and warned that they were threatened by a wide range of factors, including fisheries bycatch and climate change. Portugal pointed out that recent research, described in the paper, showed that the distribution of seven large seabird species of the Southern Ocean would shift towards Antarctica, as would fisheries movements, increasing the bycatch risk and requiring improvements to fisheries management.

7b) Implementation and Review of the Climate Change Response Work Programme

- (47) The convener of the Subsidiary Group on Climate Change Response (SGCCR), Kevin Hughes (United Kingdom) introduced WP 36 *Report of the Subsidiary Group on Climate Change Response (SGCCR) 2018-2019*. It noted that the SGCCR was established in 2017 (Decision 1 [2017]) to facilitate the implementation of the CCRWP. The paper presented a proposed new format for the CCRWP, which was developed during the intersessional period by the SGCCR, and operating functions for the group, and details of the initial implementation of the CCRWP focussing on the priority issue of non-native species. The United Kingdom also informed the Committee that the SGCCR was interested in increasing its profile, as well as the profile of the CCRWP, on the ATS webpage, and that it welcomed new participants.
- (48) The SGCCR had made four recommendations to the CEP:
1. The Committee should examine the proposed updated format for the CCRWP and, if considered appropriate, agree to its application by the SGCCR to all the climate issues within the Work Programme during the 2019/20 intersessional period.
 2. To better communicate the links between the CCRWP and CEP Five-year Work Plan, the Committee should agree that:
 - issues listed in the CEP Five-year Work Plan that were relevant to the CCRWP should be labelled as such in the Five-year Work Plan;
 - research requirements listed in the CCRWP should be added to the list of science needs attached to the CEP Five-year Work Plan; and

- during the Committee's annual review of the prioritisation of issues within the CEP Five-year Work Plan, consideration should be given to the priority status of linked issues in the updated CCRWP.
3. To progress the implementation of the CCRWP on the priority issue of 'Enhanced potential for non-native species (NNS) introduction, establishment and invasion', the CEP should:
 - request that COMNAP undertake a survey of National Antarctic Programmes' biosecurity practices, to communicate progress since the previous survey in 2008 (ATCM XXXI - IP 98) and share implemented biosecurity solutions;
 - encourage CEP Members and Observers to highlight recent research on the issue of non-native species that would inform the work of the CEP; and
 - encourage CEP Members to explore funding of relevant non-native species research with national science funding bodies (see Resolution 4 [2015]).
 4. The CEP's annual update to the ATCM on progress should include information on developments within the SGCCR.
- (49) With respect to the recommendation that research requirements listed in the CCRWP should be added to the list of science needs attached to the CEP Five-year Work Plan, the United Kingdom noted that this would best be done after the updates to the CCRWP had been completed and agreed.
- (50) The Committee engaged in extensive discussions regarding the usefulness and timeliness of these recommendations.
- (51) Many Members expressed general support for the recommendations as presented in WP 36. However, one Member expressed doubts regarding their adoption at this time.
- (52) China thanked the Convenor for the paper. China indicated that the recommendations included a complicated mechanism that could cover a wider range of issues and demand enormous research efforts. This resulted in a question between the ideal and the practical or manageable. China noted that this question had been mentioned several times in previous interventions. Following wide-ranging discussions to reach consensus on the recommendations, the Committee agreed to a revised version of the first of the SGCCR recommendations: The Committee should examine the proposed updated format for the CCRWP and, if considered appropriate,

agree to its application by the SGCCR to relevant climate issues within the Work Programme during the 2019/20 intersessional period.

- (53) Several Members supported the SGCCR convener's comments recalling that the mandate created by Decision 1 (2017) to establish the SGCCR and commence work still applied, and that work would continue under the existing ToRs for the SGCCR, and encouraging all interested Members, Observers, and experts to join and actively participate in the SGCCR.

Item 8: Environmental Impact Assessment (EIA)

8a) Draft Comprehensive Environmental Evaluations

- (54) The United States introduced WP 2 *Draft Comprehensive Environmental Evaluation (CEE) for Continuation and Modernization of McMurdo Station Area Activities*, which reported on the modernisation project of McMurdo Station and related ongoing activities. It noted that the draft CEE had been prepared in accordance with applicable provisions of Annex I, Article 3 of the Environment Protocol and the Guidelines for Environmental Impact Assessment in Antarctica. The United States recalled that McMurdo Station was established in 1955 and that much of the infrastructure at the station dated back several decades and was nearing or had exceeded its intended life expectancy. The United States reported that the proposed activity consisted of two interrelated and interdependent parts: the modernisation of McMurdo Station through the McMurdo Master Plan and the continuation of science and associated operational activities in areas supported from the McMurdo Station area hub. It highlighted that the purpose of the proposed activity was to reduce the footprint and disturbance in the area and to ensure that resources at McMurdo Station continued to support scientific research efficiently, effectively and with a high standard of environmental stewardship.
- (55) The Republic of Korea introduced WP 15 *Report of the intersessional open-ended contact group established to consider the draft CEE for the "Continuation and Modernization of McMurdo Station Area Activities"*, which provided advice on the basis of comments on the draft CEE provided by nine Parties participating in the ICG that had been established in accordance with CEP procedures. It thanked the United States for its work and noted that participants had commented favourably on several aspects of the draft CEE. It highlighted that the participants had found that the draft CEE was generally clear, well-structured, and well-presented, but had noted a few inconsistencies between sections of the draft CEE. It reported that

participants agreed that the draft CEE generally and broadly conformed to the requirements of Article 3 of Annex I to the Environment Protocol. Some participants, however, recommended reconsideration of the scope of the proposed activity and expressed the view that additional information would be required on a number of aspects for the final CEE to fully conform to the requirements of Article 3. The Republic of Korea stated that the draft CEE identified the majority of the impacts that were likely to be associated with the activity, but suggested adding additional potential impacts. It noted that the ICG had further advised that some activities within the project would have a more than minor or transitory impact. It suggested that if the United States decided to proceed with the proposed activity, the draft CEE could be strengthened by the inclusion of additional information, and recommended that the United States consider the comments made by the ICG.

- (56) The United States presented IP 82 *Initial Responses to Comments on the Draft Comprehensive Environmental Evaluation (CEE) for Continuation and Modernization of McMurdo Station Area Activities*, which responded to comments raised by the ICG in relation to the modernisation of McMurdo Station. It expressed appreciation for the efforts of the ICG participants and thanked the Republic of Korea for convening the group and providing an excellent summary of the responses. While pointing out that the draft CEE was unlike any previous CEE in relation to its long time period and broad scope, the United States noted that it fully conformed to the requirements of Article 3 of the Environment Protocol. It committed to providing additional detailed information on several issues that were raised, including: mitigation of environmental impacts; impact assessment methods; scale of impacts; alternatives; and description of the initial environment. With respect to those activities that had not been detailed sufficiently in the draft CEE, the United States assured members that it would provide a future EIA for those activities to the CEP. In addition, the United States noted that it would provide periodic feedback per the EIA Guidelines and cited IP 76 and IP 77 as examples of its CEE feedback reviews. The United States concluded that it was in the process of revising the CEE and that it would address the comments received from the ICG, from discussion during CEP XXII, and from the general public.
- (57) The Committee thanked the United States for presenting a solid and well-structured draft CEE and Members looked forward to receiving a final CEE. The Committee also thanked Ji Hee Kim from the Republic of Korea for convening the ICG and ICG participants for their hard work and constructive feedback. The Committee expressed its support for the ICG's conclusions and recommendations.

- (58) Several Members commended the United States on the quality of its draft CEE, noting the complexity of evaluating a long-term project with limited detailed information and acknowledging that the proposed activity pertained to an already degraded area and as such likely would significantly reduce the environmental impacts of the operations. Nonetheless, they stressed the importance of maintaining a gold standard when conducting EIAs and cautioned the potential for this Draft CEE setting a precedent with regard to level of detail and clarity. Several Members also indicated they would provide further comments to the United States on the draft CEE and there was a suggestion that a retrospective assessment of cumulative impacts of the station area before modernisation which supplemented to the CEE would be useful and helpful as an important reference for the EIA document preparation of other Antarctic stations.
- (59) Noting that several Members were planning to undertake modernisation projects at their research stations, the Committee highlighted the importance of the availability of clear guidance and therefore ensuring that the EIA Guidelines were consistent, fit-for-purpose and regularly reviewed to ensure that environmental assessments of these projects reach high standards. In light of these comments and the recommendations provided by the ICG reviewing the Draft CEE submitted by the US, the Committee agreed to include a related item in its Five-year Work Plan. Parties were also encouraged to submit information about EIAs they had prepared in the ATS EIA database.
- (60) ASOC stressed that because there would be an increased level of activity over an extended period of time during the construction period, it would be important to ensure that the operational footprint of the station and facilities supported from the station remained constant. ASOC looked forward to seeing the final CEE, further EIAs, and CEE follow up information, including information about environmental monitoring as mandated by Annex I, Article 5(1) of the Protocol. ASOC thanked the United States (IP 76 and 77), the United Kingdom (IP 29) and Italy (IP 109) for their papers which provided follow-up information about activities subject to CEEs in recent years.
- (61) The United States reiterated its commitment to consider all comments in its final CEE, and welcomed further discussions on updating the EIA Guidelines, including to consider guidance on approaches to address comments received on draft CEEs.
- (62) The Committee welcomed the United States' commitment to fully address in the final CEE the points raised by the ICG and in discussion during the meeting.

CEP advice to the ATCM on Draft Comprehensive Environmental Evaluation (CEE) for Continuation and Modernisation of McMurdo Station Area Activities

- (63) The Committee discussed in detail the draft Comprehensive Environmental Evaluation (CEE) prepared by the United States for the 'Continuation and Modernization of McMurdo Station Area Activities' (WP 2). The Committee discussed the report by South Korea of the ICG established to consider the draft CEE in accordance with the Procedures for Intersessional CEP Consideration of Draft CEEs (WP 15). The Committee also discussed additional information provided by the United States in response to the ICG comments (IP 82) and issues raised during the meeting.
- (64) Having reviewed the draft CEE, the CEP advised the ATCM that:
1. The draft CEE generally conformed to the requirements of Article 3 of Annex I to the Protocol on Environmental Protection to the Antarctic Treaty.
 2. If the United States decided to proceed with the proposed activity, there were some aspects for which additional information or clarification could be provided in the final CEE to enhance its comprehensiveness, as outlined in the ICG report and by Members during the meeting.
 3. The United States was furthermore encouraged to consider the detailed comments provided by ICG participants, as well as the summary of the main issues as put forward in the ICG report, and issues raised during CEP XXI as summarised in the final report and provided directly to the United States.
 4. The information provided in the CEE supported the conclusion that the impacts of some activities within the project would have a greater than minor or transitory impact, and this level of EIA had been appropriate for this project.
 5. The draft CEE was thorough, systematic, clear, well-structured and well presented, although some minor adjustments could be considered to strengthen the document even further.
- (65) The Committee noted that the CEP had updated its Five-year Work Plan to include an item on updating the Guidelines on EIAs as a result of the discussions arising from the draft CEE.
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- (66) China informed the Committee that it was working on a final CEE for the construction of its planned new station in the Ross Sea area. It noted that, in accordance to Article 3(6) of Annex I to the Protocol, the final CEE would be circulated among all Members 60 days prior to the commencement of the proposed activity.

8b) Other EIA Matters

- (67) SCAR presented IP 50 *Draft SCAR Code of Conduct on Geosciences Field Research Activities in Antarctica*. SCAR informed the Committee that following substantial input from the geoscience community, it had updated its advice to geoscientists undertaking field research in Antarctica. This update was provided to the Committee in the form of a draft SCAR Code of Conduct on Geosciences Field Research Activities in Antarctica. SCAR noted that this update was consistent with the CEP's request that it provide advice on geological heritage and geoconservation. It welcomed input and comments from CEP Members, as well as COMNAP, with a view to submitting the SCAR Code of Conduct to CEP XXIII for possible endorsement by the ATCM through a Resolution. Interested Members were invited to contribute comments by emailing the SCAR Secretariat at info@scar.org.
- (68) The Committee thanked SCAR for its significant contribution in drafting the Code of Conduct. The Committee affirmed the importance of reducing the impacts of geoscientific activity on the Antarctic environment. Several Members stated their interest in collaborating with SCAR as it worked to draft the final Code of Conduct, to be presented at CEP XXIII.
- (69) Chile presented four Information Papers under Agenda Item 8b. IP 25 *Evaluación Ambiental Antártica: Modelo de Aplicación Chileno* presenting a practical tool that Chile had been using for its EIAs in Antarctica and inviting Parties to consider it to facilitate the impact evaluation process. IP 17 *Reemplazo de oleoducto submarino por mangueras flotantes* informed the Committee on the replacement of a submarine pipeline at Base "Presidente Frei" with a floating hose, which would decrease the base's impact on the marine environment. IP 19 *Plan maestro del Estado chileno: Reconstrucción de Base Aérea Antártica "Presidente Frei", hacia una nueva matriz energética y materiales sustentables* discussed Chile's plan to upgrade the energy infrastructure at "Presidente Frei" Base with an emphasis on sustainability, and IP 22 *Estación Marítima de bahía Fildes: plan de demolición e instalación* presenting a plan for the demolition and

installation of new infrastructure at the Fildes Bay Maritime Station, which had been destroyed by a fire last year.

- (70) The Committee thanked Chile for its presentation of these four Information Papers.
- (71) Italy presented IP 109 *Progress update in the construction of the gravel runway in the area of Mario Zucchelli Station, Terra Nova Bay, Victoria Land, Antarctica*. This paper provided information about ongoing runway construction activities at Mario Zucchelli Station. Italy presented the activities it had undertaken to monitor environmental impacts during runway construction, and noted the runway's current length of 1,350 metres and that a Basler aircraft had successfully landed on the runway in February 2019. Italy highlighted that there were synergies between environmental monitoring and ongoing scientific efforts in the area.
- (72) The Committee thanked Italy for presenting IP 109 and remarked that it looked forward to future updates on the runway at Mario Zucchelli Station.
- (73) The following papers were also submitted under this agenda item, and taken as presented:
- IP 12 *Numerical evaluation of mobile sources impact at environmental impact assessment in the Antarctic* (Belarus). This paper analysed possibilities for the use of dispersion modelling for assessing the impact of vehicles on the atmospheric air in the Antarctic.
 - IP 20 *Sistema de interconexión eléctrica, hacia la disminución del consumo de combustible fósil* (Chile). This paper explained the installation of an electrical grid interconnection programme to improve energy efficiency at the "Presidente Frei" Base.
 - IP 29 *Update and CEE Compliance Report: Rothera Wharf Reconstruction and Coastal Stabilisation Project* (United Kingdom). This paper updated the CEP on progress with the Rothera Wharf construction and explained how compliance with the CEE was ensured during the first season of construction.
 - IP 76 *The Environmental Impact Assessment Feedback Process: Review of Modernization of the Amundsen-Scott South Pole Station (1998 CEE)* (United States). This paper described the United States' review of the modernisation of the Amundsen-Scott South Pole Station against the environmental impact assessment prepared for the project.

- IP 77 *The Environmental Impact Assessment Feedback Process: Review of Project IceCube (2004 CEE)* (United States). This paper described the United States' review of Project IceCube against the environmental impact assessment prepared for the project.
- IP 121 *Artigas Scientific Antarctic Station renewable energy, energy efficiency and waste management plan* (Uruguay). This paper informed about progress made on the renewable energy, energy efficiency and waste management plan the Government of Uruguay had been developing for the Artigas Scientific Antarctic Station.
- SP 9 *Annual list of Initial Environmental Evaluations (IEE) and Comprehensive Environmental Evaluations (CEE) prepared between 1 April 2018 and 31 March 2019* (ATS).

(74) The following Background Paper was also submitted under this agenda item:

- BP 8 *Initial EIA of Turkish Camp Site on Horseshoe Island* (Turkey).

Item 9: Area Protection and Management Plans

9a) Management Plans

i) *Draft Management Plans which have been reviewed by the Subsidiary Group on Management Plans*

(75) The convener of the Subsidiary Group on Management Plans (SGMP), Patricia Ortúzar (Argentina) introduced the first part of WP 64 *Subsidiary Group on Management Plans Report of activities during the intersessional period 2018-2019* on behalf of the SGMP. In accordance with terms of reference #1 to #3, the SGMP had been prepared to consider four draft Antarctic Specially Protected Area (ASPAs) management plans referred by the CEP for intersessional review:

- ASPA No 125: Fildes Peninsula, King George Island (25 de Mayo) (Chile)
- ASPA No 145: Port Foster, Deception Island, South Shetland Islands (Chile)
- ASPA No 146: South Bay, Doumer Island, Palmer Archipelago (Chile)
- ASPA No 150: Ardley Island (Ardley Peninsula), Maxwell Bay, King George Island (25 de Mayo) (Chile).

(76) The SGMP advised the CEP that the management plans were still under review by Chile, the proponent of all the plans, and that Chile had provided

the SGMP with an update on their progress. Chile had informed the SGMP, and confirmed for the Committee, that they were still working with scientists to develop the management plans for ASPA 125 Fildes Peninsula, King George Island (25 de Mayo) and ASPA 150 Ardley Island, Maxwell Bay, King George Island (25 de Mayo). The SGMP noted that Chile planned to submit revised management plans for these two ASPAs to the SGMP during July 2019.

- (77) Chile had further informed the SGMP that they intended to submit a revised version of the management plan for ASPA 146 South Bay, Doumer Island, Palmer Archipelago to the 2019 CCAMLR meeting and that a draft would also be submitted to the SGMP shortly before or after it was submitted to CCAMLR. Chile had informed the SGMP that they were working with Spain to review the boundaries of ASPA 145 Port Foster, Deception Island, South Shetland Islands. Chile had noted that the boundaries may be enlarged to improve protection of the marine life in the region. The SGMP and Chile noted that if the boundaries of ASPA 145 were changed following consultation with Spain, the management plan would be removed from the SGMP and submitted directly to the CEP.
- (78) The Committee thanked the SGMP for its advice and welcomed the progress made by Chile.

ii) Revised Draft Management Plans which have not been reviewed by the Subsidiary Group on Management Plans

- (79) The Committee considered revised management plans for nine ASPAs and two Antarctic Specially Managed Areas (ASMAs) that had not been reviewed by the SGMP. In each case the proponent(s) summarised the suggested changes to the existing management plan and recommended its approval by the Committee and referral to the ATCM for adoption.
- WP 3 *Revised Management Plan for Antarctic Specially Protected Area No 123 Barwick and Balham Valleys, Southern Victoria Land (United States).*
 - WP 4 *Revised Management Plan for Antarctic Specially Protected Area No 128 Western Shore of Admiralty Bay, King George Island, South Shetland Islands (United States, Poland).*
 - WP 7 *Revised Management Plan for Antarctic Specially Protected Area No 173 Cape Washington and Silverfish Bay, Terra Nova Bay, Ross Sea (Italy, United States).*

- WP 10 *Revision of the Management Plan for Antarctic Specially Protected Area (ASPAs) No 154: Botany Bay, Cape Geology, Victoria Land (New Zealand).*
 - WP 16 *Revised Management Plan for Antarctic Specially Protected Area No 171, Narębski Point, Barton Peninsula, King George Island (Republic of Korea).*
 - WP 20 *Revision of the Management Plan for Antarctic Specially Protected Area (ASPAs) No 141, Yukidori Valley, Langhovde, Lützow-Holm Bay (Japan).*
 - WP 27 *Revised Management Plan and maps for Antarctic Specially Managed Area No 7 Southwest Anvers Island and Palmer Basin (United States).*
 - WP 40 *Review of Antarctic Specially Protected Area (ASPAs) No 142 – Svarthamaren (Norway).*
 - WP 49 *Revision of the Management Plan for Antarctic Specially Protected Area No 161 Terra Nova Bay, Ross Sea (Italy).*
 - WP 53 *Revised Management Plan for Antarctic Specially Protected Area No 151 Lions Rump, King George Island, South Shetland Islands (Poland).*
 - WP 56 *Updated Management Plan and maps for Antarctic Specially Managed Area No 4 Deception Island (Argentina, Chile, Norway, Spain, United Kingdom, United States, ASOC, IAATO).*
- (80) With respect to WP 3 (ASPAs 123), WP 4 (ASPAs 128), and WP 7 (ASPAs 173), the United States noted that only minor changes to the existing management plans were proposed, and included minor updates to the land-ice boundary in the map (ASPAs 123), the removal of a no-longer present refuge in the map (ASPAs 128), and revisions to achieve consistency with new agreements and guidance reached by the ATCM (ASPAs 123, 128, and 173).
- (81) With respect to WP 10 (ASPAs 154), New Zealand noted that only minor changes to the existing management plan were proposed, including revision to helicopter access requirements and six new maps related to the access provisions and detailed mapping of the flora.
- (82) With respect to WP 16 (ASPAs 171), the Republic of Korea noted that only minor changes to the existing management plan were proposed, and included editorial amendments for consistency, new information on meteorological data and faunal changes, new information for educational or outreach purposes, and new information on the location of field camps. It highlighted

that the updated plan required compliance with the *Environmental Guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica (version 1.1)* appended to Resolution 4 (2018).

- (83) With respect to WP 20 (ASPA 141), Japan noted that only minor changes to the existing management plan were proposed, and included updates to supporting documentation, a change to a high-water line boundary, and minor editorial amendments.
- (84) With respect to WP 40 (ASPA 142), Norway noted that only minor changes to the existing management plan were proposed, and included updated information on the number of breeding pairs of Antarctic petrels, editorial amendments, and text about signs warning of potential rock fall, management activities, and the installation of Automatic Weather Stations.
- (85) With respect to WP 49 (ASPA 161), Italy noted that only minor changes to the existing management plan were proposed, and included an update of references and the removal of Appendix 2 to the plan, and updates to Map 1 to include the location of the new gravel runway.
- (86) With respect to WP 53 (ASPA 151), Poland noted that only minor changes to the existing management plan were proposed, and included updated information on the number of penguins and pinnipeds, added information to the map, and editorial amendments for consistency.
- (87) With respect to WP 27 (ASMA 7), the United States noted that only minor changes to the existing management plan were proposed, and included updated maps and policies to ensure that visitors to the area would have access to the most current information.
- (88) With respect to WP 56 (ASMA 4), the United Kingdom reported on the review of the ASMA 4 management plan conducted by the Deception Island Management Group (DIMG). While noting that no significant changes had been made, it mentioned several amendments related to volcanic monitoring and alert procedures, and updates relating to biosecurity with the consequential deletion of the former Appendix 11 relating to “Practical Biosecurity Measures”. This was not intended to be seen as a reduction in the importance of biosecurity in relation to the island, but an acknowledgement of the wider suite of general information now available relating to non-native species within the Treaty system.
- (89) The Committee approved all of these revised management plans that had not been reviewed by the SGMP.

- (90) The Committee highlighted that review and revision of ASPA management plans provided an opportunity for enhancing cooperation and information exchange among Members who conduct activities within or near specific ASPAs. It also made a note that it would be useful if Members could submit revised management plans with tracked changes to clearly identify proposed boundary changes, but also to clearly illustrate proposed changes on maps that included changes to boundaries.

CEP advice to the ATCM on revised management plans for ASPAs

- (91) The Committee agreed to forward the following revised management plans to the ATCM for adoption by means of a Measure:

#	Name
ASPA 123	Barwick and Balham Valleys, Southern Victoria Land
ASPA 128	Western Shore of Admiralty Bay, King George Island, South Shetland Islands
ASPA 141	Yukidori Valley, Langhovde, Lützow-Holm Bay
ASPA 142	Svarthamaren
ASPA 151	Lions Rump, King George Island, South Shetland Islands
ASPA 154	Botany Bay, Cape Geology, Victoria Land
ASPA 161	Terra Nova Bay, Ross Sea
ASPA 171	Narębski Point, Barton Peninsula, King George Island
ASPA 173	Cape Washington and Silverfish Bay, Terra Nova Bay, Ross Sea
ASMA 4	Deception Island
ASMA 7	Southwest Anvers Island and Palmer Basin

- (92) The Committee then considered seven current management plans that had been reviewed and found not to need changes.

- *WP 9 Review of the Management Plan for ASPA No 175: High altitude geothermal sites in the Ross Sea region (including parts of the summits of Mount Erebus, Ross Island and Mount Melbourne and Mount Rittmann, northern Victoria Land) (New Zealand, United States).*
- *WP 29 Review of the Management Plans for Antarctic Specially Protected Areas (ASPAs) 135 North-East Bailey Peninsula, 136 Clark Peninsula, 143 Marine Plain, 160 Frazier Islands and 162 Mawson's Huts (Australia).*
- *WP 30 Review of the Management Plan for Antarctic Specially Protected Area (ASPAs) 169, Amanda Bay, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica (Australia, China).*

- (93) With respect to WP 9 (ASPA 175), New Zealand noted that it had conducted a comprehensive review of the existing management plan for ASPA 175 in collaboration with the United States, and recommended that the CEP endorse their conclusion that no changes to the current plan were required.
- (94) Noting that New Zealand and the United States had conducted a desktop review, the Committee commended them for minimising the potential impacts incurred by on-the-ground monitoring and encouraged other Members to take a similar approach when reviewing management plans when appropriate.
- (95) With respect to WP 29 (ASPAs 135, 136, 143, 160 and 162), Australia reported on the review of the existing management plans for the five ASPAs. It concluded that the management plans remained relevant for protecting the values for which the areas were designated and that revisions to the management plans were not required.
- (96) With respect to WP 30 (ASPA 169), Australia reported on the review of the existing management plan for ASPA 169, which it had conducted jointly with China, noting that it was designated in 2008 to protect emperor penguin colonies. Australia and China concluded that the current management plan remained effective and that no revisions were required.
- (97) The Committee concluded that no changes were required to the management plans for ASPAs 135, 136, 143, 160, 162, 169 and 175, and agreed that these remained current. It noted that, in accordance with Article 6(3) of Annex V to the Environment Protocol, a next review of the management plans should be initiated again in five years (2024) or before if information should indicate the need for this.

CEP advice to the ATCM on the five-yearly review of management plans for ASPAs

- (98) The Committee agreed to advise the ATCM that five-yearly reviews of the management plans for the following ASPAs had been conducted in accordance with Article 6 (3) of Annex V to the Environment Protocol, and that the existing management plans remain in force with the next reviews to be initiated in 2024:
- ASPA 135 North-East Bailey Peninsula, Budd Coast, Wilkes Land
 - ASPA 136 Clark Peninsula, Budd Coast, Wilkes Land, East Antarctica

- ASPA 143 Marine Plain, Mule Peninsula, Vestfold Hills, Princess Elizabeth Land
 - ASPA 160 Frazier Islands, Windmill Islands, Wilkes Land, East Antarctica
 - ASPA 162 Mawson's Huts, Cape Denison, Commonwealth Bay, George V Land, East Antarctica
 - ASPA 169 Amanda Bay, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica
 - ASPA 175 High Altitude Geothermal sites of the Ross Sea region.
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iii) New draft management plans for protected/managed areas

- (99) The Committee considered draft management plans for three proposed new ASPAs:
- *WP 6 Proposal for a new Antarctic Specially Protected Area at the Rosenthal Islands, Anvers Island, Palmer Archipelago (United States).*
 - *WP 35 Draft Antarctic Specially Protected Area Management Plan for the Léonie Islands and south-east Adelaide Island, Antarctic Peninsula (United Kingdom and the Netherlands).*
 - *WP 47 Proposal for a new Antarctic Specially Protected Area at Inexpressible Island and Seaview Bay, Ross Sea (China, Italy and Republic of Korea).*
- (100) With respect to WP 6, the United States stated that given rapid ice-loss in the region of the proposed ASPA and the potential threat to this pristine area due to the increasing tourism activities in the Antarctic Peninsula area, the United States considered it appropriate to take a precautionary approach and submit a draft management plan for the proposed ASPA at the Rosenthal Islands directly to CEP XXII for consideration without conducting a prior assessment process. The United States emphasised the importance of the site for research on bird colonies and for long-term monitoring and comparison studies. It noted that information on the proposed ASPA had also been submitted to CCAMLR's Working Group on Ecosystem Monitoring and Management (WG-EMM). The United States recommended that the Committee forward the proposal to the SGMP for review in the intersessional period.
- (101) While expressing support for the proposed ASPA, some Members raised questions regarding the nature of the proposed area, 75 percent of which was marine, and to the ecological and environmental values of the area. Those

Members encouraged further discussion on these aspects of the management plan during intersessional review by the SGMP.

- (102) ASOC welcomed the proposed ASPA being established with precaution in mind, and noted that it served as an example of an inviolate area, which were currently underrepresented in the system of ASPAs.
- (103) With respect to WP 35, the United Kingdom reported that it had submitted a prior assessment for this proposed multi-site ASPA to CEP XXI. It noted that additions had been made to include the protection of the Horton, Hurley and Turner Glaciers, which provided a dramatic backdrop to the Léonie Islands and enhanced the area's aesthetic and wilderness values. The United Kingdom also highlighted the importance of the area as a control site against which to compare potential impacts at Rothera Research Station.
- (104) The Committee expressed support for the proposed ASPA and highlighted the benefits of the prior assessment process for potential new protected areas. ASOC noted that it was pleased to see a further area proposed with precaution in mind and suggested that it would protect important wilderness values.
- (105) In response to a question regarding the size of the proposed ASPA, the United Kingdom noted that the wider area around the proposed ASPA was tightly regulated for scientific use, and that the proposed management plan would reinforce existing measures at the site and in surrounding areas.
- (106) China introduced WP 47, on behalf of the co-proponents. The process of developing a draft management plan for the new proposed ASPA was illustrated. Two workshops had been held in Xiamen and Rome in the 2018/19 intersessional period involving all parties with an interest in the area. Information on the proposed ASPA had also been submitted to CCAMLR's Working Group on Ecosystem Monitoring and Management (WG-EMM). The proponents highlighted the fruitful cooperation developed among participants.
- (107) The Committee thanked China for its presentation, noting in particular the collaborative nature of the process, and that matters raised during discussions on the proposed area at CEP XXI had been considered during the development of the draft management plan. The Committee expressed support for the proposed ASPA.
- (108) While expressing support for the proposed area, ASOC questioned the need for campsites in the ASPA. It encouraged the co-proponents to

consider designating additional ASPAs in Inexpressible Island which is an ecologically significant area.

- (109) The Committee agreed to forward the three draft management plans for proposed new ASPAs to the SGMP for review. It also invited Members to join the SGMP and welcomed their contributions to discussion during the 2019/20 intersessional period.

CEP advice to the ATCM on new draft management plans for protected/managed areas

- (110) The Committee agreed to advise the ATCM that it had decided to forward the following three draft management plans for protected areas to the SGMP for review:
- Proposal for a new Antarctic Specially Protected Area at the Rosenthal Islands, Anvers Island, Palmer Archipelago.
 - Draft Antarctic Specially Protected Area Management Plan for the Léonie Islands and south-east Adelaide Island, Antarctic Peninsula.
 - Proposal for a new Antarctic Specially Protected Area at Inexpressible Island and Seaview Bay, Ross Sea.

iv) Other matters relating to management plans for protected areas

- (111) The following papers were submitted under this item, and taken as presented:
- IP 71 *Initiation of the revision process of the Management Plan for Antarctic Specially Managed Area Admiralty Bay (ASMA No 1)* (Brazil, Ecuador, Peru, Poland, United States). The paper proposed a working plan for the review of the ASMA Management Plan.
 - IP 119 *Advances in the revision of the Management Plan for the Antarctic Specially Protected Area No 112, Coppermine Peninsula, Robert Island, South Shetland Islands* (Chile). The paper reported on the ongoing revision of the management plan for ASPA 112 to be submitted in 2020.
 - IP 122 *Estado de avance de la revisión del Plan de Manejo de la ZAEP 133 "Punta Armonía"* (Argentina, Chile). The paper summarised key tasks carried out in the intersessional period on the revision of ASPA 133 Harmony Point, including fieldwork by a multi-disciplinary assessment team.

9b) Historic Sites and Monuments

- (112) The United Kingdom introduced WP 22 *Proposed addition to the list of Historic Sites and Monuments of the wreck of Sir Ernest Shackleton's vessel Endurance*. It noted that while the exact location of the wreck of Sir Ernest Shackleton's vessel Endurance was unknown, it met many of the criteria of Resolution 3 (2009) Guidelines for the designation and protection of Historic Sites and Monuments. The UK noted that it had assessed the site against the *Guidelines for the assessment and management of Heritage in Antarctica*, as annexed to Resolution 2 (2018).
- (113) The Committee thanked the United Kingdom and highlighted the importance of the *Endurance* to Antarctic history. It also noted Amundsen's tent as an example of an important Antarctic artefact that had been protected as an HSM even though its exact location was unknown. Following further discussion on whether Resolution 5 (2001) would provide adequate protections to the wreck, the Committee approved the designation of the wreck as a new HSM.
- (114) Argentina introduced WP 25 *Proposal for designation of a new Historic Site and Monument "C.A Larsen Multiexpedition cairn"*, jointly prepared with Norway, Sweden and the United Kingdom. It provided a summary of the reassessment of a site installed in 1892 by Norwegian Captain Carl Anton Larsen. Argentina reported that notification of the finding had been presented in ATCM XXXIX - WP 48 rev. 1, and proposed the designation of the site as a new HSM.
- (115) Sweden thanked Argentina for leading the work and for managing the four already established HSMs related to the Swedish Antarctic Expedition that took place between 1901 and 1903 and was led by Otto Nordenskjöld and Carl Anton Larsen.
- (116) The Committee thanked the co-authors for their proposal, and approved the designation of the C.A Larsen Multiexpedition cairn as a new HSM.
- (117) Spain introduced WP 18 rev. 1 *Notification of pre-1958 historic remains: The Spanish shipwreck "San Telmo"*, which proposed that the CEP afford protection to the remains of the *San Telmo*, a ship from the Royal Spanish Armada that vanished in the Drake Passage in September 1819, whose location remained unknown. Spain recommended that the wreck and associated materials be provided interim protection in accordance with Resolution 5 (2001) if its location were identified, and noted its intention to submit a proposal to declare the wreck of the *San Telmo* an HSM according

to the Guidelines for the Assessment and Management of Heritage in Antarctica.

- (118) The Committee acknowledged the relevance of protecting the site of the *San Telmo* wreck and noted that it was particularly important given that it was also a gravesite. The Committee agreed that if its location were identified, the wreck and all materials belonging to the ship or the crew would be afforded interim protection under Resolution 5 (2001), and noted Spain’s intention of designating the site as an HSM.
- (119) Australia introduced WP 31 *Notification of the discovery of pre-1958 historic remains at Camp Lake, Vestfold Hills, East Antarctica*, which summarised its discovery of pre-1958 historic remains associated with early Australian National Antarctic Research Expedition’s (ANARE) activities in the vicinity of Camp Lake. Australia reported that the historic remains appeared to have stemmed from ANARE’s early exploration of the Vestfold Hills in 1955 and included a rock cairn; two rock outlines of cleared tent sites; remnants of wooden crates; wire; a bar of soap; amphibious vehicle tracks; and a possible flag pole foundation. It noted that it was assessing the heritage significance of the remains, consistent with Resolution 2 (2018).
- (120) The Committee noted the discovery of the pre-1958 historic remains and acknowledged that the remains would be subject to interim protection in accordance with Resolution 5 (2001).

CEP advice to the ATCM on additions to the List of Historic Sites and Monuments

- (121) The Committee agreed to forward two proposals for additions to the List of Historic Sites and Monuments to the ATCM for approval by means of a Measure.

#	Description
New HSM	Wreck of Sir Ernest Shackleton’s vessel <i>Endurance</i>
New HSM	C.A. Larsen Multiexpedition cairn

- (122) The Committee agreed that the interim protection afforded to pre-1958 sites in accordance with Resolution 5 (2001) would apply to the historical remains at Camp Lake, Vestfold Hills, East Antarctica and if its location is discovered, the *San Telmo* wreck.
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- (123) The United Kingdom introduced WP 58 *The Benefits of Conservation Management Plans for Antarctic Heritage*. It recalled discussions at ATCM XLI relating to the new *Guidelines for the assessment and management of Heritage in Antarctica* as annexed to Resolution 2 (2018), and noted that the CEP had added to its Five-year Work Plan the issue of Conservation Management Plans for discussions at its 2020 meeting. The United Kingdom noted the global significance of Antarctic heritage, despite Antarctica's remote location. Having reviewed a number of examples of Conservation Management Plans developed for Antarctic HSMs, the United Kingdom recommended that the CEP:
- Note that a number of examples of Conservation Management Plans had already been developed for Antarctic HSMs, and that these had proved a useful tool to direct and inform the ongoing management of HSMs;
 - Recommend that Parties undertaking management of HSMs consider whether it would be helpful to develop Conservation Management Plans, in a format and style tailored, as appropriate, for each HSM (noting that some HSMs were unlikely to need such plans);
 - Encourage Parties to share Conservation Management Plans, or other examples of best practice tools developed to underpin the future sustainability of Antarctic HSMs; and
 - Consider at CEP XXIII whether to endorse additional guidance in relation to Conservation Management Plans.
- (124) The United Kingdom offered to lead discussions during the intersessional period with a view to providing some guidance on this topic to CEP XXIII.
- (125) The Committee thanked the United Kingdom for its work and expressed support for the paper's recommendations. It also encouraged Members undertaking conservation management work to consider HSM designation as a management tool. It noted that not all cultural heritage sites would require a Conservation Management Plan and that any plans that were developed should be fit-for-purpose. The Committee welcomed the offer by the United Kingdom to lead intersessional discussions and report back to CEP XXIII.
- (126) Argentina introduced WP 65 *Proposal to redesign the format of the list of Historic Sites and Monuments*, noting that its paper served as a response to the call from CEP XXI to consider the format of the list of HSMs in greater detail. Following analysis of the existing list of HSMs as well as the fields included in other relevant sources, in particular the cover sheet required to follow proposals for new HSMs provided in Resolution 2 (2018), Argentina had identified a

series of additional fields to incorporate in the list of HSMs, including: Name, Type, Conservation Status, Description of the historical context, Applicable criteria in accordance with Resolution 3 (2009), Management tools and Photos. With the intention of increasing visibility, Argentina also requested that the ATS update its website to incorporate the new fields and proposed that the information be formatted in a style similar to the Site Guidelines for Visitors. The Committee thanked Argentina for its paper. It agreed to the proposal for the incorporation of new fields of information to the list of HSMs contained in WP 65, and agreed to forward the proposed new format to the ATCM for approval and adoption through a Decision.

- (127) The Committee agreed to a proposed process for implementing the new format for current HSM. For the purpose of incorporating the current list of HSM into the new format, the Committee agreed to create an online forum on the CEP discussion forum where Parties undertaking management would be able to share with Members information relevant to an HSM to facilitate the drafting of a Working Paper presenting a list of the HSMs (current and the newly approved listings) in the new format. The Secretariat agreed to assist the CEP in establishing this forum on the ATS website.

CEP advice to the ATCM on redesigning the format of the list of Historic Sites and Monuments

- (128) The Committee agreed to a new format for the list of Historic Sites and Monuments, incorporating the following new fields of information in addition to the current fields (as identified in the current HSM list presented in Measure 9 [2016]):

- Name
- Type
- Conservation Status
- Description of the historical context
- Applicable criteria in accordance with Resolution 3 (2009)
- Management tools
- Photos
- Physical features of the environment and cultural and local context

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- (129) Belgium presented IP 34 *Inspection du Site et Monument Historique No 45, Plaque de l'expédition de Gerlache, île Brabant, pointe Metchnikoff*, which documented an inspection of HSM 45 led by a Belgian team on 3 March 2019.

It reported that the Gerlache Expedition Plaque was very well maintained and noted the discovery of remaining debris from an indeterminate research camp that could potentially predate the Environment Protocol. It highlighted that, although the team was not equipped for complete site rehabilitation, partial cleanup was conducted.

- (130) The following paper was also submitted under this agenda item, and taken as presented:
- IP 160 *C.A. Larsen Multiexpedition cairn* (Norway). It provided a short historical background on Carl Anton Larsen and the expedition that first erected the cairn and pole.

9c) Site Guidelines

- (131) The United States introduced WP 26 *Revisions to the Visitor Site Guide for Site No 26 Torgersen Island, Arthur Harbor, southwest Anvers Island*. It reported that the guidelines were modified following a comprehensive review of ASMA No 7, which included consideration of the provisions for access to the Torgersen Island Visitor Zone. Owing to recent declines in the local breeding population of Adélie penguins, the United States recommended that the Visitor Zone be closed to all visits except for scientific or management purposes during the main breeding period of 1 October to 15 January inclusive.
- (132) The Committee thanked the United States for its paper, noting that the proposed revision was aligned with the recommendation of the Antarctic Tourism Workshop held in Rotterdam in April 2019 encouraging Parties, when developing and reviewing site guidelines, to give further consideration to elaborating seasonal considerations.
- (133) The Committee agreed to forward the revised Site Guidelines for Torgersen Island to the ATCM for adoption.
- (134) The United Kingdom introduced WP 54 *Revision of Guidelines for Visitor Sites in the South Shetland Islands: Revised Guidelines for Yankee Harbour and Half Moon Island*, jointly prepared with IAATO. The United Kingdom noted that, at its recent annual meeting, IAATO amended its site guidelines for Yankee Harbour and Half Moon Island to update factual content and increase protection for the site. Given that IAATO operators regularly visited both these sites and had taken proactive steps to amend the site guidelines where they recognised change was required, the United Kingdom suggested that it was reasonable to follow these changes across into Antarctic Treaty site

guidelines so that they apply to all visitors to the sites. The United Kingdom also referred to CEP discussions, emphasising the need for a dynamic system of site guidelines revisions and updates.

- (135) The Committee supported the United Kingdom's approach and emphasised that site guidelines should be flexible and responsive to changes, and take into account advice from experts and expert organisations such as IAATO. The Committee agreed to forward the Site Guidelines for Yankee Harbour and Half Moon Island to the ATCM for adoption.
- (136) Argentina introduced WP 63 *Revision of Site Guidelines to Snow Hill Hut*, jointly prepared with Sweden, and noted that the current guidelines were adopted in 2007. Argentina reported that the proposed modifications were primarily related to: safety measures for visitors; the strengthening of protection by the establishment of a new closed area with archaeological value near the hut; the establishment of clear communication channels for the coordination prior to each visit; and the update of the map and the photographs. Argentina added that, following informal consultations with IAATO, it had modified the landing requirements to include ships carrying 200 or fewer passengers aboard.
- (137) Sweden acknowledged Argentina's efforts in preserving and protecting the Snow Hill Hut, noting it was a particularly important site for Swedish Antarctic history.
- (138) The Committee agreed to forward the revised Site Guidelines for Snow Hill Hut for adoption by the ATCM.
- (139) The United Kingdom introduced WP 55 *Visitor Site Guidelines Assessment and Review Checklists*, jointly submitted with Argentina, ASOC, Australia, IAATO, and the United States. It recalled that the CEP XXI had expressed support for the development of a formal checklist to aid the future review of Site Guidelines. It noted that two checklists had been developed, *Site Guidelines for Visitors checklist for new sites* and *Site Guidelines for Visitors checklist for sites with existing guidelines*. It recommended that: the CEP endorse both sets of guidelines; encourage Parties assessing sites for new guidelines or reviewing existing guidelines to make use of the checklists; and request the Secretariat make the checklists available on the ATS Website.
- (140) The Committee thanked the proponents for their work, and noted the use of the check lists would be useful in increasing the clarity of Site Guidelines and transparency of the development and review of site guidelines. Following discussions the proposed checklists were combined into one and text was

edited to improve clarity and better reflect that the single checklist could be used to both assess new sites and review existing site guidelines.

- (141) The Committee agreed to endorse the Site Guidelines for Visitors checklist, encourage Parties that are either assessing sites for new guidelines or reviewing existing guidelines to make use of the checklist, request the Secretariat to make the checklist available on the ATS website, and forward the checklist to the ATCM for adoption through a Resolution.

CEP advice to the ATCM on Site Guidelines for Visitors

- (142) The Committee agreed to forward the following revised Site Guidelines to the ATCM for adoption:

- Torgersen Island, Arthur Harbor
- Yankee Harbour
- Half Moon Island
- Snow Hill Hut

- (143) The Committee also endorsed the Site Guidelines for Visitors Checklist. To encourage Parties to make use of the checklist, the CEP asked the Secretariat to make the checklist available on the website and agreed to forward the checklist to the ATCM to encourage the use of the list by means of a Resolution.

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- (144) IAATO presented IP 142 *Report on IAATO Operator Use of Antarctic Peninsula Landing Sites and ATCM Visitor Site Guidelines, 2018-19 Season*, which reported the data collected by IAATO from IAATO Operator Post Visit Report Forms for the 2018-2019 season. It informed the Committee that the 2018/19 total number of passengers from ships making landings in the Antarctic Peninsula (44,303) had surpassed the previous 2017/18 season total (41,517) and that the increase in tourism levels was expected to continue into the 2019/20 season. IAATO emphasised that over 95% of all landed tourism activity in the Antarctic Peninsula continued to be focused on traditional commercial ship-borne tourism. IAATO highlighted that most visited sites were covered either by ATCM Site Guidelines for Visitors, IAATO operator landing site guidelines, or National Programme management guidelines. It further observed that all visits were conducted in accordance with landing limits established in applicable Site Guidelines for Visitors, and that the IAATO ship scheduler had been used effectively to ensure that no limits had been exceeded.

- (145) The Committee thanked IAATO for the report and welcomed its continued commitment to reporting to the CEP on the use of the IAATO operator landing site guidelines and ATCM Site Guidelines for Visitors. It observed that regular updates from IAATO were useful to inform the work of the Committee.
- (146) Spain presented IP 43 *Site management of Elephant Point, Livingston Island, South Shetland Islands* (IAATO, Portugal, Spain, United Kingdom). It focused on management tools needed to further preserve Elephant Point, as the area was increasingly visited by tourist and scientists. Following a recent site visit and a review of the different protection and management tools available, Spain proposed the development of Site Guidelines for Visitors as the most practical approach for this area. Spain stated that it would be working with IAATO over the intersessional period to prepare guidelines for the next CEP meeting.
- (147) IAATO noted that, at its annual meeting, the suggestions from IP 43 had been accepted as site guidelines for Elephant Point and would only be replaced once the ATS had developed further guidelines.
- (148) The following paper was also submitted under this agenda item, and taken as presented:
- IP 148 *Evaluating the efficacy of viewing distance guideline in minimizing visitor disturbance to penguins: A camera trap approach* (Ecuador). The paper described research designed to improve our understanding of how the presence of humans could influence penguins' behaviour at early phases of the summer at a highly visited site in the Antarctic Peninsula using a camera trap approach.

9d) Marine Spatial Protection and Management

- (149) New Zealand introduced WP 48 *Harmonisation of Marine Protection Initiatives across the Antarctic Treaty System*. The paper reported on informal discussions held by interested Parties to develop a response to the ATCM's request in Resolution 5 (2017) "to consider any appropriate actions within the Antarctic Treaty Consultative Meeting's competence to contribute to the achievement of the specific objectives set forth in CCAMLR Conservation Measure 91-05". New Zealand informed the Committee that intersessional work had focused on drafting a list of general complementary measures that could support connectivity between land and ocean, and strengthen marine protection initiatives. It pointed out that participants had agreed

that a staged approach to the work would be appropriate, starting with broad initiatives, and aiming to progress towards addressing appropriate complementary actions to contribute to the objectives of CCAMLR MPAs. It noted that participants had also agreed that many aspects of the CEP's ongoing work supported marine protection, and that this work would not open or duplicate discussion regarding the identification, designation or management of CCAMLR MPAs.

- (150) The Committee thanked New Zealand for leading informal discussions and for its paper. A few Members suggested that intersessional discussions had lacked the necessary time to reach a satisfactory comprehensiveness and that their views had not been entirely reflected in WP 48.
- (151) A number of general points were raised during this discussion, including: the importance of ensuring that discussions in the CEP/ATCM did not duplicate CCAMLR's important work or vice-versa; the need to work towards articulating different views and perspectives; the need to reflect the participants' views in an objective and balanced way; the potential benefit of further discussing and refining terminology (considering terms such as synergy and integration replacing the term complementarity); the added value of drawing on outcomes of the Joint SCAR/CEP Workshop on Further Developing the Protected Area System; the importance of working with and considering the knowledge of other organisations, in particular CCAMLR and SCAR; that discussions about harmonisation of marine protection required careful and detailed consideration; and that the CEP played an important role in ensuring marine protection across Antarctica.
- (152) While most Members had expressed a desire to formalise further discussions on harmonisation of marine protection initiatives through an ICG, a few Members felt that this was premature and indicated a need for further informal discussions to clarify the remit of the task.
- (153) Most Members underlined the importance of responding to the request from the ATCM through Resolution 5 (2017) in a timely and responsive manner, and regretted that the Committee was not able to initiate formalised discussions. The Committee welcomed New Zealand's offer to continue to facilitate informal discussions during the coming intersessional period.
- (154) China pointed out that the Working Paper did not reflect its opinions correctly, and reiterated that its concerns expressed in the last year's CEP still remain. However, China is willing to continue the discussion through an informal ICG.

- (155) SCAR drew the Committee's attention to the SCAR Expert Group on Birds and Marine Mammals and research related to the analysis of Retrospective Analysis of Antarctic Tracking Data and the identification of Areas of Ecological Significance. SCAR noted that relevant data would be released further in the year and would provide insight into both important areas and threats facing the Southern Ocean ecosystem.
- (156) ASOC presented IP 130 *ASOC update on Marine Protected Areas in the Southern Ocean 2018-2019*, which provided an update on MPA discussions at CCAMLR XXXVII in October 2018. It also referred to IP 108 *Developments in the process for adoption of a Marine Protected Area in the west Antarctic Peninsula and south Scotia Arc (DIMPA)*, submitted by Argentina and Chile, and expressed its support for the establishment of the proposed MPA in CCAMLR MPA Planning Domain 1. ASOC highlighted that this proposal was particularly relevant in the global context of climate change and biodiversity loss. Reflecting on WP 48, ASOC recommended to continue discussions on the harmonisation of marine protection initiatives.
- (157) Uruguay congratulated the authors of IP 130 and IP 108 and highlighted the relevance of both papers to the CEP's discussions on marine spatial protection. It expressed its willingness to participate in future developments to the establishment and management of the MPA in Domain 1.
- (158) The following paper was also submitted under this agenda item, and taken as presented:
- IP 108 *Developments in the process for adoption of a Marine Protected Area in the west Antarctic Peninsula and south Scotia Arc (DIMPA)* (Argentina, Chile). This paper described the progress made during 2017 and 2018 towards the establishment of an MPA in Domain 1.

9e) Other Annex V Matters

- (159) Argentina presented the second part of WP 64 *Subsidiary Group on Management Plans Report of activities during the intersessional period 2018-2019*, which addressed the SGMP's work during 2018/19 under its ToRs 4 and 5. Argentina reminded the Committee that ToRs 4 and 5 had tasked the SGMP to work with relevant Parties to ensure progress on review of management plans overdue for five-year review; consider further improvements to the Guidance for assessing an area for a potential Antarctic Specially Managed Area designation; and review and update the SGMP work plan.

- (160) Argentina reported that no Members requested assistance on their management plan reviews. The SGMP’s intersessional work had thus focused on reviewing the “Guidance for assessing an area for a potential ASMA designation”. The convenor stated that modifications proposed by the SGMP had been incorporated into a draft flowchart, which the SGMP recommended that the CEP adopt and attach to its report, encourage use, and include in the Guidelines at a future review. The SGMP also proposed a Work Plan for the upcoming intersessional period, noting that the CEP may wish to add more tasks such as those arising from the outcomes of the *SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System* held prior to CEP XXII.
- (161) The Committee thanked the SGMP for its report and agreed to attach the flowchart to its report (Appendix 2) and to encourage use and include in the “Guidelines for assessing an area for a potential Antarctic Specially Managed Area designation” at a future review; encouraged further participation among Members; and agreed to adopt the following SGMP work plan for 2019/20:

Terms of Reference	Suggested tasks
ToR 1 to 3	Review draft management plans referred by CEP for intersessional review and provide advice to proponents (including the four pending plans from previous intersessional period)
ToR 4 and 5	Work with relevant Parties to ensure progress on review of management plans overdue for five year review
	Consider options for supporting proponents to conclude the revision of management plans that remain for several intersessional periods under the scope of the SGMP
	Review and update SGMP work plan
Working Papers	Prepare report for CEP XXIII against SGMP ToRs 1 to 5

- (162) Norway introduced WP 44 *Proposed Criteria for de-designation of Antarctic Specially Protected Areas*, jointly prepared with Australia, New Zealand, and the United Kingdom. In accordance with a task identified in the Five-year Work Plan, it proposed a set of criteria for de-designation of ASPAs, as well as an outline of a possible process for ASPA de-designation. The suggested process included guidance on: how the CEP should be asked to consider the potential de-designation of an ASPA; the potential outcomes following an initial notification to the CEP; and the process going forward for a potential de-designation of an ASPA. Norway noted that the Antarctic protected area system was dynamic and that de-designations required rigorous consideration and monitoring.

- (163) The Committee thanked the proponents of WP 44 and emphasised the importance of discussing and formulating criteria for the de-designation of protected areas. While expressing general support for the proposal put forward, some Members suggested that the proposed criteria and process for de-designation lacked clarity and would benefit from further consideration. One Member noted that the results of this work and the suggested criteria could be used for the goal of elaborating guidance for the five yearly review of management plans. It was also suggested that new proposal procedures should be developed when new values emerged and preconditions should be set when the CEP required relevant expertise. ASOC added that de-designation of protected areas required careful consideration and that there was no urgent need to de-designate ASPAs at present.
- (164) The Committee agreed that further discussion on protected area de-designation was required, and welcomed the offer from Norway to lead further intersessional work and report back to the CEP XXIII.
- (165) Canada introduced WP 67 *Coastal Camping Coordination*, jointly prepared with the United States. The paper considered issues related to an increasing number of visitors engaging in vessel-supported short overnight stays (VSSOSs) and associated points relating to site management. It noted that the ATCM and CEP had discussed VSSOSs in previous meetings. It drew attention to the Antarctic Tourism Workshop held in Rotterdam in April 2019, at which coastal camping had been further discussed. It provided five recommendations:
- encourage Treaty Parties to reconsider including explicit guidance on camping in Site Guidelines for Visitors;
 - encourage IAATO to work with member-operators that are experienced in or interested in coastal camping to generate an updated list of current and prospective camping locations;
 - request that SCAR and other relevant experts evaluate the suitability of prospective sites for camping and develop guidance to be included in Site Guidelines for Visitors;
 - promote discussions amongst NCAs that currently review coastal camping activities and other interested Parties and observers to enhance harmonisation on issues such as numbers of campers and camping locations; and
 - consider the development of coastal camping guidelines to help ensure consistent application of best practices and minimise impacts to the Antarctic environment.

- (166) Canada noted that further guidance would be useful and needed, as tourism activities were expected to increase.
- (167) Members engaged in wide-ranging discussion, which raised many key issues relating to the clear value and possible limitations of developing guidance related to VSSOSs, including:
- Recognition of the timeliness of WP 67 and subsequent discussion due to many Members' observations of increased interest in VSSOSs;
 - The importance of improving coordination among competent authorities who permit or authorise these activities;
 - A general desire to agree upon shared guidelines in order to minimise cumulative impacts of VSSOSs and related activities as assessed during the EIA process;
 - The importance of gaining clarity in identifying appropriate VSSOS sites;
 - The value of guidelines to ensure conflict is avoided between VSSOSs and scientific activities;
 - The need for clear language when describing the different type of "camping" activities that occur in Antarctica noting that this point had already been discussed at the ATCM in the past and that "non-permanent installation" was then used;
 - The desire to provide guidance for competent authorities without unintentionally further incentivising coastal camping; and
 - Recognition that improvement in the control of tourism activities would be necessary to ensure that activities are undertaken respectful of such guidance on camping, such as the establishment of on-board observers.
- (168) IAATO drew the Committee's attention to ATCM XXXVI - IP 98 (*IAATO Guidelines for Short Overnight Stays*) and highlighted its ongoing efforts to better track VSSOS activity in its post-season reports and to keep its Field Operations Manual (FOM) updated. It reminded the Committee that the FOM was available upon request.
- (169) The Committee acknowledged the existing and ongoing work of IAATO to develop guidance to ensure VSSOSs were conducted in a safe and environmentally sound manner. It also welcomed offers from IAATO and SCAR to support the proponents of WP 67 and other interested Members to develop further criteria and guidance related to VSSOSs.

- (170) The Committee thanked Canada and the United States for drawing its attention to this important topic. The Committee expressed general support for the recommendations and agreed on the usefulness of additional guidance regarding VSSOs.
- (171) The Committee agreed to:
- encourage Parties and invited Experts with an interest in vessel supported short overnight stays to participate in the ICG reviewing visitor site guidelines with a view to ensuring that short overnight stays are considered in the updating of the guidelines;
 - invite IAATO to work with member-operators that are experienced in or interested in short overnight stays to review the list of current camping locations, as reported in IP 98 (2013), and update the committee as appropriate;
 - invite SCAR and other relevant experts to develop criteria, with reference to IAATO's camp site selection criteria, that can be used in considering new camping areas for consideration by CEP 23; and
 - add an item to the Five-year Work Plan to develop guidelines for short overnight stays to ensure consistent application of best practices and minimise impacts to the Antarctic environment.
- (172) Australia and SCAR introduced WP 70 *Recommendations arising from the Joint SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System, Prague, Czech Republic, 27-28 June 2019*, prepared jointly with the United States and the Czech Republic. They also referred to IP 165 *Co-convenor's report of the joint SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System, Prague Czech Republic, 27-28 June 2019*, also prepared jointly with the United States and the Czech Republic.
- (173) Australia and SCAR informed the CEP that the Joint SCAR/CEP Workshop on Further Developing the Antarctic Protected Area System was hosted by the Czech Ministry of the Environment at the Masaryk College in Prague, Czech Republic, from 27-28 June 2019. The workshop was co-convened by Ewan McIvor (Australia), Chandrika Nath (SCAR), Polly Penhale (United States) and Aleks Terauds (SCAR), and was attended by 50 participants, including 9 representatives of SCAR, representatives of 19 CEP Members and representatives of 3 CEP Observers (see list of participants in IP 165).
- (174) Australia and SCAR highlighted that the workshop was highly constructive, and had demonstrated the value of continuing the effective engagement

between SCAR and the CEP, in general, and particularly on the systematic further development of the protected area system. They highlighted the co-conveners' observations regarding key outcomes under the workshop terms of reference, including general agreement that:

- the current series of ASPAs continued to serve an important purpose, but in general had not been identified in a systematic manner;
- initiating further work to systematically develop the protected area system, in conjunction with the application of other tools, would help to advance the protection of Antarctica's outstanding values;
- it remained important to draw on the best available science and also to continue to build the level of scientific information over time;
- dedicated work should be initiated to develop a series of ASPAs that address the criteria in Article 3.2 of Annex V; and
- any future protected area system would need to be implemented effectively and efficiently.

(175) Australia and SCAR advised the Committee that five recommendations had been agreed by participants during the workshop:

- Recommendation 1: That the CEP considers the draft Report on the State of the Antarctic Protected Area System (Attachment A to WP 70), which is an objective report not an evaluation or assessment, and as appropriate, forwards the report to the ATCM in accordance with its role to provide advice on the 'operation and further elaboration of the Antarctic Protected Area system'.
- Recommendation 2: That the CEP encourages Members, SCAR and other Observers and Experts to prioritise and support further research that will build on the existing body of scientific evidence to support the further development of the protected area system in accordance with Article 3.2 of Annex V.
- Recommendation 3: Recognising SCAR's role in facilitating access to data, that the CEP requests SCAR to consider establishing a repository of information relevant to identifying ASPAs within a systematic environmental-geographic framework (*eg*, environmental datasets, human activity data, analyses of the implications of global pressures).
- Recommendation 4: That the CEP initiates a programme of work involving close engagement with SCAR and other stakeholders (*eg*, COMNAP, IAATO, ASOC), to develop a framework for systematically developing the protected area system (*eg*, to identify goals/objectives,

related science requirements, priorities for actions to be taken by the CEP and Parties, timeframe for action, measures to evaluate progress).

- Recommendation 5: That the CEP supports a programme of work to review and rationalise its existing protected area guidance materials. This could also involve consideration of guidance for the five-yearly review of management plans.
- (176) The Committee recognised that the workshop was a productive forum for discussion and reflection to address actions and priorities in the CEP Five-year Work Plan. Members highlighted several important aspects of the workshop, including:
- The outcomes of the workshop reflected a substantial amount of work on the part of the co-conveners and more than 50 workshop participants;
 - All workshop discussions were informed by a wide body of literature, including peer-reviewed publications, as well as scientific presentations delivered at the workshop; and
 - The recommendations emerging from the workshop reflected the breadth of information considered, and were agreed by all workshop participants.
- (177) Members provided some constructive advice to advance discussions on how best to develop the Antarctic Protected Areas system. Members highlighted the value of:
- considering not only protected areas but also refuges for Antarctic flora and fauna;
 - including redundancy in the Protected Areas system;
 - establishing protected areas for values that had not yet been protected, such as aesthetics;
 - ensuring that the general framework for management was flexible;
 - considering connectivity between land and sea in the further development of the system; and
 - engaging SCAR and IAATO, who are working on a systematic conservation planning process focused on the Antarctic Peninsula, which could inform further development of the system.
- (178) China recalled that there had been intensive discussions in those two days, and that divergent or various opinions had been expressed. Notes of these different opinions had also been taken and presented in the plenary. It noted that in general, intensive discussion and divergent views were essential to the

success of a workshop. In respect to the outcomes of the workshop, China stated that ToR 1 had not been fully discharged by reference to last year's WP 16. China is of the view that there was a general recognition or agreement that an assessment or evaluation on the basis of scientific methodology was crucial in providing scientific advice. Consequently, China recommended that the CEP should initiate an assessment in accordance with the last year's WP 16. Moreover, China indicated that some different opinions expressed in the workshop had been missed in both WP 70 and IP 165, and as a result they had not been reflected in the recommendations. China urged that recommendations should have covered all views in a balanced and scientific way.

- (179) Some Members agreed on the importance of an assessment.
- (180) Australia advised that the co-convenors of the workshop had made best efforts to reflect the key points raised during the workshop in the papers presented to the Meeting.
- (181) ASOC commended the workshop conveners and participants for their hard work. It noted that there were no legal, scientific, or practical barriers to expanding the Antarctic protected areas system. ASOC encouraged the CEP to proceed without delay on all recommendations resulting from this workshop.
- (182) Following discussion, the Committee:
- Agreed to forward the draft Report on the State of the Antarctic Protected Area System (Attachment A to WP 70) to the ATCM, noting it was an objective report not an evaluation or assessment, in accordance with its role to provide advice on the 'operation and further elaboration of the Antarctic Protected Area system'.
 - Agreed to assess the effectiveness of the current series of ASPAs with regard to the provisions of Article 3.2 of Annex V, and in light of the other provisions of the Environment Protocol (including consideration of methodologies).
 - Encouraged Members, SCAR and other Observers and Experts to prioritise and support further research that will build on the existing body of scientific evidence to support the further development of the protected area system in accordance with Article 3.2 of Annex V.
 - Recognised SCAR's role in facilitating access to data, and encouraged SCAR to consider establishing a repository of information relevant to identifying ASPAs within a systematic environmental-geographic

framework (eg, environmental datasets, human activity data, analyses of the implications of global pressures – see Attachment B to WP 70).

- Agreed to initiate a programme of work involving close engagement with SCAR and other stakeholders (eg, COMNAP, IAATO, ASOC), and to develop a guideline for systematically developing the protected area system, including identifying goals/objectives, assessment of current protected areas, related science requirements, priorities for actions to be taken by the CEP and Parties, timeframe for action and implementation, and measures to evaluate progress.
- Agreed to support a programme of work to review and rationalise its existing protected area guidance materials, noting it could also involve consideration of guidance for the five-yearly review of management plans.

(183) The CEP updated its Five-year Work Plan to include actions agreed by the Committee from discussions on the Protected Areas workshop.

CEP advice to the ATCM on the Protected Areas Workshop

(184) In accordance with its role to provide advice on the operation and further elaboration of the Antarctic Treaty System, the Committee agreed to advise the ATCM that it had considered a draft report on the State of the Antarctic Protected Area System (Attachment A to WP 70), noting it was an objective report and not an evaluation or assessment. The Committee agreed to forward the report to the ATCM.

(185) The Secretariat presented SP 7 *Visits to sites and protected areas reporting and mapping developments*, which provided background on the development of two interactive maps detailing visits to sites and to Protected Areas, and demonstrated the new tools on the website. The Secretariat invited Members to access and use the maps, and provide comments directly to the Secretariat.

(186) The Committee thanked the Secretariat for these useful developments. It noted that the maps could only be as good as the data on which they were based, and encouraged Members to take extra precaution to ensure that they recorded data in a timely and correct manner into the EIES.

(187) SCAR presented IP 24 *Systematic Conservation Plan for the Antarctic Peninsula Project Updates*, submitted jointly with IAATO. It provided an update and next steps on a collaborative project undertaken by SCAR and IAATO to develop a systematic conservation plan for the Antarctic Peninsula. SCAR pointed out the project aimed to inform the Antarctic community on how best to concurrently manage biodiversity and human activities in the

region, and contribute to the sustainable management of IAATO activities into the future. It further reported on the establishment of a Liaison Group to provide advice, input and data to the project. SCAR invited interested parties to contact the SCAR Secretariat via *scp@scar.org* stating their interest in the liaison group and indicating in what capacity they would wish to participate.

- (188) In response to a question, SCAR noted that the project was currently focused on the assessment phase and that implementation would be considered in the future.
- (189) The Committee thanked SCAR and IAATO for their initiative and took note of the call for participation in the project.
- (190) ASOC presented IP 134 *Systematic expansion of the Antarctic protected areas network*, which examined some key issues concerning the requirement under Annex V to the Environment Protocol to identify and include in the series of ASPAs a range of area categories. ASOC recommended Parties to work cooperatively towards achieving the area protection objectives of the Environment Protocol to which all Parties had committed. ASOC recommended that Parties consider ways to streamline ASPA listing and review so that there can be a focus on the expansion of the ASPA system; and that Parties develop approaches to earmark new areas as part of a systematic conservation planning process rather than individually.
- (191) The following papers were also submitted under this agenda item, and taken as presented:
- IP 40 *Report of the Antarctic Specially Managed Area No 6 Larsemann Hills Management Group* (Australia, China, India and the Russian Federation). This paper reported on the commencement of a review of the ASMA management plan for ASPA 174 Stornes and the ASMA management plan for ASMA 6 Larsemann Hills.
 - IP 52 *A snapshot of terrestrial biodiversity protection in Antarctic Specially Protected Areas* (Australia and SCAR). This paper summarised the first continent-wide assessment of terrestrial biodiversity protection within ASPAs.
 - IP 86 *Topic Summary: CEP Discussions on Further Developing the Antarctic Protected Area System* (Australia). This paper presented a summary of CEP meeting documents and discussions on the topic of further developing the Antarctic Protected Areas system.
 - IP 117 *Relevance of Rip Point, Nelson Island, to be proposed as ASPA* (Chile). This paper reported on a review of the scientific

information available for the site with a view to assessing tools for better protecting it in accordance with CEP guidelines.

- IP 119 *Advances in the revision of the Management Plan for the Antarctic Specially Protected Area No 112, Coppermine Peninsula, Robert Island, South Shetland Islands* (Chile). This paper reported on the ongoing revision of the management plan for ASPA 112.

Item 10: Conservation of Antarctic Flora and Fauna

10a) Quarantine and Non-native Species

- (192) The United Kingdom introduced WP 34 *Non-native Species Response Protocol*, prepared jointly with Spain, Argentina, France, and New Zealand. The paper highlighted that the CEP Non-native Species Manual recognised that the response to a non-native species introduction should be undertaken as a priority, to prevent an increase in the species' distribution range and to make eradication simpler, cost effective, and more likely to succeed. The response protocol aimed to assist Parties in their response to a non-native species introduction, facilitating a more rapid and appropriate response, and thereby help reduce the risk to Antarctic ecosystems. Recognising that there would still be a need for site specific advice, the paper recommended that the CEP consider the draft Non-native Species Response Protocol and, if deemed acceptable, request that the Antarctic Treaty Secretariat append it to the CEP Non-native Species Manual.
- (193) The Committee thanked the United Kingdom, Spain, Argentina, France, and New Zealand for developing the Non-native Species Response Protocol. It observed that the topic of responding to non-native species invasion had high importance and that the protocol would be a very useful tool for Parties. The Committee agreed to request that the Antarctic Treaty Secretariat append the Non-native Species Response Protocol to the CEP Non-native Species Manual and to encourage its use broadly. The Committee further noted IAATO's intention to add this protocol to its Field Operations Manual.
- (194) COMNAP introduced WP 50 *Review and Update of the "Checklists for supply chain managers of National Antarctic Programs for the reduction in risk of transfer of non-native species"*, prepared jointly with SCAR. The paper presented an update of the 2010 checklists of the same name. It noted that both the original checklist and this updated version had been prepared as a collaborative effort between COMNAP and SCAR. COMNAP further informed the Committee that the original 2010 checklist had been translated

into several languages and was widely used. It also noted that work was underway to develop a new checklist aimed at reducing intra-continental transfer of species. COMNAP and SCAR recommended: that the CEP replace the 2010 version of the checklists currently found in the CEP Non-native Species Manual with the revised 2019 version of the checklists, and that Parties encourage their National Antarctic Programmes and other supply chain managers and operators in their countries to use the checklists on a voluntary basis.

- (195) The Committee thanked SCAR and COMNAP for their efforts to update these very important checklists. It noted that the 2010 checklists were widely used by Parties, National Antarctic Programmes, and IAATO. The Committee agreed that it would replace the 2010 version of the checklists currently found in the CEP Non-native Species Manual with the revised 2019 version of the checklists, and that Members would encourage their National Antarctic Programmes and other supply chain managers and operators in their countries to use the checklists on a voluntary basis. The Committee noted the importance of making this guidance widely available so that all operators have access to these checklists, and encouraged its translation into multiple languages.
- (196) The Committee also welcomed the announcement from COMNAP and SCAR that they are developing a checklist aimed at reducing the intra-continental transfer of species. It observed that this important work would be highly relevant for many national programmes.
- (197) The following papers were also submitted under this agenda item, and taken as presented:
- IP 27 *Marine non-native species in the Antarctic Treaty area* (United Kingdom). This paper presented recent knowledge regarding the introduction pathways/vectors, risk, known status and potential impacts of marine non-native species in the Antarctic Treaty area.
 - IP 32 *Anthropogenic transfer of terrestrial species within Antarctica: assessing the risks* (United Kingdom, Spain). This paper presented recent knowledge regarding the pathways and risks of transfer of non-native species between Antarctic biogeographic regions.
 - IP 38 *Report on the extent of sewage treatment plant infestations across the Antarctic Treaty area: Survey results* (COMNAP). This paper presented the results of a COMNAP survey to identify any flies present in station sewage treatment facilities across the Antarctic

Treaty area and an update on the non-native fly extent at facilities on King George Island.

- IP 120 *Report of the 2018/2019 summer campaign of the joint monitoring programme of non-native flies in King George Island / Isla 25 de Mayo* (Uruguay, Argentina, Brazil, Chile, China, Germany, Republic of Korea, the Russian Federation). The paper provided an update of a joint monitoring programme to collect relevant data on the presence of the non-native fly *Trichocera maculipennis* in stations on King George Island to inform management actions to control the fly.
- IP 150 *Eradication of a non-native grass Poa annua L. from Western Shore of Admiralty Bay, King George Island, South Shetland Islands – update 2018/2019* (Poland). This paper presented the results of a research study on the eradication of the non-native species *Poa annua* from ASPA No 128 Western Shore of Admiralty Bay and Arctowski Station.

10b) Specially Protected Species

- (198) The United Kingdom presented IP 42 *Emperor penguins - vulnerable to projected rates of warming and sea ice loss; an international collaboration to inform species-related conservation decision-making and conservation planning*, prepared jointly with ASOC, Australia, Finland, France, Germany, Monaco, Norway and SCAR. The United Kingdom reported that an international group of experts had collaborated to review the dependence and vulnerability of emperor penguins to climate change. The paper noted that emperor penguins are threatened by the ongoing loss of their breeding habitat as sea ice declines. The co-authors considered that species-related management options, informed by the best available science, could be developed in order to reduce or eliminate other anthropogenic stressors from emperor penguins and thereby improve the resilience of this species. The paper concluded that emperor penguins should continue to be the focus of collaborative international research.
- (199) The Committee thanked the United Kingdom and the other co-authors for the useful paper. Several Members shared existing efforts to improve understanding of the dependence and vulnerability of emperor penguins to climate change. ASOC noted that its member organisation WWF had supported the satellite monitoring of emperor penguin populations and looked forward to further progress on the issue. The Committee encouraged further research and collaboration on the subject.

- (200) Monaco suggested an informal intersessional group to investigate management and conservation planning options that might be considered for the species.

10c) Other Annex II Matters

- (201) SCAR introduced WP 17 *SCAR's Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica*. This paper represented the culmination of a substantial review and revision of the Code of Conduct during the 2017/18 and 2018/19 intersessional periods. The revised non-mandatory code of conduct was included in Attachment A. SCAR highlighted that content of the code of conduct had been expanded to include all animals for which information was available and for which relevant research was being conducted. It noted it had also completed typographical, grammatical, and phrasing updates. SCAR recommended that the CEP: recognise that broad and extensive consultation had been undertaken in this review and revision; recognise that the revised code of conduct replaced the existing code of conduct; and consider the revised code of conduct for dissemination and encouragement of adoption when planning and undertaking work that involved the use of animals in Antarctica.
- (202) The Committee thanked SCAR for the considerable work it had completed to produce the Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica. After some slight adjustments, the Committee endorsed SCAR's Code of Conduct for use of animals for scientific purposes, and agreed to forward it to the ATCM for approval by a draft Resolution on encouraging its dissemination and use. The usefulness of having this code of conduct translated was highlighted.

CEP advice to the ATCM on SCAR's Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica

- (203) The Committee endorsed SCAR's Code of Conduct for use of animals for scientific purposes in Antarctica, and agreed to forward it to the ATCM for approval by a draft Resolution on encouraging its dissemination and use.
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- (204) SCAR introduced WP 68 *Anthropogenic Noise in the Southern Ocean: an Update*. In response to a request from CEP XVII, SCAR noted that it had completed a comprehensive review of peer-reviewed literature and convened a committee of experts, chaired by Mahlon C. (Chuck) Kennicutt, to provide further advice on this issue, and bring all relevant information

together. SCAR also referred to BP 3 *Anthropogenic Noise in the Southern Ocean: an Update*, which supports the Working Paper with more details on scientific knowledge regarding the effect of noise on marine wildlife. Based on its findings, SCAR observed that research on acoustic environments and anthropogenic noise was continuing to progress, with most studies conducted outside the Antarctic region. It also noted that the state-of-knowledge of potential impacts of anthropogenic noise on marine life was varied. In concluding, SCAR noted that there are significant gaps in the scientific knowledge needed to advance evidence-based policy-making on the impacts of noise in Antarctic marine environments. SCAR outlined a number of actions that would be required to address these gaps:

- expanding the scope of studies of species and taxonomic groups' exposure-response to anthropogenic noise;
- standardising methodologies, experimental approaches and metrics of effectiveness;
- improving knowledge of the spatial and temporal scales of natural ambient and anthropogenic sound in Antarctic waters;
- conducting risk assessments that determine the likelihood that individuals and populations will be exposed to harmful levels of sound;
- facilitating accessibility to all types of data and encouraging data sharing;
- improving mitigation and management solutions; and
- fostering a collaborative relationship between all stakeholders.

SCAR recommended that the CEP encourage the development of this research and related activities to address gaps in the evidence-base needed to support decision-making and policy development relating to the impacts of noise in the Antarctic marine environment. Recognising broad interest in this topic, SCAR indicated that it would be happy to work with interested parties to summarise this knowledge for the Antarctic Environments Portal.

- (205) By fully supporting the recommendations in WP 68, Germany stressed the need to urgently close the several significant gaps in knowledge mentioned by SCAR, since competent authorities would still need to come to a conclusion if a permit for activities that involved underwater noise were to be requested. Germany informed about its research to support decision-making in this regard in IP 31 *Results from the international workshop "The Effects of Noise on Marine Mammals in Antarctica" held in November 2018 in Germany*. Its paper reported on its research to support decision-making in this regard and Germany explained that the workshop had been convened to determine

the current state of knowledge on the effects of noise on marine mammals in Antarctica. The workshop had also facilitated discussion among marine mammal experts regarding research priorities. Germany elaborated that workshop participants had recommended a brief series of future workshops to refine marine mammal noise exposure criteria for Antarctica to have a criteria matrix that addresses Antarctic native marine mammal species only and the three main sources of underwater noise, namely: seismic airguns, hydroacoustic equipment, and ships. Germany highlighted that it would issue a call for workshops in the series in the second half of 2019, and would inform the CEP Contact Points about it and invite interested parties to answer the call.

- (206) ASOC noted that it was possible for action to be taken on this matter. Referring to recommendations from its IP 131 *Emerging Issues for Southern Ocean Vessel Management*, ASOC encouraged Members to commit to applying the existing Convention on Migratory Species Guidelines to reduce underwater noise, and to support further work being undertaken by the International Maritime Organization to address noise from shipping.
- (207) The Committee thanked SCAR for its comprehensive work and for its introduction of WP 68. It also thanked Germany for its useful presentation of IP 31. The Committee emphasised the importance of understanding and addressing the effects of noise in marine environments. It was in this context noted that this item in the 5YWP should be given a higher priority level. Members agreed that it would be useful to have a summary of SCAR's findings on the Antarctic Environments Portal, noting that these summaries would also be useful as supporting material for permitting authorities and assessment of activities. The Committee thanked SCAR for its willingness to work with interested parties on this task. It also noted the value of connecting this work with the work of the Arctic Council's Working Group on Protection of the Arctic Marine Environment.
- (208) The Committee encouraged research and other activities to address gaps in management-relevant knowledge regarding the impacts of noise on the Antarctic environment, and in particular encouraged National Antarctic Programmes to follow up on this call.
- (209) Germany presented IP 10 *An update to the state of knowledge of wildlife responses to unmanned aerial vehicles*, jointly prepared with Portugal, SCAR and Spain. The paper summarised the major findings and discussion that emerged from the SCAR workshop "*Drones and Antarctic Biology*" held at the SCAR Biology Symposium in Leuven on 9 July 2017. It noted

that a scientific publication had been compiled to provide details on the key outcomes and recommendations (Mustafa *et al.* 2018).

(210) The following paper was also submitted under this agenda item, and taken as presented:

- IP 97 *New IAATO Procedures for Operating in the Vicinity of Whales* (IAATO). This paper summarised the new IAATO actions that would commence in the 2019/20 Antarctic season to mitigate ship strike risks.

(211) The following Background Paper was also submitted under this agenda item:

- BP 3 *Anthropogenic Noise in the Southern Ocean: an Update* (SCAR), which supported WP 68 provided in response to a request from CEP XVII that SCAR update information on anthropogenic sound in the Southern Ocean.

Item 11: Environmental Monitoring and Reporting

(212) The United Kingdom introduced WP 14 *Reducing Plastic Pollution in Antarctica and the Southern Ocean*. Noting that marine plastic pollution was increasingly being recognised as a major conservation issue both globally and within the Antarctic Treaty area, it stressed the importance of reducing transportation of macroplastics and microplastics to the Antarctic region. It referred the Committee to IP 33 *Quantifying and understanding the impacts of plastic pollution in the Southern Ocean*, which it jointly submitted with Peru, as well as IP 133 *Mitigating microplastic pollution in Antarctica*, submitted by ASOC; IP 8 *Annual Report for 2018/19 of the Council of Managers of National Antarctic Programs (COMNAP)*, submitted by COMNAP; and IP 99 *Reducing Single-Use Plastic and Waste Generated by Polar Tourism*, submitted by IAATO; all of which provided further information relevant to WP 14. The United Kingdom made six recommendations to the Committee regarding efforts that could be undertaken to reduce plastic pollution in the Antarctic.

(213) ASOC presented IP 133 *Mitigating microplastic pollution in Antarctica*, which included additional details on microplastics research in the Southern Ocean. ASOC noted that action to address this issue was already underway, and that Coalition of Legal Toothfish Operators (COLTO) members were installing laundry water filters to capture microplastic on their vessel. It further noted that COMNAP had also recommended that National Antarctic Programmes ban personal care products containing microbeads. To facilitate

the implementation of mitigation methods by those operating in the Antarctic, IP 133 provided an appendix with practical information on various laundry water filtration methods. ASOC observed that because it was impossible to recover microplastics from the marine environment, installing laundry filters and banning personal care products containing microbeads were simple, yet meaningful, steps that could be taken to prevent further contamination of Antarctic marine ecosystems.

- (214) COMNAP welcomed WP 14 and drew the Committee's attention to recommendations from COMNAP's plastics workshop held in 2018 that can be found on the COMNAP website. It noted that they are broadly aligned with the United Kingdom's recommendations in their paper. COMNAP also thanked ASOC for its paper, and noted that information on microplastics and filters had been shared with all National Antarctic Programmes.
- (215) The Committee thanked the United Kingdom for raising this important topic for discussion, as well as Peru, ASOC, IAATO, and COMNAP for their informative papers. It recognised that this issue was a significant problem in Antarctica and the Southern Ocean that could have long-lasting environmental impacts. It expressed wide support for taking steps to minimise impacts of microplastics and macroplastics in the region. The Committee encouraged those Members who reported relevant research projects to continue providing updates.
- (216) The Committee agreed that there is scope for further work to progress actions and measures on this important topic in the coming years. Since the Committee could not agree on recommendations regarding macroplastics, the Committee agreed to the amended proposed recommendations and to forward them to the ATCM through a draft Resolution.

CEP advice to the ATCM on mitigating microplastic pollution in Antarctica

- (217) The Committee considered a report on mitigating microplastic pollution in Antarctica, and agreed to forward a draft resolution recommending steps that could be undertaken to reduce plastic pollution in the Antarctic.
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- (218) New Zealand introduced WP 52 *Antarctic Environments Portal*, jointly prepared with Australia, the Netherlands, Norway, SCAR, Spain, and the United States, and referenced IP 23 *Antarctic Environments Portal: Content Management Plan* (Australia, the Netherlands, New Zealand, Norway, SCAR, Spain, United States).

- (219) New Zealand highlighted that the Antarctic Environments Portal had continued to support the work of the CEP by making available to all CEP Members and Antarctic Treaty Parties, up-to-date, state-of-knowledge reports on issues of relevance to the Committee's work programme. New Zealand acknowledged the significant contributions of the late Professor David Walton in his role as editor of the Portal. It observed that his tireless work in bringing scientific knowledge to support the work of the Antarctic Treaty system would be his enduring legacy.
- (220) New Zealand and its co-authors recommended that the CEP:
- renew its support for the Antarctic Environments Portal, recognising that it continued to support the work of the Committee;
 - review the Content Management Plan and provide suggestions for further issues to be covered through Information Summaries in the Portal, relevant to the CEP's agenda and interests; and
 - ensure the Portal continued to support the work of the Committee, by identifying how they could assist the ongoing operation of the Portal through SCAR with direct funding or support-in-kind.
- (221) While discussing this paper, Members raised many key points to consider in ensuring the continuing utility of the Antarctic Environments Portal, including:
- keeping the Portal as an independent, third party, neutral entity that was not affiliated with or financed by the ATCM or CEP;
 - keeping costs manageable and the financial impact neutral for SCAR's Secretariat;
 - ensuring that the materials presented on the topic were apolitical and based on the best available science;
 - continuing to increase geographic representation in portal materials;
 - focussing on essential issues relevant to the work of the CEP to avoid duplication with other similar services;
 - ensuring that the processes for both accessing and contributing to the Portal were clear, open to all scientists, and had high visibility; and
 - suggesting to develop the Content Management Plan taking into account the list of science needs identified in the Five-year Work Plan and in the Climate Change Response Work Plan.
- (222) In the spirit of transparency, the Netherlands informed the Committee that it intended to make a financial contribution to support the Portal for two years. The United Kingdom and New Zealand also indicated that they would

make financial contributions. Spain indicated that it intends to support the translation of Portal materials into Spanish; and France indicated that it intended to continue to support the translation of Portal materials into French.

- (223) While supporting the fact that the Antarctic Environments Portal continued to contribute to SCAR's role of providing independent and objective scientific advice to the CEP, China drew the attention of the Committee to the fact that the Antarctic Environments Portal is an independent third-party information platform not officially affiliated with, or managed, financed, or directed by the CEP or ATCM.
- (224) SCAR informed the Committee that it was very pleased to assume the operation of the Antarctic Environments Portal after the end of the current arrangements, and to ensure the ongoing delivery of content of relevance to the CEP and to its Members. It reminded the Committee that doing so was well-aligned with SCAR's role in providing independent and objective advice to the Antarctic Treaty System. It indicated that all scientists would be welcome to contribute as it worked to expand the geographic coverage of materials presented in the Portal. Finally, SCAR acknowledged the importance of maintaining transparency regarding financial contributions to maintain neutrality in the finished products presented on the Portal. It noted that it had a very strict set of guidelines aimed to preserve transparency and neutrality when considering accepting monetary contributions.
- (225) The Committee thanked the authors of WP 52 for their work on the Antarctic Environments Portal. The Committee broadly agreed on the recommendations provided in WP 52. It stressed the need for using the Portal to address priority issues in the Five-year Work Plan. It thanked SCAR for assuming management of the Portal in the coming year and agreed to adopt the recommendations as presented in WP 52.
- (226) The United Kingdom introduced WP 62 *The Status and Monitoring of Antarctic Seal Species*. It examined the status of Antarctic seal species, and explored relevant methods of protection in the ATCM and CEP as well as current levels of protection. It suggested that current low levels of protection might reflect a lack of data on seal numbers and status in the Antarctic. The United Kingdom recommended that the Committee urge SCAR and other scientists to increase research into Antarctic seal species. It recommended that the Committee encourage interested Parties to join informal intersessional work in assessing the available management tools for the protection of Antarctic seals and considering whether additional protection for Antarctic seals was required.

- (227) The Committee thanked the United Kingdom for raising this important issue. Expressing their support for the recommendations in the paper, a number of Members and Observers noted ongoing research on Antarctic seals and urged for more research. The Committee highlighted tools that are currently in development, such as the Important Marine Mammal Areas (IMMA) and the Retrospective Analysis of Antarctic Tracking Data (RAATD) and might be useful to these efforts. It expressed support for ongoing intersessional discussions on these topics.
- (228) SCAR reiterated the existence of ongoing relevant research. It echoed the Committee's observations about the potential of initiatives like the Retrospective Analysis Antarctic Tracking Data (RAATD), Important Marine Mammal Areas (IMMA), and the use of remotely sensed data to inform the management and conservation of seals. SCAR drew the Committee's attention to its own activities in these initiatives through groups such as the Expert Group on Birds and Marine Mammals (EG-BAMM) and the Action Group on Remote Sensing.
- (229) Australia presented IP 100 *Progress with development of a methodology to assess the relative sensitivity of sites to visits by tourists*, prepared jointly with New Zealand, Norway, the United Kingdom, the United States and IAATO. The paper provided an update on work since CEP XIX in relation to Recommendation 3 of the CEP Tourism Study. Australia noted that, over the last intersessional period, the methodology to assess the relative sensitivity of sites to visits by tourists had been updated based on feedback from Members and Observers. Australia noted the co-authors' intention to trial the methodology and report back on its process to CEP XXIII.
- (230) The Committee thanked Australia for the progress report. It encouraged Members to engage in the trial over the coming intersessional period, and looked forward to receiving a further update in the coming year.
- (231) The following papers were also submitted under this agenda item, and taken as presented:
- IP 6 *The Reference Elevation Model of Antarctica: A New Tool for Supporting Research and Operations on the Continent* (United States), which noted that the Model was a powerful tool for Antarctic field logistics and planning as well as research and monitoring of environmental change on the Antarctic continent.
 - IP 23 *Antarctic Environments Portal: Content Management Plan* (Australia, the Netherlands, New Zealand, Norway, SCAR, Spain,

United States). This paper invited the Committee to provide comments on the content management plan and provide feedback on the Portal website.

- IP 33 *Quantifying and understanding the impacts of plastic pollution in the Southern Ocean* (United Kingdom, Peru). This paper encouraged Parties to support scientific research efforts on plastics in the Southern Ocean, with a view to supporting evidence-based decision making by the Committee on this issue.
- IP 99 *Reducing Single-Use Plastic and Waste Generated by Polar Tourism* (IAATO). This paper provided a brief overview of recent efforts and presented IAATO's new guidelines for visitors.
- IP 102 *Environmental Monitoring and Management Plan for Contaminated Areas at the Comandante Ferraz Antarctic Station (EACF)* (Brazil). This paper noted that the Brazilian Antarctic Programme had been complying with the guidelines established by the Madrid Protocol as relevant to the EACF surroundings.
- IP 124 *Avances de Colombia en la elaboración de un Índice de Sensibilidad Ambiental a Derrames de hidrocarburos para la Isla Rey Jorge* (Colombia).
- IP 154 *Antarctic Data Analysis: A tool to support evidence-based environmental management* (New Zealand). This paper presented and welcomed input on the primary outcome of a New Zealand research project to develop a tool that would enable environmental managers to understand and minimise environmental impacts when assessing the planning, permitting, and implementation of Antarctic activities.

(232) The following Background Paper was also submitted under this agenda item:

- BP 20 *DNA Metabarcoding as a tool for marine conservation, monitoring and management* (Portugal, Australia, Germany, New Zealand, United Kingdom).

Item 12: Inspection Reports

(233) Chile introduced WP 39 *General recommendations of the joint inspections between Argentina and Chile, in accordance with Article VII of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection*, and referred to IP 83 *Report of the Joint Inspections' Program undertaken by Argentina and Chile under Article VII of the Antarctic Treaty and Article 14 of the Environmental Protocol*, both prepared jointly with Argentina. It reported that

Chile and Argentina conducted joint inspections between 17 February and 2 March of 2019 of the following facilities: Palmer Station (United States), Akademik Vernadsky Station (Ukraine), Port Lockroy (United Kingdom) and St. Kliment Ohridski Station (Bulgaria). Chile noted that an observer from Uruguay and the Republic of Korea also joined the inspection.

(234) While the inspection report (IP 83) presented twelve general recommendations for consideration, Chile drew the Committee's attention to three recommendations relevant to the CEP:

- A wider circulation of "Checklist A: Antarctic Stations and Subsidiary Installations" (Resolution 3 [2010]) would seem desirable as well as better training of Antarctic station personnel regarding its proper use. Taking into account the usual limited time for conducting inspections, it recommended that stations have a completed "Checklist A" available for the inspection team prior to the inspection, to assist in the process. It was highlighted that of four inspected stations, only one provided a complete and updated checklist for the inspectors, making a decisive contribution to the visit (Recommendation c).
- For Consultative Parties to consider discussing that inspected Parties provide feedback to following ATCM about the consideration given to the particular recommendations made during inspections. The lack of proper follow-up to recommendations from inspections seemed to undermine the effectiveness of the inspection system, with the consequent misuse of significant logistical resources. Giving the example of the four inspected stations, only one had adequately addressed all of the observations made as a result of previous inspections (Recommendation e).
- As two of the inspected stations had ATCM designated Historic Sites and Monuments (HSMs), it seemed appropriate to consider that the inspector team's field observations regarding what defines an HSM, as contained in the inspections report, could be used as valuable input for ongoing discussions about HSM designation and management, recalling that the designation of HSMs implies further responsibilities for those Consultative Parties who are proponents of the HSM management (Recommendation l).

(235) Ukraine thanked the inspection team for conducting the inspection at Akademik Vernadsky Station and for providing very useful feedback. It noted that since Ukraine began its work at Akademik Vernadsky in 1996, standards for environmental protection had improved and the station was in the process

of being upgraded. Ukraine stressed that the feedback would be used to train personnel and be incorporated a follow-up report. In conclusion, Ukraine mentioned that the focus of its ten-year plan beginning in 2021 would be on environmental values and waste management. It referred the Committee to IP 105, which provided a follow up on actions taken by Ukraine in response to recommendations made by previous inspections.

- (236) The United Kingdom thanked the inspection team for inspecting Port Lockroy, which it noted was an HSM that also functioned as a museum. The United Kingdom highlighted that it undertook extensive environmental monitoring, including annual assessments of breeding success of Gentoo penguins, at Port Lockroy. These activities informed site management and the suitability of site guidelines. The United Kingdom expressed support for all three highlighted recommendations, with a focus on Recommendations C and E. It noted that they were acting on some of the recommendations in the inspection report and drew the Committee's attention to its comments recorded in IP 83.
- (237) The United States stated its appreciation for the inspection at Palmer Station, and the resulting exchange with colleagues. In regards to Recommendation C, it noted that, while the Checklist was an excellent tool, Members should not be limited to the questions on the checklist as they may wish to share other relevant information. In regards to Recommendation E, the United States noted the value of providing feedback to the ATCM regarding inspection reports. It further expressed that such follow-up should not be mandatory and could usefully be pursued on a case-by-case basis. The United States noted that it had twice received recommendations regarding its wastewater treatment and emphasised that the station currently met the standards of the Protocol and that planning is ongoing.
- (238) Bulgaria thanked the inspection team for inspecting St. Kliment Ohridski station. Referring to the recent inspection at St. Kliment Ohridski station, Bulgaria commented on the importance of protecting Antarctica through the inspection process. It noted its previous efforts to address recommendations made during a 2014 inspection. This included the creation of a new National Program for Polar Research to provide financing for scientific activities, and a number of successful scientific expeditions hosted by the base and international scientific collaboration. It noted efforts to improve waste management at the station. It highlighted the fact that the Lame Dog Hut at St. Kliment Ohridski was the oldest building on Livingston Island which has a particular technical and architectural value, and as such had been

designated as HSM 91 in 2015. Since then, unusual weather had resulted in structural damage and an inventory of the items at the museum would soon be underway, with a draft management plan to follow. Bulgaria also reiterated its commitment to incorporating the recommendations emerging from the inspection of St. Kliment Ohridski station, and more broadly to protect Antarctica.

- (239) Uruguay and the Republic of Korea thanked Argentina and Chile for the invitation to join the inspection team as observers, noting it had been a very fruitful experience for all involved.
- (240) Highlighting the value of inspections in its own programmes, IAATO noted it welcomed inspections and offered to provide assistance with the inspection process that involved tourist operators.
- (241) The Committee thanked Chile and Argentina for the report and for the efforts on the inspections undertaken during 2019. There was broad support for the three recommendations highlighted from the inspection report. The Committee noted that follow up reports on recommendations after inspections were a useful, but not mandatory, process, and the use of Checklist A, although recommended, was not a limitation on inspecting Parties.
- (242) The following paper was also submitted under this agenda item, and taken as presented:
- IP 105 *Follow-up the Recommendations of the Inspections at Vernadsky station since 1999* (Ukraine). This paper detailed actions taken by Ukraine to follow the recommendations presented after earlier inspections at Vernadsky station.
- (243) The following Background Papers were submitted under this agenda item:
- BP 7 *Follow-up to the Recommendations of the Inspection at the SANAP Summer Station* (South Africa).
 - BP 10 *Follow-up to the Recommendations of the Inspections at the Eco-Nelson Facility* (Czech Republic).
 - BP 19 *Follow-up to the Recommendations of the Inspection at the SANAE Station* (South Africa).

Item 13: General Matters

- (244) France introduced WP 41 *The Ice Memory Project*, jointly prepared with Italy, and noted that the project was launched in 2015 and featured an international

scientific collaboration between several States. The first phase of the project, currently underway, involved collecting ice cores from the deep layers of key endangered glaciers before they lost their ability to preserve environmental history in optimal conditions. The second phase of the project involved the long-term storage of these ice cores for future generations of scientists. France recommended that the CEP and ATCM offer their feedback on the project and discuss the possibility of initiating and coordinating international collaboration to all Parties interested in taking part in the storage of ice cores in Antarctica.

- (245) The Committee thanked France and Italy for their paper. It recognised the scientific value of the Ice Memory project and expressed broad support towards the general aim of the project and its underlining principles. It noted that the project could have profound implications for safeguarding and improving our understanding of Antarctic environmental history.
- (246) Several Members noted that there were still a number of environmental aspects of the project that needed further attention, and stressed the need to ensure that the project comply with the provisions of the Environment Protocol. Some Members highlighted the potential risks and environmental impacts that could derive from long distance transportation of ice cores, including non-native species invasion, and underlined the importance of conducting environmental impact assessment.
- (247) The Committee agreed that further discussions on the implementation of the Ice Memory Project would be beneficial, particularly in relation to concerns raised regarding potential environmental risks, and called for further interaction and information in the planning process. The Committee encouraged interested Members to work with France and Italy on this matter.
- (248) SCAR expressed its willingness to work with interested Parties to help progress the aims of this project through both existing and developing SCAR groups.
- (249) China introduced WP 45 *Report of the Informal Discussion for the intersessional period of 2018/19 on the revised draft Code of Conduct for Protection of Dome A area in Antarctica*. China recalled ATCM XLI - WP 14, in which it provided an overview of the informal intersessional discussions it had led during the 2017/18 intersessional period regarding to the draft code of conduct for the protection of the Dome A area. Based on feedback, China had revised the draft code of conduct. China had then encouraged interested Members and Observers to contribute to the revised draft code of conduct through informal discussions at the CEP Forum on 7 January 2019. China

noted that Germany, New Zealand, France, the United States, Australia and ASOC provided comments, which were summarised in WP 45.

- (250) China noted that the Members' concerns had focused on two main issues: the application of the code of conduct to other National Antarctic Programmes, and the potential restrictions for scientific activities planned and implemented by other Parties. China stressed that the code of conduct would not limit access to the Dome A area, and reminded Members that it would welcome bilateral and multilateral consultations on improving the protection of the values of the area. It recommended that the CEP support its efforts to protect the Dome A area by encouraging further improvements to the conduct and facilitating cooperation and coordination with China.
- (251) The Committee thanked China for its paper and acknowledged the scientific value of the Dome A area. Several Members sought further information and clarification on the potential implication and use of the code of conduct on other National Antarctic Programmes and science in the area.
- (252) Some Members highlighted the potential for collaboration with other countries performing research in the area and with large international projects such as the Ice Memory Project. Some Members also noted the importance of Parties committing to work collaboratively for the coordination of activities in the area, as it is done elsewhere throughout the continent, with the ultimate goal of protecting the values present in Dome A.
- (253) ASOC also thanked China for the opportunity to participate in the informal discussions. In addition to supporting China's desire to use the precautionary approach to protect the area's unique values, ASOC noted that their suggestion to develop ASPA proposals for the area in the future was very positive. ASOC encouraged all ATCPs to work cooperatively to coordinate activities and to develop ASPAs in other areas with important scientific and environmental values to achieve concrete and timely outcomes.
- (254) The Committee acknowledged China's ongoing efforts on the protection of the values of the Dome A area and some Members expressed support for its recommendation to encourage further improvements to the code of conduct. Most Members encouraged the cooperation with China during the next intersessional period and to contribute to the improvement of its draft code of conduct, although it was noted that it may not be appropriate to continue such exchanges as an informal contact group discussion on the ATS discussion forum.
- (255) The Secretariat presented SP 8 *The Secretariat Website*, which presented an outline of the progress made during the current year in the redesign of

the institutional website of the Antarctic Treaty Secretariat (beta.ats.aq). It provided a summary of the project's background and current status, highlighting the new features that were relevant to the Committee through on-screen demonstrations and asked for feedback from Members and Observers.

- (256) The Committee thanked the Secretariat for its update, and welcomed its hard work on redesigning the ATS website. It highlighted that these website updates were critical for increasing the visibility of the Committee's activities.
- (257) Colombia reported that it had satisfactorily concluded internal national procedures to adhere to the Protocol and that it expected to finalise ratification soon.
- (258) The following papers were also submitted under this agenda item, and taken as presented:
- IP 41 *Footprint in Antarctica* (Australia). This paper summarised recent Australian research, which used satellite imagery and GIS mapping techniques to examine the area of the Antarctic continent covered by buildings, and the area of ice-free ground that was physically disturbed.
 - IP 56 *The Harmonization of Turkish Law to the Protocol on Environmental Protection to the Antarctic Treaty* (Turkey). The paper gave a brief report on Turkey's studies on the harmonisation of Turkish Law to the Protocol on Environmental Protection to the Antarctic Treaty and described a way forward.
 - IP 68 *Outcomes of the 2017 UN Conference on Oceans and a look forward to the 2020 conference in Lisbon, Portugal* (Portugal, Sweden, WMO). The paper described the potential of the ATS to contribute positively to the implementation of SDG14 (Life Below Water) of the UN 2030 Agenda for Sustainable Development.
 - IP 95 *Results of PEI International Workshop on Education and Outreach April 2017, Rovereto, Italy* (Italy, Germany, India, Portugal) which provided the results of the International workshop on education and outreach of Polar Educators International (PEI) association, held in April 2017.
- (259) The following Background Paper was also submitted under this agenda item:
- BP 25 *Implementación de nuevos equipos para el tratamiento de desechos sólidos-líquidos, en la Estación "Pedro Vicente Maldonado"* (Ecuador).

Item 14: Election Officers

(260) The Committee agreed to re-elect Dr Kevin Hughes from the United Kingdom to serve a second two-year period as CEP Vice-Chair.

(261) The Committee warmly congratulated Dr Kevin Hughes on his appointment.

Item 15: Preparation for the Next Meeting

(262) The Committee adopted the Preliminary Agenda for CEP XXIII (Appendix 3).

Item 16: Adoption of the Report

(263) The Committee adopted its Report.

Item 17: Closing of the Meeting

(264) The Committee welcomed Tito Acero to the floor, noting his upcoming retirement from his position as Assistant Executive Secretary of the Antarctic Treaty Secretariat. The Committee warmly thanked Mr Acero for many years of dedication to the Antarctic Treaty System and to the CEP in particular, and recognised his commitment to excellence and hard work.

(265) The Chair closed the Meeting on Friday, 5 July 2019.

Appendix 1

CEP Five-year Work Plan

Issue / Environmental Pressure: Introduction of non-native species	
Priority: 1	
Actions:	
<ol style="list-style-type: none"> 1. Continue developing practical guidelines & resources for all Antarctic operators. 2. Implement related actions identified in the Climate Change Response Work Programme. 3. Consider the spatially explicit, activity-differentiated risk assessments to mitigate the risks posed by terrestrial non-native species. 4. Develop a surveillance strategy for areas at high risk of non-native species establishment. 5. Give additional attention to the risks posed by intra-Antarctic transfer of propagules. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Initiate work to develop a non-native species response strategy, including appropriate responses to diseases of wildlife • To help the Committee in assessing the effectiveness of the Manual, request a report from COMNAP on the implementation of quarantine and biosecurity measures by its members
CEP XXIII 2020	<ul style="list-style-type: none"> • Discuss the intersessional work concerning the development of a response strategy for inclusion in the Non-native Species Manual, and the implementation of quarantine and biosecurity measures by COMNAP members. Review IMO report on biofouling guidelines • SCAR to present information on existing mechanism to assist with the identification of non-native species
Intersessional period 2020/21	<ul style="list-style-type: none"> • Ask SCAR to compile a list of available biodiversity information sources and databases to help Parties establish which native species are present at Antarctic sites and thereby assist with identifying the scale and scope of current and future introductions • Develop generally applicable monitoring guidelines. More detailed or site-specific monitoring may be required for particular locations • Request a report from Parties and Observers on the application of biosecurity guidelines by their members
CEP XXIV 2021	<ul style="list-style-type: none"> • Discuss the intersessional work concerning the development of monitoring guidelines for inclusion in the NNS Manual • Consider the reports from Parties and Observers on the application of biosecurity guidelines by their members
Intersessional period 2021/22	<ul style="list-style-type: none"> • Initiate work to assess the risk of marine non-native species introductions
CEP XXV 2022	<ul style="list-style-type: none"> • Discuss the intersessional work concerning the risks of marine non-native species
Intersessional period 2022/23	<ul style="list-style-type: none"> • Develop specific guidelines to reduce non-native species release with wastewater discharge • Review the progress and contents of the CEP Non-native Species Manual
CEP XXVI 2023	<ul style="list-style-type: none"> • CEP to consider if intersessional work is required to review/update the Non-native Species Manual
Intersessional period 2023/24	<ul style="list-style-type: none"> • As appropriate, intersessional work to review the Non-native Species Manual

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CEP XXVII 2024	<ul style="list-style-type: none"> • CEP to consider report of ICG, if established, and consider adoption of revised Non-native Species Manual by the ATCM through a resolution
Science knowledge and information needs: <ul style="list-style-type: none"> • Identify terrestrial and marine regions and habitats at risk of introduction • Identify native species at risk of relocation and vectors and pathways for intra-continental transfer • Synthesise knowledge of Antarctic biodiversity, biogeography and bioregionalisation and undertake baseline studies to establish which native species are present • Identify pathways for the introduction of marine species (including risks associated with wastewater discharge) • Assess risks and pathways for introduction of microorganisms that might impact on existing microbial communities • Monitor for non-native species in the terrestrial and marine environments (including microbial activity near sewage treatment plant discharges) • Identify techniques to rapidly respond to non-native species introductions • Identify pathways for introduction of non-native species without any direct human intervention 	

Issue / Environmental Pressure: Tourism and NGO activities	
Priority: 1	
Actions:	
<ol style="list-style-type: none"> 1. Provide advice to ATCM as requested. 2. Advance recommendations from ship-borne tourism ATME. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Work on framework for pre-assessment relating to new, novel or particularly concerning activities • Continued work on site sensitivity methodology
CEP XXIII 2020	<ul style="list-style-type: none"> • Consideration of advice from SCAR on potential design of an environmental monitoring programme to assess the impacts of tourism • Consider outcomes of discussions relating to pre-assessment relating to new, novel or particularly concerning activities • Discuss the trial site sensitivity methodology
Intersessional period 2020/21	
CEP XXIV 2021	<ul style="list-style-type: none"> • Consider report from SCAR and others on wilderness values and their practical application • Report from SCAR on carrying capacity
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	
Science knowledge and information needs: <ul style="list-style-type: none"> • Consistent and dedicated monitoring of tourism impacts • Monitor visitor sites covered by Site Guidelines 	

Issue /Environmental Pressure: Climate Change Implications for the Environment	
Priority: 1	
Actions:	
<ol style="list-style-type: none"> 1. Consider implications of climate change for management of Antarctic environment. 2. Implement the Climate Change Response Work Programme. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Subsidiary group conducts work in accordance with agreed work plan
CEP XXIII 2020	<ul style="list-style-type: none"> • Standing agenda item • Consider subsidiary group report • SCAR provides update to ACCE report, with input as appropriate from WMO, ICED and SOOS • Consider review of subsidiary group • Review implementation of actions arising from 2016 joint CEP/ SC-CAMLR workshop • Plan for five-yearly joint SC-CAMLR/CEP workshop during 2021/22 intersessional period
Intersessional period 2020/21	
CEP XXIV 2021	<ul style="list-style-type: none"> • Finalise plans for joint SC-CAMLR/CEP workshop during 2021/22 intersessional period
Intersessional period 2021/22	<ul style="list-style-type: none"> • Regular five-yearly joint SC-CAMLR CEP workshop
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	
Science knowledge and information needs:	
<ul style="list-style-type: none"> • Improve understanding of current and future change to the terrestrial (including aquatic) biotic and abiotic environment due to climate change • Long-term monitoring of change to the terrestrial (including aquatic) biotic and abiotic environment due to climate change • Continue to develop biogeographic tools to provide a sound basis for informing Antarctic area protection and management at regional and continental scales in light of climate change, including identifying the need to set aside reference areas for future research and identifying areas resilient to climate change • Identify and prioritise Antarctic biogeographic regions most vulnerable to climate change • Understand and predict near-shore marine changes and impacts of the change • Long-term monitoring of change to the near-shore marine biotic and abiotic environment due to climate change • Assessment on impact of ocean acidification to marine biota and ecosystems • Understand population status, trends, vulnerability and distribution of key Antarctic species • Understand habitat status, trends, vulnerability and distribution • Southern Ocean observations and modelling to understand climate change • Identify areas that may be resilient to climate change • Monitor emperor penguin colonies, including using remote sensing and complementary techniques, to identify trends in populations and potential climate change <i>refugia</i> 	

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Issue / Environmental Pressure: Processing new and revised protected / managed area management plans	
Priority: 1	
Actions:	
<ol style="list-style-type: none"> 1. Refine the process for reviewing new and revised management plans. 2. Update existing guidelines. 3. Develop guidelines to ASMA preparation. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • SGMP conducts work as per agreed work plan including the consideration of three management plans corresponding to new ASPAs proposals. Consider options for supporting proponents to conclude the revision of management plans that remain for several intersessional periods under the scope of the SGMP. • Informal discussions led by Norway on guidance for de-designation of ASPAs
CEP XXIII 2020	<ul style="list-style-type: none"> • Consider SGMP report • Consider outcomes of informal discussions on guidance for de-designation of ASPAs
Intersessional period 2020/21	<ul style="list-style-type: none"> • SGMP conducts work as per agreed work plan
CEP XXIV 2021	<ul style="list-style-type: none"> • Consider SGMP report
Intersessional period 2021/22	<ul style="list-style-type: none"> • SGMP conducts work as per agreed work plan
CEP XXV 2022	<ul style="list-style-type: none"> • Consider SGMP report
Intersessional period 2022/23	<ul style="list-style-type: none"> • SGMP conducts work as per agreed work plan
CEP XXVI 2023	<ul style="list-style-type: none"> • Consider SGMP report
Intersessional period 2023/24	<ul style="list-style-type: none"> • SGMP conducts work as per agreed work plan
CEP XXVII 2024	<ul style="list-style-type: none"> • Consider SGMP report
Science knowledge and information needs: <ul style="list-style-type: none"> • Monitoring to assess the status of values at ASPA 107 Emperor Island • Use remote sensing techniques to monitor changes in vegetation within ASPAs • Long-term monitoring of biological values in ASPAs 	

Issue / Environmental Pressure: Operation of the CEP and Strategic Planning	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Keep the five-year work plan up to date based on changing circumstances and ATCM requirements. 2. Identify opportunities for improving the effectiveness of the CEP. 3. Consider long-term objectives for Antarctica (50-100 years' time). 4. Consider opportunities for enhancing the working relationship between the CEP and the ATCM. 	
Intersessional period 2019/20	
CEP XXIII 2020	
Intersessional period 2020/21	
CEP XXIV 2021	
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	

Issue / Environmental Pressure: Repair or Remediation of Environmental Damage	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Respond to further request from the ATCM related to repair and remediation, as appropriate. 2. Monitor progress on the establishment of Antarctic-wide inventory of sites of past activity. 3. Consider guidelines for repair and remediation. 4. Members develop practical guidelines and supporting resources for inclusion in the Clean-up Manual. 5. Continue developing bioremediation and repair practices for inclusion in the Clean-up Manual. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Continuous review of the Manual. Parties to work on the development of new techniques or guidelines
CEP XXIII 2020	<ul style="list-style-type: none"> • Insertion of new tools and guidelines as they become available and agreed by the Committee
Intersessional period 2020/21	<ul style="list-style-type: none"> • Continuous review of the Manual. Parties to work on the development of new techniques or guidelines
CEP XXIV 2021	<ul style="list-style-type: none"> • Continuous review of the Manual and insertion of new tools and guidelines as they become available
Intersessional period 2021/22	<ul style="list-style-type: none"> • Continuous review of the Manual. Parties to work on the development of new techniques or guidelines
CEP XXV 2022	<ul style="list-style-type: none"> • Continuous review of the Manual and insertion of new tools and guidelines as they become available
Intersessional period 2022/23	<ul style="list-style-type: none"> • Continuous review of the Manual. Parties to work on the development of new techniques or guidelines
CEP XXVI 2023	<ul style="list-style-type: none"> • Continuous review of the Manual and insertion of new tools and guidelines as they become available
Intersessional period 2023/24	<ul style="list-style-type: none"> • Continuous review of the Manual. Parties to work on the development of new techniques or guidelines
CEP XXVII 2024	<ul style="list-style-type: none"> • Continuous review of the Manual and insertion of new tools and guidelines as they become available
Science knowledge and information needs:	
<ul style="list-style-type: none"> • Research to inform the establishment of appropriate environmental quality targets for the repair or remediation of environmental damage in Antarctica • Techniques to prevent mobilisation of contaminants such as melt water diversion and containment barriers • Techniques for <i>in situ</i> and <i>ex situ</i> remediation of sites contaminated by fuel spills or other hazardous substances 	

Issue / Environmental Pressure: Monitoring and state of the environment reporting	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Identify key environmental indicators and tools. 2. Establish a process for reporting to the ATCM. 3. SCAR to support information to COMNAP and CEP. 	
Intersessional period 2019/20	
CEP XXIII 2020	
Intersessional period 2020/21	
CEP XXIV 2021	<ul style="list-style-type: none"> • Consider monitoring report by UK on ASPA 107
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	

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CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	
Science knowledge and information needs:	
<ul style="list-style-type: none"> • Long-term monitoring of change to the terrestrial (including aquatic) biotic and abiotic environment due to climate change • Long-term monitoring of change to the near-shore marine biotic and abiotic environment due to climate change • Monitor bird populations to inform future management actions • Use remote sensing techniques to monitor changes in vegetation within ASPAs and more widely • Monitor emperor penguin colonies, using remote sensing and complementary techniques, to identify potential climate change <i>refugia</i> • Long-term monitoring of biological values in ASPAs • Long-term monitoring to verify or detect environmental impacts associated with human activities • Long-term monitoring and sustained observations of environmental change • Consistent and dedicated monitoring of tourism impacts • Systematic and regular monitoring of visitor sites covered by Site Guidelines • Long-term monitoring of biological indicators at sites visited by tourists 	

Issue / Environmental Pressure: Marine spatial protection and management	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Cooperation between the CEP and SC-CAMLR on common interest issues. 2. Cooperate with CCAMLR on Southern Ocean bioregionalisation and other common interests and agreed principles. 3. Identify and apply processes for spatial marine protection. 4. Consider connectivity between land and ocean, and complementary actions that could be taken by Parties with respect to MPAs. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Informal discussions led by New Zealand on matters relating to Resolution 5 (2017)
CEP XXIII 2020	<ul style="list-style-type: none"> • Consider outcomes from informal discussions led by New Zealand on matters relating to Resolution 5 (2017)
Intersessional period 2020/21	
CEP XXIV 2021	
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	

Issue / Environmental Pressure: Site specific guidelines for tourist-visited sites	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Periodically review the list of sites subject to Site Guidelines and consider whether development of guidelines should be need for additional sites. 2. Regular review of all existing Site Guidelines to ensure that they are accurate and up to date, this includes precautionary updates where appropriate. 3. Provide advice to ATCM as required. 4. Review the format of the Site Guidelines. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Develop guidelines for short overnight stays to ensure consistent application of best practices and minimise impacts to the Antarctic environment
CEP XXIII 2020	<ul style="list-style-type: none"> • Standing agenda item; Parties to report on their reviews of Site Guidelines
Intersessional period 2020/21	<ul style="list-style-type: none"> • Development of a repository of pictures to aid in the regular review of Site Guidelines
CEP XXIV 2021	<ul style="list-style-type: none"> • Standing agenda item; Parties to report on their reviews of Site Guidelines
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	
Science knowledge and information needs:	
<ul style="list-style-type: none"> • Long-term monitoring to assess the status and recovery of vegetation at Barrientos Island • Systematic and regular monitoring of visitor sites covered by Site Guidelines 	

Issue / Environmental Pressure: Overview of the protected areas system	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Apply the Environmental Domains Analysis (EDA) and Antarctic Conservation Biogeographic Regions (ACBR) to enhance the protected areas system. 2. Maintain and develop Protected Area database. 3. Assess the extent to which Antarctic IBAs are or should be represented within the series of ASPAs. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • United Kingdom to lead discussion with interested Members and Observers, on Antarctic Specially Protected Areas and Important Bird Areas • Undertake work to advance actions agreed by the Committee from discussions on the protected areas workshop
CEP XXIII 2020	<ul style="list-style-type: none"> • Consider report of intersessional work on Antarctic Specially Protected Areas and Important Bird Areas • Review progress on the work to advance actions agreed by the Committee from discussions on the protected areas workshop
Intersessional period 2020/21	<ul style="list-style-type: none"> • Undertake work to advance actions agreed by the Committee from discussions on the protected areas workshop
CEP XXIV 2021	<ul style="list-style-type: none"> • Review progress on the work to advance actions agreed by the Committee from discussions on the protected areas workshop
Intersessional period 2021/22	

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CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	
Science knowledge and information needs:	
<ul style="list-style-type: none"> • Continue to develop biogeographic tools to provide a sound basis for informing Antarctic area protection and management at regional and continental scales in light of climate change, including identifying the need to set aside reference areas for future research and identifying areas resilient to climate change • Use remote sensing techniques to monitor changes in vegetation within ASPAs and more widely, to inform the further development of the Antarctic protected areas system 	

Issue / Environmental Pressure: Implementing and improving the EIA provisions of Annex I	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Refine the process for considering CEEs and advising the ATCM accordingly. 2. Develop guidelines for assessing cumulative impacts. 3. Review EIA guidelines and consider wider policy and other issues. 4. Consider application of strategic environmental assessment in Antarctica. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Discuss changes to the EIA database with a view to giving proposals to the Secretariat. Discuss the mechanisms to provide answers to the comments that are transmitted through the intersessional contact groups or other means on the global environmental impact assessments • Consider potential changes required to EIA database to improve its utility • Establish ICG to review draft CEEs as required • Members and Observers work to progress and coordinate information that will assist development of guidance on identifying and assessing cumulative impacts • Members to work on further guidance with regards to commenting processes related to CEEs
CEP XXIII 2020	<ul style="list-style-type: none"> • Consideration of ICG reports on draft CEE, as required
Intersessional period 2020/21	<ul style="list-style-type: none"> • Establish ICG to review draft CEEs as required • Consider Members work related to commenting processes related to CEEs • Members and Observers work to progress and coordinate information that will assist development of guidance on identifying and assessing cumulative impacts
CEP XXIV 2021	<ul style="list-style-type: none"> • Ask SCAR to provide guidance on how to do an environmental baseline condition survey, and consider their advice in due course • Consideration of ICG reports on draft CEE, as required
Intersessional period 2021/22	<ul style="list-style-type: none"> • Establish ICG to review draft CEEs as required • Members and Observers work to progress and coordinate information that will assist development of guidance on identifying and assessing cumulative impacts

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CEP XXV 2022	<ul style="list-style-type: none"> • Encourage parties to provide feedback on the utility of the revised set of <i>Guidelines for Environmental Impact Assessment in Antarctica</i> in the preparation of EIAs • Consideration of the options for preparing guidance on identifying and assessing cumulative impacts • Consideration of ICG reports on draft CEE, as required
Intersessional period 2022/23	<ul style="list-style-type: none"> • Establish ICG to review draft CEEs as required
CEP XXVI 2023	<ul style="list-style-type: none"> • Consideration of ICG reports on draft CEE, as required
Intersessional period 2023/24	<ul style="list-style-type: none"> • Establish ICG to review draft CEEs as required
CEP XXVII 2024	<ul style="list-style-type: none"> • Consideration of ICG reports on draft CEE, as required

Issue / Environmental Pressure: Designation and management of Historic Sites and Monuments	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Maintain the list and consider new proposals as they arise. 2. Consider strategic issues as necessary, including issues relating to designation of HSM versus clean-up provisions of the Protocol. 3. Review the presentation of the HSM list with the aim to improve information availability. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Informal intersessional discussions to consider how the CEP can better develop conservation management plans as tools to protect Antarctic heritage • Contribute information on the HSMs that have already been designated, in accordance with the new list format that was agreed at CEP XXII as basis for Working Paper
CEP XXIII 2020	<ul style="list-style-type: none"> • Review proposals relating to how conservation management plans can contribute to the management of HSMs • Consider the list of HSM in new format
Intersessional period 2020/21	<ul style="list-style-type: none"> • Consider how environmental impact assessments can form a part of Historic Site and Monument assessment
CEP XXIV 2021	<ul style="list-style-type: none"> • Review proposals relating to EIAs and the HSM listing process
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	

Issue / Environmental Pressure: Biodiversity knowledge	
Priority: 2	
Actions:	
<ol style="list-style-type: none"> 1. Maintain awareness of threats to existing biodiversity. 2. CEP to consider further scientific advice on wildlife disturbance. 	
Intersessional period 2019/20	<ul style="list-style-type: none"> • Informal intersessional discussions relating to assessing the protection of Antarctic seals
CEP XXIII 2020	<ul style="list-style-type: none"> • Report on informal intersessional discussions relating to assessing the protection of Antarctic seals • Report from relevant parties relating to further protection of emperor penguins
Intersessional period 2020/21	

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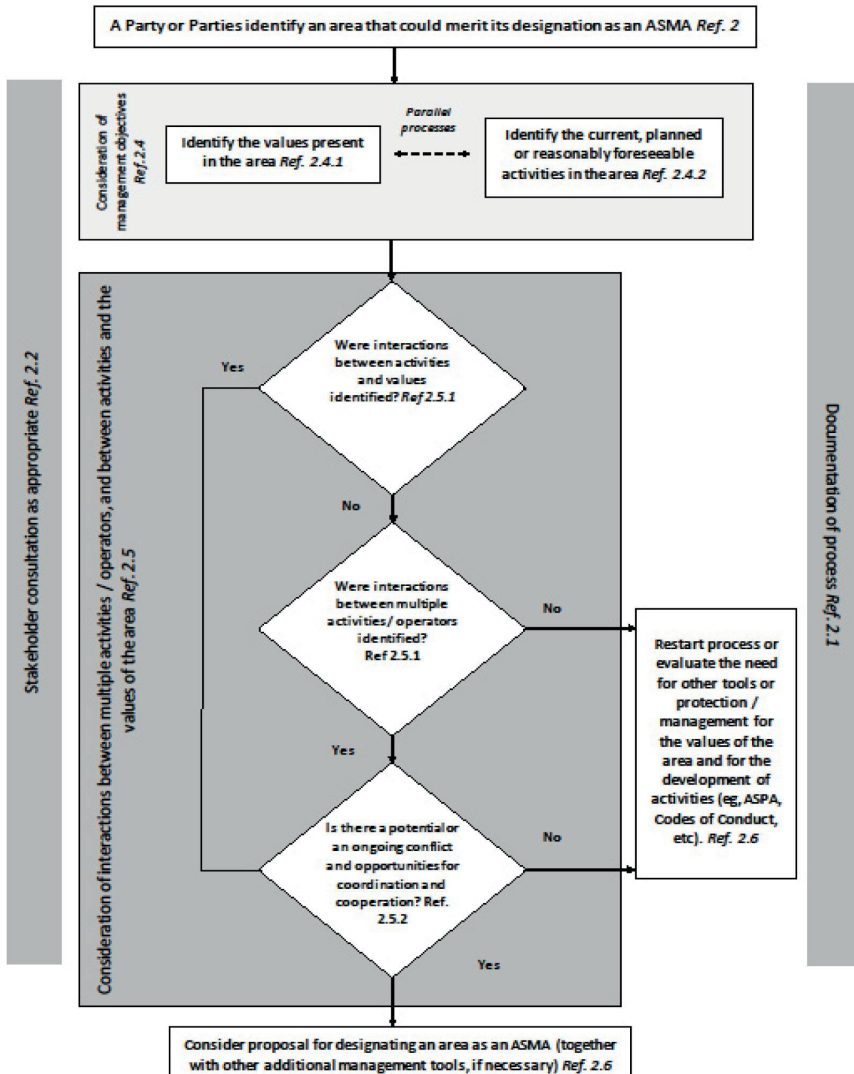
CEP XXIV 2021	
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	
<p>Science knowledge and information needs:</p> <ul style="list-style-type: none"> • Research on the environmental impacts of remotely piloted aircraft systems (RPAS), particularly on wildlife responses including: <ul style="list-style-type: none"> - a range of species including flying seabirds and seals; - both behavioural and physiological responses; - demographic effects, including breeding numbers and breeding success; - ambient environmental conditions, for example, wind and noise; - the effects of RPAS of different sizes and specifications; - the contribution of RPAS noise to wildlife disturbance; - comparisons with control sites and human disturbance; and - habituation effects • Collection and submission of further spatially explicit biodiversity data • Research on the impacts of underwater noise on Antarctic marine mammals • Synthesis of available knowledge on the biogeography, bioregionalisation and endemism within Antarctica • Site-specific, timing-specific and species-specific studies to understand the impacts arising from interactions between human activities and wildlife and support evidence-based guidelines to avoid disturbance • Inventory of Mt Erebus ice caves and microbial communities • Regular population counts and research to understand the status and trends in the southern giant petrel population 	

Issue / Environmental Pressure: Outreach and education	
Priority: 3	
<p>Actions:</p> <ol style="list-style-type: none"> 1. Review current examples and identify opportunities for greater education and outreach. 2. Encourage Members to exchange information regarding their experiences in this area. 3. Establish a strategy and guidelines for exchanging information between Members on Education and Outreach for long term perspective. 	
Intersessional period 2019/20	
CEP XXIII 2020	<ul style="list-style-type: none"> • Bulgaria to draw to the Committee's attention any outcomes from the ICG on Education and Outreach of direct relevance to the work of the CEP
Intersessional period 2020/21	
CEP XXIV 2021	
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	

Issue / Environmental Pressure: Protection of outstanding geological values	
Priority: 3	
Actions:	
1. Consider further mechanisms for protection of outstanding geological values.	
Intersessional period 2019/20	
CEP XXIII 2020	• Consider advice from SCAR
Intersessional period 2020/21	
CEP XXIV 2021	
Intersessional period 2021/22	
CEP XXV 2022	
Intersessional period 2022/23	
CEP XXVI 2023	
Intersessional period 2023/24	
CEP XXVII 2024	

Appendix 2

Flowchart to illustrate/summarise the process of evaluating and drawing conclusions with regard to assessing an area for potential ASMA designation



Appendix 3

Preliminary Agenda for CEP XXIII (2020)

1. Opening of the Meeting
2. Adoption of the Agenda
3. Strategic Discussions on the Future Work of the CEP
4. Operation of the CEP
5. Cooperation with other Organisations
6. Repair and Remediation of Environment Damage
7. Climate Change Implications for the Environment
 - a. Strategic Approach
 - b. Implementation and Review of the Climate Change Response Work Programme
8. Environmental Impact Assessment (EIA)
 - a. Draft Comprehensive Environmental Evaluations
 - b. Other EIA Matters
9. Area Protection and Management Plans
 - a. Management Plans
 - b. Historic Sites and Monuments
 - c. Site Guidelines
 - d. Marine Spatial Protection and Management
 - e. Other Annex V Matters
10. Conservation of Antarctic Flora and Fauna
 - a. Quarantine and Non-native Species
 - b. Specially Protected Species
 - c. Other Annex II Matters
11. Environmental Monitoring and Reporting
12. Inspection Reports
13. General Matters
14. Election of Officers
15. Preparation for the Next Meeting
16. Adoption of the Report
17. Closing of the Meeting

3. Appendices

Prague Declaration on the Occasion of the Sixtieth Anniversary of the Antarctic Treaty

On the occasion of the sixtieth anniversary of the signing of the Antarctic Treaty on December 1, 1959, the Consultative Parties to the Antarctic Treaty,

Reaffirming the 2009 ATCM XXXII Washington Ministerial Declaration on the 50th Anniversary of the Antarctic Treaty,

Further reaffirming the 2011 ATCM XXXIV Buenos Aires Declaration on Antarctic Cooperation on the Occasion of the 50th Anniversary of the Entry into Force of the Antarctic Treaty,

Recognising the achievements of the application of the Antarctic Treaty in preserving and promoting peace and international cooperation in Antarctica,

Valuing the importance of international cooperation to ensure that all activities in Antarctica are conducted in accordance with the requirements of the Antarctic Treaty system,

Recognising that the international cooperation under the Antarctic Treaty as initiated by the twelve original signatories, has kept an entire continent outside the fluctuations of world politics,

Affirming the openness of the Antarctic Treaty system to all States with an interest in Antarctica,

Recognising that it is in the interest of all humankind that Antarctica continue to be used exclusively for peaceful purposes,

Mindful that freedom of scientific investigation in Antarctica and peaceful international cooperation are cornerstones of the Antarctic Treaty,

Reaffirming the commitment of the Consultative Parties to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems, and the designation of Antarctica as a natural reserve, devoted to peace and science,

Reaffirming the 2016 ATCM XXXIX Santiago Declaration on the 25th Anniversary of the signing of the Protocol on Environmental Protection to the Antarctic Treaty,

Recognising that concrete results from scientific research in, from and about Antarctica over the past sixty years have expanded the boundaries of human knowledge of natural processes taking place not only in Antarctica but also globally, including our knowledge of the impacts of global environmental change and the contribution of human activity to this change,

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Mindful of the need to ensure that all human activity in Antarctica is conducted in a manner that effectively promotes the continued protection of the Antarctic environment and minimises or mitigates its impacts,

Hereby:

1. Reaffirm their strong commitment to the objectives and purposes of the Antarctic Treaty, its Protocol on Environmental Protection and other instruments of the Antarctic Treaty system;
2. Reaffirm the importance of the contribution made by the Treaty, and by Article IV in particular, to ensuring the continuance of international harmony in Antarctica;
3. Confirm that the Antarctic Treaty system ensures the effective and enduring international governance of Antarctica, providing for Antarctica's use only for peaceful purposes, free from measures of a military nature, guaranteeing freedom of scientific investigation and cooperation to that end, and designating Antarctica as a natural reserve devoted to peace and science;
4. State their intention to approve all Measures adopted by the Antarctic Treaty Consultative Meeting in accordance with the Antarctic Treaty;
5. Highlight the importance of, and the need to further refine and enhance, the exchange of information between Parties;
6. Underline the ability of the Antarctic Treaty system to evolve and adapt to addressing current and future challenges, including those at a planetary scale, and the importance of drawing on the best scientific and technical advice available when addressing these challenges;
7. Pledge to further strengthen their efforts to preserve and protect the Antarctic terrestrial and marine environments and to continue to identify and effectively address newly emerging Antarctic environmental challenges;
8. Appreciate the significant contribution of the Committee for Environmental Protection as a fundamental source of the best possible advice on environmental stewardship to inform decisions of the ATCM;
9. Reaffirm their commitment under the Protocol on Environmental Protection to the Antarctic Treaty to the prohibition of any activity relating to mineral resources, other than scientific research;
10. Underline the importance and contribution of all scientific investigation in, from and about Antarctica to the better understanding of our world; humankind's place in and effects on it; and the implications of climate change and other environmental changes;
11. Reaffirm their commitment to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems;

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12. Reinforce the value of the engagement of the Scientific Committee on Antarctic Research (SCAR) in providing scientific advice; and the Council of Managers of National Antarctic Programs (COMNAP) in providing advice and assistance on issues relating to Antarctic operations to Antarctic Treaty Consultative Meetings;
13. Reaffirm the importance of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) within the Antarctic Treaty system, and commit to continue to cooperate closely with CCAMLR, including on matters related to conservation of Antarctic marine living resources;
14. Reaffirm their intention to actively seek ways to address challenges and impacts arising from current and future tourism and non-governmental activities;
15. Renew their commitment to promote co-operative scientific, technical and educational programmes and outreach activities;
16. Pledge to support and strengthen further scientific and logistical cooperation among national Antarctic programmes;
17. Encourage States that are not Parties to the Antarctic Treaty and are committed to its objectives and purposes to accede to it; and
18. Encourage those States that are Party to the Antarctic Treaty but not yet Party to its Protocol on Environmental Protection, including its Annexes, as well as other instruments of the Antarctic Treaty system in accordance with their provisions, to accede to them.

Adopted at Prague, the Czech Republic, July 8, 2019

Preliminary Agenda for ATCM XLIII, Working Groups and Allocation of Items

Plenary

- 1) Opening of the Meeting
- 2) Election of Officers and Creation of Working Groups
- 3) Adoption of the Agenda, Allocation of Items to Working Groups and Consideration of the Multi-year Strategic Work Plan
- 4) Operation of the Antarctic Treaty System: Reports by Parties, Observers and Experts
- 5) Report of the Committee for Environmental Protection

Working Group 1: (*Policy, Legal, Institutional*)

- 6) Operation of the Antarctic Treaty System: General matters
- 7) Operation of the Antarctic Treaty System: Matters related to the Secretariat
- 8) Liability
- 9) Biological Prospecting in Antarctica
- 10) Exchange of Information
- 11) Education Issues
- 12) Multi-year Strategic Work Plan

Working Group 2: (*Science, Operations, Tourism*)

- 13) Safety and Operations in Antarctica
- 14) Inspections under the Antarctic Treaty and Environment Protocol
- 15) Science issues, future science challenges, scientific cooperation and facilitation
- 16) Implications of Climate Change for Management of the Antarctic Treaty Area
- 17) Tourism and Non-governmental Activities in the Antarctic Treaty Area, including Competent Authorities Issues

Plenary

- 18) Preparation of the 44th Meeting
- 19) Any other Business
- 20) Adoption of the Final Report
- 21) Close of the Meeting

Host Country Communiqué

From 2 to 11 July 2019, the Czech Republic hosted the XLII Antarctic Treaty Consultative Meeting (ATCM). The meeting was chaired by Mr Martin Smolek (the Czech Republic). The XXII meeting of the Committee for Environmental Protection (CEP) was held from 1 to 5 July 2019 and was chaired by Ms Birgit Njåstad (Norway). The Meetings were organised by the Ministry of Foreign Affairs of the Czech Republic.

Over 370 participants from the Antarctic Treaty Parties, experts, representatives of civil society and international observers attended the annual Meeting. The Meeting was opened by the Minister of Foreign Affairs of the Czech Republic Mr Tomáš Petříček. The Meeting welcomed Slovenia as a Party to the Antarctic Treaty, bringing the number of Parties to 54.

The ATCM adopted the Prague Declaration on the sixtieth anniversary of the signing of the Antarctic Treaty. The Declaration, *inter alia*, reaffirms the commitment of the Consultative Parties to the principles and purposes of the Antarctic Treaty, including the protection and preservation of Antarctica.

Strengthening of international collaboration in scientific and operational matters and exchange of information remained at the centre of the ATCM discussions. A special seminar dedicated to status and impact of hydrography in Antarctic waters showed that enhanced cooperation will assist in gaining better knowledge of the ocean, which can bring more safety to navigation. Air safety in Antarctica was widely discussed by the ATCM. A substantive exchange of information was held on sharing of science plans and studying impacts of climate change. Furthermore, the ATCM continued to discuss education and outreach activities, inspections, bioprospecting and general matters related to the operation of the Antarctic Treaty system.

The ATCM discussions focused also on Antarctic tourism and non-governmental activities. Enhanced cooperation among competent national authorities and the importance of knowledge and assessment of impacts of tourism and non-governmental activities in Antarctica was stressed. Extreme and novel activities in Antarctica remain a concern of the Parties.

Antarctic tourism was also dealt with by the CEP which endorsed recommendations arising from the Antarctic Tourism Workshop, held in Rotterdam, the Netherlands, from 3 to 5 April. The CEP also followed up on discussions held on the margins of the Joint SCAR/ CEP Workshop on Further Developing the Antarctic Protected Area System that was held in Prague, the Czech Republic, from 27 to 28 June. Views were exchanged by the CEP on conservation of fauna and flora, climate change implications for the environment and environmental impact assessment. Mitigating microplastic pollution in Antarctica was a

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particular point of attention. The Parties also assessed 11 Antarctic specially protected areas and two Historic Sites and Monuments in Antarctica.

Parties expressed their gratitude to the Czech government and their appreciation for the excellent facilities provided for the Meeting.

The next ATCM will be hosted in Finland, from 25 May to 4 June 2020.

PART II

Measures, Decisions and Resolutions

1. Measures

**Antarctic Specially Protected Area No 123
(Barwick and Balham Valleys, Southern Victoria Land):
Revised Management Plan**

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPA”) and approval of Management Plans for those Areas;

Recalling

- Recommendation VIII-4 (1975), which designated Barwick Valley, Victoria Land as Site of Special Scientific Interest (“SSSI”) No 3 and annexed a Management Plan for the Site;
- Recommendations X-6 (1979), XII-5 (1983), XIII-7 (1985), Resolution 7 (1995) and Measure 2 (2000), which extended the expiry date of SSSI 3;
- Decision 1 (2002), which renamed and renumbered SSSI 3 as ASPA 123;
- Measures 1 (2002), 6 (2008) and 3 (2013), which adopted revised Management Plans for ASPA 123;

Recalling that Recommendations VIII-4 (1975), X-6 (1979), XII-5 (1983), XIII-7 (1985) and Resolution 7 (1995) were designated as no longer current by Decision 1 (2011);

Recalling that Measure 2 (2000) did not become effective and was withdrawn by Measure 5 (2009);

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 123;

Desiring to replace the existing Management Plan for ASPA 123 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Protected Area No 123 (Barwick and Balham Valleys, South Victoria Land), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 123 annexed to Measure 3 (2013) be revoked.

Antarctic Specially Protected Area No 128 (Western shore of Admiralty Bay, King George Island, South Shetland Islands): Revised Management Plan

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPA”) and approval of Management Plans for those Areas;

Recalling

- Recommendation X-5 (1979), which designated the Western shore of Admiralty Bay, King George Island as Site of Special Scientific Interest (“SSSI”) No 8 and annexed a Management Plan for the Site;
- Recommendations X-6 (1979), XII-5 (1983), XIII-7 (1985) and Resolution 7 (1995), which extended the expiry date for SSSI 8;
- Measure 1 (2000), which adopted a revised Management Plan for SSSI 8;
- Decision 1 (2002), which renamed and renumbered SSSI 8 as ASPA 128;
- Measure 2 (2006), which designated Admiralty Bay, King George Island as Antarctic Specially Managed Area (“ASMA”) No 1, within which ASPA 128 is located;
- Measure 4 (2014), which adopted a revised Management Plan for ASPA 128;

Recalling that Recommendations X-15 (1979), XII-5 (1983), XIII-7 (1985) and Resolution 7 (1995) were designated as no longer current by Decision 1 (2011);

Recalling that Measure 1 (2000) did not become effective and was withdrawn by Decision 3 (2017);

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Noting Measure 14 (2014), which adopted a revised Management Plan for ASMA 1;

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 128;

Desiring to replace the existing Management Plan for ASPA 128 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Protected Area No 128 (Western shore of Admiralty Bay, King George Island, South Shetland Islands), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 128 annexed to Measure 4 (2014) be revoked.

**Antarctic Specially Protected Area No 141
(Yukidori Valley, Langhovde, Lützow-Holm Bay):
Revised Management Plan**

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPA”) and approval of Management Plans for those Areas;

Recalling

- Recommendation XIV-5 (1987), which designated Yukidori Valley, Langhovde, Lützow-Holm Bay as Site of Special Scientific Interest (“SSSI”) No 22 and annexed a Management Plan for the Site;
- Recommendation XVI-7 (1991), which extended the expiry date of SSSI 22;
- Measure 1 (2000), which adopted a revised Management Plan for SSSI 22;
- Decision 1 (2002), which renamed and renumbered SSSI 22 as ASPA 141;
- Measure 7 (2014), which adopted a revised Management Plan for ASPA 141;

Recalling that Recommendation XVI-7 (1991) did not become effective and was designated as no longer current by Decision 1 (2011);

Recalling that Measure 1 (2000) did not become effective and was withdrawn by Decision 3 (2017);

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 141;

Desiring to replace the existing Management Plan for ASPA 141 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Protected Area No 141 (Yukidori Valley, Langhovde, Lützow-Holm Bay), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 141 annexed to Measure 7 (2014) be revoked.

Antarctic Specially Protected Area No 142 (Svarthamaren): Revised Management Plan

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPAs”) and approval of Management Plans for those Areas;

Recalling

- Recommendation XIV-5 (1987), which designated Svarthamaren as Site of Special Scientific Interest (“SSSI”) No 23 and annexed a Management Plan for the Site;
- Resolution 3 (1996), which extended the expiry date of SSSI 23;
- Measure 1 (1999), which adopted a revised Management Plan for SSSI 23;
- Decision 1 (2002), which renamed and renumbered SSSI 23 as ASPA 142;
- Measures 2 (2004), 8 (2009) and 8 (2014), which adopted revised Management Plans for ASPA 142;

Recalling that Resolution 3 (1996) was designated as no longer current by Decision 1 (2011);

Recalling that Measure 1 (1999) did not become effective and was withdrawn by Measure 8 (2009);

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 142;

Desiring to replace the existing Management Plan for ASPA 142 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Protected Area No 142 (Svarthamaren), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 142 annexed to Measure 8 (2014) be revoked.

Antarctic Specially Protected Area No 151 (Lions Rump, King George Island, South Shetland Islands): Revised Management Plan

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPAs”) and approval of Management Plans for those Areas;

Recalling

- Recommendation XVI-2 (1991), which designated Lions Rump, King George Island, South Shetland Islands as Site of Special Interest (“SSSI”) No 34 and annexed a Management Plan for the Site;
- Measure 1 (2000), which annexed a revised Management Plan for SSSI 34;
- Decision 1 (2002), which renamed and renumbered SSSI 23 as ASPA 151;
- Measure 11 (2013), which adopted a revised Management Plan;

Recalling that Measure 1 (2000) did not become effective and was withdrawn by Decision 3 (2017);

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 151;

Desiring to replace the existing Management Plan for ASPA 151 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

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1. the revised Management Plan for Antarctic Specially Protected Area No 151 (Lions Rump, King George Island, South Shetland Islands), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 151 annexed to Measure 11 (2013) be revoked.

**Antarctic Specially Protected Area No 154
(Botany Bay, Cape Geology, Victoria Land):
Revised Management Plan**

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPA”) and approval of Management Plans for those Areas;

Recalling

- Measure 3 (1997), which designated Botany Bay, Cape Geology, Victoria Land as Site of Special Scientific Interest (“SSSI”) No 37 and adopted a Management Plan for the Site;
- Decision 1 (2002), which renamed and renumbered SSSI 37 as ASPA 154;
- Measures 2 (2003), 11 (2008) and 12 (2013), which adopted revised Management Plans for ASPA 154;

Recalling that Measure 3 (1997) did not become effective and was withdrawn by Measure 6 (2011);

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 154;

Desiring to replace the existing Management Plan for ASPA 154 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

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That:

1. the revised Management Plan for Antarctic Specially Protected Area No 154 (Botany Bay, Cape Geology, Victoria Land), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 154 annexed to Measure 12 (2013) be revoked.

Antarctic Specially Protected Area No 161 (Terra Nova Bay, Ross Sea): Revised Management Plan

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPA”) and approval of Management Plans for those Areas;

Recalling

- Measure 2 (2003), which designated Terra Nova Bay, Ross Sea as ASPA 161 and adopted a Management Plan for the Area;
- Measures 14 (2008) and 15 (2013), which adopted revised Management Plans for ASPA 161;

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 161;

Desiring to replace the existing Management Plan for ASPA 161 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Protected Area No 161 (Terra Nova Bay, Ross Sea), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 161 annexed to Measure 15 (2013) be revoked.

Antarctic Specially Protected Area No 171 (Narębski Point, Barton Peninsula, King George Island): Revised Management Plan

The Representatives,

Recalling Articles 4, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Protected Areas (“ASPAs”) and approval of Management Plans for those Areas;

Recalling

- Measure 13 (2009), which designated Narębski Point, Barton Peninsula, King George Island as ASPA 171 and adopted a Management Plan for the Area;
- Measure 11 (2014), which adopted a revised Management Plan for ASPA 171;

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 171;

Desiring to replace the existing Management Plan for ASPA 171 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Protected Area No 171 (Narębski Point, Barton Peninsula, King George Island), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 171 annexed to Measure 11 (2014) be revoked.

**Antarctic Specially Protected Area No 173
(Cape Washington and Silverfish Bay, Terra Nova Bay,
Ross Sea): Revised Management Plan**

The Representatives,

Recalling Articles 3, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty providing for the designation of Antarctic Specially Protected Areas (“ASPA”) and approval of Management Plans for those Areas;

Recalling Measure 17 (2013), which designated Cape Washington and Silverfish Bay, Terra Nova Bay, Ross Sea as ASPA 173 and adopted a Management Plan for the Area;

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASPA 173;

Noting further the approval of the Commission for the Conservation of Antarctic Marine Living Resources (“CCAMLR”), at its thirty-first meeting, of the draft Management Plan for a new ASPA at Cape Washington and Silverfish Bay, Terra Nova Bay, Ross Sea;

Desiring to replace the existing Management Plan for ASPA 173 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

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1. the revised Management Plan for Antarctic Specially Protected Area No 173 (Cape Washington and Silverfish Bay, Terra Nova Bay, Ross Sea), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Protected Area No 173 annexed to Measure 17 (2013) be revoked.

Antarctic Specially Managed Area No 4 (Deception Island): Revised Management Plan

The Representatives,

Recalling Articles 4, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Managed Areas (“ASMA”) and the approval of Management Plans for those Areas;

Recalling

- Measure 3 (2005), which designated Deception Island as ASMA 4 and adopted a Management Plan for the Area;
- Measure 10 (2012), which adopted a revised Management Plan for ASMA 4;

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASMA 4;

Desiring to replace the existing Management Plan for ASMA 4 with the revised Management Plan;

Recommend to their Governments the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

1. the revised Management Plan for Antarctic Specially Managed Area No 4 (Deception Island), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Managed Area No 4 annexed to Measure 10 (2012) be revoked.

Antarctic Specially Managed Area No 7 (Southwest Anvers Island and Palmer Basin): Revised Management Plan

The Representatives,

Recalling Articles 4, 5 and 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, providing for the designation of Antarctic Specially Managed Areas (“ASMA”) and the approval of Management Plans for those Areas;

Recalling

- Measure 1 (2008), which designated Southwest Anvers Island and Palmer Basin as Antarctic Specially Managed Area No 7 and annexed a Management Plan for the Area;
- Measures 2 (2009) and 14 (2010), which adopted revised Management Plans for ASMA 7;

Noting that the Committee for Environmental Protection (“CEP”) has endorsed a revised Management Plan for ASMA 7;

Noting Measure 6 (2014) concerning Antarctic Specially Protected Area (“ASPA”) No 139 (Biscoe Point, Anvers Island), which is located within ASMA 7;

Desiring to replace the existing Management Plan for ASMA 7 with the revised Management Plan;

Recommend the following Measure for approval in accordance with paragraph 1 of Article 6 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

That:

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1. the revised Management Plan for Antarctic Specially Managed Area No 7 (Southwest Anvers Island and Palmer Basin), which is annexed to this Measure, be approved; and
2. the Management Plan for Antarctic Specially Managed Area No 7 annexed to Measure 14 (2010) be revoked.

Revised List of Antarctic Historic Sites and Monuments: the Wreck of Sir Ernest Shackleton's vessel *Endurance* and C.A. Larsen Multiexpedition cairn

The Representatives,

Recalling the requirements of Article 8 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty to maintain a list of current Historic Sites and Monuments ("HSM") and that such sites shall not be damaged, removed or destroyed;

Recalling

- Measure 9 (2016), which revised and updated the List of HSM, and subsequent Measures which have added further HSM to the List of HSM;
- Resolution 2 (2018), which recommended non-mandatory Guidelines for assessment and management of Heritage in Antarctica;

Recommend to their Governments the following Measure for approval in accordance with paragraph 2 of Article 8 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty:

1. the following be added to the List of Historic Sites and Monuments:

"Endurance, Wreck of the vessel owned and used by Sir Ernest Shackleton during his 1914-15 Trans-Antarctic Expedition.

Wreck of the vessel *Endurance*, including all artefacts contained within or formerly contained within the ship, which may be lying on the seabed in or near the wreck within a 150m radius. This includes all fixtures and fittings associated with the ship, including ship's wheel, bell, etc. The designation also includes all items of personal possessions left on the ship by the ship's company at the time of its sinking."

Location: The exact location of the wreck is unknown as the ship floated in the pack ice for some distance.

Location records made by Frank Worsley, Shackleton's skipper and master navigator, give precise coordinates of the location of sinking of the ship but these have not been verified since 1915. We know the wreck is somewhere on the seabed in the Weddell Sea. It is proposed to designate the wreck and all artefacts contained within or formerly contained within the ship, which may be lying on the seabed in or near the wreck.

Original proposing Party: United Kingdom

Party undertaking management: United Kingdom

"C.A. Larsen Multiexpedition cairn.

The site consists of a rock cairn installed in 1892 by Norwegian Capt. Carl Anton Larsen during the first land-exploration of the area around the current location of Argentina's Marambio Station, where the first Antarctic fossil discoveries were made. The cairn used to have an attached wooden pole (2m high and 5cm diameter) of which nothing remains."

Location: 64°14'13.06"S - 56°35'7.50"W, northeast of the Argentine Station Marambio, Antarctic Peninsula.

Original proposing Parties: Argentina/Norway/Sweden/United Kingdom.

Parties undertaking management: Argentina/Norway/Sweden/United Kingdom; and

2. the revised and updated List of Historic Sites and Monuments be annexed to this Measure.

Revised List of Historic Sites and Monuments

No	Description	Location	Designation/ Amendment
1.	<p>Flag mast erected in December 1965 at the South Geographical Pole by the First Argentine Overland Polar Expedition.</p> <p>Original proposing Party: Argentina Party undertaking management: Argentina</p>	90°S	Rec. VII-9
2.	<p>Rock cairn and plaques at Syowa Station in memory of Shin Fukushima, a member of the 4th Japanese Antarctic Research Expedition, who died in October 1960 while performing official duties. The cairn was erected on 11 January 1961, by his colleagues. Some of his ashes repose in the cairn.</p> <p>Original proposing Party: Japan Party undertaking management: Japan</p>	69°00'S, 39°35'E	Rec. VII-9
3.	<p>Rock cairn and plaque on Proclamation Island, Enderby Land, erected in January 1930 by Sir Douglas Mawson. The cairn and plaque commemorate the landing on Proclamation Island of Sir Douglas Mawson with a party from the British, Australian and New Zealand Antarctic Research Expedition of 1929-31.</p> <p>Original proposing Party: Australia Party undertaking management: Australia</p>	65°51'S, 53°41'E	Rec. VII-9
4.	<p>Pole of Inaccessibility Station building. Station building to which a bust of V.I. Lenin is fixed, together with a plaque in memory of the conquest of the Pole of Inaccessibility by Soviet Antarctic explorers in 1958. As of 2007 the station building was covered by snow. The bust of Lenin is erected on the wooden stand mounted on the building roof at about 1.5 m high above the snow surface.</p> <p>Original proposing Party: Russia Party undertaking management: Russia</p>	82°06'42"S, 55°01'57"E	Rec. VII-9 Measure 11 (2012)
5.	<p>Rock cairn and plaque at Cape Bruce, Mac. Robertson Land, erected in February 1931 by Sir Douglas Mawson. The cairn and plaque commemorate the landing on Cape Bruce of Sir Douglas Mawson with a party from the British, Australian and New Zealand Antarctic Research Expedition of 1929-31.</p> <p>Original proposing Party: Australia Party undertaking management: Australia</p>	67°25'S, 60°47'E	Rec. VII-9

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No	Description	Location	Designation/ Amendment
6.	<p>Rock cairn at Walkabout Rocks, Vestfold Hills, Princess Elizabeth Land, erected in 1939 by Sir Hubert Wilkins. The cairn houses a canister containing a record of his visit.</p> <p>Original proposing Party: Australia Party undertaking management: Australia</p>	68°22'S, 78°33'E	Rec. VII-9
7.	<p>Ivan Khmara's Stone. Stone with inscribed plaque erected at Buromsky island in memory of Ivan Khmara, driver-mechanic, the member of the 1st Complex Antarctic Expedition of the USSR (1st Soviet Antarctic Expedition) who perished on fast ice in the performance of duties on 21.01.1956. Initially the stone was erected at Mabus Point, Mirny observatory. In 1974, 19th SAE, the stone was moved to Buromsky Island because of construction activity.</p> <p>Original proposing Party: Russia Party undertaking management: Russia</p>	66°32'04"S, 92°59'57"E	Rec. VII-9 Measure 11 (2012)
8.	<p>Anatoly Shcheglov's Monument. Metal stele with plaque in memory of Anatoly Shcheglov, driver-mechanic who perished in the performance of duties, erected on sledge on the Mirny – Vostok route, at 2 km from Mirny station.</p> <p>Original proposing Party: Russia Party undertaking management: Russia</p>	66°34'43"S, 92°58'23"E	Rec. VII-9 Measure 11 (2012)
9.	<p>Buromsky Island Cemetery. Cemetery on Buromsky Island, near Mirny Observatory in which are buried citizens of the USSR (Russian Federation), Czechoslovakia, GDR and Switzerland (members of the Soviet and Russian Antarctic Expeditions) who perished in the performance of their duties.</p> <p>Original proposing Party: Russia Party undertaking management: Russia</p>	66°32'04"S, 93°00'E	Rec. VII-9 Measure 11 (2012)
10.	<p>Soviet Oasis Station Observatory. Magnetic observatory building at Dobrowolsky station (a part of the former Soviet station Oasis transferred to Poland) at Bunger Hills with a plaque in memory of the opening of Oasis station in 1956.</p> <p>Original proposing Party: Russia Party undertaking management: Russia</p>	66°16'30"S, 100°45'03"E	Rec. VII-9 Measure 11 (2012)
11.	<p>Vostok Station Tractor. Heavy tractor ATT 11 at Vostok station which participated in the first traverse to the Earth Geomagnetic Pole, with plaque in memory of the opening of the Station in 1957.</p> <p>Original proposing Party: Russia Party undertaking management: Russia</p>	78°27'48"S, 106°50'06"E	Rec. VII-9 Measure 11 (2012)
12.	<i>Cross and plaque at Cape Denison, George V Land. (Removed from the Antarctic Treaty list of Historic Sites and Monuments subsumed with HSM 13 into HSM 77).</i>		
13.	<i>Hut at Cape Denison, George V Land, (Removed from the Antarctic Treaty list of Historic Sites and Monuments subsumed with HSM 12 into HSM 77).</i>		

Annex: Revised List of Historic Sites and Monuments

No	Description	Location	Designation/ Amendment
14.	<p>Site of ice cave at Inexpressible Island, Terra Nova Bay, constructed in March 1912 by Victor Campbell's Northern Party, British Antarctic Expedition, 1910-13. The party spent the winter of 1912 in this ice cave. A wooden sign, plaque and seal bones remain at the site.</p> <p>Original proposing Party: New Zealand Parties undertaking management: New Zealand/Italy/UK</p>	74°54'S, 163°43'E	Rec. VII-9 Measure 5 (1995)
15.	<p>Hut at Cape Royds, Ross Island, built in February 1908 by the British Antarctic Expedition of 1907-09, led by Sir Ernest Shackleton. Restored in January 1961 by the Antarctic Division of New Zealand Department of Scientific and Industrial Research.</p> <p>Site incorporated within ASPA 157</p> <p>Original proposing Parties: New Zealand/UK Parties undertaking management: New Zealand/UK</p>	77°33'S, 116°10'E	Rec. VII-9
16.	<p>Hut at Cape Evans, Ross Island, built in January 1911 by the British Antarctic Expedition of 1910- 1913, led by Captain Robert F. Scott. Restored in January 1961 by the Antarctic Division of New Zealand Department of Scientific and Industrial Research.</p> <p>Site incorporated within ASPA 155</p> <p>Original proposing Parties: New Zealand /UK Parties undertaking management: New Zealand/UK</p>	77°38'S, 166°24'E	Rec. VII-9
17.	<p>Cross on Wind Vane Hill, Cape Evans, Ross Island, erected by the Ross Sea Party, led by Captain Aeneas Mackintosh, of Sir Ernest Shackleton's Imperial Trans-Antarctic Expedition of 1914-1916, in memory of three members of the party who died in the vicinity in 1916.</p> <p>Site incorporated within ASPA 155</p> <p>Original proposing Parties: New Zealand/UK Parties undertaking management: New Zealand/UK</p>	77°38'S, 166°24'E	Rec. VII-9
18.	<p>Hut at Hut Point, Ross Island, built in February 1902 by the British Antarctic Expedition of 1901-04, led by Captain Robert F. Scott. Partially restored in January 1964 by the New Zealand Antarctic Society, with assistance from the United States Government.</p> <p>Site incorporated within ASPA 158</p> <p>Original proposing Parties: New Zealand/UK Parties undertaking management: New Zealand/UK</p>	77°50'S, 166°37'E	Rec. VII-9

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No	Description	Location	Designation/ Amendment
19.	<p>Cross at Hut Point, Ross Island, erected in February 1904 by the British Antarctic Expedition of 1901- 04, in memory of George Vince, a member of the expedition, who died in the vicinity.</p> <p>Original proposing Parties: New Zealand/UK Parties undertaking management: New Zealand/UK</p>	77°50'S, 166°37'E	Rec. VII-9
20.	<p>Cross on Observation Hill, Ross Island, erected in January 1913 by the British Antarctic Expedition of 1910-13, in memory of Captain Robert F. Scott's party which perished on the return journey from the South Pole in March 1912.</p> <p>Original proposing Parties: New Zealand/UK Parties undertaking management: New Zealand/UK</p>	77°51'S, 166°41'E	Rec. VII-9
21.	<p>Remains of stone hut at Cape Crozier, Ross Island, constructed in July 1911 by Edward Wilson's party of the British Antarctic Expedition (1910-13) during the winter journey to collect Emperor penguin eggs.</p> <p>Original proposing Party: New Zealand Parties undertaking management: New Zealand/UK</p>	77°31'S, 169°22'E	Rec. VII-9
22.	<p>Three huts and associated historic relics at Cape Adare. Two were built in February 1899 during the British Antarctic (<i>Southern Cross</i>) Expedition, 1898-1900, led by Carsten E. Borchgrevink. The third was built in February 1911 by Robert F. Scott's Northern Party, led by Victor L.A. Campbell.</p> <p>Scott's Northern Party hut has largely collapsed with only the porch standing in 2002.</p> <p>Site incorporated within ASPA 159</p> <p>Original proposing Parties: New Zealand/UK Parties undertaking management: New Zealand/UK</p>	71°18'S, 170°12'E	Rec. VII-9
23.	<p>Grave at Cape Adare of Norwegian biologist Nicolai Hanson, a member of the British Antarctic (<i>Southern Cross</i>) Expedition, 1898-1900, led by Carsten E. Borchgrevink. A large boulder marks the head of the grave with the grave itself outlined in white quartz stones. A cross and plaque are attached to the boulder.</p> <p>Original proposing Parties: New Zealand/ UK Parties undertaking management: New Zealand/Norway</p>	71°17'S, 170°13'E	Rec. VII-9
24.	<p>Rock cairn, known as 'Amundsen's cairn', on Mount Betty, Queen Maud Range erected by Roald Amundsen on 6 January 1912, on his way back to <i>Framheim</i> from the South Pole.</p> <p>Original proposing Party: Norway Party undertaking management: Norway</p>	85°11'S, 163°45'W	Rec. VII-9
25.	<i>De-listed.</i>		

Annex: Revised List of Historic Sites and Monuments

No	Description	Location	Designation/ Amendment
26.	<p>Abandoned installations of Argentine Station 'General San Martin' on Barry Island, Debenham Islands, Marguerite Bay, with cross, flag mast, and monolith built in 1951.</p> <p>Original proposing Party: Argentina Party undertaking management: Argentina</p>	68°08'S, 67°08'W	Rec. VII-9
27.	<p>Cairn with a replica of a lead plaque erected on Megalestris Hill, Petermann Island, in 1909 by the second French expedition led by Jean-Baptiste E. A. Charcot. The original plaque is in the reserves of the Museum National d'Histoire Naturelle (Paris).</p> <p>Original proposing Parties: Argentina/France/UK Parties undertaking management: France/UK</p>	65°10'S, 64°09'W	Rec. VII-9
28.	<p>Rock cairn at Port Charcot, Booth Island, with wooden pillar and plaque inscribed with the names of the first French expedition led by Jean-Baptiste E. A. Charcot which wintered here in 1904 aboard <i>Le Français</i>.</p> <p>Original proposing Party: Argentina Parties undertaking management: Argentina/France</p>	65°03'S, 64°01'W	Rec. VII-9
29.	<p>Lighthouse named 'Primero de Mayo' erected on Lambda Island, Melchior Islands, by Argentina in 1942. This was the first Argentine lighthouse in the Antarctic.</p> <p>Original proposing Party: Argentina Party undertaking management: Argentina</p>	64°18'S, 62°59'W	Rec. VII-9
30.	<p>Shelter at Paradise Harbour erected in 1950 near the Chilean Base 'Gabriel Gonzalez Videla' to honour Gabriel Gonzalez Videla, the first Head of State to visit the Antarctic. The shelter is a representative example of pre-IGY activity and constitutes an important national commemoration.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	64°49'S, 62°51'W	Rec. VII-9
31.	<i>De-listed.</i>		
32.	<p>Concrete monolith erected in 1947, near Capitán Arturo Prat Base on Greenwich Island, South Shetland Islands. Point of reference for Chilean Antarctic hydrographic surveys. The monolith is representative of an important pre-IGY activity and is currently preserved and maintained by personnel from Prat Base.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	62°28'S, 59°40'W	Rec. VII-9

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No	Description	Location	Designation/ Amendment
33.	<p>Shelter and cross with plaque near Capitán Arturo Prat Base (Chile), Greenwich Island, South Shetland Islands. Named in memory of Lieutenant-Commander González Pacheco, who died in 1960 while in charge of the station. The monument commemorates events related to a person whose role and the circumstances of his death have a symbolic value and the potential to educate people about significant human activities in Antarctica.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	62°29'S, 59°40'W	Rec. VII-9
34.	<p>Bust at Capitán Arturo Prat Base (Chile), Greenwich Island, South Shetland Islands, of the Chilean naval hero Arturo Prat, erected in 1947. The monument is representative of pre-IGY activities and has symbolic value in the context of Chilean presence in Antarctica.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	62°50'S 59°41'W,	Rec. VII-9
35.	<p>Wooden cross and statue of the Virgin of Carmen erected in 1947 near Capitán Arturo Prat Base (Chile), Greenwich Island, South Shetland Islands. The monument is representative of pre-IGY activities and has a particularly symbolic and architectural value.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	62°29'S, 59°40'W	Rec. VII-9
36.	<p>Replica of a metal plaque erected by Eduard Dallmann at Potter Cove, King George Island, to commemorate the visit of his German expedition on 1 March, 1874 on board <i>Grönland</i>.</p> <p>Original proposing Parties: Argentina/UK Parties undertaking management: Argentina/Germany</p>	62°14'S, 58°39'W	Rec. VII-9

Annex: Revised List of Historic Sites and Monuments

No	Description	Location	Designation/ Amendment
37.	<p>O'Higgins Historic Site located on Cape Legoupil, Antarctic Peninsula and comprising the following structures of historical value:</p> <ul style="list-style-type: none"> • "Capitán General Bernardo O'Higgins Riquelme" Bust, erected in 1948 opposite the Base known under the same name. General O'Higgins was the first ruler of Chile to recognise the importance of Antarctica. It has a symbolic meaning in the history of Antarctic exploration since it was during his government that the vessel Dragon landed on the coast of the Antarctic Peninsula in 1820. This monument is also representative of pre-IGY activities in Antarctica. (63°19'14.3" S / 57°53'53.9"W) • Former "Capitán General Bernardo O'Higgins Riquelme" Antarctic Base, unveiled on 18th February, 1948 by the President of the Republic of Chile, Gabriel González Videla, the first President in the world to visit Antarctica. It is considered as a model pioneering base in the modern period of Antarctic exploration. (63°19' S, 57°54'W) • Plaque in memory of Lieutenants Oscar Inostroza Contreras and Sergio Ponce Torrealba, who perished in the Antarctic Continent for the sake of peace and science, on 12th August, 1957. (63°19'15.4" S / 57°53'52.9"W) • Virgen del Carmen Grotto, located in the surroundings of the base, built approximately forty years ago. It has served as a place of spiritual withdrawal for the staff of the different Antarctic stations and expeditions. (63°19'15.9" S / 57°54'03.2"W). <p>Original proposing Party: Chile Party undertaking management: Chile</p>	63°19'S, 57°54'W	Rec. VII-9 Measure 11 (2012)
38.	<p>Wooden hut on Snow Hill Island built in February 1902 by the main party of the Swedish South Polar Expedition led by Otto Nordenskjöld.</p> <p>Original proposing Parties: Argentina/ UK Parties undertaking management: Argentina/Sweden</p>	64°22'S, 56°59'W	Rec. VII-9
39.	<p>Stone hut at Hope Bay, Trinity Peninsula, built in January 1903 by a party of the Swedish South Polar Expedition.</p> <p>Original proposing Parties: Argentina/UK Parties undertaking management: Argentina/Sweden</p>	63°24'S, 56°59' W	Rec. VII-9

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No	Description	Location	Designation/ Amendment
40.	<p>Bust of General San Martin, grotto with a statue of the Virgin of Lujan, and a flag mast at Base 'Esperanza', Hope Bay, erected by Argentina in 1955; together with a graveyard with stele in memory of members of Argentine expeditions who died in the area.</p> <p>Original proposing Party: Argentina Party undertaking management: Argentina</p>	63°24'S, 56°59'W	Rec. VII-9
41.	<p>Stone hut on Paulet Island built in February 1903 by survivors of the wrecked vessel <i>Antarctic</i> under Captain Carl A. Larsen, members of the Swedish South Polar Expedition led by Otto Nordenskjöld, together with a grave of a member of the expedition and the rock cairn built by the survivors of the wreck at the highest point of the island to draw the attention of rescue expeditions.</p> <p>Original proposing Parties: Argentina/UK Parties undertaking management: Argentina/Sweden/Norway</p>	63°34'S, 55°45'W	Rec. VII-9 Measure 5 (1997)
42.	<p>Area of Scotia Bay, Laurie Island, South Orkney Island, in which are found: stone hut built in 1903 by the Scottish Antarctic Expedition led by William S. Bruce; the Argentine meteorological hut and magnetic observatory, built in 1905 and known as Moneta House; and a graveyard with twelve graves, the earliest of which dates from 1903.</p> <p>Original proposing Party: Argentina Party undertaking management: Argentina/UK</p>	60°46'S, 44°40'W	Rec. VII-9
43.	<p>Cross erected in 1955, at a distance of 1,300 metres north-east of the Argentine General Belgrano I Station (Argentina) and subsequently moved to Belgrano II Station (Argentina), Nunatak Bertrab, Confin Coast, Coats Land in 1979.</p> <p>Original proposing Party: Argentina Party undertaking management: Argentina</p>	77°52'S, 34°37'W	Rec. VII-9
44.	<p>Plaque erected at the temporary Indian station 'Dakshin Gangotri', Princess Astrid Kyst, Dronning Maud Land, listing the names of the First Indian Antarctic Expedition which landed nearby on 9 January 1982.</p> <p>Original proposing Party: India Party undertaking management: India</p>	70°45'S, 11°38'E	Rec. XII-7

Annex: Revised List of Historic Sites and Monuments

No	Description	Location	Designation/ Amendment
45.	<p>Plaque on Brabant Island, on Metchnikoff Point, mounted at a height of 70 m on the crest of the moraine separating this point from the glacier and bearing the following inscription:</p> <p>This monument was built by François de Gerlache and other members of the Joint Services Expedition 1983-85 to commemorate the first landing on Brabant Island by the Belgian Antarctic Expedition, 1897-99: Adrien de Gerlache (Belgium) leader, Roald Amundsen (Norway), Henryk Arctowski (Poland), Frederick Cook (USA) and Emile Danco (Belgium) camped nearby from 30 January to 6 February 1898.</p> <p>Original proposing Party: Belgium Party undertaking management: Belgium</p>	64°02'S, 62°34'W	Rec. XIII-16
46.	<p>All the buildings and installations of Port-Martin base, Terre Adélie constructed in 1950 by the 3rd French expedition in Terre Adélie and partly destroyed by fire during the night of 23 to 24 January 1952.</p> <p>Original proposing Party: France Party undertaking management: France</p>	66°49'S, 141°24'E	Rec. XIII-16
47.	<p>Wooden building called 'Base Marret' on the Ile des Pétrels, Terre Adélie, where seven men under the command of Mario Marret overwintered in 1952 following the fire at Port Martin Base.</p> <p>Original proposing Party: France Party undertaking management: France</p>	66°40'S, 140°01'E	Rec. XIII-16
48.	<p>Iron cross on the North-East headland of the Ile des Pétrels, Terre Adélie, dedicated as a memorial to André Prudhomme, head meteorologist in the 3rd International Geophysical Year expedition who disappeared during a blizzard on 7 January 1959.</p> <p>Original proposing Party: France Party undertaking management: France</p>	66°40'S, 140°01'E	Rec. XIII-16
49.	<p>The concrete pillar erected by the First Polish Antarctic Expedition at Dobrolowski Station on the Bunge Hill to measure acceleration due to gravity $g = 982,439.4 \text{ mgal} \pm 0.4 \text{ mgal}$ in relation to Warsaw, according to the Potsdam system, in January 1959.</p> <p>Original proposing Party: Poland Party undertaking management: Poland</p>	66°16'S, 100°45'E	Rec. XIII-16

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No	Description	Location	Designation/ Amendment
50.	<p>A brass plaque bearing the Polish Eagle, the national emblem of Poland, the dates 1975 and 1976, and the following text in Polish, English and Russian:</p> <p>In memory of the landing of members of the first Polish Antarctic marine research expedition on the vessels 'Profesor Siedlecki' and 'Tazar' in February 1976.</p> <p>This plaque, south-west of the Chilean and Soviet stations, is mounted on a cliff facing Maxwell Bay, Fildes Peninsula, King George Island.</p> <p>Original proposing Party: Poland Party undertaking management: Poland</p>	62°12'S, 59°01'W	Rec. XIII-16
51.	<p>The grave of Włodzimierz Puchalski, surmounted by an iron cross, on a hill to the south of Arctowski station on King George Island. W. Puchalski was an artist and a producer of documentary nature films, who died on 19 January 1979 whilst working at the station.</p> <p>Original proposing Party: Poland Party undertaking management: Poland</p>	62°13'S, 58°28'W	Rec. XIII-16
52.	<p>Monolith erected to commemorate the establishment on 20 February 1985 by the Peoples Republic of China of the 'Great Wall Station' on Fildes Peninsula, King George Island, in the South Shetland Islands. Engraved on the monolith is the following inscription in Chinese: 'Great Wall Station, First Chinese Antarctic Research Expedition, 20 February 1985'.</p> <p>Original proposing Party: China Party undertaking management: China</p>	62°13'S, 58°58'W	Rec. XIII-16
53.	<p>Bust of Captain Luis Alberto Pardo, monolith and plaques on Point Wild, Elephant Island, south Shetland Islands, celebrating the rescue of the survivors of the British ship <i>Endurance</i> by the Chilean Navy cutter <i>Yelcho</i> displaying the following words:</p> <p>"Here on August 30th, 1916, the Chilean Navy cutter <i>Yelcho</i> commanded by Pilot Luis Pardo Villalón rescued the 22 men from the Shackleton Expedition who survived the wreck of the 'Endurance' living for four and one half months in this Island".</p> <p>The Monolith and the plaques have been placed on Elephant Island and their replicas on the Chilean bases Capitan Arturo Prat (62°30'S, 59°49'W) and President Eduardo Frei (62°12'S, 62°12'W). Bronze busts of the pilot Luis Pardo Villalón were placed on the three above-mentioned monoliths during the XXIVth Chilean Antarctic Scientific Expedition in 1987-88.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	61°03'S, 54°50'W	Rec. XIV-8 Rec. XV-13

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No	Description	Location	Designation/ Amendment
54.	<p>Richard E. Byrd Historic Monument, McMurdo Station, Antarctica. Bronze bust on black marble, 5ft high x 2ft square, on wood platform, bearing inscriptions describing the polar achievements of Richard Evelyn Byrd. Erected at McMurdo Station in 1965.</p> <p>Original proposing Party: USA Party undertaking management: USA</p>	77°51'S, 166°40'E	Rec. XV-12
55.	<p>East Base, Antarctica, Stonington Island. Buildings and artefacts at East Base, Stonington Island and their immediate environs. These structures were erected and used during two U.S. wintering expeditions: the Antarctic Service Expedition (1939-1941) and the Ronne Antarctic Research Expedition (1947-1948). The size of the historic area is approximately 1,000 metres in the north-south direction (from the beach to Northeast Glacier adjacent to Back Bay) and approximately 500 metres in the east-west direction.</p> <p>Original proposing Party: USA Party undertaking management: USA</p>	68°11'S, 67°00'W	Rec. XIV-8
56.	<p>Waterboat Point, Danco Coast, Antarctic Peninsula. The remains and immediate environs of the Waterboat Point hut. It was occupied by the UK two-man expedition of Thomas W. Bagshawe and Maxime C. Lester in 1921-22. Only the base of the boat, foundations of doorposts and an outline of the hut and extension still exist. It is situated close to the Chilean station 'President Gabriel Gonzáles Videla'.</p> <p>Original proposing Party: Chile/UK Parties undertaking management: Chile/UK</p>	64°49'S, 62°51'W	Rec. XVI-11
57.	<p>Commemorative plaque at 'Yankee Bay' (Yankee Harbour), MacFarlane Strait, Greenwich Island, South Shetland Islands. Near a Chilean refuge. Erected to the memory of Captain Andrew MacFarlane, who in 1820 explored the Antarctic Peninsula area in the brigantine <i>Dragon</i>.</p> <p>Original proposing Parties: Chile/UK Parties undertaking management: Chile/UK</p>	62°32'S, 59°45'W	Rec. XVI-11
58.	<i>De-listed.</i>		

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No	Description	Location	Designation/ Amendment
59.	<p>A cairn on Half Moon Beach, Cape Shirreff, Livingston Island, South Shetland Islands and a plaque on 'Cerro Gaviota' opposite San Telmo Islets commemorating the officers, soldiers and seamen aboard the Spanish vessel <i>San Telmo</i>, which sank in September 1819; possibly the first people to live and die in Antarctica.</p> <p>Site incorporated within ASPA 149</p> <p>Original proposing Parties: Chile/Spain/Peru Parties undertaking management: Chile/Spain/Peru</p>	62°28'S, 60°46'W	Rec. XVI-11
60.	<p>Wooden pole and cairn (I), and wooden plaque and cairn (II), both located at Penguins Bay, southern coast of Seymour Island (Marambio), James Ross Archipelago. The wooden pole and a cairn (I) were installed in 1902 during the Swedish South Polar Expedition led by Dr. Otto Nordenskjöld. This cairn used to have attached a 4 m high wooden pole – nowadays only 44cm high –, guy-lines and a flag, and was installed to signal the location of a well stocked deposit, composed of few wooden boxes containing food supplies, notes and letters saved inside bottles. The deposit was to be used in case the Swedish South Polar Expedition was forced to retreat on its way to the south.</p> <p>The wooden plaque (II) was placed on 10 November 1903 by the crew of a rescue mission of the Argentinean Corvette Uruguay in the site where they met the members of the Swedish expedition led by Dr Otto Nordenskjöld. The text of the wooden plaque reads as follows:</p> <p>“10.XI.1903 Uruguay (Argentine Navy) in its journey to give assistance to the Swedish Antarctic expedition.”</p> <p>In January 1990, a rock cairn (II) was erected by Argentina in memory of this event in the place where he plaque is located.</p> <p>Original proposing Parties: Argentina/Sweden Parties undertaking management: Argentina/Sweden</p>	(I): 64°17'47.2"S, 56°41'30.7"W (II): 64°16'S, 56°39'W	Rec. XVII-3 Measure 9 (2016)
61.	<p>'Base A' at Port Lockroy, Goudier Island, off Wiencke Island, Antarctic Peninsula. Of historic importance as an Operation Tabarin base from 1944 and for scientific research, including the first measurements of the ionosphere, and the first recording of an atmospheric whistler, from Antarctica. Port Lockroy was a key monitoring site during the International Geophysical Year of 1957/58.</p> <p>Original Proposing Party: UK Party undertaking management: UK</p>	64°49'S, 63°29'W	Measure 4 (1995)

Annex: Revised List of Historic Sites and Monuments

No	Description	Location	Designation/ Amendment
62.	<p>'Base F (Wordie House)' on Winter Island, Argentine Islands. Of historic importance as an example of an early British scientific base.</p> <p>Original proposing Party: UK Parties undertaking management: UK/Ukraine</p>	65°15'S, 64°16'W	Measure 4 (1995)
63.	<p>'Base Y' on Horseshoe Island, Marguerite Bay, western Graham Land. Noteworthy as a relatively unaltered and completely equipped British scientific base of the late 1950s. 'Blalklock', the refuge hut nearby, is considered an integral part of the base.</p> <p>Original proposing Party: UK Party undertaking management: UK</p>	67°48'S, 67°18'W	Measure 4 (1995)
64.	<p>'Base E' on Stonington Island, Marguerite Bay, western Graham Land. Of historical importance in the early period of exploration and later British Antarctic Survey (BAS) history of the 1960s and 1970s.</p> <p>Original proposing Party: UK Party undertaking management: UK</p>	68°11'S, 67°00'W	Measure 4 (1995)
65.	<p>Message post, Svend Foyn Island, Possession Islands. A pole with a box attached was placed on the island on 16 January 1895 during the whaling expedition of Henryk Bull and Captain Leonard Kristensen of the ship <i>Antarctic</i>. It was examined and found intact by the British Antarctic Expedition of 1898-1900 and then sighted from the beach by the USS <i>Edisto</i> in 1956 and USCGS <i>Glacier</i> in 1965.</p> <p>Original proposing Parties: New Zealand/Norway/UK Parties undertaking management: New Zealand/ Norway</p>	71°56'S, 171°05'W	Measure 4 (1995)
66.	<p>Prestrud's Cairn, Scott Nunataks, Alexandra Mountains, Edward VII Peninsula. The small rock cairn was erected at the foot of the main bluff on the north side of the nunataks by Lieutenant K. Prestrud on 3 December 1911 during the Norwegian Antarctic Expedition of 1910-1912.</p> <p>Original proposing Parties: New Zealand/ Norway/ UK Parties undertaking management: New Zealand/Norway</p>	77°11'S, 154°32'W	Measure 4 (1995)

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No	Description	Location	Designation/ Amendment
67.	<p>Rock shelter, 'Granite House', Cape Geology, Granite Harbour. This shelter was constructed in 1911 for use as a field kitchen by Griffith Taylor's second geological excursion during the British Antarctic Expedition of 1910-1913. It was enclosed on three sides with granite boulder walls and used a sledge to support a seal-skin roof. The stone walls of the shelter have partially collapsed. The shelter contains corroded remnants of tins, a seal skin and some cord. The sledge is now located 50 m seaward of the shelter and consists of a few scattered pieces of wood, straps and buckles.</p> <p>Site incorporated within ASPA 154</p> <p>Original proposing Parties: New Zealand/Norway/UK Parties undertaking management: New Zealand/UK</p>	77°00'S, 162°32'E	Measure 4 (1995)
68.	<p>Site of depot at Hells Gate Moraine, Inexpressible Island, Terra Nova Bay. This emergency depot consisted of a sledge loaded with supplies and equipment which was placed on 25 January 1913 by the British Antarctic Expedition, 1910-1913. The sledge and supplies were removed in 1994 in order to stabilize their deteriorating condition.</p> <p>Original proposing Parties: New Zealand/Norway/UK Parties undertaking management: New Zealand/UK</p>	74°52'S, 163°50'E	Measure 4 (1995)
69.	<p>Message post at Cape Crozier, Ross Island, erected on 22 January 1902 by Captain Robert F. Scott's <i>Discovery</i> Expedition of 1901-04. It was to provide information for the expedition's relief ships, and held a metal message cylinder, which has since been removed.</p> <p>Site incorporated within ASPA 124</p> <p>Original proposing Parties: New Zealand/Norway/UK Parties undertaking management: New Zealand/UK</p>	77°27'S, 169°16'E	Measure 4 (1995)
70.	<p>Message post at Cape Wadworth, Coulman Island. A metal cylinder nailed to a red pole 8 m above sea level placed by Captain Robert F. Scott on 15 January 1902. He painted the rocks behind the post red and white to make it more conspicuous.</p> <p>Original proposing Parties: New Zealand/Norway/UK Parties undertaking management: New Zealand/UK</p>	73°19'S, 169°47'E	Measure 4 (1995)

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No	Description	Location	Designation/ Amendment
71.	<p>Whalers Bay, Deception Island, South Shetland Islands. The site comprises all pre-1970 remains on the shore of Whalers Bay, including those from the early whaling period (1906-12) initiated by Captain Adolphus Andresen of the Sociedad Ballenera de Magallanes, Chile; the remains of the Norwegian Hektor Whaling Station established in 1912 and all artefacts associated with its operation until 1931; the site of a cemetery with 35 burials and a memorial to ten men lost at sea; and the remains from the period of British scientific and mapping activity (1944-1969). The site also acknowledges and commemorates the historic value of other events that occurred there, from which nothing remains.</p> <p>Original proposing Parties: Chile/ Norway Parties undertaking management: Chile/Norway/UK</p>	62°59'S, 60°34'W	Measure 4 (1995)
72.	<p>Mikkelsen Cairn, Tryne Islands, Vestfold Hills. A rock cairn and a wooden mast erected by the landing party led by Captain Klarius Mikkelsen of the Norwegian whaling ship <i>Thorshavn</i> and including Caroline Mikkelsen, Captain Mikkelsen's wife, the first woman to set foot on East Antarctica. The cairn was discovered by Australian National Antarctic Research Expedition field parties in 1957 and again in 1995.</p> <p>Original proposing Parties: Australia/Norway Parties undertaking management: Australia/Norway</p>	68°22'S 78°24'E	Measure 2 (1996)
73.	<p>Memorial Cross for the 1979 Mount Erebus crash victims, Lewis Bay, Ross Island. A cross of stainless steel which was erected in January 1987 on a rocky promontory three kilometers from the Mount Erebus crash site in memory of the 257 people of different nationalities who lost their lives when the aircraft in which they were travelling crashed into the lower slopes of Mount Erebus, Ross Island. The cross was erected as a mark of respect and in remembrance of those who died in the tragedy.</p> <p>Original proposing Party: New Zealand Party undertaking management: New Zealand</p>	77°25'S, 167°27'E	Measure 4 (1997)
74.	<p>The un-named cove on the south-west coast of Elephant Island, including the foreshore and the intertidal area, in which the wreckage of a large wooden sailing vessel is located.</p> <p>Original proposing Party: UK Party undertaking management: UK</p>	61°14'S, 55°22'W	Measure 2 (1998)
75.	<p>The A Hut of Scott Base, being the only existing Trans Antarctic Expedition 1956/1957 building in Antarctica sited at Pram Point, Ross Island, Ross Sea Region, Antarctica.</p> <p>Original proposing Party: New Zealand Party undertaking management: New Zealand</p>	77°51'S, 166°46'E	Measure 1 (2001)

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No	Description	Location	Designation/ Amendment
76.	<p>The ruins of the Base Pedro Aguirre Cerda Station, being a Chilean meteorological and volcanological center situated at Pendulum Cove, Deception Island, Antarctica, that was destroyed by volcanic eruptions in 1967 and 1969.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	62°59'S, 60°40'W	Measure 2 (2001)
77.	<p>Cape Denison, Commonwealth Bay, George V Land, including Boat Harbour and the historic artefacts contained within its waters. This Site is contained within ASMA No 3, designated by Measure 1 (2004). Part of this site is also contained within ASPA No 162, designated by Measure 2 (2004).</p> <p>Original proposing Party: Australia Party undertaking management: Australia</p>	67°00'30"S, 142°39'40"E	Measure 3 (2004)
78.	<p>Memorial plaque at India Point, Humboldt Mountains, Wohlthat Massif, central Dronning Maud Land erected in memory of three scientists of the Geological Survey of India (GSI) and a communication technician from the Indian Navy - all members of the ninth Indian Expedition to Antarctica, who sacrificed their lives in this mountain camp in an accident on 8th January 1990.</p> <p>Original proposing Party: India Party undertaking management: India</p>	71°45'08"S, 11°12'30"E	Measure 3 (2004)
79.	<p>Lillie Marleen Hut, Mt. Dockery, Everett Range, Northern Victoria Land.</p> <p>The hut was erected to support the work of the German Antarctic Northern Victoria Land Expedition (GANOVEX I) of 1979/1980. The hut, a bivouac container made of prefabricated fiberglass units insulated with polyurethane foam, was named after the Lillie Glacier and the song "Lillie Marleen". The hut is closely associated with the dramatic sinking of the expedition ship "Gotland II" during GANOVEX II in December 1981.</p> <p>Original proposing Party: Germany Party undertaking management: Germany</p>	71°12'S, 164°31'E	Measure 5 (2005)
80.	<p>Amundsen's Tent. The tent was erected at 90° by the Norwegian group of explorers led by Roald Amundsen on their arrival at the South Pole on 14 December 1911. The tent is currently buried underneath the snow and ice in the vicinity of the South Pole.</p> <p>Original proposing Party: Norway Party undertaking management: Norway</p>	90°S	Measure 5 (2005)

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No	Description	Location	Designation/ Amendment
81.	<p>Rocher du Débarquement (Landing Rock), being a small island where Admiral Dumont D'Urville and his crew landed on 21 January 1840 when he discovered Terre Adélie.</p> <p>Original proposing Party: France Party undertaking management: France</p>	66°36.30'S, 140°03.85'E	Measure 3 (2006)
82.	<p>Monument to the Antarctic Treaty and Plaque. This Monument is located near the Frei, Bellingshausen and Escudero bases, Fildes Peninsula, King George Island. The plaque at the foot of the monument commemorates the signatories of the Antarctic Treaty. This Monument has 4 plaques in the official languages of the Antarctic Treaty. The plaques were installed in February 2011 and read as follows: "This historic monument, dedicated to the memory of the signatories of the Antarctic Treaty, Washington D.C., 1959, is also a reminder of the legacy of the First and Second International Polar Years (1882-1883 and 1932-1933) and of the International Geophysical Year (1957-1958) that preceded the Antarctic Treaty, and recalls the heritage of International Cooperation that led to the International Polar Year 2007-2008". This monument was designed and built by the American Joseph W. Pearson, who offered it to Chile. It was unveiled in 1999, on the occasion of the 40th anniversary of the signature of the Antarctic Treaty.</p> <p>Original proposing Party: Chile Party undertaking management: Chile</p>	62°12'01"S; 58°57'41"W	Measure 3 (2007) Measure 11 (2011)
83.	<p>Base "W", Detaille Island, Lallemand Fjord, Loubert Coast. Base "W" is situated on a narrow isthmus at the northern end of Detaille Island, Lallemand Fjord, Loubert Coast. The site consists of a hut and a range of associated structures and outbuildings including a small emergency storage building, bitch and pup pens, anemometer tower and two standard tubular steel radio masts (one to the south west of the main hut and the other to the east). Base "W" was established in 1956 as a British science base primarily for survey, geology and meteorology and to contribute to the IGY in 1957. As a relatively unaltered base from the late 1950s, Base "W" provides an important reminder of the science and living conditions that existed when the Antarctic Treaty was signed 50 years ago.</p> <p>Original proposing Party: UK Party undertaking management: UK</p>	66°52'S; 66°48'W	Measure 14 (2009)
84.	<p>Hut at Damoy Point, Dorian Bay, Wiencke Island, Palmer Archipelago. The site consists of a well- preserved hut and the scientific equipment and other artefacts inside it. It is located at Damoy Point on Dorian Bay, Wiencke Island, Palmer Archipelago. The hut was erected in 1973 and used for a number of years as a British summer air facility and transit station for scientific personnel. It was last occupied in 1993.</p> <p>Original proposing Party: UK Party undertaking management: UK</p>	64°49'S; 63°31'W	Measure 14 (2009)

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No	Description	Location	Designation/ Amendment
85.	<p>Plaque Commemorating the PM-3A Nuclear Power Plant at McMurdo Station. The plaque is approximately 18 x 24 inches, made of bronze and secured to a large vertical rock at McMurdo Station, the former site of the PM-3A nuclear power reactor. It is approximately half way up the west side of Observation Hill. The plaque text details achievements of PM-3A, Antarctica's first nuclear power plant.</p> <p>Original proposing Party: USA Party Undertaking Management: USA</p>	77°51'S, 166°41'E	Measure 15 (2010)
86.	<p>No 1 Building at Great Wall Station. The No 1 Building, built in 1985 with a total floor space of 175 square meters, is located at the centre of the Chinese Antarctic Great Wall Station which is situated in Fildes Peninsula, King George Island, South Shetlands, West Antarctica. The Building marked the commencement of China devoting to Antarctic research in the 1980s, and thus it is of great significance in commemorating China's Antarctic expedition.</p> <p>Original proposing Party: China Party undertaking management: China</p>	62°13'4"S, 58°57'44"W	Measure 12 (2011)
87.	<p>Location of the first permanently occupied German Antarctic research station "Georg Forster" at the Schirmacher Oasis, Dronning Maud Land. The original site is situated by the Schirmacher Oasis and marked by a commemorative bronze plaque with the label in German language:</p> <p style="text-align: center;">Antarktisstation Georg Forster 70° 46' 39" S 11° 51' 03" E von 1976 bis 1996</p> <p>The plaque is well preserved and affixed to a rock wall at the southern edge of the location. This Antarctic research station was opened on 21 April 1976 and closed down in 1993. The entire site has been completely cleaned up after the dismantling of the station was successfully terminated on 12 February 1996. The site is located about 1.5 km east of the current Russian Antarctic research station Novolazarevskaya.</p> <p>Original proposing Party: Germany Party undertaking management: Germany</p>	70°46'39"S, 11°51'03"E Elevation: 141 m above sea level	Measure 18 (2013)
88.	<p>Professor Kudryashov's Drilling Complex Building. The drilling complex building was constructed in the summer season of 1983-84. Under the leadership of Professor Boris Kudryashov, ancient mainland ice samples were obtained.</p> <p>Original proposing Party: Russian Federation Party undertaking management: Russian Federation</p>	78°28'S, 106°48'E Height above sea level 3,488 m.	Measure 19 (2013)

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No	Description	Location	Designation/ Amendment
89.	<p>Terra Nova Expedition 1910-12, Upper “Summit Camp” used during survey of Mount Erebus in December 1912. Camp Site location includes part of a circle of rocks, which were likely used to weight the tent valences. The camp site was used by a science party on Captain Scott’s Terra Nova Expedition, who undertook mapping and collected geological specimens on Mount Erebus in December 1912.</p> <p>Original proposing Parties: UK, New Zealand and USA Parties undertaking management: UK, New Zealand and USA</p>	<p>77°30.348’S, 167°10.223’E</p> <p>Circa 3,410 m above sea level</p>	Measure 20 (2013)
90.	<p>Terra Nova Expedition 1910-12, Lower “Camp E” Site used during survey of Mount Erebus in December 1912. Camp Site location consists of a slightly elevated area of gravel and includes some aligned rocks, which may have been used to weight the tent valences. The camp site was used by a science party on Captain Scott’s Terra Nova Expedition, who undertook mapping and collected geological specimens on Mount Erebus in December 1912.</p> <p>Original proposing Parties: UK, New Zealand and USA Parties undertaking management: UK, New Zealand and USA</p>	<p>77°30.348’S, 167°9.246’E</p> <p>Circa 3,410 m above sea level</p>	Measure 21 (2013)
91.	<p>Lame Dog Hut at the Bulgarian base St. Kliment Ohridski, Livingston Island.</p> <p>The Lame Dog Hut was erected in April 1988, and had been the main building of St. Kliment Ohridski base until 1998. It is presently the oldest preserved building on Livingston Island, used as radio shack and post office, and hosting a museum exhibition of associated artefacts from the early Bulgarian science and logistic operations in Antarctica.</p> <p>Original proposing Party: Bulgaria Party undertaking management: Bulgaria</p>	<p>62°38’29” S, 60°21’53”W</p>	Measure 19 (2015)
92.	<p>Oversnow heavy tractor “Kharkovchanka” that was used in Antarctica from 1959 to 2010.</p> <p>The oversnow heavy tractor “Kharkovchanka” was designed and produced at the Malyshev Transport Machine-Building Plant in Kharkov specially for organizing inland sledge-tractor traverses in Antarctica. This was the first non-serial transport vehicle of the Soviet machine- building produced exclusively for operations in Antarctica. This tractor was not used outside Antarctica. Thus, the STT “Kharkovchanka” is a unique historical sample of engineering- technical developments made for exploration of Antarctica.</p> <p>Original proposing Party: the Russian Federation Party undertaking management: the Russian Federation</p>	<p>69°22’41,0”S, 76°22’59,1”E.</p>	Measure 19 (2015)

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No	Description	Location	Designation/ Amendment
93.	<p><i>Endurance</i>, Wreck of the vessel owned and used by Sir Ernest Shackleton during his 1914-15 Trans-Antarctic Expedition.</p> <p>Wreck of the vessel <i>Endurance</i>, including all artefacts contained within or formerly contained within the ship, which may be lying on the seabed in or near the wreck within a 150m radius. This includes all fixtures and fittings associated with the ship, including ship's wheel, bell, etc. The designation also includes all items of personal possessions left on the ship by the ship's company at the time of its sinking.</p> <p>Location records made by Frank Worsley, Shackleton's skipper and master navigator give precise coordinates of the location of sinking of the ship but these have not been verified since 1915, We know the wreck is somewhere on the seabed in the Weddell Sea. It is proposed to designate the wreck and all artefacts contained within or formerly contained within the ship, which may be lying on the seabed in or near the wreck.</p> <p>Original proposing Party: UK Party undertaking management: UK</p>	<p>The exact location of the wreck is unknown as the ship floated in the pack ice for some distance.</p>	<p>Measure 12 (2019)</p>
94.	<p>C.A. Larsen Multiexpedition cairn.</p> <p>The site consists of a rock cairn installed in 1892 by Norwegian Capt. Carl Anton Larsen during the first land-exploration of the area around the current location of the Argentina's Marambio Station, where the first Antarctic fossil discoveries were made. The cairn used to have an attached wooden pole (2m high and 5cm diameter) of which nothing remains.</p> <p>Location: northeast of the Argentine Station Marambio, Antarctic Peninsula.</p> <p>Original proposing Party: Argentina, Norway, Sweden and UK Party undertaking management: Argentina, Norway, Sweden and UK</p>	<p>64°14'13.06"S, 56°35'7.50"W</p>	<p>Measure 12 (2019)</p>

2. Decisions

Redesign of the Format of the List of Historic Sites and Monuments

The Representatives,

Recalling the requirements of Article 8 of Annex V to the Protocol on Environmental Protection to the Antarctic Treaty to maintain a list of current Historic Sites and Monuments (“HSM”), and that such sites “shall not be damaged, removed or destroyed”;

Recalling

- Measure 9 (2016), which revised and updated the List of HSM;
- Resolution 2 (2018) on the Guidelines for the assessment and management of Heritage in Antarctica;
- Resolution 3 (2018) on the Revised Guide to the presentation of Working Papers containing proposals for Antarctic Specially Protected Areas, Antarctic Specially Managed Areas or Historic Sites and Monuments;

Decide:

1. to incorporate the following new fields of information, in addition to the existing fields of “No”, “Description”, “Location” and “Designation/Amendment”, to the List of HSM:
 - a. Name;
 - b. Type;
 - c. Conservation status;
 - d. Description of the historical context;
 - e. Applicable criteria in accordance with Resolution 3 (2009);
 - f. Management tools;

- g. Photos;
 - h. Physical features of the environment and cultural and local context;
2. to invite the Parties to provide information for these new fields about the HSM in respect of which they have undertaken management with the aim of providing as much information as possible;
 3. to ask the Secretariat of the Antarctic Treaty (“the Secretariat”) to create an online forum on the Committee on Environmental Protection (“CEP”) discussion forum where Parties undertaking management can share information relevant to an HSM to facilitate the drafting of a Working Paper by the relevant Parties for ATCM XLIII presenting a list of the HSM incorporating the new fields of information;
 4. to update the revised List of HSM attached to Measure 12 (2019) in order to incorporate the new fields of information after ATCM XLIII so as to allow the Parties sufficient time to provide the new information; and
 5. to request the Secretariat to modify, after ATCM XLIII, the information fields of the List of HSM on its webpage, including geographical co-ordinates of the HSM and other resources that it may develop.

Notification by the Consultative Parties of the list of Observers under Article VII of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection to the Antarctic Treaty through the Secretariat of the Antarctic Treaty

The Representatives,

Recalling that Article VII of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection to the Antarctic Treaty provide that the Antarctic Treaty Consultative Parties shall inform the other Consultative Parties of the designation of observers to carry out inspections;

Bearing in mind that since the entry into force of the Antarctic Treaty and the subsequent creation of the Secretariat of the Antarctic Treaty (“the Secretariat”), new and more efficient ways of sending and exchanging information have been developed, such as the circulars that the Secretariat sends to the Contracting Parties via electronic mail;

Recalling in this regard Article 2.2 (c) of Measure 1 (2003);

Considering that the preservation and distribution of information constitutes one of the principal functions of the Secretariat;

Decide:

1. the communication of the names of designated observers and the notice of termination of their appointment through the Secretariat of the Antarctic Treaty (“the Secretariat”) is considered to be a suitable and adequate means of communication in conformity with Article VII (1) of the Antarctic Treaty and Article 14 of the Protocol on Environmental Protection to the Antarctic Treaty;

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2. in addition, this information may, but need not, also be communicated to each of the Consultative Parties via the traditional diplomatic channels;
3. once such information has been received, the Secretariat shall immediately notify all of the Consultative Parties via a circular sent through electronic mail;
4. the Secretariat shall include all information provided in communications identified in paragraph 1 of this Decision on the restricted section of its website; and
5. Decision 7 (2013) be revoked.

Secretariat Report, Programme and Budget

The Representatives,

Recalling Measure 1 (2003) on the establishment of the Secretariat of the Antarctic Treaty (“the Secretariat”);

Recalling Decision 2 (2012) on the establishment of the open-ended Intersessional Contact Group (“ICG”) on Financial Issues to be convened by the host country of the next Antarctic Treaty Consultative Meeting (“ATCM”);

Bearing in mind the Financial Regulations for the Secretariat of the Antarctic Treaty annexed to Decision 4 (2003);

Decide:

1. to approve the audited Financial Report for 2017/2018 annexed to this Decision (Annex 1);
2. to take note of the Secretariat Report 2018/2019, which includes the Provisional Financial Report for 2018/2019, annexed to this Decision (Annex 2);
3. to take note of the Five Year Forward Budget Profile 2020/2021-2024/2025 and approve the Secretariat Programme 2019/2020, including the Budget for 2019/2020, annexed to this Decision (Annex 3);
4. to direct the Secretariat to establish an Involuntary Separation from Service Fund in accordance with the provisions of Regulation 6.2 (d) of the Financial Regulations for the Secretariat of the Antarctic Treaty, to be used to defray the expenses to be paid according to Rule 10.5 of the Staff Regulations for the Secretariat of the Antarctic Treaty adopted by Decision 4 (2019) in case of an involuntary separation from service of a general staff member; and
5. to invite the host country for the next ATCM to request that the Executive Secretary open the ATCM forum for the open-ended ICG on Financial Issues and provide assistance to it.

Audited Financial Report for 2017/2018

OPINION OF THE AUDITOR

Executive Secretary
of the Antarctic Treaty Secretariat
Maipu 757, 4th floor
CUIT 30-70892567 1

Re: ATCM XLII - CEP XXII Antarctic Treaty Consultative Meeting, 2019 -
Prague, Czech Republic

1. Report on Financial Statements

We have audited the attached Financial Statements of the Antarctic Treaty Secretariat, which include the following: Statement of Income and Expenditure, Statement of Financial Position, Statement of Equity, Cash Flow Statement and Explanatory Notes for the financial period commencing 1st April 2017 and ending 31st March 2018.

2. Management Responsibility for Financial Statements

The Antarctic Treaty Secretariat, constituted under Argentine Act No 25.888 of 14th May 2004, is responsible for the preparation and reasonable presentation of the attached financial statements according to methods of accounting based on cash movements in accordance with International Accounting Standards and the specific Standards for Antarctic Treaty Consultative Meetings. Such responsibility includes: designing, implementing and maintaining internal controls for the preparation and presentation of the Financial Statements such that they are free of misstatements, due to error or fraud, selecting and implementing appropriate accounting policies, and preparing accounting estimates which are reasonable under the circumstances.

3. Auditor's Responsibility

Our responsibility is to express an opinion on these Financial Statements based on our audit.

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The audit was conducted in accordance with International Auditing Standards and the Annex to Decision 3 (2012) of the XXXI Antarctic Treaty Consultative Meeting, which describes the tasks to be carried out by the external auditor.

These standards require compliance with ethical requirements, and planning and execution of the audit so as to provide reasonable assurance that the Financial Statements are free of material errors.

An audit includes the execution of procedures in order to obtain evidence of the amounts and the exposure reflected in the Financial Statements. The procedures selected depend on the auditor's judgement, including an assessment of the risks of material errors in the Financial Statements.

In conducting such a risk assessment, the auditor considers the internal control relevant to the preparation and reasonable presentation of the Financial Statements by the organisation, in order to design suitable procedures that are appropriate to the circumstances.

An audit also includes an assessment of appropriateness of the accounting principles used, an opinion on whether the accounting estimates made by management are reasonable, as well as an assessment of the general presentation of the Financial Statements.

We believe that the audited evidence we have obtained is sufficient and appropriate to provide a basis for our opinion as auditors.

4. Opinion

In our opinion, the attached Financial Statements of the Antarctic Treaty Secretariat corresponding to the financial period ending 31st March 2018 have been prepared, in all material aspects, in accordance with International Accounting Standards, the specific standards for Antarctic Treaty Consultative Meetings, and methods of accounting based on cash flow.

5. Other Matters

The information contained in Note 1 to the attached financial statements, indicates that they were prepared by the Antarctic Treaty Secretariat following the guidelines established in the Financial Regulations, Annexed to Decision 4 (2003), which differ in certain aspects of valuation and presentation from the professional accounting standards in force in the Autonomous City of Buenos Aires, Argentina.

6. Additional Information Required by Law

Pursuant to the analysis described in point 3, I report that the above-mentioned Financial Statements are based on accounting records that are not transcribed into books in accordance with current Argentine standards.

We also report that, according to the accounting entries as at 31st March 2018, the liabilities accrued in favour of the Argentine Single Social Security System in Argentine pesos and pursuant to settlements made by the Secretariat amounting to \$337,738.67 (US\$ 16,515.38), there was no debt due and payable in Argentine pesos as at that date.

It is worth noting that labour relations are governed by Antarctic Treaty Secretariat Staff Regulations.

Autonomous City of Buenos Aires, 21st March 2019

SINDICATURA GENERAL DE LA NACIÓN

Dr. ALEJANDRO FABIÁN DÍAZ
CONTADOR PÚBLICO (UBA)
C.P.C.E.C.A.B.A. T 194 F 224

ATCM XLII Final Report

1 Statement of Income and Expenditure for All Funds for the Period 1st April 2017 to 31st March 2018 and compared with the previous year.

INCOME	Budget		
	31/03/2017	31/03/2018	31/03/2018
Contributions (Note 9)	1,378,097	1,378,097	1,378,097
General fund (Note 1.10)	0	50,000	0
Other income (Note 2)	59,182	3,000	3,025
Total income	1,437,279	1,431,097	1,381,122
EXPENDITURE			
Salaries and wages	699,021	736,288	723,347
Translation and Interpretation Services	302,260	316,388	326,826
Travel and accommodation	70,972	103,000	109,682
Information technology	38,569	47,750	44,618
Printing, editing and copying	16,650	25,705	19,265
General services	77,443	46,164	44,539
Communications	17,890	20,995	17,997
Office expenses	18,138	20,952	15,415
Administration	9,307	17,620	10,178
Representation expenses	4,473	4,000	6,234
Financing	7,881	12,249	17,168
Total expenses	1,262,603	1,351,111	1,335,268
FUND APPROPRIATION			
Staff termination fund	31,419	29,986	29,948
Staff replacement fund	-	50,000	-
Working capital fund	-	-	-
Contingency fund	-	-	-
Total fund appropriation	31,419	79,986	29,948
Total expenditure and appropriation	1,294,022	1,431,097	1,365,216
Surplus from the period	143,257	-	15,906

This statement should be read together with the accompanying Notes 1 to 9

Annex 1: Audited Financial Report for 2017/2018

2. Financial Situation Status as at 31 March 2018, and in comparison with the previous financial year

ASSETS	<u>31/03/2017</u>	<u>31/03/2018</u>
Current assets		
Cash and cash equivalent (Note 3)	1,462,262	1,336,701
Contributions owed (Note 9)	40,649	79,508
Other debtors (Note 4)	32,800	37,084
Other current assets (Note 5)	115,523	96,363
Total current assets	1,651,235	1,549,655
Non-current assets		
Fixed assets (Note 1.3 and 6)	89,397	79,323
Total non-current assets	89,397	79,323
Total Assets	1,740,632	1,628,979
 LIABILITIES		
Current liabilities		
Accounts payable (Note 7)	25,358	55,814
Contributions received in advance (Note 9)	376,722	339,217
Special voluntary fund for specific purposes (Note 1.9)	22,889	52,883
Remuneration and contributions payable (Note 8)	29,511	24,479
Total current liabilities	454,480	472,394
Non-current liabilities		
Staff Termination Fund (Note 1.4)	271,600	174,065
Staff Replacement Fund (Note 1.5)	50,000	50,000
Contingency fund (Note 1.6)	30,000	30,000
Fixed assets replacement fund (Note 1.7)	23,101	13,027
Total non-current liabilities	374,701	267,092
Total Liabilities	829,181	739,486
NET ASSETS	911,451	889,493

This statement should be read together with the accompanying Notes 1 to 9

3. Statement of changes in Net Assets as at 31st March 2017 and 2018

Represented by	<u>Net assets</u> <u>31/03/2017</u>	<u>Income</u>	<u>Expenditure and</u> <u>Appropriation</u>	<u>Others</u> <u>income</u>	<u>Net assets</u> <u>31/03/2018</u>
General Fund	681,499	1,378,097	-1,365,216	3,025	
- covering replacement fund (Note 1.10)			-37,851		659,541
Working capital fund (Note 1.8)	229,952		-		229,952
Net assets	911,451				889,493

This statement should be read together with the accompanying Notes 1 to 9

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4 Cash flow statement for the period 1st April 2017 to 31st March 2018 and compared to the previous financial year.

Variations in cash and cash equivalents	<u>31/03/2018</u>	<u>31/03/2017</u>
Cash and cash equivalent at the beginning of the financial year	1,462,262	1,227,598
Cash and cash equivalents at year end	1,336,701	1,462,262
Net increase in cash and cash equivalents	-125,562	234,664
Causes of the variations in cash and cash equivalents		
Operating activities		
Contributions received	962,512	1,086,686
Payment of salaries	-732,347	-746,795
Payment of translation services	-289,051	-302,260
Payment of travel, accommodation, etc.	-89,085	-71,148
Printing, editing and copying payment	-19,265	-16,650
General services payment	-42,615	-30,855
Other payments to providers	-81,464	-57,077
Net cash and cash equivalents from operating activities	-291,315	-138,099
Investment activities		
Purchase of fixed assets	-12,425	-35,921
Net cash and cash equivalents from investment activities	-12,425	-35,921
Financing activities		
Contributions received in advance	339,217	376,722
Payment of severance and replacement expenditure	-165,333	0
Preparation for ATCM XLI	-48,760	0
Collection pt. 5.6 of Staff Regulations	162,860	182,980
Payment pt. 5.6 of Staff Regulations	-171,139	-162,698
Net advance rent	44,257	29,966
Net AFIP movement	25,681	-15,951
Miscellaneous income	8,563	5,516
Net cash and cash equivalents from financing activities	195,346	416,535
Foreign currency activities		
Net loss	-17,168	-7,852
Net cash and cash equivalents from foreign currency activities	-17,168	-7,852
Net increase in cash and cash equivalents	-125,562	234,664

This statement should be read together with the accompanying Notes 1 to 9

NOTES to the FINANCIAL STATEMENTS as of 31st MARCH 2017 and 2018

1 BASIS FOR PREPARATION OF FINANCIAL STATEMENTS

These financial statements are expressed in US dollars, pursuant to the guidelines established in the Financial Regulations, Annex to Decision 4 (2003). These statements were prepared in accordance with the International Financial Reporting Standards (IFRS) of the International Accounting Standards Board (IASB). The accounting method used is accrual-based.

1.1 Historical Cost

The accounts are prepared in accordance with the historical cost rule, except where otherwise indicated.

1.2 Premises

The Secretariat Offices are provided by the Ministry of Foreign Affairs, International Trade and Worship of the Argentine Republic. Their use is free of rent and common costs.

1.3 Fixed Assets

All items are valued at historical cost, less accumulated depreciation. Depreciation is calculated on a straight-line basis at annual rates appropriate to their estimated useful life. The aggregate residual value of fixed assets does not exceed their economic utilisation value.

1.4 Staff Termination Fund

Pursuant to article 10.4 of the Staff Regulations, the fund shall be sufficiently funded to compensate executive staff members at a rate of one month base pay for each year of service.

1.5 Staff Replacement Fund

This fund is used to cover Secretariat executive staff travel expenses to and from Secretariat Head Office.

1.6 Contingency Fund

In accordance with Decision 4 (2009), this Fund was created to pay for translation expenses that may arise from an unexpected increase in the number of documents submitted before the ATCM for translation.

1.7 Fixed Assets Replacement Fund

Pursuant to the IAS, assets with a useful life of more than one financial year shall be reflected as an asset in the Statement of Financial Position. Up to March 2010, the balancing entry was an adjustment to the General Fund. As from April 2010, the balancing entry of these assets will be shown in the liability under such item.

1.8 Working capital fund

Pursuant to article 6.2 (a) of the Financial Regulations, the fund not exceed one-sixth (1/6) of the budget for the current financial year. In the current financial year, this fund was unallocated.

1.9 Special voluntary fund for specific purposes

Pt (82) of the XXXV ATCM Final Report, to receive voluntary contributions by the parties. The voluntary fund is money to pay for rent and common costs for the fiscal year.

1.10 General Fund

This Fund was established in order to account for the Secretariat's income and expenditure. With the aim of increasing the amount of the Replacement Fund to \$50,000 -Decision 1 (2009) ATCM-, \$37,851 from this fund was reclassified.

NOTES to the FINANCIAL STATEMENTS as of 31st MARCH 2017 and 2018

	<u>31/03/2017</u>	<u>31/03/2018</u>
2 Other Income		
Interest earned	4,786	2,651
Special contribution Chile (Note 1.10)	54,000	-
Discounts obtained	396	374
Total	59,182	3,025
3 Takings and cash equivalent		
Cash in dollars	2,125	1,983
Cash in Argentine pesos	153	271
BNA special dollar account	1,442,553	1,204,058
BNA Argentine peso account	17,431	130,389
Investments	-	-
Total	1,462,262	1,336,701
4 Other debtors		
Staff Regulations pt. 5.6	32,800	37,084
5 Other current assets		
Advance payments	44,293	56,586
VAT receivable	66,234	34,773
Other expenses to recover	4,995	5,004
Total	115,523	96,363
6 Fixed Assets		
Books and subscriptions	14,085	15,651
Office equipment	40,826	42,398
Furniture	50,971	50,971
Computer hardware and software	141,788	151,075
Total original cost	247,670	260,095
Accumulated depreciation	-158,272	-180,772
Total	89,397	79,323
7 Accounts payable		
Commercial	9,815	13,255
Accrued expenditure	11,267	52,138
Other	4,275	-9,579
Total	25,358	55,814
8 Payable remuneration and contributions		
Remuneration	9,001	0
Contributions	20,510	24,479
Total	29,511	24,479

NOTES to the FINANCIAL STATEMENTS as of 31st MARCH 2017 and 2018

9 Contributions due, committed, cancelled and received in advance.

Contributions Parties	Due 31/03/2017	Comm-itted	Cancelled \$	Due 31/03/2018	Anticipated 31/03/2018
Germany	13	52,217	52,218	12	-
Argentina		60,347	60,347	-	-
Australia	25	60,347	60,347	25	-
Belgium	50	40,021	40,021	50	-
Brazil	327	40,021	0	40,348	-
Bulgaria		33,923	33,923	-	-
Chile		46,119	46,119	-	-
China	25	46,119	46,094	50	46,144
Korea		40,021	40,021	-	40,021
Ecuador		33,923	33,923	-	-
Spain		46,119	46,119	-	-
United States of America	25	60,347	60,347	25	-
Finland		40,021	40,021	-	40,041
France	12	60,347	60,359	-	-
India	75	46,119	46,169	25	-
Italy		52,217	52,217	-	-
Japan		60,347	60,347	-	-
Norway		60,347	60,347	-	-
New Zealand	-15	60,347	60,322	10	60,347
Netherlands		46,119	46,099	20	-
Peru		33,923	19,117	14,806	-
Poland	25	40,021	40,046	-	-
Czech Republic		40,021	40,021	-	-
Russia		46,119	46,119	-	46,119
South Africa		46,119	46,119	-	46,119
Sweden		46,119	46,109	10	-
United Kingdom		60,347	60,347	-	60,347
Ukraine		40,021	15,894	24,127	-
Uruguay	40,087	40,021	80,108	-	79
Total	40,649	1,378,097	1,339,240	79,508	339,217

Albert Lluberias Bonaba
Executive Secretary

Roberto A. Fennell
Financial Manager

Provisional Financial Report for 2018/2019

Estimate of Income and Expenditure for all Funds for the Period 1 April 2018 to 31 March 2019

APPROPRIATION LINES	Audited Statement 2017/18	Budget 2018/19	Prov Statement 2018/19
INCOME			
CONTRIBUTIONS pledged	\$ 1,378,097	\$ 1,378,097	\$ 1,378,097
*) From General Fund	\$ -	\$ 129,038	\$ -
Voluntary contributions	\$ -	\$ -	\$ -
Other income	\$ 3,025	\$ 3,000	\$ 1,376
Total Income	\$ 1,381,122	\$ 1,510,135	\$ 1,379,473
EXPENSES			
SALARIES			
Executive	\$ 326,637	\$ 321,841	\$ 321,841
General staff	\$ 358,960	\$ 373,143	\$ 375,949
ATCM support staff	\$ 20,743	\$ 9,932	\$ 9,014
Trainee	\$ 800	\$ 9,600	\$ 1,800
Overtime	\$ 16,207	\$ 11,000	\$ 10,601
Total Salaries	\$ 723,347	\$ 725,516	\$ 719,205
TRANSLATION AND INTERPRETATION			
Translation and interpretation	\$ 326,826	\$ 175,000	\$ 211,318
TRAVEL			
Travel, lodging, allowance, misc.	\$ 109,682	\$ 61,300	\$ 32,736
INFORMATION TECHNOLOGY			
Hardware	\$ 9,287	\$ 10,000	\$ 6,919
Software	\$ 1,197	\$ 3,000	\$ 1,446
Development	\$ 24,291	\$ 31,500	\$ 30,279
Hardware & software maintenance	\$ 2,634	\$ 2,250	\$ 2,024
Support	\$ 7,209	\$ 9,000	\$ 5,844
Total Information Technology	\$ 44,618	\$ 55,750	\$ 46,512
PRINTING, EDITING & COPYING			
Final Report	\$ 17,293	\$ 19,000	\$ 9,784
Other publications	\$ 1,972	\$ 5,000	\$ 3,332
Total Printing Editing & Copying	\$ 19,265	\$ 24,000	\$ 13,116
GENERAL SERVICES			
Legal advice & counselling	\$ 1,246	\$ 2,500	\$ 3,116
External audit	\$ 14,897	\$ 13,000	\$ 20,260
Payroll services	\$ -	\$ -	\$ -
Rapporteur services	\$ -	\$ -	\$ -
Cleaning, maintenance & security	\$ 8,905	\$ 11,000	\$ 6,871
Training	\$ 7,394	\$ 5,000	\$ 3,857
Banking	\$ 9,541	\$ 7,000	\$ 6,432
Rental of equipment	\$ 2,556	\$ 2,503	\$ 2,503
Total General Services	\$ 44,539	\$ 41,003	\$ 43,039
COMMUNICATION			
Telephone	\$ 4,945	\$ 7,500	\$ 3,149
Internet	\$ 3,321	\$ 3,200	\$ 2,134
Web hosting	\$ 7,931	\$ 9,600	\$ 7,394
Postage	\$ 1,800	\$ 2,700	\$ 1,370
Total Communication	\$ 17,997	\$ 23,000	\$ 14,047

*) To cover expected deficit for organisation of ATCM 2018.

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	Audited Statement 2017/18	Budget 2018/19	Prov Statement 2018/19
OFFICE			
Stationery & consumables	\$ 6,041	\$ 4,885	\$ 2,072
Books & subscriptions	\$ 2,923	\$ 3,409	\$ 546
Insurance	\$ 3,793	\$ 4,413	\$ 3,984
Furniture	\$ -	\$ 1,280	\$ 1,225
Office equipment	\$ 2,659	\$ 4,544	\$ 1,814
Office improvement	\$ -	\$ 2,841	\$ -
Total Office	\$ 15,416	\$ 21,372	\$ 9,641
ADMINISTRATIVE			
Office supplies	\$ 2,345	\$ 5,113	\$ 2,577
Local transport	\$ 776	\$ 908	\$ 369
Utilities	\$ 4,729	\$ 7,407	\$ 4,280
Miscellaneous	\$ 2,328	\$ 4,544	\$ 2,667
Total Administrative	\$ 10,178	\$ 17,972	\$ 9,892
REPRESENTATION			
Representation	\$ 6,234	\$ 4,000	\$ 923
FINANCING			
Net exchange (gain)/loss	\$ 17,168	\$ 12,494	\$ 36,876
ATCM 2018			
Organisation	\$ -	\$ 321,700	\$ 230,925
SUBTOTAL EXPENSES	\$ 1,335,269	\$ 1,483,107	\$ 1,368,232
FUND APPROPRIATION			
Working Capital Fund	\$ -	\$ -	\$ -
Staff Replacement Fund	\$ -	\$ -	\$ -
Staff Termination Fund	\$ 29,948	\$ 27,028	\$ 30,052
Translation Contingency Fund	\$ -	\$ -	\$ -
Total Fund Appropriation	\$ 29,948	\$ 27,028	\$ 30,052
TOTAL EXPENSES & APPROPRIATIONS	\$ 1,365,217	\$ 1,510,135	\$ 1,398,284
** Surplus / (Deficit) for the period	\$ 15,906	\$ 0	\$ (18,811)

** Actual deficit due to the extraordinary cost for organisation of ATCM 2018, covered by the General Fund.

Annex 2: Provisional Financial Report for 2018/2019

FUNDS ACTIVITY

	Audited Statement 2017/18	Net Movements 2018/19	Prov Statement 2018/19
General Fund	\$ 659,541		
-deficit for the period: Prov. Statement 2018/19		\$ (18,811)	\$ 640,730
Working Capital Fund	\$ 229,952	\$ -	\$ 229,952
*** Staff Termination Fund	\$ 174,065		
-appropriation Prov. Statement 2018/19		\$ 30,052	\$ 204,117
*** Staff Replacement Fund	\$ 50,000	\$ -	\$ 50,000
**** Translation Contingency Fund	\$ 30,000	\$ -	\$ 30,000

FINANCIAL REGULATION 6.3

General Fund	\$ 659,541	\$ (18,811)	\$ 640,730
***** Unpaid Contributions	\$ (79,512)		\$ (80,476)
Cash Surplus	\$ 580,029		\$ 560,254

*** Decision 1 (2006)

**** Decision 4 (2009)

***** Unpaid contributions as of 31 March 2018 and 31 March 2019

Secretariat Programme 2019/2020

Introduction

This work programme outlines the activities proposed for the Secretariat in the Financial Year 2019/20 (1 April 2019 to 31 March 2020).

The programme and the accompanying budget figures for 2019/20 are based on the Forecast Budget for the Financial Year 2019/2020 (Decision 1 [2018], Annex 3).

The programme focuses on the Secretariat's regular activities, such as the preparation of the ATCM XLII and ATCM XLIII, the publication of Final Reports, tasks assigned to the Secretariat under Measure 1 (2003), and the various specific tasks requested by the latest ATCMs.

Contents:

1. ATCM/CEP support
2. Information Technology
3. Documentation and Public Information
4. Management
5. Financial Matters

Appendix 1: Provisional Statement for the Financial Year 2018/19, Budget for the Financial Year 2019/20, Forecast Budget for the Financial Year 2020/21

Appendix 2: Contribution Scale for the Financial Year 2020/21

Appendix 3: Salary Scale

1. ATCM/CEP Support

ATCM XLII

For the meeting in Prague the Secretariat will organise the services for translation and interpretation. It is responsible for pre- and post-sessional translation and for the T&I services during the ATCM, maintaining contact with the current provider of interpretation services, ONCALL.

The Secretariat has established a section of its website to make the documents available for delegates and to provide online registration for delegates to the meeting. The Secretariat will also provide delegates with a USB flash drive with documents submitted to this meeting and other relevant materials. An application in the drive allows offline browsing of all documents as well as automatic synchronisation with an online database that includes the latest updates.

ATCM XLII Final Report

The Secretariat will also organise the note-taking services during the meeting and is responsible for the compilation and editing of the Reports of the CEP Meeting and ATCM.

Meeting's Report and other publications

The Secretariat will translate, publish and distribute the ATCM XLII Final Report and its Annexes in the four Treaty languages pursuant to the Procedures for the Submission, Translation and Distribution of Documents for the ATCM and the CEP Meeting. The Final Report will be available on the Secretariat's website and hard copies will be distributed by courier and diplomatic channels. The book will also be available for purchase through online retailers.

The Secretariat will also publish the Rules of Procedure of the ATCM and the CEP, and other publications arising from decisions taken by ATCM XLII, as appropriate.

Support of intersessional activities

During recent years both the CEP and the ATCM have produced an important amount of intersessional work, mainly through Intersessional Contact Groups (ICGs). The Secretariat will provide technical support for the online establishment of the ICGs agreed at the ATCM XLII and CEP XXII and will produce specific documents if required by the ATCM or the CEP.

The Secretariat will update its website with the measures adopted by the ATCM and with the information produced by the CEP and the ATCM.

The Secretariat will also take part in monthly video calls coordinated by the CEP Chair to facilitate the intersessional work of the CEP and prepare for this CEP meeting.

Coordination and contact

Aside from maintaining constant contact via email, telephone and other means with the Parties and international institutions of the Antarctic Treaty System, attendance at meetings is an important tool to maintain coordination and communication.

The travelling to be undertaken is as follows:

- COMNAP XXXI 2019, to be held in Plovdiv, Bulgaria, in July 2019, participating at the COMNAP Annual General Meeting (AGM). Attendance to the meeting will provide an opportunity to further strengthen the relationship and interaction with COMNAP.
- CCAMLR, Hobart, Australia, from 21 October to 01 November 2019. The CCAMLR meeting, which takes place roughly halfway between succeeding ATCMs, provides an opportunity for the Secretariat to brief the ATCM Representatives, many of whom attend the CCAMLR meeting, on developments in the Secretariat's work. Liaison with the CCAMLR Secretariat is also important for the Antarctic Treaty Secretariat, as many of its regulations are modelled after those of the CCAMLR Secretariat.

- Coordination Meetings with Finland as Host Country of ATCM XLIII in Helsinki, tentatively in March 2020.

ATCM XLIII

The Government of Finland and the Secretariat of the Antarctic Treaty will jointly prepare ATCM XLIII, which will take place in Helsinki, Finland, in 2020.

The responsibilities of the Host Country Secretariat and the Antarctic Treaty Secretariat are clearly defined and described in the Organisational Manual, which is updated annually by the Antarctic Treaty Secretariat. The main tasks of the AT Secretariat at the meeting are document management, supervision of technical services, organisation of translation and interpretation services, and support for the compilation and publication of the Final Report. The host country is responsible for the organisation of the venue, the provision of technical services, the rapporteur services and the accompanying programme.

The Secretariat held preliminary contact with the Governments of France and Germany in relation to the organisation of ATCM XLIV and ATCM XLV.

2. Information Technology

Development of the Secretariat website

During the second half of 2019 the Secretariat will launch the new version of its website, which will include a complete redesign of the graphic interface, content restructuring, and new security features. Further details are included in SP 8 *The Secretariat Website*.

Mapping tools

The Secretariat will continue to explore the possibility of using the existing web-based geographical information platform presented at ATCM XLI for representing a variety of georeferenced content already existing in its databases. See SP 7 for the latest developments on this subject.

Upgrading of internal information storage and handling processes

The Secretariat will start a process of redefinition and centralisation of its internal information repositories and handling processes using Sharepoint 365 cloud technology. The aim of this project is to improve collaboration, data classification, access and retention, and information security.

Information Exchange and the Electronic Information Exchange System

The Secretariat will continue to assist Parties in posting their information exchange materials, as well as process information uploaded using the File Upload functionality. Additional Summarized Reports could be added on request by the ATCM.

3. Documentation and Public Information

Documents of the ATCM

The Secretariat will continue its efforts to complete its archive of the Final Reports and other records of the ATCM and other meetings of the Antarctic Treaty System in the four Treaty languages. Assistance from Parties in searching for their files will be essential in order to achieve a complete archive at the Secretariat. A detailed list of missing papers in our database is available to all delegations interested in collaborating.

Glossary

The Secretariat will continue to maintain the Secretariat's glossary of terms and expressions of the ATCM to generate a nomenclature in the four Treaty languages. The usefulness and evolution of this glossary depend mainly on the contributions of terms from interested Parties.

Antarctic Treaty database

The database of Recommendations, Measures, Decisions and Resolutions of the ATCM is at present complete in English and nearly complete in Spanish and French, although the Secretariat still lacks various Final Report copies in those languages. In Russian, further Final Reports are lacking. The Secretariat is willing at all times to incorporate any Final Reports or discussion documents from Consultative and Special Meetings that are still missing in our database.

Image Bank

The Secretariat will continue to incorporate to the image bank photographic material currently available in its archive. Likewise, we would like to invite Parties to provide the Secretariat with original photographic material to be published in the image bank under a Creative Commons license. We would especially appreciate receiving photographs corresponding to the first Antarctic Treaty Meetings.

Public Information

The Secretariat and its website will continue to function as a clearinghouse for information on the Parties' activities and relevant developments in Antarctica.

4. Management

Personnel

On 1 April 2019 the Secretariat staff consisted of the following personnel:

Annex 3: Secretariat Programme 2019/2020

<i>Position</i>	<i>Since</i>	<i>Rank</i>	<i>Step</i>	<i>Term</i>
<i>Executive staff</i>				
Executive Secretary (ES)	01-09-2017	E1	2	31-08-2021
Assistant Executive Secretary (AES)	01-01-2005	E3	15	15-07-2019
<i>General staff</i>				
Information Officer	01-11-2004	G1	6	
Information Technology Officer	01-02-2006	G1	6	
Finance Officer (part time)	01-12-2008	G2	6	
Editor	01-02-2006	G2	5	
IT specialist (part time)	01-02-2019	G3	1	
Communications Specialist (part time)	01-10-2010	G4	4	
Office Manager	15-11-2012	G4	4	
Cleaning Professional (part time)	01-07-2015	G7	4	

As announced in the Secretariat Report, Mr Acero will be replaced by Mr Wydler as Assistant Executive Secretary on 16 July 2019 and Ms Violeta Antinarelli retired from her position as Librarian on 31 Dec 2018. To replace those positions the Secretariat has appointed an IT Specialist (G3) and plans to appoint an additional general staff G2 position in August 2019. The number of employees of the Secretariat will remain the same, and since ranks and steps of newer staff are lower than those being replaced (G3-VI to G3-I and G1-VI to G2-I) there are no budgetary implications.

Due to the evolution of the requirements to support the ATCM and CEP since the creation of the ATS, the Executive Secretary considers that it would be important to start a review process of the descriptions of roles and responsibilities of the ATS staff, with the aim of keeping the ATS a small but dynamic, effective, robust and modern organisation.

To support the analysis of the organisational structure of the Secretariat and to make recommendations on the descriptions, requirements and effective performance of the job posts, an external consulting service would need to be hired. To this end, an internationally recognized consulting firm (PW&C) has been selected, requiring an investment of 12,500 US\$ for the development of this analysis during the current fiscal year, which would be extracted from the general fund without affecting the proposed annual budget.

5. Financial Matters

The Budget for the Financial Year 2019/20 and the Forecast Budget for the Financial Year 2020/21 are shown in Appendix 1.

Draft Budget for the Financial Year 2019/20

Allocation to the appropriation lines follows closely the proposed forecast from last year. Only smaller adjustments have been implemented according to the foreseen expenses in the Financial Year 2019/2020.

Salaries

The cost of living continued to rise in Argentina in the year 2019. The inflation rate (Índice de Precios al Consumidor) for 2019 published by INDEC (Instituto Nacional de Estadística y Censos de la República Argentina) was 47.6% but was compensated by a devaluation of the Argentine Peso against the US\$ of 49.15%. Therefore, the Executive Secretary proposes to maintain a zero percent increase to the salaries of the General Staff and the Executive Staff.

Regulation 5.10 of the Staff Regulations requires the compensation of General Staff members when they are required to work more than 40 hours per week. Overtime is requested during the ATCM.

With the termination of his contract the outgoing Assistant Executive Secretary will be entitled to receive the payment for staff termination under Regulation 10.4 of the ATCM Staff Regulations. At ATCM XXXIII (Punta del Este) 2010, “the ATCM agreed that Regulation 10.4 applied to all departures from service of executive staff, subject to the specific caveats set out in Regulation 10” (Final Report ATCM XXXIII, para. 100).

The salary scale is provided in Appendix 3.

Funds

Working Capital Fund

According to Financial Regulation 6.2 (a), the Working Capital Fund must be maintained at 1/6 of the Secretariat’s budget (currently 229,952 US\$).

Staff Termination Fund

The Staff Termination Fund will be credited with 25,359 US\$ in accordance with Staff Regulation 10.4 (see Appendix 1).

Staff Replacement Fund

Since both are Argentine residents, relocation costs will not be incurred for the outgoing or the incoming Assistant Executive Secretaries.

Forecast Programme for the Financial Year 2020/21

It is expected that most of the ongoing activities of the Secretariat will be continued in the Financial Year 2020/21, and therefore, unless the programme undergoes major changes, no major change in appropriation lines or the staff positions are foreseen.

The contributions for the Financial Year 2020/2021 will not rise. Appendix 2 shows the contribution scale for the Financial Year 2020/2021.

Five-year Forward Budget profile 2020/21 - 2024/25

Under reasonable assumptions the budget profile allows a zero-nominal increase in contributions until 2024/25 as explained in SP 6.

Appendix 1

Provisional Statement FY 2018/19, Forecast FY 2019/20,
Budget FY 2019/20 and Forecast FY 2020/21

APPROPRIATION LINES	Prov Statement 2018/19	Forecast 2019/20	Budget 2019/20	Forecast 2020/21
INCOME				
CONTRIBUTIONS pledged	\$ 1,378,097	\$ 1,378,097	\$ 1,378,097	\$ 1,378,097
From General Fund	\$ -	\$ -	\$ -	\$ -
*) Voluntary contributions	\$ -	\$ -	\$ 52,500	\$ -
Other income	\$ 1,376	\$ 3,000	\$ 3,000	\$ 3,500
Total income	\$ 1,379,473	\$ 1,381,097	\$ 1,433,597	\$ 1,381,597
EXPENSES				
SALARIES				
Executive	\$ 321,841	\$ 302,657	\$ 309,159	\$ 297,737
General staff	\$ 375,949	\$ 383,876	\$ 381,849	\$ 392,386
ATCM support staff	\$ 9,014	\$ 21,160	\$ 18,115	\$ 18,115
Trainee	\$ 1,800	\$ 9,600	\$ 4,800	\$ 4,800
Overtime	\$ 10,601	\$ 16,000	\$ 15,000	\$ 15,000
Total Salaries	\$ 719,205	\$ 733,293	\$ 728,923	\$ 728,038
TRANSLATION AND INTERPRETATION				
Translation and Interpretation	\$ 211,318	\$ 330,774	\$ 316,544	\$ 316,708
TRAVEL				
Travel, lodging, allowance, misc.	\$ 32,736	\$ 95,000	\$ 97,500	\$ 119,500
INFORMATION TECHNOLOGY				
Hardware	\$ 6,919	\$ 10,050	\$ 11,000	\$ 11,500
Software	\$ 1,446	\$ 3,015	\$ 3,000	\$ 3,000
Development	\$ 30,279	\$ 22,613	\$ 30,200	\$ 26,500
Hardware & software maintenance	\$ 2,024	\$ 2,261	\$ 2,250	\$ 2,250
Support	\$ 5,844	\$ 9,045	\$ 7,500	\$ 7,500
Total Information Technology	\$ 46,512	\$ 46,984	\$ 53,950	\$ 50,750
PRINTING, EDITING & COPYING				
Final Report	\$ 9,784	\$ 19,095	\$ 15,000	\$ 15,000
Other publications	\$ 3,332	\$ 5,024	\$ 3,288	\$ 3,000
Total Printing Editing & Copying	\$ 13,116	\$ 24,119	\$ 18,288	\$ 18,000
GENERAL SERVICES				
Legal advice & counselling	\$ 3,116	\$ 2,550	\$ 5,500	\$ 5,500
Payroll services	\$ -	\$ -	\$ 9,100	\$ 8,400
External audit	\$ 20,260	\$ 13,260	\$ 14,885	\$ 14,885
*) Rapporteur services	\$ -	\$ -	\$ 52,500	\$ -
Cleaning, maintenance & security	\$ 6,871	\$ 11,220	\$ 10,000	\$ 9,000
Training	\$ 3,857	\$ 5,100	\$ 5,000	\$ 5,000
Banking	\$ 6,432	\$ 7,140	\$ 7,000	\$ 7,000
Rental of equipment	\$ 2,503	\$ 2,553	\$ 2,503	\$ 2,503
Total General Services	\$ 43,039	\$ 41,823	\$ 106,488	\$ 52,288
COMMUNICATION				
Telephone	\$ 3,149	\$ 7,650	\$ 4,000	\$ 3,500
Internet	\$ 2,134	\$ 3,264	\$ 3,200	\$ 3,200
Web hosting	\$ 7,394	\$ 9,792	\$ 9,900	\$ 9,900
Postage	\$ 1,370	\$ 2,754	\$ 3,000	\$ 2,000
Total Communication	\$ 14,047	\$ 23,460	\$ 20,100	\$ 18,600

*) Rapporteur services for ATCM 2019 covered by voluntary contribution from the Czech Republic.

ATCM XLII Final Report

	Prov Statement 2018/19	Forecast 2019/20	Budget 2019/20	Forecast 2020/21
OFFICE				
Stationery & consumables	\$ 2,072	\$ 4,983	\$ 4,000	\$ 3,000
Books & subscriptions	\$ 546	\$ 3,477	\$ 1,000	\$ 1,000
Insurance	\$ 3,984	\$ 4,501	\$ 4,000	\$ 4,000
Furniture	\$ 1,225	\$ 1,306	\$ 1,500	\$ 1,500
Office equipment	\$ 1,814	\$ 4,635	\$ 5,000	\$ 4,000
Office improvement	\$ -	\$ 2,898	\$ 3,000	\$ 3,000
Total Office	\$ 9,641	\$ 21,799	\$ 18,500	\$ 16,500
ADMINISTRATIVE				
Office supplies	\$ 2,577	\$ 5,215	\$ 3,500	\$ 3,000
Local transport	\$ 369	\$ 926	\$ 700	\$ 700
Miscellaneous	\$ 2,667	\$ 4,635	\$ 4,000	\$ 3,200
Utilities	\$ 4,280	\$ 7,555	\$ 6,000	\$ 5,500
Total Administrative	\$ 9,892	\$ 18,331	\$ 14,200	\$ 12,400
REPRESENTATION				
Representation	\$ 923	\$ 4,000	\$ 4,000	\$ 4,000
FINANCING				
Net exchange (gain)/loss	\$ 36,876	\$ 12,744	\$ 29,745	\$ 19,000
ATCM 2018				
Organisation	\$ 230,925	\$ -	\$ -	\$ -
SUBTOTAL EXPENSES	\$ 1,368,232	\$ 1,352,328	\$ 1,408,238	\$ 1,355,784
FUND APPROPRIATIONS				
Working Capital Fund	\$ -	\$ -	\$ -	\$ -
Staff Replacement Fund	\$ -	\$ -	\$ -	\$ -
Staff Termination Fund	\$ 30,052	\$ 28,769	\$ 25,359	\$ 25,813
Translation Contingency Fund	\$ -	\$ -	\$ -	\$ -
Total Fund Appropriation	\$ 30,052	\$ 28,769	\$ 25,359	\$ 25,813
TOTAL EXPENSES & APPROPRIATIONS	\$ 1,398,284	\$ 1,381,097	\$ 1,433,597	\$ 1,381,597
** Surplus / (Deficit) for the period	\$ (18,811)	\$ 0	\$ 0	\$ 0
FUND BALANCE				
Working Capital Fund	\$ 229,952	\$ 229,952	\$ 229,952	\$ 229,952
Staff Replacement Fund	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
*** Staff Termination Fund	\$ 204,117	\$ 47,726	\$ 44,316	\$ 70,129
Translation Contingency Fund	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000

** Deficit due to the extraordinary cost for organisation of ATCM 2018, covered by the General Fund.

*** Staff termination compensation (Staff Regulation 10.4 and Final Report ATCM XXXII para 100) for the Assistant Executive Secretary in 2019

Appendix 2

Contribution Scale FY 2020/21

Party	Cat.	Mult.	Variable	Fixed	Total
Argentina	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Australia	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Belgium	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
Brazil	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
Bulgaria	E	1	\$ 10,163	\$ 23,760	\$ 33,923
Chile	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
China	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
Czech Republic	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
Ecuador	E	1	\$ 10,163	\$ 23,760	\$ 33,923
Finland	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
France	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Germany	B	2.8	\$ 28,456	\$ 23,760	\$ 52,216
India	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
Italy	B	2.8	\$ 28,456	\$ 23,760	\$ 52,216
Japan	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Republic of Korea	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
Netherlands	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
New Zealand	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Norway	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Peru	E	1	\$ 10,163	\$ 23,760	\$ 33,923
Poland	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
Russian Federation	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
South Africa	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
Spain	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
Sweden	C	2.2	\$ 22,359	\$ 23,760	\$ 46,119
Ukraine	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
United Kingdom	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
United States	A	3.6	\$ 36,587	\$ 23,760	\$ 60,347
Uruguay	D	1.6	\$ 16,261	\$ 23,760	\$ 40,021
Budget					\$1,378,097

Salary Scale FY 2019/2020

Schedule A
SALARY SCALE FOR THE EXECUTIVE STAFF
(United States Dollar)

2019/20 Level	STEPS														
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
E1 A	\$135,302	\$137,519	\$140,337	\$142,855	\$145,373	\$147,890	\$150,407	\$152,926							
E1 B	\$169,127	\$172,274	\$175,421	\$178,568	\$181,716	\$184,863	\$188,009	\$191,156							
E2 A	\$113,932	\$116,075	\$118,218	\$120,359	\$122,501	\$124,642	\$126,783	\$128,926	\$131,069	\$133,211	\$135,352	\$136,595	\$137,709		
E2 B	\$142,415	\$145,093	\$147,772	\$150,449	\$153,126	\$155,802	\$158,479	\$161,156	\$163,837	\$166,513	\$169,190	\$169,494	\$172,136		
E3 A	\$95,007	\$97,073	\$99,140	\$101,207	\$103,275	\$105,341	\$107,408	\$109,476	\$111,542	\$113,608	\$115,675	\$116,915	\$118,154	\$120,193	\$122,231
E3 B	\$118,758	\$121,341	\$123,925	\$126,509	\$129,094	\$131,676	\$134,260	\$136,845	\$139,427	\$142,010	\$144,594	\$146,143	\$147,693	\$150,242	\$152,798
E4 A	\$78,779	\$80,693	\$82,608	\$84,518	\$86,435	\$88,347	\$90,257	\$92,174	\$94,089	\$95,999	\$97,915	\$98,448	\$100,336	\$102,223	\$104,110
E4 B	\$100,866	\$102,882	\$104,898	\$106,914	\$108,930	\$110,946	\$112,962	\$114,977	\$116,993	\$118,999	\$120,999	\$122,993	\$124,919	\$127,778	\$130,137
E5 A	\$95,474	\$97,029	\$98,579	\$100,129	\$101,679	\$103,229	\$104,779	\$106,329	\$107,879	\$109,429	\$110,979	\$112,529	\$114,079	\$115,629	\$117,179
E5 B	\$81,644	\$83,786	\$85,928	\$88,069	\$90,210	\$92,352	\$94,493	\$96,635	\$98,776	\$100,917	\$103,058	\$104,200	\$106,341	\$108,482	\$110,623
E6 A	\$51,706	\$53,351	\$54,994	\$56,641	\$58,284	\$59,928	\$61,575	\$63,219	\$64,862	\$66,505	\$68,148	\$69,791	\$71,434	\$73,077	\$74,720
E6 B	\$64,632	\$66,689	\$68,742	\$70,801	\$72,855	\$74,910	\$76,969	\$79,024	\$81,078	\$82,328	\$83,135				

Note: Row B is the base salary (shown in Row A) with an additional 25% for salary on-costs (retirement fund and insurance premiums, installation and repatriation grants, education allowances etc.) and is the total salary entitlement for executive staff in accordance with regulation 5.

Schedule B
SALARY SCALE FOR THE GENERAL STAFF
(United States Dollar)

Level	STEPS														
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
G1	\$64,798	\$67,810	\$70,834	\$73,856	\$77,005	\$80,291									
G2	\$53,990	\$56,598	\$59,028	\$61,546	\$64,172	\$66,909									
G3	\$44,990	\$47,093	\$49,199	\$51,288	\$53,477	\$55,760									
G4	\$37,493	\$39,242	\$40,991	\$42,741	\$44,594	\$46,466									
G5	\$30,972	\$32,419	\$33,863	\$35,310	\$36,818	\$38,391									
G6	\$25,398	\$26,571	\$27,756	\$28,941	\$30,177	\$31,465									
G7	\$13,724	\$14,317	\$14,911	\$15,505	\$16,124	\$16,770									

Staff Regulations for the Secretariat of the Antarctic Treaty

The Representatives,

Recalling Measure 1 (2003) on the establishment of the Secretariat of the Antarctic Treaty (“the Secretariat”);

Recalling Decision 3 (2003) on Staff regulations for the Secretariat;

Decide:

1. to adopt the Staff Regulations for the Secretariat of the Antarctic Treaty annexed to this Decision; and
2. that the Annex to Decision 3 (2003) be revoked.

Staff Regulations for the Secretariat of the Antarctic Treaty

STAFF REGULATIONS

REGULATION 1

PREAMBLE

1.1 These Staff Regulations establish the fundamental principles of employment, regulate the working relationships and establish the rights and duties of members of the staff of the Secretariat of the Antarctic Treaty (the Secretariat), and includes the Staff members who render their services in and receive remuneration from the Antarctic Secretariat.

1.2 In the text of these Staff Regulations, reference to staff members in the masculine gender shall apply to staff members of both sexes, unless it is clearly inappropriate from the context to do so.

REGULATION 2

DUTIES, OBLIGATIONS AND PRIVILEGES

2.1 Staff members, upon accepting their appointments, shall pledge themselves to discharge their duties faithfully and to conduct themselves solely with the interests of the ATCM in mind. Their responsibilities as staff members are not national but are exclusively owed to the ATCM.

2.2 Staff members shall at all times conduct themselves in a manner in keeping with the Antarctic Treaty. They shall always bear in mind the loyalty, discretion and tact imposed on them by their responsibilities in the performance of their duties. They shall avoid all actions, statements or public activities which might be detrimental to the ATCM and its aims.

2.3 Staff members are not required to renounce either their national feelings or their political or religious convictions, but must ensure that such views or convictions do not adversely affect their official duties or the interests of the ATCM. Staff members shall uphold the highest standards of efficiency, competence, and integrity. The concept of integrity includes, but is not limited to, probity, impartiality, fairness, honesty, and truthfulness in all matters affecting their work and status.

2.4 In the performance of their duties, staff members may neither seek nor accept instructions from any government or authority other than the ATCM.

2.5 Staff members shall observe maximum discretion regarding official matters and shall abstain from making private use of information they possess by reason of their position. Authorisation for the release of information for official purposes shall lie with the ATCM or the Executive Secretary, as the case may require.

2.6 Staff members shall, in general, have no employment other than with the Secretariat. In special cases, staff members may accept other employment, provided that it does not interfere with their duties in the Secretariat, and that prior authorisation by the Executive Secretary has been obtained. The ATCM's prior authorisation shall be obtained in respect of the Executive Secretary.

2.7 No staff member may be associated in the management of a business, industry or other enterprise, or have a financial interest therein if, as a result of the official position held in the Secretariat, he/she may benefit from such association or interest. Ownership of non-controlling stock in a company shall not be considered to constitute a financial interest within the meaning of this Regulation.

2.8 Staff members shall enjoy the privileges and immunities granted to them under the Headquarters Agreement for the Secretariat of the Antarctic Treaty, pursuant to Article 5 of Measure 1 (2003) of the XXVI ATCM.

REGULATION 3 HOURS OF WORK

3.1 The normal working day shall be eight hours, Monday to Friday, for a total of forty hours per week.

3.2 The Executive Secretary shall establish the working hours, and may alter them for the benefit of the ATCM, as circumstances may require.

3.3 Staff members may work flexible hours in accordance with the Flextime System included in the internal procedures, with the approval of the Executive Secretary and in the interest of the functioning of the Secretariat.

3.4 Full-Time staff members shall take a lunch break of no less than 30 minutes and no longer than 1 hour, to be taken no later than five hours after beginning the working day.

REGULATION 4 CLASSIFICATION OF STAFF

4.1 Staff members shall be classified in either of the two following categories:

(a) Executive Category

Positions of high responsibility of an executive nature. These posts will be filled by appropriately qualified professionals, preferably with University qualifications or the equivalent. Staff members in this category will be recruited internationally but only among nationals of Consultative Parties.

(b) General Staff Category

All other staff, such as translators, interpreters, technical, administrative and auxiliary positions. Such staff members shall be recruited in Argentina from among nationals of Consultative Parties.

4.2 Persons employed under Regulation 11 shall not be classified as staff members.

**REGULATION 5
SALARIES AND OTHER REMUNERATION**

5.1 The scale of salaries for staff members in the executive category is attached in Schedule A. The salaries of staff members in the executive category shall be paid in US currency.

5.2 The scale of salaries for staff members in the general category is attached in Schedule B. The salaries of staff members in the general category shall be paid in US currency.

5.3 For the purposes of these regulations the term 'dependent' means:

- (a) any unsalaried child, who is born of, or adopted by, a staff member, his/her spouse, or their children, who is below the age of eighteen years and who is dependent on a staff member for main and continuing support;
- (b) any child fulfilling the conditions laid down in paragraph (a) above, but who is between eighteen and twenty-five years of age and is receiving school or university education or vocational training;
- (c) any handicapped child who is dependent on a staff member for main and continuing support;
- (d) any other child who is given a home by and is dependent on a staff member for main and continuing support;
- (e) any member of the family forming part of the household of the staff member, for whose main and continuing support a staff member is legally responsible.

5.4 The salaries of staff members in the executive category shall begin at Step 1 of the level at which they are appointed. They shall remain at that level for at least the first year of employment.

5.5 The promotion of the Executive Secretary and other staff members from one level to another requires the prior approval of the ATCM.

5.6 The Executive Secretary shall seek to make arrangements for any staff member in the executive category whose salary is subject to income tax in his/her home country, to be reimbursed for that tax. Such arrangements shall be made only on the basis that the direct costs of reimbursement are paid by the staff member's home country. Staff members in the general category will be responsible for the payment of income tax, if any on their salaries in their home country.

5.7 Staff members shall receive annual step increases, subject to satisfactory performance of their duties. Step increases shall cease once the staff member has reached the highest step in the level in which he/she is serving.

5.8 Only in very special cases, on the proposal of the Executive Secretary and with the approval of the ATCM, may a staff member in the executive category be appointed at a salary higher than Step 1 of the relevant level.

5.9 Staff members in the executive category are not entitled to overtime pay or compensatory leave.

5.10 Staff members in the general category required to work more than 40 hours during one week will be compensated, at the discretion of the Executive Secretary:

- (a) with compensatory leave equivalent to hours of overtime performed; or
- (b) by remuneration per overtime hour, to be calculated at the rate of time and a half, or if the additional time is worked on a Sunday, or on holidays listed in Regulation 7.8, at the rate of double time.

5.11 The ATCM shall pay duly justified representation expenses incurred by the Executive Secretary in the performance of his/her duties within the limits prescribed annually in the budget.

5.12 With the prior approval of the Executive Secretary, an employee in the general services category who must carry out all the duties of an employee of a higher classification for a period of a minimum of four weeks shall be paid the salary of the corresponding higher category while carrying out these tasks.

REGULATION 6 RECRUITMENT AND APPOINTMENT

6.1 In accordance with Article 3 of Measure 1 (2003), the ATCM shall appoint an Executive Secretary and shall establish the remuneration and such other entitlements as it deems appropriate. The Executive Secretary's term of office shall be for four years unless otherwise decided by the ATCM and the Executive Secretary shall be eligible for reappointment for one additional term. The total length of employment may not exceed eight years.

6.2 In accordance with Article 3 of Measure 1 (2003) the Executive Secretary shall appoint, direct, and supervise other staff members. The paramount consideration in the appointment, transfer or promotion of staff members shall be the need to secure the highest standards of efficiency, competence and integrity. Qualifications being equivalent, gender and geographic balance will be taken into account when selecting candidates. Subject to this, due consideration should be given to recruiting Executive staff on as wide a basis as possible from among the nationals of Consultative Parties.

6.3 Upon selection, each staff member shall receive an offer of appointment stating:

Annex: Staff Regulations for the Secretariat of the Antarctic Treaty

- (a) that the appointment is subject to these regulations and to changes which may be made to them from time to time;
- (b) the nature of the appointment including a description of the duties and tasks of the position;
- (c) the date on which the staff member is required to commence duty and the working hours;
- (d) the period of appointment, the notice required to terminate it and the period of probation;
- (e) for executive staff the period of appointment, which shall not exceed four years, and which may be renewed in consultation with the ATCM;
- (f) the category, level, commencing rate of salary and the scale of steps increases and the maximum salary attainable;
- (g) the allowances attached to the appointment;
- (h) any special terms and conditions which may be applicable.

6.4 Together with the offer of appointment, staff members shall be provided with a copy of these Regulations. Upon acceptance of the offer staff members shall sign the relevant Work Contract and state in writing that they are familiar with and accept the conditions set out in these Regulations.

6.5 The Executive Secretary shall carry out an annual evaluation of the performance of the staff member's duties, using a recognised method, to ensure the continued improvement of management, as well as to facilitate consideration of the promotion of, or justify the separation from the service of, the staff member.

REGULATION 7

LEAVE

7.1 Staff members shall be entitled to 25 paid work days of annual leave during each working year of service, or for periods of less than a full calendar year at the rate of two paid work days for each completed month of service. Said leave shall be divided into 15 paid work days for holiday leave, which may be taken consecutively, and 10 additional paid work days that shall be taken in periods of no more than 3 days. Annual holiday leave is cumulative, but at the end of each calendar year, not more than 15 workdays may be carried over to the following year. Additional leave is not cumulative.

7.2 The taking of leave shall not cause undue disruption to normal Secretariat operations. In accordance with this principle, leave dates and duration shall be subject to the needs of the ATCM. Leave dates shall be approved by the Executive Secretary who shall, as far as possible, bear in mind the personal circumstances, needs and preferences of staff members.

7.3 Annual leave may be taken in one or more periods. Staff members shall inform the Executive Secretary of their intention to take holiday leave at least four weeks in advance

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after verifying with other staff members that such leave would not result in an overlap that might affect the normal functioning of the Secretariat.

7.4 Any absence not approved within the terms of these Regulations shall be deducted from annual leave.

7.5 Staff members who, upon termination of their appointment, have accumulated annual leave which has not been taken shall receive the cash equivalent estimated on the basis of the last salary received to a limit of 30 days.

7.6 After 18 months of service the Secretariat shall, in accordance with Regulations 9.3 and 9.4, pay fares to the staff member's home country on annual leave for internationally recruited staff members and their dependents. Following this, home leave fares shall be granted at two-year intervals provided that:

- (a) dependants who benefit from this grant have resided at Buenos Aires for at least 6 months prior to travel;
- (b) it is expected that staff members will return to the Secretariat to continue rendering their services for a minimum additional period of 6 months.

7.7 The possibility of combining travel to home country on leave with official travel in Secretariat service may also be considered provided the functions of the Secretariat are not disadvantaged.

7.8 Staff members shall be entitled to the holidays and non-working days established by law and/or decree by the Argentine Republic and/or the City of Buenos Aires, i.e.:

Fixed Holidays

1 January	New Year's Day
24 March	National Holiday
02 April	National Holiday
01 May	National Holiday
25 May	National Holiday
9 July	National Holiday
8 December	Immaculate Conception
25 December	Christmas Day

Moveable Holidays and Non-Work Days

Monday and Tuesday of Carnival
Holy Thursday
Good Friday

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17 June	National Holiday
20 June	National Holiday
17 August	National Holiday
12 October	National Holiday
20 November	National Holiday

7.9 If under special circumstances members of the staff are required to work on one of the aforementioned days, or if any one of the above holidays falls on a Saturday or Sunday, the holiday shall be observed on another day to be set by the Executive Secretary, who shall take into account the efficient functioning of the Secretariat.

7.10 Staff members shall be entitled to the following special leave:¹

- (a) For marriage: 10 consecutive days;
- (b) For the death of a spouse, domestic partner, children or parents: 3 consecutive days;
- (c) For the death of siblings, parents-in-law or grandparents: 1 day;
- (d) For moving house: 2 days;
- (e) For sitting an exam at second or university level: 2 consecutive days per exam, with a maximum of 10 days per calendar year;
- (f) To care for, due to illness, the employee's spouse, parents or children: 2 days, unless at the Executive Secretary's discretion and for justified reasons a longer time period is granted.

7.11 Following twelve months of continued employment in the Secretariat staff may request unpaid leave for personal reasons of up to a maximum of three months. Such leave shall not cause undue disturbance to the normal functioning of the Secretariat. Under this stipulation, the dates and duration of the leave shall be subject to the approval of the Executive Secretary.

7.12 Staff members shall not be granted sick leave for a period of more than three consecutive days or more than a total of seven working days in any calendar year without a medical certificate.

7.13

- (a) Staff members shall be granted certified sick leave not exceeding 12 months in any four consecutive years. The staff member shall receive full salary for the first six months of such leave and half salary for the remaining six months, although no more than four months on full salary shall normally be granted in any period of 12 consecutive months.

¹ Regulations 7.10, 7.11 and 7.14 are established in accordance with prevailing Argentine national law; the ATCM should review any significant change in Argentine national law but may at any time review these provisions.

- (b) In the event of longer-term sickness which prevents a staff member from fulfilling his/her duties with the Secretariat, the staff member and his/her dependents shall be entitled to return travel and expenses for relocating to his/her country of origin or former residence at the expense of the Secretariat.

7.14 After six months of employment in the Secretariat, staff members shall be entitled to maternity leave. On the basis of medical advice that the birth will probably take place within six weeks, staff members shall be entitled to be absent from duty until eight weeks after the birth. During this period, staff members shall receive full pay and corresponding benefits. On the other hand, the father shall receive 10 days of paid leave that may be used in the same period described above.

7.15 After twelve months of continuous employment in the Secretariat, staff members shall be entitled to parental leave of up to three months of unpaid leave for the birth or adoption of a child.

REGULATION 8

SOCIAL SECURITY

8.1 It is a condition of employment that each staff member will contribute to a recognised retirement fund and have adequate medical, hospital, life and disability insurance cover to the satisfaction of the Executive Secretary. Such insurance cover shall include adequate provision for dependents. Staff members shall be responsible for the full payment of contributions to their retirement fund and insurance premiums.

8.2 In the event of death of a staff member following illness or surgery not resulting from an accident covered by the appropriate insurance, the right to salary, allowances and other corresponding benefits shall cease on the day on which death occurs, unless the deceased leaves dependents, in which case these shall be entitled to mortality allowances and return travel and removal expenses to their country of origin or former residence at the expense of the Secretariat.

8.3 Eligibility of the dependents of a deceased staff member for the payment of return travel and removal expenses shall lapse if the travel is not undertaken within six months of the date of the staff member's death.

8.4 The above mortality allowance for death shall be calculated in accordance with the following scale:

Years of Service	Months of Gross Salary Following Death
Less than 3 years	3 months
3 years and more, but less than 7 years	4 months
7 years and more, but less than 9 years	5 months
9 years and more	6 months

8.5 The Secretariat shall pay for customary and reasonable expenses for shipment of the staff member's body from the place of death to the place designated by the next of kin.

REGULATION 9 TRAVEL

9.1 Staff members may be required to undertake travel, including international travel, on behalf of the Secretariat. All official travel shall be authorised by the Executive Secretary in advance within the limits of the budget, and the itinerary and travelling conditions shall be those best suited for maximum effectiveness in the fulfilment of duties assigned.

9.2 With regard to official travel, a reasonable travel allowance shall be paid in advance for accommodation and daily living expenses.

9.3 Economy class shall be utilised, wherever feasible, for air travel. For journeys over nine hours in flying time, business class may be utilised.

9.4 First class may be utilised for land travel, but not for travel by sea or air.

9.5 Following completion of a journey for official purposes, staff members shall repay any travel allowances to which, in the event, they were not entitled. Where staff members have incurred expenses above and beyond those for which travel allowances have been paid, they shall be reimbursed, against receipts and vouchers, as long as such expenses were necessarily incurred in pursuit of their official duties.

9.6 On taking up an appointment in the Executive Category staff members shall be eligible for:

- (a) payment of air fares (or equivalent) and travel allowance for themselves, their spouses and dependents to Buenos Aires;
- (b) payment of removal costs, including the shipment of personal effects and household goods from place of residence to Buenos Aires, subject to a maximum volume of 30 cubic metres or one international standard shipping container;
- (c) payment or reimbursement of sundry other reasonable expenses related to relocation, including insurance of goods in transit and excess baggage charges. Such payments shall be subject to prior approval by the Executive Secretary.

9.7 Staff members who, in the course of their duty, are required to use private motor vehicles for official travel purposes shall, with the prior authorisation of the Executive Secretary, be entitled to receive a reimbursement of the reasonable costs involved. The costs associated with normal daily travel to and from the place of work shall not be reimbursed.

REGULATION 10 SEPARATION FROM SERVICE

10.1 Staff members may resign at any time upon giving three months notice or such lesser period as may be approved by the Executive Secretary (in the case of staff other than the Executive Secretary) or the ATCM (in the case of the Executive Secretary).

10.2 In the event of a staff member resigning without giving the required notice the Executive Secretary (in the case of staff members other than the Executive Secretary) or the ATCM (in the case of the Executive Secretary) reserves the right to decide whether repatriation expenses or any other allowance shall be paid.

10.3 Appointment of staff members may be terminated upon prior written notice at least three months in advance, by the Executive Secretary (and in the case of the Executive Secretary by the ATCM) when this is deemed to be for the benefit of the efficient functioning of the Secretariat due to restructuring of the Secretariat or if it is considered that the staff member does not give satisfactory service, fails to comply with the duties and obligations set out in these Regulations, or is incapacitated for service.

10.4 In the event of separation from service with the Secretariat, executive staff members shall be compensated at a rate of one month base pay for each year of service, beginning the second year, unless the cause of termination has been gross dereliction of duties imposed in Regulation 2.

10.5 In the event of involuntary separation from service of a general staff member, he/she shall be compensated at a rate of one month base pay for each year of service, except when the Executive Secretary considers that the staff member has not given satisfactory service, fails to comply with the duties and obligations set out in these Regulations, or is incapacitated for service. If the cause of the termination has been a gross dereliction of the duties stipulated in Article 2, said compensation shall not be granted.

10.6 On separation from service, an executive staff member shall be entitled to the following:

- (a) payment of economy class air fares (or equivalent) to the staff member's country of origin or former residence, for the staff member and dependent members of his/her family; and
- (b) payment of removal costs, including the shipment of personal effects and household goods from place of residence in Buenos Aires to the country of origin or former residence, subject to a maximum volume of 30 cubic metres or one international shipping container.

10.7 Any member of staff shall be entitled to end his/her relationship with the Secretariat in order to take retirement, with advance notice of three (3) months from the date of the termination.

10.8 The Executive Secretary may request that a staff member take retirement benefit, provided that said staff member has met the requirements to obtain retirement benefit established by Law in the Argentine Republic. Prior notice to this effect shall be given and

the working relationship shall be maintained for one year from said notice. Upon expiry of that period, the fully binding working relationship shall be deemed terminated.

REGULATION 11 TEMPORARY PERSONNEL UNDER CONTRACT

11.1 The Executive Secretary may contract temporary personnel necessary to discharge special duties of a short-term nature in the service of the Secretariat. Short term shall be defined as a contract lasting less than six months. Such personnel shall be classified as additional help and may be paid on an hourly basis.

11.2 Persons in this category may include additional translators, interpreters, typists, and other persons contracted for meetings, as well as those whom the Executive Secretary contracts for a specific task.

REGULATION 12 APPLICATION AND AMENDMENT OF REGULATIONS

12.1 The Executive Secretary is responsible for the administration of these Staff Regulations on behalf of the ATCM. The ATCM shall determine their applicability to the Executive Secretary.

12.2 Any doubts arising from application of these Regulations shall be resolved by the Executive Secretary following consultation with the ATCM.

12.3 All matters not foreseen in these Regulations shall be brought to the attention of the ATCM by the Executive Secretary.

12.4 These Regulations including the schedules may be amended by a Decision of the ATCM.

Schedule A
SALARY SCALE FOR THE EXECUTIVE STAFF CATEGORY
OF THE SECRETARIAT OF THE ANTARCTIC TREATY
 (United States Dollar)

Level	STEPS															
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XI	XI	XII	XIV	XV
E1 A	\$135,902	\$137,819	\$140,337	\$142,855	\$145,373	\$147,890	\$150,407	\$152,926								
E1 B	\$169,127	\$172,274	\$175,421	\$178,569	\$181,716	\$184,863	\$188,009	\$191,156								
E2 A	\$113,932	\$116,075	\$118,218	\$120,359	\$122,501	\$124,642	\$126,783	\$128,926	\$131,069	\$133,211	\$135,352	\$135,352	\$135,352	\$137,709		
E2 B	\$142,415	\$145,093	\$147,772	\$150,449	\$153,126	\$155,802	\$158,479	\$161,156	\$163,837	\$166,513	\$169,190	\$169,190	\$169,190	\$172,136		
E3 A	\$95,007	\$97,073	\$99,140	\$101,207	\$103,275	\$105,341	\$107,408	\$109,476	\$111,542	\$113,608	\$115,675	\$115,675	\$115,675	\$118,154		
E3 B	\$118,758	\$121,341	\$123,925	\$126,509	\$129,094	\$131,676	\$134,260	\$136,845	\$139,427	\$142,010	\$144,594	\$144,594	\$144,594	\$147,693		
E4 A	\$78,779	\$80,693	\$82,609	\$84,518	\$86,435	\$88,347	\$90,257	\$92,174	\$94,089	\$96,000	\$97,915	\$98,448	\$98,448	\$100,336		
E4 B	\$98,474	\$100,866	\$103,262	\$105,648	\$108,044	\$110,434	\$112,822	\$115,217	\$117,611	\$119,999	\$122,393	\$123,060	\$123,060	\$125,419		
E5 A	\$65,315	\$67,029	\$68,739	\$70,452	\$72,162	\$73,873	\$75,586	\$77,293	\$79,007	\$80,719	\$82,427	\$82,981	\$82,981			
E5 B	\$81,644	\$83,786	\$85,924	\$88,065	\$90,203	\$92,342	\$94,482	\$96,617	\$98,759	\$100,899	\$103,034	\$103,726	\$103,726			
E6 A	\$51,706	\$53,351	\$54,994	\$56,641	\$58,294	\$59,928	\$61,575	\$63,219	\$64,862	\$66,506	\$68,149	\$68,149	\$68,149			
E6 B	\$64,632	\$66,689	\$68,742	\$70,801	\$72,855	\$74,910	\$76,969	\$79,024	\$81,078	\$82,328	\$83,135	\$83,135	\$83,135			

Note: Row B is the base salary (shown in Row A) with an additional 25% for salary on-costs (retirement fund and insurance premiums, installation and repatriation grants, education allowances etc.) and is the total salary entitlement for executive staff in accordance with regulation 5.1.

Schedule B
SALARY SCALE FOR THE GENERAL STAFF CATEGORY
OF THE SECRETARIAT OF THE ANTARCTIC TREATY
 (United States Dollar)

Level	STEPS															
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XI	XI	XII	XIV	XV
G1	\$64,788	\$67,810	\$70,834	\$73,856	\$77,006	\$80,291										
G2	\$53,990	\$56,508	\$59,028	\$61,546	\$64,172	\$66,909										
G3	\$44,990	\$47,089	\$49,189	\$51,288	\$53,477	\$55,760										
G4	\$37,493	\$39,242	\$40,991	\$42,741	\$44,584	\$46,466										
G5	\$30,972	\$32,419	\$33,863	\$35,310	\$36,818	\$38,391										
G6	\$25,388	\$26,571	\$27,756	\$28,941	\$30,177	\$31,465										
G7	\$13,724	\$14,317	\$14,911	\$15,505	\$16,124	\$16,770										

Multi-year Strategic Work Plan for the Antarctic Treaty Consultative Meeting

The Representatives,

Reaffirming the values, objectives and principles contained in the Antarctic Treaty and its Protocol on Environmental Protection;

Recalling Decision 3 (2012) on the Multi-year Strategic Work Plan (“the Plan”) and its principles;

Bearing in mind that the Plan is complementary to the agenda of the Antarctic Treaty Consultative Meeting (“ATCM”) and that the Parties and other ATCM participants are encouraged to contribute as usual to other matters on the ATCM agenda;

Decide:

1. to adopt the Plan annexed to this Decision; and
2. that the Plan annexed to Decision 3 (2018) is no longer current.

ATCM Multi-year Strategic Work Plan

	Priority	ATCM XLII (2019)	Intersessional	ATCM XLIII (2020)	Intersessional	ATCM XLIV (2021)	Intersessional	ATCM XLV (2022)
1.	Consider coordinated outreach to non-party states whose nationals or assets are active in Antarctica and states that are Antarctic Treaty Parties but not yet to the Protocol	ATCM to identify and reach out to non-party states whose nationals are active in Antarctica	Coordination to be considered within Competent Authority online forum					
2.	Contribute to nationally and internationally coordinated education and outreach activities from an Antarctic Treaty perspective	WG 1 to consider the report of the ICG on Education and Outreach	ICG on Education and Outreach	WG 1 to consider the report of the ICG on Education and Outreach				
3.	Share and discuss strategic science priorities in order to identify and pursue opportunities for collaboration as well as capacity building in science, particularly in relation to climate change	Consider outcomes of intersessional discussions on strategic science priorities		SCAR will report on the outcomes of the ACCE update, which represents a comprehensive decadal update				
4.	To bring Annex VI into force and to continue to gather information on repair and remediation of environmental damage and other relevant issues to inform future negotiations on liability	ATCM to evaluate progress made towards Annex VI becoming effective in accordance with Article IX of the Antarctic Treaty, and what action may be necessary and appropriate to encourage Parties to approve Annex VI in a timely manner	<p>ATS to be in touch with IOPC Funds, IMO, ICAO and IGP&I Clubs</p> <p>Secretariat to prepare a report summarising all relevant measures and resolutions and previous advice from the CEP relating to environmental remediation and liability matters</p> <p>Secretariat to prepare a report on the limits of liability in relevant international instruments</p>	<p>ATCM to evaluate progress made towards Annex VI becoming effective in accordance with Article IX of the Antarctic Treaty, and what action may be necessary and appropriate to encourage Parties to approve Annex VI in a timely manner</p> <p>ATCM to consider the implications of liability limits in other relevant international instruments for the potential future amendment of the limits in Article 9 of Annex VI</p> <p>ATCM to take a decision in 2020 on the establishment of a timeframe for the resumption of negotiations on liability in accordance with Article 16 of the Protocol on Environmental Protection, or sooner if the Parties so decide in light of progress made in approving Measure 1 (2005) – see Decision 5 (2015)</p>				

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	Priority	ATCM XLII (2019)	Intersessional	ATCM XLIII (2020)	Intersessional	ATCM XLIV (2021)	Intersessional	ATCM XLV (2022)
5.	Assess the progress of the CEP on its ongoing work to review best practices and to improve existing tools and develop further tools for environmental protection, including environmental impact assessment procedures	WG 1 to further discuss the issues raised in part 8b of the CEP XX Report		WG 1 to consider advice of the CEP and discuss the policy considerations of the review of Environmental Impact Assessment (EIA)				
6.	Collection and use of biological material in Antarctica	WG 1 to discuss the collection and use of biological material in Antarctica	Informal exchange of information through ATCM forum Encourage Parties to respond to SCAR's survey	WG 1 to discuss the collection and use of biological material in Antarctica, including, where relevant, building on discussions during ATCM XLII on a possible voluntary exchange of information under the EIES Consider the report from SCAR and further discuss this topic				
7.	Address the recommendations of the Antarctic Treaty Meeting of Experts on Implications of Climate Change for Antarctic Management and Governance (CEP-ICG)	Agree how to deal with any outstanding recommendations from the ATME on Climate Change Implications (2010)		Parties to provide an update on how National Programs have considered the effect of climate change on new infrastructure in the EIA process Parties to provide updates on risk assessment approaches taken to identify potential climate change implications for current and future Antarctic, logistics and environmental values Space agencies – discussion on space-based technologies for observing the Antarctic region in the context of climate change		Update from COMNAP on its work with national programmes to use consistent methods to quantify and publish savings made by energy efficiencies and which contribute to both (a) reducing carbon footprint and (b) reducing fuel consumption		Parties and/or COMNAP to provide updates on use of atmospheric models to evaluate the potential for wind regimes around their individual stations, to determine the potential for wind power as a means of cutting fuel costs and greenhouse gas emissions
8.	Discuss implementation of the Climate Changes Response Work Programme (CCRWP)	WG 2 to consider annual update from CEP on implementation of CCRWP		WG 2 to consider annual update from CEP on implementation of CCRWP		WG 2 to consider annual update from CEP on implementation of CCRWP		WG 2 to consider annual update from CEP on implementation of CCRWP
9.	Modernisation of Antarctic Stations in context of climate change	WG 2 to discuss exchange of information and COMNAP advice		Discussion on modernisation of Antarctic stations				
10.	Review and discuss issues related to increased aviation activity in Antarctica, and assess the need for additional action	ATCM XLII WG 2 to have a dedicated discussion on aviation activity, including non-government air traffic and UAVs/RPAs, in Antarctica ATCM XLII WG 2 to consider any views presented on air safety issues by ICAO	The meeting to seek advice addressing risks and other issues identified during discussions at ATCM XLII	Discuss information from COMNAP on progress related to the issues identified in the air activity discussion		Discuss information from the Antarctic Aviation Workshop presented by COMNAP		

Annex: ATCM Multi-year Strategic Work Plan

	Priority	ATCM XLII (2019)	Intersessional	ATCM XLIII (2020)	Intersessional	ATCM XLIV (2021)	Intersessional	ATCM XLV (2022)
11.	To take note of the International Code for Ships Operating in Polar Waters; to continue to strengthen cooperation among Antarctic marine operators; and to take into account developments in the IMO	WG 2 to consider developments at IMO, and discuss further maritime safety issues		Exchange views on national experiences in implementing the Polar Code in Antarctica				
12.	Hydrographic surveying in Antarctica	ATCM to have a dedicated seminar on hydrography in Antarctica, with a presentation of IHO		Parties, IHO and IAATO to report on progress in hydrography				
13.	Review and assess the need for additional actions regarding area management and permanent infrastructure related to tourism, as well as issues related to land based and adventure tourism, and address the recommendations of the CEP Tourism Study	Further consideration of environmental issues relating to tourism based on any new advice from the CEP SCAR and IAATO to provide an interim report on progress of the systematic conservation plan for the Antarctic Peninsula		Consideration of possibly increased search and rescue burdens on national Antarctic programmes due to increased tourism activity in Antarctica				
14.	Develop a strategic approach to environmentally managed tourism and non-governmental activities in Antarctica	Further discussions relating to issues arising from the growth of tourism, including any implications of the potential growth in non-IAATO registered operators	Competent authorities to engage in permanent online forum Manual on Tourism. Intersessional compilation Informal intersessional discussions on possible applicability and use of tourist fees Intersessional discussions to review compatibility of information exchange requirements and Post Visit Report Continue informal intersessional discussions amongst NCAs on coastal camping Carry out an ICG to propose a draft operational framework that could be implemented at the national level on a voluntary basis, to Parties willing to deploy Observers on tourist vessels under their jurisdiction	ATCM to consider: Draft manual on Tourism Progress on compatibility of information exchange requirements and Post Visit Report Presenting the results of the discussions carried out by the ICG	Discuss On Board Observer Scheme options	Consider the results of intersessional discussions related to On Board Observer Scheme options		
15.	Visitor site monitoring	To analyse CEP progress on recommendations 3 and 7 of the CEP Tourism Study Secretariat to report back to ATCM XLII	Secretariat to explore the possibility of extending the mapping tool to include sites not covered by existing site guidelines	To analyse CEP progress on recommendations 3 and 7 of the CEP Tourism Study				

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	Priority	ATCM XLII (2019)	Intersessional	ATCM XLIII (2020)	Intersessional	ATCM XLIV (2021)	Intersessional	ATCM XLV (2022)
16.	Continue cooperation between Parties to proactively identify and address current and future trends related to the ATS		Informal consultations on identifying relevant issues and trends, which could include, <i>inter alia</i> , overview of the application of Article IX (2) of the Antarctic Treaty, general analysis of relationship between the ATS and other relevant international legal frameworks, consideration of Antarctic-related activities by persons that are not under the jurisdiction of States Parties to the Antarctic Treaty	Consider outcomes of informal consultations and identify issues and trends for further consideration				
17.	Enhancing compliance with ATCM regulations relating to non-governmental activities including tourism activities			Working Group 1 to provide legal advice on how those operating in Antarctica can most effectively gather and share evidence of suspected non-compliance				

Note: The ATCM Working Groups mentioned above are not permanent but are established by consensus at the end of each Antarctic Treaty Consultative Meeting.

Manual of Regulations and Guidelines Relevant to Tourism and Non-Governmental Activities in Antarctica

The Representatives,

Noting the yearly increase in tourist numbers in the Antarctic Treaty area;

Desiring to ensure that non-governmental activities in Antarctica are carried out in full compliance with the Antarctic Treaty and its Protocol on Environmental Protection;

Desiring to improve the efficiency of the Antarctic Treaty system and compliance with its legal framework;

Taking into consideration the outcomes of the Rotterdam workshop on Antarctic tourism, especially the Chair's Report and the Information Paper submitted to Antarctic Treaty Consultative Meeting ("ATCM") XLII;

Conscious of the relevance of a compilation of provisions on non-governmental activities in the Antarctic;

Decide:

1. to create the Manual of Regulations and Guidelines Relevant to Tourism and Non-Governmental Activities in the Antarctic Treaty area ("the Manual");
2. to task the Secretariat of the Antarctic Treaty ("the Secretariat") with compiling, producing and making the Manual available to the Parties;
3. to request the Secretariat to open an informal forum, convened by France, on its website allowing exchanges with the Parties, in order to enable them to guide and assist the elaboration of the Manual;

4. that Observers and Experts participating in the ATCM, especially the International Association of Antarctica Tour Operators (“IAATO”), will be encouraged to provide input;
5. that the Manual will be a digital document, accessible via the Secretariat’s website; and
6. that the Secretariat will produce updated versions of the Manual.

Indicative List of Texts that Could Be Included in the Manual

- The Antarctic Treaty and the Madrid Protocol, particularly:
 - Article 1 of the Antarctic Treaty;
 - Excerpts from the Madrid Protocol: Articles 1, 2, 3 and 8;
 - Annexes I and II to the Madrid Protocol;
 - Excerpts from Annex III to the Madrid Protocol: Articles 1 to 7 and Article 12;
 - Excerpts from Annex IV to the Madrid Protocol: Articles 1 to 10.
- All Measures, Recommendations and Decisions adopted by the ATCM relating to tourism and non-governmental activities.
- All relevant guidance provided by the ATCM and CEP.
- All Site Guidelines for Visitors.
- References to legal instruments adopted outside the ATCM framework:
 - International Maritime Organization Polar Code;¹
 - The MARPOL Convention;
 - The SOLAS Convention.

¹ Cf. IMO resolutions MSC.385(94) and MEPC.264(68) relating respectively to safety and pollution prevention.

Reviewing Requirements for Exchanging Information on Non-Governmental Expeditions

The Representatives,

Noting Articles III (1)(a) and VII (5) of the Antarctic Treaty;

Conscious of the obligations within the Protocol on Environmental Protection to the Antarctic Treaty (“the Environmental Protocol”) and its Annexes to exchange information;

Conscious also of decisions of the Antarctic Treaty Consultative Meeting (“ATCM”) in relation to the information to be exchanged by Parties;

Desiring to ensure that the exchange of information by Parties is conducted in the most efficient and timely manner;

Desiring also that the information to be exchanged by Parties can be readily identified;

Recalling Decision 4 (2012), which decided that the Parties will use the Electronic Information Exchange System (“EIES”) to exchange information in accordance with the Antarctic Treaty and the Environment Protocol and its Annexes and which specified that Parties will continue to work with the Secretariat of the Antarctic Treaty (“the Secretariat”) to refine and improve the EIES;

Noting that Decision 4 (2012) requires Parties to update relevant sections of the EIES regularly throughout the year, and at a minimum in accordance with Resolution 6 (2001), in order that such information be available and accessible to Parties as soon as practicable;

Decide that:

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1. the Annex to this Decision represents a consolidated list of the information agreed to be exchanged by Parties;
2. the Secretariat shall modify the EIES to reflect the information contained in the Annex attached to this Decision, and make available, as soon as practicable, information submitted by Parties; and
3. the Annex to Decision 5 (2016) is no longer current.

Information Exchange Requirements

1. Pre-season Information

The following information should be submitted as early as possible, preferably by 1 October, and in any event no later than the start of the activities being reported.

1.1. Operational information

1.1.1. National Expeditions

A. Stations

Names of Year-Round stations (giving region, latitude and longitude), status, maximum population and medical support available.

Names of Seasonal stations/bases and field camps (giving region, latitude, longitude), status, operating period, maximum population and medical support available.

Names of refuges (giving region, latitude and longitude) medical facilities and accommodation capacity. Other major field activities, *eg*, scientific traverse (giving locations).

B. Vessels

Name of vessels, country of registry of vessels, number of voyages, planned departure dates, areas of operation, ports of departure and arrival to and from Antarctica, and purpose of voyage (*eg*, science deployment, resupply, change-over, oceanography, etc).

Maximum Crew, Maximum Passengers.

C. Aircraft

Category (Intercontinental Flights, Intracontinental Flights, Local Helicopter Flights), type of aircraft, planned number of flights, period of flights or planned departure dates, routes and purpose.

D. Research Rockets

Coordinates of the place of launching, time and date/period, direction of launching, planned maximum altitude, impact area, type and specifications of rockets, purpose and title of research project.

E. Military

- Number of military personnel in expeditions, and rank of any officers.
- Number and types of armaments possessed by personnel.

- Number and types of armaments of ships and aircraft and information on military equipment, if any, and its location in the Antarctic Treaty Area.

1.1.2. Non-governmental Expeditions¹

A. Vessel-based Operations

Name of operator, name of vessel, Maximum crew, Maximum Passengers, country of registry of vessel, number of voyages, expedition leader, planned departure dates, ports of departure and arrival to and from Antarctica, areas of operation including the names of proposed visited sites and the planned dates at which these visits will take place, type of activity, whether these visits include landing, (optionally) duration of landing and the number of visitors that participate in each of the specific activities.

B. Land-based Operations

Name of expedition, name of the operator, method of transportation to, from and within Antarctica, type of adventure/activity, location/s of activities and/or routes, dates of expedition, number of personnel involved, contact address, web-site address.

C. Aircraft Activities

Name of operator, type of aircraft, number of flights, period of flights, departure date per flight, departure and arrival location per flight, route per flight, purpose per flight, and number of passengers.

D. Denial of Authorizations

Name of Vessel and/or Expedition, Name of Operator, Date, Reason for Denial.

1.2. Visits to Protected Areas

Name and number of protected area, number of people permitted to visit, date/period and purpose.

2. Annual Report

The following information should be submitted as early as possible after the end of the austral summer season, but in all cases before 1 October, with a reporting period of 1 April to 30 March.

¹ Provision of information on Non-governmental expeditions will be allowed for it to be provided as soon as possible after completion of national processes, with the relevant timing description being: 'as soon as possible following completion of national processes, preferably by the pre-season target date of 1 October, and no later than the start of the activity'.

2.1. Scientific Information

2.1.1. Forward Plans²

Details of strategic or multi-year science plans or contact point for printed version. List of planned participations in major, international, collaborative science programs/projects.

2.1.2. Science Activities in Previous Year

List of research projects undertaken in previous year under science discipline (giving location/s, principal investigator, project name or number, discipline and main activity/remarks).

2.2. Operational information

2.2.1. National expeditions

Update of information given under 1.1.1.

2.2.2. Non-governmental expeditions

Update of information given under 1.1.2 plus, for section 1.1.2.A and B: total amount of passengers transported in each journey, total number of crew members on board in each journey.

2.3. Permit Information

2.3.1. Visits to Protected Areas

Update of information provided under 1.2.

2.3.2. Taking and harmful interference with flora and fauna

Permit number, permit period, Species, location, amount, sex, age and purpose.³

2.3.3. Introduction of non-native species

Permit number, permit period, species, location, amount, purpose,⁴ removal or disposal.

2.4. Environmental Information

2.4.1. Compliance with the Protocol⁵

Description of measure, date of effect.

² Optional provision of information on Forward plans will be allowed at any time, for example when domestic plans are completed or updated.

³ Purpose with reference to Article 4 of Annex II to the Protocol.

⁴ Purpose with reference to Article 4 of Annex II to the Protocol.

⁵ New measures adopted during past year in accordance with Article 13 of the Protocol on Environmental Protection to the Antarctic Treaty including the adoption of laws and regulations, administrative actions and enforcement measures.

2.4.2. Contingency Plans

Title of Contingency Plan(s) for oil spills and other environmental emergencies, copies (PDFs) or contact point for printed versions.

2.4.3. List of IEEs and CEEs⁶

List of IEEs/CEEs undertaken during year giving proposed activity, (optionally) period/length, location, level of assessment and decision taken.

2.4.4. Monitoring activities report⁷

Name of activity, location, procedures put in place, significant information obtained, action taken in consequence thereof.

2.4.5. Waste Management Plans

Title, name of site/vessel, copy (PDF) or contact point for printed version. Report on implementation of waste management plans during the year.

2.4.6. Measures taken to implement the provisions of Annex V⁸

Description of measures.

2.4.7. Procedures relating to EIAs

Description of appropriate National Procedures.

2.4.8. Prevention of marine pollution⁹

Description of measures.

3. Permanent Information

The following information should be submitted in accordance with the requirements of the Antarctic Treaty and Protocol on Environmental Protection to the Antarctic Treaty. The information can be updated at any time.

⁶ Information on IEEs and CEEs is encouraged to be provided 'as soon as domestic processes are concluded, while maintaining the existing deadline for Parties to submit the information'.

⁷ Monitoring activities connected with activities subject to initial and comprehensive environmental evaluations (referred to in Protocol Annex I, Art. 6.1 c).

⁸ Information on measures taken to implement Annex V including site inspections and any steps taken to address instances of activities in contravention of the provisions of ASPA or ASMA management plans.

⁹ Measures to ensure that any warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service acts in a manner consistent, so far as is reasonable and practicable, with the Annex.

3.1. Science Facilities

3.1.1. Automatic Recording Stations/Observatories

Site name, co-ordinates (latitude and longitude), elevation (m), parameters recorded, observation frequency, reference number (*eg*, WMO no.).

3.2. Operational Information

A. Stations

Name of Year-Round stations (giving region, latitude and longitude), status, date established and accommodation and medical facilities.

Name of Seasonal stations/bases and field camps (giving region, latitude, longitude), status, operating period and maximum population.

Names of refuges (giving region, latitude and longitude) medical facilities and accommodation capacity. Search and Rescue Information.

B. Vessels

Name of vessels, Flag State, ice strength, length, beam and gross tonnage (a link may be provided to COMNAP data). Maximum crew, Maximum Passengers.

Search and Rescue Information.

C. Aircraft

Quantity and type of aircraft operated. Search and Rescue Information.

3.3. Environmental Information

3.3.1. Waste Management Plans

Title of Plan, site/vessel, copy (PDF) or contact point for printed version.

3.3.2. Contingency Plans

Title of Contingency Plan(s) for Oil Spills and other environmental emergencies, copies (PDFs) or contact point for printed versions.

3.3.3. Inventory of Past Activities

Name of station/base/field camp/traverse/crashed aircraft/etc, co-ordinates (latitude and longitude) period during which activity undertaken; description/purpose of activities undertaken; description of equipment or facilities remaining.

3.3.4. Compliance with the Protocol¹⁰

Description of measure, date of effect.

3.3.5. Procedures relating to EIAs

Same as 2.4.7.

3.3.6. Prevention of marine pollution

Same as 2.4.8.

3.3.7. Measures taken to implement the provisions of Annex V

Same as 2.4.6.

3.4. Other Information

3.4.1. Relevant National Legislation

Description of law, regulation, administrative action or other measure, date of effect/enacted, giving copy (PDF) or contact point for printed version.

¹⁰ Measures adopted in accordance with Article 13 of the Protocol on Environmental Protection to the Antarctic Treaty including the adoption of laws and regulations, administrative actions and enforcement measures.

3. Resolutions

Revised Antarctic Clean-Up Manual

The Representatives,

Recalling the requirement under Article 1(5) of Annex III to the Protocol on Environmental Protection to the Antarctic Treaty that “past and present waste disposal sites on land and abandoned work sites of Antarctic activities shall be cleaned up by the generator of such wastes and the user of such sites”, and that this “obligation shall not be interpreted as requiring the removal of any structure designated as a historic site or monument, or the removal of any structure or waste material in circumstances where the removal by any practical option would result in greater adverse environmental impact than leaving the structure or waste material in its existing location”;

Noting that under Resolution 2 (2013) the Antarctic Treaty Consultative Meeting (“ATCM”) adopted a Clean-Up Manual to provide guidance to the Parties in order to support Parties in meeting the requirement above, and encouraged the Committee for Environmental Protection (“CEP”) to continue to develop the Clean-Up Manual, with the input of the Scientific Committee on Antarctic Research (“SCAR”) and the Council of Managers of National Antarctic Programs (“COMNAP”);

Considering the revision of the Clean-Up Manual by the CEP;

Desiring to update the Clean-Up Manual to reflect developments and advances in clean-up in Antarctica;

Recommend to their Governments that:

1. the Clean-Up Manual annexed to this Resolution replace the Clean-Up Manual adopted under Resolution 2 (2013);
2. the Committee for Environmental Protection (“CEP”) be encouraged to continue to develop the Clean-Up Manual with the input of the Scientific

Committee on Antarctic Research (“SCAR”) and the Council of Managers of National Antarctic Programs (“COMNAP”); and

3. the Secretariat of the Antarctic Treaty post the text of Resolution 2 (2013) on its website in a way that makes clear that it is no longer current.

Antarctic Clean-Up Manual

1. Introduction

a) Background

In 1975 the Antarctic Treaty Parties adopted Recommendation VIII-11, which contained the first agreed guidance for the appropriate management and disposal of waste generated by expeditions and stations, with a view to minimising impacts on the Antarctic environment. As awareness of the potential environmental impacts of the disposal of waste in the Antarctic region increased, in parallel with improvements in logistics and technology, the Parties identified a need for improved on-site treatment of wastes and for the removal of some wastes from the Antarctic Treaty area.

Through Recommendation XV-3 (1989) the Parties adopted more stringent waste disposal and management practices, based on recommendations from a SCAR Panel of Experts on Waste Disposal in the Antarctic, with the aim of minimising impact on the Antarctic environment and minimising interference with scientific research or other legitimate uses of the Antarctic. These practices not only addressed requirements for the management of wastes associated with present and future activities, but also called for programmes to clean up existing waste disposal sites and abandoned work sites, and for an inventory of locations of past activities.

Many elements of Recommendation XV-3 are closely reflected in the current provisions for waste disposal and management, contained in Annex III to the Environment Protocol, on Waste Disposal and Waste Management. The Environment Protocol as a whole sets the context in which the provisions of Annex III should be implemented.

Among other requirements Annex III provides, in Article 1.5, that:

‘Past and present waste disposal sites on land and abandoned work sites of Antarctic activities shall be cleaned up by the generator of such wastes and the user of such sites. This obligation shall not be interpreted as requiring:

- a) the removal of any structure designated as a historic site or monument; or
- b) the removal of any structure or waste material in circumstances where the removal by any practical option would result in greater adverse environmental impact than leaving the structure or waste material in its existing location.’

Prior to these instruments, waste management at Antarctic facilities often involved the open burning and disposal of waste in tips. Similarly, it was commonplace to abandon disused facilities and leave them to deteriorate. Many past waste disposal sites and abandoned work sites require ongoing management today. Such sites are frequently characterised by a mix of physical debris (*eg*, building materials, machinery, vehicles, general rubbish)

plus chemical contaminants, some of which may be in containers (which are subject to deterioration) and some of which may have been released into the environment. In some instances waste disposal sites extend into the near shore marine environment. Seepage and runoff from abandoned sites, and from more recent spill sites, can result in contamination spreading to other parts of the environment. In general such contaminants degrade very slowly in Antarctic conditions.

Based on extrapolation from a few well documented sites, it has been estimated that the volume of abandoned, unconfined tip materials in Antarctica may be greater than 1 million m³ and that the volume of petroleum-contaminated sediment may be similar (Snape and others, 2001). Although this is a relatively small volume compared to the situation in other parts of the world, the significance of the associated environmental impacts is magnified due to the fact that many Antarctic contaminated sites are located in the relatively rare coastal ice-free areas that provide habitat for most of the terrestrial flora and fauna.

b) Overall Clean-Up objective

The overall objective for Parties' actions to address environmental risks posed by past waste disposal sites on land, abandoned works sites of Antarctic activities, and sites contaminated by spills of fuel or other hazardous substances is:

To minimise adverse impact on the Antarctic environment, and to minimise interference with the natural values of Antarctica, with scientific research and with other uses of Antarctica which are consistent with the Antarctic Treaty, by cleaning up past waste disposal sites on land, abandoned work sites of Antarctic activities, and sites contaminated by spills of fuel or other hazardous substances. Such clean-up actions shall not require the removal of any: structure designated as a historic site or monument: pre-1958 historic artefacts / sites subject to the interim protection provided by the provisions of Resolution 5 (2001); or structure or waste material in circumstances where the removal by any practical option would result in greater adverse environmental impact than leaving the structure or waste material in its existing location.¹

This objective reflects requirements outlined in Annex III (Waste Disposal and Waste Management) to the Protocol on Environmental Protection to the Antarctic Treaty (the Environment Protocol) and later Resolutions relevant to sites and objects/artefacts of potential historic or heritage value.

c) Purpose of the Clean-Up Manual

The purpose of this manual is to provide guidance to Antarctic Treaty Parties in order to meet the objective above. The manual includes key guiding principles and links to practical

¹ Resolution 2 (2018) *Guidelines for the assessment and management of Heritage in Antarctica* includes guidance and support in the process of assessing and determining whether a site/object should be managed as heritage, including whether it merits Historic Site and Monument (HSM) listing, in the context of obligations under both Annex V and Annex III to the Protocol on Environmental Protection to the Antarctic Treaty (Environment Protocol).

guidelines and resources that operators can apply and use, as appropriate, to assist with addressing the requirements of the Environment Protocol, in particular Annex III. The practical guidelines are recommendatory and not all guidelines will be appropriate to all operations, or to all sites. The manual is intended to be updated and added to as new work, research and best practice emerge.

The guidance provided here is focussed on the repair and remediation of past waste disposal sites on land, abandoned work sites of Antarctic activities, and sites contaminated by spills of fuel or other hazardous substances. Practical guidance for preventing, monitoring and responding to the introduction of non-native species is presented in the Committee for Environmental Protection (CEP) Non-Native Species Manual.

The Council of Managers of National Antarctic Programs (COMNAP) has developed a Fuel Manual, which outlines important measures for spill prevention and containment. This Clean-Up Manual complements the COMNAP Fuel Manual by providing guidance on appropriate clean-up and restoration actions, which the COMNAP Fuel Manual indicates should be addressed as part of the Operational Plans to be prepared for individual facilities or relevant geographic areas.

In practice, it will not be practicable to clean up all past waste disposal sites on land, abandoned work sites of Antarctic activities and contaminated sites immediately or concurrently, so the manual also aims to provide guidance on identifying priorities for clean-up activities, and on remediating or removing contaminated materials to a level where ongoing environmental risks are mitigated.

Reasons to undertake timely clean-up action, in accordance with the provisions of the Environment Protocol, include:

- many abandoned waste disposal sites and abandoned work sites contain potential contaminants in containers (*eg*, drums filled with fuel, oil, chemicals), and there is a limited time before they deteriorate, causing contamination and making clean-up much more difficult;
- as noted by the 2010 Antarctic Treaty Meeting of Experts on Climate Change and Implications for Antarctic Management and Governance, climate changes could accelerate localised release of contamination from past waste disposal sites and abandoned work sites through increased melting;
- the harmful effects of chemical contaminants on the environment and ecosystem can increase with increasing exposure time, and increase the chance of cumulative impacts from exposure to other environmental stressors;
- dispersion processes (*eg*, entrainment with melt water) can cause the total area contaminated to increase with time, in some cases resulting in contamination of the marine environment;
- some sites may otherwise be lost to the ocean or covered by ice/snow where they may continue to have detrimental impacts but will be much more difficult and costly to manage; and

- possible risks to human health (*eg*, hazardous chemicals or other substances, such as asbestos).

2. Key Guiding Principles

Information management

Record keeping is important throughout the clean-up process and should commence well before any clean-up activities occur on site.

- 1) Record keeping should be designed so that information on individual sites is easily accessible and so that information on actions and events at each site can be added over time.
- 2) The record of information should be kept up to date and should include the precise location and status of contaminated sites, planned and actual timelines for clean-up actions, the clean-up actions that have occurred, the reasons why key decisions were made and the lessons learned.
- 3) The type of information to be recorded should reflect its intended use, including:
 - site assessment and prioritisation;
 - supporting operational decisions;
 - ensuring compliance to environmental impact assessment / permit conditions;
 - monitoring and evaluating the effectiveness of a clean-up process; and
 - facilitating the exchange of information between Parties and with other stakeholders.
- 4) Record keeping should be designed so that it can also be used as the foundation for the Antarctic-wide inventory of locations of past activity, in accordance with Article 8.3 of Annex III.

Site assessment / characterisation

An assessment of the features of the site that will influence how contaminants behave, and the environmental values that may be impacted, should be undertaken before considering how best to clean up a site.

- 5) The site assessment should consider:
 - the nature and extent of physical debris and/or chemical contamination, and the landscape (*eg*, geology, geomorphology, hydrology, glaciology) of the site and surrounding area, with particular emphasis on slope, aspect and water flows;
 - potential challenges for clean-up actions presented by the location, landscape, and surrounding area (*eg*, accessibility and susceptibility to damage from machinery or recovery equipment);

- the environmental values of the site and surrounding area, including the range of values protected under the Environment Protocol; and
 - likely changes at the site including deterioration of containers (such as rusting fuel drums), changes in chemical compositions (*eg*, through natural weathering processes) and transport of the contaminants (*eg*, from wind or water flow).
- 6) All available information should be used to assess the current impact and potential future threat to the environment from the contamination.

Environmental risk assessment

Environmental risk assessment is the process of determining the inherent risks posed by the site to the environmental values.

- 7) The environmental risk assessment should use the information gained during site assessment, including uncertainties, and should inform the decisions taken throughout the clean-up process.
- 8) The environmental risk assessment should assist to prioritise which site(s) should be cleaned up first, to decide among the various clean-up options (see below) and to set realistic targets for clean-up (see below).
- 9) The environmental risk assessment should be regularly reviewed and confirmed or modified during the clean-up process.

Environmental quality targets for clean-up

In some cases, the complete removal of all traces of contamination would be impractical, or would result in greater adverse environmental impact. Environmental quality targets for clean-up are the concentration of contaminant that may remain within the environment without creating unacceptable impacts on the environmental values of the site.

- 10) Environmental quality targets for clean-up should be determined on a site specific basis taking into account the characteristics of the site and the environmental values present.
- 11) From the viewpoint of biodiversity conservation, environmental quality targets should be based on the sensitivity of relevant species to the specific contaminants (such as from ecotoxicology studies).
- 12) Environmental quality targets are just one factor when considering the options for clean-up (see below).

Consideration of clean-up options

At the highest level the range of possible clean-up options for sites contaminated by fuel and other hazardous substances may include: do nothing (which may result in natural attenuation); containment on site to reduce dispersion; *in situ* remediation to enhance attenuation processes; removal from the site with treatment in Antarctica (clean-up *ex*

situ); and removal from the Antarctic Treaty area. Within each of these options there are further choices of possible clean-up actions (see below).

- 13) A risk assessment should be undertaken for all clean-up options being considered, with a focus on ensuring that greater adverse environmental impact does not occur as a result of the clean-up process.
- 14) Options analysis should consider the environmental quality targets and risk of additional adverse impacts arising from the clean-up activity. Given the practical realities of operating in Antarctica, other relevant considerations are likely to include feasibility, available technology, practicality, safety of personnel, cost-effectiveness, and opportunities for international cooperation.

Clean-up actions

Clean-up actions are the operational activities that happen at the site and / or elsewhere on material that has been removed from the site.

- 15) Wherever appropriate, plans and environmental impact assessments for new activities in Antarctica should consider the nature and scale of any clean-up activity which will be subsequently required. Actions to clean up sites of past activities should also be subject to environmental impact assessment in accordance with the provisions of the Protocol.²
- 16) Clean-up techniques developed for contaminated sites in other regions of the world may have some value in Antarctica but are likely to require modification to make them suitable for local conditions.
- 17) All clean-up options, including the 'do nothing' option, may require some commitment of resources, such as monitoring (see below) to confirm the environmental risk assessment.
- 18) In some cases containment on site to reduce dispersion will be identified as the best means of protecting environmental values. Techniques for containment should be designed for:
 - the types of contaminants present (the principal distinction being organic (*eg*, fuel) or inorganic (*eg*, metals from waste dumps); and
 - the characteristics of the environment (*eg*, freeze/thaw process, seasonal presence of free water, physical characteristics of the site such as slope and substrate).
- 19) *In situ* remediation to enhance attenuation processes (*eg*, enhanced biodegradation by the adding of nutrients, increasing temperature and aerating soil) can be cost-effective and is likely to be less disturbing to the environment than options requiring extraction, but techniques must be appropriate for the types of contaminants and the characteristics of the environment (as above).

² The *Guidelines for Environmental Impact Assessment in Antarctica* (Resolution 1 [2016]) provide advice on the process for and elements that require consideration in an environmental impact assessment.

- 20) Removal from the site with treatment in Antarctica may create more disturbance at the site than *in situ* remediation but has the potential advantage of relocation to a site that is more easily managed such as close to a station. The receiving site should be controlled to ensure the safety of personnel and to prevent further environmental impact (eg, clearly identifiable and known to station personnel, contained to prevent dispersal of contaminants).
- 21) In some cases the removal of contaminated materials from the Antarctic Treaty area may be the most appropriate option for addressing the requirements of the Environment Protocol. As above, this may create more disturbance than *in situ* remediation and, in the case of ice-free sites, also has the disadvantage of removing rare soil from Antarctica. This option is also likely to be the most costly, is dependent on the availability and capacity of shipping, and may raise biosecurity or contaminated material concerns for the receiving country.
- 22) Monitoring and evaluation (see below) should be designed as an integral part of the clean-up process.
- 23) Clean-up should be considered complete only once the environmental quality targets have been met.

Monitoring and evaluation

Monitoring and evaluation are both used to characterise and record the quality of the environment but have specific and distinct roles before, during and/or after clean-up.

- 24) Monitoring should be undertaken to identify and provide early warning of any adverse effects of the clean-up activity that may require modifications of procedures, and to assess and verify predictions identified in the environmental impact assessment.
- 25) Evaluation refers to determining whether the clean-up activity has achieved the desired environmental quality targets.
- 26) Both monitoring and evaluation should focus on the vulnerable environmental values of the site and take into account the final use of the data.

3. Guidelines and resources to support clean-up

As the manual is developed, this section will be expanded to contain voluntary guidelines and resources to assist Parties to address their clean-up obligations under Annex III to the Protocol. Examples of desirable materials include:

- a standard approach and/or form for record keeping and reporting on clean-up activities;
- checklists and/or matrices for environmental risk assessment;
- guidance for detailed site assessment;

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- scientific information to inform the setting of appropriate environmental quality targets;
- techniques for preventing mobilisation of contaminants such as melt water diversion and containment barriers;
- techniques for *in situ* and *ex situ* remediation of sites contaminated by fuel spills or other hazardous substances;
- techniques for the clean-up of buildings or other structures at abandoned work sites;
- techniques for separation and recovery of fuel spilled on ice or snow;
- guidance for planning and undertaking monitoring and evaluation; and
- guidance for the identification and detection of sites requiring clean-up (including for example abandoned worksites, waste disposal sites, spill sites covered by ice/snow).

Resources

Checklist for Preliminary Site Assessment: See Annex 1.

Guidance for Construction and Management of Biopiles for the Bioremediation of Petroleum Hydrocarbon Contaminated Soil in the Antarctic: See Annex 2.

Guidance for Construction and Management of Permeable Reactive Barriers for the Treatment of Hydrocarbon Contaminated Groundwater in the Antarctic: See Annex 3.

References

General

- The Antarctic Environments Portal includes information summaries relevant to clean-up (<https://www.environments.aq/>)
- EMERGENCY PREVENTION, PREPAREDNESS AND RESPONSE (EPPR). 2017. Field Guide for Oil Spill Response in Arctic Waters (2nd Edition), Arctic Council Secretariat. (<https://oaarchive.arctic-council.org/handle/11374/2100>).

CEP papers

- ATCM XXXV/IP6 (Australia). 2012. *Topic Summary: CEP Discussions on Clean-Up* (contains links to electronic versions of papers on the subject of clean-up submitted to the Committee for Environmental Protection between 1998 and 2011).

Published papers

- ALVES, C.M., FERREIRA, C.M.H., SOARES, H.M.V.M. 2018. Relation between different metal pollution criteria in sediments and its contribution on assessing toxicity. *Chemosphere*, 208, 390-398.
- ARONSON, R.B., THATJE, S., MCCLINTOCK, J.B., & HUGHES, K.A. 2011. Anthropogenic impacts on marine ecosystems in Antarctica. *Annals of the New York Academy of Sciences*, 1223, 82-107.
- BROOKS, S.T., JABOUR, J., BERGSTROM, D.M. 2018. What is 'footprint' in Antarctica: Proposing a set of definitions. *Antarctic Science*, 30 (4), 227-235.
- ERRINGTON, I., KING, C.K., WILKINS, D., SPEDDING, T., HOSE, G.C. 2018. Ecosystem effects and the management of petroleum-contaminated soils on subantarctic islands. *Chemosphere*, 194, 200-210.
- POLAND, J.S., RIDDLE, M.J., & ZEEB, B.A. 2003. Contaminants in the Arctic and the Antarctic: a comparison of sources, impacts, and remediation options. *Polar Record*, 39(211), 369-383.
- RIDDLE, M. 2000. Scientific studies of Antarctic life are still the essential basis for long-term conservation measures. In Davison, W., Howard-Williams, C., & Broady, P. Eds. *Antarctic Ecosystems: Models for Wider Ecological Understanding*. New Zealand Natural Sciences, Canterbury University, 497-302.
- TIN, T., FLEMING, Z.L., HUGHES, K.A., AINLEY, D.G., CONVEY, P., MORENO, C.A., PFEIFFER, S., SCOTT, J., & SNAPE, I. 2009. Impacts of local human activities on the Antarctic environment. *Antarctic Science*, 21, 3-33.

Site assessment / characterisation

Published papers

- ABAKUMOV, E.V., LODYGIN, E.D., GABOV, D.A., & KRYLENKOV, V.A. 2014. Polycyclic aromatic hydrocarbons content in Antarctica soils as exemplified by the Russian polar stations. *Gigiena i sanitaria*, (1), 31-35.
- AMARO, E., PADEIRO, A., MÃO DE FERRO, A., MOTA, A.M., LEPPE, M., VERKULICH, S., HUGHES, K.A., PETER, H.-U., & CANÁRIO, J. 2015. Assessing trace element contamination in Fildes Peninsula (King George Island) and Ardley Island, Antarctic. *Marine Pollution Bulletin*, 97(1-2), 523-527.
- BRAUN, C., HERTEL, F. AND PETER, H. U. 2017. Environmental management: The Fildes Peninsula paradigm. *Handbook on the Politics of Antarctica*, K. Dodds, A. D. Hemmings and P. Roberts. Cheltenham, UK, Edward Elgar Publishing: 351-367.
- CABRERIZO, A., TEJEDO, P., DACHS, J., & BENAYAS, J. 2016. Anthropogenic and biogenic hydrocarbons in soils and vegetation from the South Shetland Islands (Antarctica). *Science of the Total Environment*, 569, 1500-1509.
- DALFIOR, B.M., RORIZ, L.D., JUNIOR, R.F., DE FREITAS, A.C., DA SILVA, H.E., CARNEIRO, M., LICINIO, M., & BRANDAO, G.P. 2016. EVALUATION OF Pb, Cd,

Sn, Co, Hg, Mo ANDAs IN SOIL FROM FILDES PENINSULA - ANTARCTICA. *Quimica Nova*, 39(8), 893-900.

- DAUNER, A.L.L., HERNÁNDEZ, E.A., MAC CORMACK, W.P., & MARTINS, C.C. 2015. Molecular characterisation of anthropogenic sources of sedimentary organic matter from Potter Cove, King George Island, Antarctica. *Science of the Total Environment*, 502(0), 408-416.
- FRYIRS, K.A., HAFSTEINSDÓTTIR, E.G., STARK, S.C., & GORE, D.B. 2015. Metal and petroleum hydrocarbon contamination at Wilkes Station, East Antarctica. *Antarctic Science*, 27(02), 118-133.
- FREIDMAN, B.L., CAMENZULI, D., & LACKIE, M. 2014. Locating an ice-covered Antarctic landfill using ground magnetometry. *Antarctic Science*, 26(4), 361-368.
- GUERRA, M.B.B., NETO, E.L., PRIANTI, M.T.A., PEREIRA-FILHO, E.R., & SCHAEFER, C.E.G.R. 2013. Post-fire study of the Brazilian Scientific Antarctic Station: Toxic element contamination and potential mobility on the surrounding environment. *Microchemical Journal*, 110, 21-27.
- GUERRA, M.B.B., ROSA, P.F., SCHAEFER, C.E.G.R., MICHEL, R.F.M., ALMEIDAB, I.C., & PEREIRA-FILHO, E.R. 2012. Chemometric tools in chemical fractionation data of soil samples from five antarctic research stations. *Journal of the Brazilian Chemical Society*, 23(7), 1388-1394.
- KLEIN, A.G., SWEET, S.T., WADE, T.L., SERICANO, J.L., & KENNICUTT, M.C. 2012. Spatial patterns of total petroleum hydrocarbons in the terrestrial environment at McMurdo Station, Antarctica. *Antarctic Science*, 24(5), 450-466.
- PADEIRO, A., AMARO, E., DOS SANTOS, M.M.C., ARAUJO, M.F., GOMES, S.S., LEPPE, M., VERKULICH, S., HUGHES, K.A., PETER, H.U., & CANARIO, J. 2016. Trace element contamination and availability in the Fildes Peninsula, King George Island, Antarctica. *Environmental Science-Processes & Impacts*, 18(6), 648-657.
- PETER, H.-U., BRAUN, C., JANOWSKI, S., NORDT, A., NORDT, A., & STELTER, M. 2013. The current environmental situation and proposals for the management of the Fildes Peninsula Region. Report No. UBAFB 001662/E. In Federal Environment Agency (Umweltbundesamt), Germany, 127.
- PRUS, W., FABIÁŃSKA, M.J., & ŁABNO, R. 2015. Geochemical markers of soil anthropogenic contaminants in polar scientific stations nearby (Antarctica, King George Island). *Science of the Total Environment*, 518-519(0), 266-279.
- RAYMOND, T., KING, C. K., RAYMOND, B., STARK, J. S. & SNAPE, I. 2016. Oil Pollution in Antarctica. In: FINGAS, M. (ed.) *Oil Spill Science and Technology*. Gulf Professional Publishing.
- RAYMOND, T. C. & SNAPE, I. 2016. Using triage for environmental remediation in Antarctica. *Restoration Ecology*, 1-6.
- STARK, J.S., KIM, S.L., & OLIVER, J.S. 2014b. Anthropogenic Disturbance and Biodiversity of Marine Benthic Communities in Antarctica: A Regional Comparison. *PLoS ONE*, 9(6), 24.

- VÁZQUEZ, S., MONIEN, P., PEPINO MINETTI, R., JÜRGENS, J., CURTOSI, A., VILLALBA PRIMITZ, J., FRICKENHAUS, S., ABELE, D., MAC CORMACK, W. & HELMKE, E. 2017. Bacterial communities and chemical parameters in soils and coastal sediments in response to diesel spills at Carlini Station, Antarctica. *Science of The Total Environment*, 605, 26-37.

Environmental risk assessment

Published papers

- CHU, W.L., DANG, N.L., KOK, Y.Y., IVAN YAP, K.S., PHANG, S.M., CONVEY, P. 2018. Heavy metal pollution in Antarctica and its potential impacts on algae. *Polar Science* (in Press).
- CHU Z., YANG Z., WANG Y., SUN L., YANG W., YANG L., GAO Y. (2019). Assessment of heavy metal contamination from penguins and anthropogenic activities on Fildes Peninsula and Ardley Island, Antarctic. *Science of the Total Environment*, 646, 951-957.
- GUERRA, M.B.B., NETO, E.L., PRIANTI, M.T.A., PEREIRA-FILHO, E.R., & SCHAEFER, C.E.G.R. 2013. Post-fire study of the Brazilian Scientific Antarctic Station: Toxic element contamination and potential mobility on the surrounding environment. *Microchemical Journal*, 110, 21-27.
- PEREIRA, J.L., PEREIRA, P., PADEIRO, A., GONÇALVES, F., AMARO, E., LEPPE, M., VERKULICH, S., HUGHES, K.A., PETER, H.-U., & CANÁRIO, J. 2017. Environmental hazard assessment of contaminated soils in Antarctica: Using a structured tier 1 approach to inform decision-making. *Science of the Total Environment*, 574, 443-454.
- STARK, J.S., BRIDGEN, P., DUNSHEA, G., GALTON-FENZI, B., HUNTER, J., JOHNSTONE, G., KING, C., LEEMING, R., PALMER, A., SMITH, J., SNAPE, I., STARK, S., & RIDDLE, M. 2016a. Dispersal and dilution of wastewater from an ocean outfall at Davis Station, Antarctica, and resulting environmental contamination. *Chemosphere*, 152, 142-157.
- STARK, J.S., CORBETT, P.A., DUNSHEA, G., JOHNSTONE, G., KING, C., MONDON, J.A., POWER, M.L., SAMUEL, A., SNAPE, I., & RIDDLE, M. 2016b. The environmental impact of sewage and wastewater outfalls in Antarctica: An example from Davis station, East Antarctica. *Water Research*, 105, 602-614.
- WASLEY, J., MOONEY, T. J. & KING, C. K. 2016. Soil invertebrate community change over fuel-contaminated sites on a subantarctic island: An ecological field-based line of evidence for site risk assessment. *Integr Environ Assess Manag*, 12, 306-14.

Environmental quality targets for clean-up

Published papers

- ALEXANDER, F.J., KING, C.K., REICHEL-TBRUSHETT, A.J., & HSTATHAMARRISON, P.L. 2017. Fuel oil and dispersant toxicity to the Antarctic sea urchin (*Sterechinus neumayeri*). *Environmental Toxicology and Chemistry*, 36(6), 1563-1571.
- ARBEL, J., KING, C.K., RAYMOND, B., WINSLEY, T., & Mengersen, K.L. 2015. Application of a Bayesian nonparametric model to derive toxicity estimates based on the response of Antarctic microbial communities to fuel-contaminated soil. *Ecology and Evolution*, 5(13), 2633-2645.
- BROWN, K.E., KING, C.K., & HARRISON, P.L. 2017. Lethal and behavioral impacts of diesel and fuel oil on the Antarctic amphipod *Paramoera walkeri*. *Environmental Toxicology and Chemistry*, 36(9), 2444-2455.
- CANDY, S.G., SFILIGOJ, B.J., KING, C.K., & MONDON, J.A. 2015. Modelling grouped survival times in toxicological studies using Generalized Additive Models. *Environmental and Ecological Statistics*, 22(3), 465-491.
- COLLINS, C.A. 2015. *Natural and Anthropogenic Disturbance in McMurdo Sound, Antarctica: Iceberg Scours, Human-Derived Pollutants, and their Effects on Benthic Communities*. San Jose State University.
- DE OLIVEIRA, M.F., RODRIGUES, E., SUDA, C.N.K., VANI, G.S., DONATTI, L., RODRIGUES, E., & LAVRADO, H.P. 2017. Evidence of metabolic microevolution of the limpet *Nacella concinna* to naturally high heavy metal levels in Antarctica. *Ecotoxicology and Environmental Safety*, 135, 1-9.
- HARVEY, A.N., SNAPE, I., & SICILIANO, S.D. 2012b. Validating potential toxicity assays to assess petroleum hydrocarbon toxicity in polar soil. *Environmental Toxicology and Chemistry*, 31(2), 402-407.
- KOPPEL, D.J., GISSI, F., ADAMS, M.S., KING, C.K., & JOLLEY, D.F. 2017. Chronic toxicity of five metals to the polar marine microalga *Cryothecomonas armigera* – Application of a new bioassay. *Environmental Pollution*, 228(Supplement C), 211-221.
- LISTER, K.N., LAMARE, M.D., & BURRITT, D.J. 2015b. Pollutant resilience in embryos of the Antarctic sea urchin *Sterechinus neumayeri* reflects maternal antioxidant status. *Aquatic Toxicology*, 161, 61-72.
- MARCUS ZAMORA, L., KING, C.K., PAYNE, S.J., & VIRTUE, P. 2015. Sensitivity and response time of three common Antarctic marine copepods to metal exposure. *Chemosphere*, 120, 267-272.
- NYDAHL, A.C., KING, C.K., WASLEY, J., JOLLEY, D.F., & ROBINSON, S.A. 2015. Toxicity of fuel-contaminated soil to Antarctic moss and terrestrial algae. *Environmental Toxicology and Chemistry*, 34(9), 2004-2012.
- PAYNE, S.J., KING, C.K., ZAMORA, L.M., & VIRTUE, P. 2014. Temporal changes in the sensitivity of coastal Antarctic zooplankton communities to diesel fuel:

A comparison between single- and multi-species toxicity tests. *Environmental Toxicology and Chemistry*, 33(4), 882-890.

- PIECHNIK, C.A., HOCKNER, M., DE SOUZA, M., DONATTI, L., & TOMANEK, L. 2017. Time course of lead induced proteomic changes in gill of the Antarctic limpet *Nacella Concinna* (Gastropoda: Patellidae). *Journal of Proteomics*, 151, 145-161.
- PROCTOR, A.H., KING, C.K., HOLAN, J.R., & WOTHERSPOON, S.J. 2017. Integrated Modeling of Survival Data from Multiple Stressor Ecotoxicology Experiments. *Environmental Science & Technology*, 51(12), 7271-7277.
- SFILIGOJ, B.J., KING, C.K., CANDY, S.G., & MONDON, J.A. 2015. Determining the sensitivity of the Antarctic amphipod *Orchomenella pinguides* to metals using a joint model of survival response to exposure concentration and duration. *Ecotoxicology*, 24(3), 583-594.
- VAN DORST, J., SICILIANO, S.D., WINSLEY, T., SNAPE, I., & FERRARI, B.C. 2014b. Bacterial targets as potential indicators of diesel fuel toxicity in subantarctic soils. *Applied and Environmental Microbiology*, 80(13), 4021-4033.

Consideration of clean-up options

CEP papers

- ATCM XXXVII IP 7 *Remediation Plan for the Brazilian Antarctic Station area* (Brazil)
- ATCM XXXVIII IP 16 *Bioremediation on the Brazilian Antarctic Station area* (Brazil)
- ATCM XXXVIII BP 12 *Remediation of fuel-contaminated soil using biopile technology at Casey Station* (Australia)
- ATCM XXXVIII BP 13 *Remediation and reuse of soil from a fuel spill near Lake Dingle, Vestfold Hills* (Australia)
- ATCM XXXIX IP 76 *Environmental Remediation in Antarctica* (Brazil)

Published papers

Degradation of contaminants by naturally occurring microorganisms

- AISLABIE, J.M., RYBURN, J., GUTIERREZ-ZAMORA, M.L., RHODES, P., HUNTER, D., SARMAH, A.K., BARKER, G.M., & FARRELL, R.L. 2012. Hexadecane mineralization activity in hydrocarbon-contaminated soils of Ross Sea region Antarctica may require nutrients and inoculation. *Soil Biology and Biochemistry*, 45, 49-60.
- CAMENZULI, D., & FREIDMAN, B.L. 2015. On-site and in situ remediation technologies applicable to petroleum hydrocarbon contaminated sites in the Antarctic and Arctic. *Polar Research*, 34, 24492.

- CAMENZULI, D., FREIDMAN, B., STATHAM, T., MUMFORD, K., & GORE, D.B. 2014. On-site and in situ remediation technologies applicable to metal-contaminated sites in Antarctica and the Arctic: a review. *Polar Research*, 33, 21522.
- DELILLE, D., COULON, F. 2008. Comparative mesocosm study of biostimulation efficiency in two different oil-amended sub-antarctic soils. *Microbial Ecology*, 56 (2), 243-252.
- FILLER, D., SNAPE, I., & BARNES, D., EDS. 2008. *Bioremediation of Petroleum Hydrocarbons in Cold Regions*. Cambridge. 288 PP.
- GENTILE, G., BONSIGNORE, M., SANTISI, S., CATALFAMO, M., GIULIANO, L., GENOVESE, L., YAKIMOV, M.M., DENARO, R., GENOVESE, M., & CAPPELLO, S. 2016. Biodegradation potentiality of psychrophilic bacterial strain *Oleispira antarctica* RB-8T. *Marine Pollution Bulletin*, 105(1), 125-130.
- HABIB, S., AHMAD, S.A., JOHARI, W.L.W., SHUKOR, M.Y.A., YASID, N.A. 2018. Bioremediation of petroleum hydrocarbon in antarctica by microbial species: An overview. *Pertanika Journal of Science and Technology*, 26 (1), 1-20.
- JURELEVICIUS, D., ALVAREZ, V.M., PEIXOTO, R., ROSADO, A.S., & SELDIN, L. 2012a. Bacterial polycyclic aromatic hydrocarbon ring-hydroxylating dioxygenases (PAH-RHD) encoding genes in different soils from King George Bay, Antarctic Peninsula. *Applied Soil Ecology*, 55, 1-9.
- JURELEVICIUS, D., COTTA, S.R., PEIXOTO, R., ROSADO, A.S., & SELDIN, L. 2012b. Distribution of alkane-degrading bacterial communities in soils from King George Island, Maritime Antarctic. *European Journal of Soil Biology*, 51, 37-44.
- MALAVENDA, R., RIZZO, C., MICHAUD, L., GERÇE, B., BRUNI, V., SYLDATK, C., HAUSMANN, R., & LO GIUDICE, A. 2015. Biosurfactant production by Arctic and Antarctic bacteria growing on hydrocarbons. *Polar Biology*, 38(10), 1565-1574.
- MCWATTERS, R.S., WILKINS, D., SPEDDING, T., HINCE, G., RAYMOND, B., LAGERREWSKIJ, G., TERRY, D., WISE, L., & SNAPE, I. 2016a. On site remediation of a fuel spill and soil reuse in Antarctica. *Science of the Total Environment*, 571, 963-973.
- MUANGCHINDA, C., CHAVANICH, S., VIYAKARN, V., WATANABE, K., IMURA, S., VANGNAI, A.S., & PINYAKONG, O. 2015. Abundance and diversity of functional genes involved in the degradation of aromatic hydrocarbons in Antarctic soils and sediments around Syowa Station. *Environmental Science and Pollution Research*, 22(6), 4725-4735.
- OKERE, U.V., CABRERIZO, A., DACHS, J., JONES, K.C., & SEMPLE, K.T. 2012. Biodegradation of phenanthrene by indigenous microorganisms in soils from Livingstone Island, Antarctica. *Fems Microbiology Letters*, 329(1), 69-77.
- TRIBELLI, P.M., DI MARTINO, C., LÓPEZ, N.I., & RAIGER IUSTMAN, L.J. 2012. Biofilm lifestyle enhances diesel bioremediation and biosurfactant production in the Antarctic polyhydroxyalkanoate producer *Pseudomonas extremaustralis*. *Biodegradation*, 23(5), 645-651.

- SIMPANEN, S., DAHL, M., GERLACH, M., MIKKONEN, A., MALK, V., MIKOLA, J., ROMANTSCHUK, M. 2016. Biostimulation proved to be the most efficient method in the comparison of in situ soil remediation treatments after a simulated oil spill accident. *Environmental Science and Pollution Research*, 23 (24), 25024-25038.
- VÁZQUEZ, S., NOGALES, B., RUBERTO, L., MESTRE, C., CHRISTIE-OLEZA, J., FERRERO, M., BOSCH, R., & MAC CORMACK, W.P. 2013. Characterization of bacterial consortia from diesel-contaminated Antarctic soils: Towards the design of tailored formulas for bioaugmentation. *International Biodeterioration and Biodegradation*, 77, 22-30.
- WANG, Y.B., LIU, F.M., LIANG, Q., HE, B.J., & MIAO, J.L. 2014. Low-temperature degradation mechanism analysis of petroleum hydrocarbon-degrading antarctic psychrophilic strains. *Journal of Pure and Applied Microbiology*, 8(1), 47-53.

Containment on site to reduce contaminant migration

- FREIDMAN, B.L., GRAS, S.L., SNAPE, I., STEVENS, G.W., & MUMFORD, K.A. 2016b. The performance of ammonium exchanged zeolite for the biodegradation of petroleum hydrocarbons migrating in soil water. *Journal of Hazardous Materials*, 313, 272-282.
- FREIDMAN, B.L., GRAS, S.L., SNAPE, I., STEVENS, G.W., & MUMFORD, K.A. 2016a. Application of controlled nutrient release to permeable reactive barriers. *Journal of Environmental Management*, 169, 145-154.
- FREIDMAN, B.L., SPEIRS, L.B.M., CHURCHILL, J., GRAS, S.L., TUCCI, J., SNAPE, I., STEVENS, G.W., & MUMFORD, K.A. 2017a. Biofilm communities and biodegradation within permeable reactive barriers at fuel spill sites in Antarctica. *International Biodeterioration & Biodegradation*, 125(Supplement C), 45-53.
- FREIDMAN, B.L., TERRY, D., WILKINS, D., SPEDDING, T., GRAS, S.L., SNAPE, I., STEVENS, G.W., & MUMFORD, K.A. 2017b. Permeable bio-reactive barriers to address petroleum hydrocarbon contamination at subantarctic Macquarie Island. *Chemosphere*, 174(Supplement C), 408-420.
- HAFSTEINSDOTTIR, E.G., FRYIRS, K.A., STARK, S.C., & GORE, D.B. 2014. Remediation of metal-contaminated soil in polar environments: Phosphate fixation at Casey Station, East Antarctica. *Applied Geochemistry*, 51, 33-43.
- HAFSTEINSDOTTIR, E.G., WHITE, D.A., & GORE, D.B. 2013. Effects of freeze-thaw cycling on metal-phosphate formation and stability in single and multi-metal systems. *Environmental Pollution*, 175, 168-177.
- MCWATTERS, R.S., ROWE, R.K., WILKINS, D., SPEDDING, T., JONES, D., WISE, L., METS, J., TERRY, D., HINCE, G., GATES, W.P., DI BATTISTA, V., SHOAI, M., BOUZZA, A., & SNAPE, I. 2016b. Geosynthetics in Antarctica: Performance of a composite barrier system to contain hydrocarbon-contaminated soil after three years in the field. *Geotextiles and Geomembranes*, 44(5), 673-685.

- MCWATERS, R.S., ROWE, R.K., & RUTTER, A. 2016c. Geomembrane applications for controlling diffusive migration of petroleum hydrocarbons in cold region environments. *Journal of Environmental Management* (181), 80-94.
- MUMFORD, K.A., RAYNER, J.L., SNAPE, I., STARK, S.C., STEVENS, G.W., & GORE, D.B. 2013. Design, installation and preliminary testing of a permeable reactive barrier for diesel fuel remediation at Casey Station, Antarctica. *Cold Regions Science and Technology*, 96, 96-107.
- MUMFORD, K.A., RAYNER, J.L., SNAPE, I., & STEVENS, G.W. 2014. Hydraulic performance of a permeable reactive barrier at Casey Station, Antarctica. *Chemosphere*, 117, 223-231.
- MUMFORD, K.A., POWELL, S.M., RAYNER, J.L., HINCE, G., SNAPE, I., & STEVENS, G.W. 2015. Evaluation of a permeable reactive barrier to capture and degrade hydrocarbon contaminants. *Environmental Science and Pollution Research*, 22(16), 12298-12308.
- STATHAM, T. 2015. *Zero-valent iron for the in situ remediation of Antarctic contaminated sites*. University of Melbourne.
- STATHAM, T.M., MASON, L.R., MUMFORD, K.A., & STEVENS, G.W. 2015a. The specific reactive surface area of granular zero-valent iron in metal contaminant removal: Column experiments and modelling. *Water Research*, 77, 24-34.
- STATHAM, T.M., MUMFORD, K.A., & STEVENS, G.W. 2015c. Removal of Copper and Zinc from Ground Water by Granular Zero-Valent Iron: A Study of Kinetics. *Separation Science and Technology*, 50(12), 1748-1756.
- STATHAM, T.M., MUMFORD, K.A., RAYNER, J.L., & STEVENS, G.W. 2015b. Removal of copper and zinc from ground water by granular zero-valent iron: A dynamic freeze-thaw permeable reactive barrier laboratory experiment. *Cold Regions Science and Technology*, 110(0), 120-128.
- STATHAM, T.M., STARK, S.C., SNAPE, I., STEVENS, G.W., & MUMFORD, K.A. 2016. A permeable reactive barrier (PRB) media sequence for the remediation of heavy metal and hydrocarbon contaminated water: A field assessment at Casey Station, Antarctica. *Chemosphere*, 147, 368-375.
- WHITE, D.A., HAFSTEINSDÓTTIR, E.G., GORE, D.B., THOROGOOD, G., & STARK, S.C. 2012. Formation and stability of Pb-, Zn- & Cu-PO₄ phases at low temperatures: Implications for heavy metal fixation in polar environments. *Environmental Pollution*, 161, 143-153.

In situ remediation with enhanced attenuation

- HARVEY, A.N., SNAPE, I., & SICILIANO, S.D. 2012a. Changes in liquid water alter nutrient bioavailability and gas diffusion in frozen antarctic soils contaminated with petroleum hydrocarbons. *Environmental Toxicology and Chemistry*, 31(2), 395-401.

- MARTÍNEZ ÁLVAREZ, L. M., BALBO, A. L., MAC CORMACK, W. P., & RUBERTO, L. A. M. 2015. Bioremediation of a petroleum hydrocarbon-contaminated Antarctic soil: optimization of a biostimulation strategy using response-surface methodology (RSM). *Cold Regions Science and Technology*, 119, 61-67.
- MARTÍNEZ ÁLVAREZ, L.M., RUBERTO, L.A.M., LO BALBO, A., & MAC CORMACK, W.P. 2017. Bioremediation of hydrocarbon-contaminated soils in cold regions: Development of a pre-optimized biostimulation biopile-scale field assay in Antarctica. *Science of the Total Environment*, 590–591, 194-203.
- WALWORTH, J., HARVEY, P., & SNAPE, I. 2013. Low temperature soil petroleum hydrocarbon degradation at various oxygen levels. *Cold Regions Science and Technology*, 96, 117-121.

Removal from site with treatment in Antarctica

- DE JESUS, H.E., PEIXOTO, R.S., CURY, J.C., VAN ELSAS, J.D., & ROSADO, A.S. 2015. Evaluation of soil bioremediation techniques in an aged diesel spill at the Antarctic Peninsula. *Applied Microbiology and Biotechnology*, 99(24), 10815-10827.
- DIAS, R.L., RUBERTO, L., CALABRÓ, A., BALBO, A.L., DEL PANNO, M.T., & MAC CORMACK, W.P. 2015. Hydrocarbon removal and bacterial community structure in on-site biostimulated biopile systems designed for bioremediation of diesel-contaminated Antarctic soil. *Polar Biology*, 38(5), 677-687.
- DIAS, R.L., RUBERTO, L., HERNÁNDEZ, E., VÁZQUEZ, S.C., LO BALBO, A., DEL PANNO, M.T., & MAC CORMACK, W.P. 2012. Bioremediation of an aged diesel oil-contaminated Antarctic soil: Evaluation of the “on site” biostimulation strategy using different nutrient sources. *International Biodeterioration and Biodegradation*, 75, 96-103.
- WHELAN, M.J., COULON, F., HINCE, G., RAYNER, J., MCWATTERS, R., SPEDDING, T., & SNAPE, I. 2015. Fate and transport of petroleum hydrocarbons in engineered biopiles in polar regions. *Chemosphere*, 131, 232-240.

Clean-up actions

CEP papers

- ATCM XXXVIII WP 49 *Environmental Remediation in Antarctica* (Brazil, Argentina)
- ATCM XXXVIII IP 41 *Remediation and Closure of Dry Valley Drilling Project Boreholes in Response to Rising Lake Levels* (United States)
- ATCM XXXVIII BP 12 *Remediation of fuel-contaminated soil using biopile technology at Casey Station* (Australia)
- ATCM XXXVIII BP 13 *Remediation and reuse of soil from a fuel spill near Lake Dingle, Vestfold Hills* (Australia)

ATCM XLII Final Report

- ATCM XL IP 74 *Clean-up and removal of Italy installations at Sitry airfield camp along the avio-route MZS-DDU, Antarctica (Italy)*
- ATCM XL IP 48 *Clean-up of Scientific Equipment and Infrastructure from Mt. Erebus, Ross Island, Antarctica (United States)*
- ATCM XL IP 49 *Report on Clean-up at Metchnikoff Point, Brabant Island (United Kingdom)*
- ATCM XL BP 18 *Tareas de Gestión Ambiental en la Base Belgrano II (Argentina)*

Published papers

- MCWATTERS, R.S., WILKINS, D., SPEDDING, T., HINCE, G., RAYMOND, B., LAGEREWSKIJ, G., TERRY, D., WISE, L., & SNAPE, I. 2016a. On site remediation of a fuel spill and soil reuse in Antarctica. *Science of the Total Environment*, 571, 963-973.
- MCWATTERS, R.S., ROWE, R.K., WILKINS, D., SPEDDING, T., HINCE, G., RICHARDSON, J., SNAPE, I. 2019. Modelling of vapour intrusion into a building impacted by a fuel spill in Antarctica. *Journal of Environmental Management*, 231, 467-482.
- SNAPE, I., RIDDLE, M.J., STARK, S., COLE, C.M., KING, C.K., DUBESQUE, S., & GORE, D.B. 2001. Management and Remediation of contaminated sites at Casey Station, Antarctica. *Polar Record*, 37(202), 199-214.
- URYUPOVA, E., & SPIRIDONOV, V. 2017. Russia and the environmental protection of Antarctica: the 25th anniversary of the Madrid Protocol. *Polar Record*, 53(4), 376-381.

Monitoring and evaluation

Published papers

- AISLABIE, J.M., NOVIS, P.M., & FERRARI, B. 2014. Microbiology of eutrophic (Ornithogenic and Hydrocarbon-Contaminated) soil. In *Antarctic Terrestrial Microbiology: Physical and Biological Properties of Antarctic Soils*. 91-113.
- CABRITA, M.T., PADEIRO, A., AMARO, E., DOS SANTOS, M.C., LEPPE, M., VERKULICH, S., HUGHES, K.A., PETER, H.-U., & CANÁRIO, J. 2017. Evaluating trace element bioavailability and potential transfer into marine food chains using immobilised diatom model species *Phaeodactylum tricorutum*, on King George Island, Antarctica. *Marine Pollution Bulletin*, 121(1), 192-200.
- CURY, J.C., JURELEVICIUS, D.A., VILLELA, H.D.M., JESUS, H.E., PEIXOTO, R.S., SCHAEFER, C.E.G.R., BÍCEGO, M.C., SELDIN, L., & ROSADO, A.S. 2015. Microbial diversity and hydrocarbon depletion in low and high diesel-polluted soil samples from Keller Peninsula, South Shetland Islands. *Antarctic Science*, 27(03), 263-273.
- DA SILVA ROCHA, A.J., BOTELHO, M.T., HASUE, F.M., DE ARRUDA CAMPOS ROCHA PASSOS, M.J., VIGNARDI, C.P., NGAN, P.V., & GOMES, V. 2015. Genotoxicity

of shallow waters near the Brazilian Antarctic station “Comandante Ferraz” (EACF), Admiralty Bay, King George Island, Antarctica. *Brazilian Journal of Oceanography*, 63(1), 63-70.

- ILLUMINATI, S., ANNIBALDI, A., TRUZZI, C., & SCARPONI, G. 2016. Heavy metal distribution in organic and siliceous marine sponge tissues measured by square wave anodic stripping voltammetry. *Marine Pollution Bulletin*, 111(1-2), 476-482.
- LISTER, K.N., LAMARE, M.D., & BURRITT, D.J. 2015a. Oxidative damage and antioxidant defence parameters in the Antarctic bivalve *Laternula elliptica* as biomarkers for pollution impacts. *Polar Biology*, 38(10), 1741-1752.
- PAN, Q., WANG, F., ZHANG, Y., CAI, M., HE, J., & YANG, H. 2013. Denaturing gradient gel electrophoresis fingerprinting of soil bacteria in the vicinity of the Chinese Great Wall Station, King George Island, Antarctica. *Journal of Environmental Sciences (China)*, 25(8), 1649-1655.
- RICHARDSON, E.L., KING, C.K., & POWELL, S.M. 2015. The use of microbial gene abundance in the development of fuel remediation guidelines in polar soils. *Integrated Environmental Assessment and Management*, 11(2), 235-241.
- STARK, J.S., SNAPE, I., & RIDDLE, M.J. 2006. Abandoned Antarctic waste disposal sites: Monitoring remediation outcomes and limitations at Casey Station. *Ecological Management and Restoration*, 7(1), 21-31.
- VAN DORST, J., SICILIANO, S.D., WINSLEY, T., SNAPE, I., & FERRARI, B.C. 2014b. Bacterial targets as potential indicators of diesel fuel toxicity in subantarctic soils. *Applied and Environmental Microbiology*, 80(13), 4021-4033
- VÁZQUEZ, S., MONIEN, P., PEPINO MINETTI, R., JÜRGENS, J., CURTOSI, A., VILLALBA PRIMITZ, J., FRICKENHAUS, S., ABELE, D., MAC CORMACK, W., & HELMKE, E. 2017. Bacterial communities and chemical parameters in soils and coastal sediments in response to diesel spills at Carlini Station, Antarctica. *Science of the Total Environment*, 605, 26-37.
- VODOPIVEZ, C., CURTOSI, A., VILLAAMIL, E., SMICHOWSKI, P., PELLETIER, E., & MAC CORMACK, W.P. 2015. Heavy metals in sediments and soft tissues of the Antarctic clam *Laternula elliptica*: More evidence as a possible biomonitor of coastal marine pollution at high latitudes? *Science of the Total Environment*, 502(0), 375-384.

Case studies

- CAMPBELL, S., AFFLECK, R.T., SINCLAIR, S. 2018. Ground-penetrating radar studies of permafrost, periglacial, and near-surface geology at McMurdo Station, Antarctica. *Cold Regions Science and Technology*, 148, 38-49.
- COLABUONO, F.I., TANIGUCHI, S., CIPRO, C.V.Z., DA SILVA, J., BÍCEGO, M.C., & MONTONE, R.C. 2015a. Persistent organic pollutants and polycyclic aromatic hydrocarbons in mosses after fire at the Brazilian Antarctic Station. *Marine Pollution Bulletin*, 93(1-2), 266-269.

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- NETO, E.D., GUERRA, M.B.B., THOMAZINI, A., DAHER, M., DE ANDRADE, A.M., & SCHAEFER, C. 2017. Soil Contamination by Toxic Metals Near an Antarctic Refuge in Robert Island, Maritime Antarctica: A Monitoring Strategy. *Water Air and Soil Pollution*, 228(2).
- POLMEAR, R., STARK, J.S., ROBERTS, D., & McMINN, A. 2015. The effects of oil pollution on Antarctic benthic diatom communities over 5 years. *Marine Pollution Bulletin*, 90(1-2), 33-40.
- ROURA, R. M. 2004. Monitoring and remediation of hydrocarbon contamination at the former site of Greenpeace's World Park Base, Cape Evans, Ross Island, Antarctica. *Polar Record*, 40 (212), 51-67.
- STARK, J.S., JOHNSTONE, G.J., & RIDDLE, M.J. 2014a. A sediment mesocosm experiment to determine if the remediation of a shoreline waste disposal site in Antarctica caused further environmental impacts. *Marine Pollution Bulletin*, 89(1-2), 284-295.
- TREVIZANI, T.H., FIGUEIRA, R.C.L., RIBEIRO, A.P., THEOPHILO, C.Y.S., MAJER, A.P., PETTI, M.A.V., CORBISIER, T.N., & MONTONE, R.C. 2016. Bioaccumulation of heavy metals in marine organisms and sediments from Admiralty Bay, King George Island, Antarctica. *Marine Pollution Bulletin*, 106(1-2), 366-371.

Annex 1

Checklist for Preliminary Site Assessment

ASSESSMENT AND REPORTING INFORMATION			
Title of Report/ Assessment			
Date of Report		Prepared by:	Contact details:
Date of Site Visit (if applicable)		Assessor(s):	Contact details:

GENERAL CHARACTERISTICS OF SITE				
Place Name				
Location (coordinates of point)				Status (Antarctic Specially Protected Area (ASP) / Antarctic Specially Managed Area (ASMA) etc):
Location (coordinates of bounding polygon)	North:	South:	East:	West:
Nearest Operational Antarctic Station		Distance from Station:	Accessibility:	
General Description of Site				
Landscape Type (seasonally ice-free land, lake, permanent snow/ice, marine)				
Geomorphology (slope, aspect, hydrology, landscape features etc.)				
Geology (rock type, rock fracturing etc.)				
Regolith (depth and type of soil/sediment if present, depth to permafrost etc.)				
Fauna / flora present				

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HISTORY OF SITE USE AND CONTAMINATION EVENTS	
History of Site Use and Activities	
Information Sources (Station/Voyage Leader Reports, people interviewed, photographs etc.)	
Contamination History (operational activities and events, such as spills and spill responses if applicable)	
Information Sources (Station/Voyage Leader reports, incident reports, people interviewed, photographs etc.)	

CONTAMINANT CHARACTERISATION					
Contaminant Type	Contained Material (eg, in drums, containers, fuel storages) estimated quantity (range: min/max)	Uncontained/mixed with soil/water etc. estimated quantity (range: min/max)	Evidence (field observations - sight, smell etc.)	Coverage (patchy/localised, whole site etc.)	Samples Taken (Yes/No, number, type)
1. General waste (including abandoned waste dumps)					
2. Metals (eg, batteries, equipment with heavy metals)					
3. Hydrocarbons (including fuel and oil)					
4. Other organic chemicals (eg, polychlorinated biphenyls [PCBs], flame retardants etc.)					
5. Radionuclides					
6. Sewage, Nutrients					
7. Biological wastes					
8. Asbestos					
9. Other Contaminants					

CONTAMINANT MOBILISATION PROCESSES AND PATHWAYS		
Mobilising Processes	Site Specific Information on Processes	Timing (daily/seasonal/multi-year/occasional etc.)
Surface melt streams		
Sub-surface/groundwater		
Tidal inundation		
Wind		
Deterioration of containers		
Sensitivity to climate change processes		
Other processes (such as vehicle movements)		

VALUES/RECEPTORS POTENTIALLY OR ACTUALLY IMPACTED		
Values/Receptor	Site-Specific Information on Values/Receptors and Exposure Pathways (include estimates of distance from contaminants)	Actual or Potential Impacts?
Fauna and flora		
Scientific		
Historic		
Aesthetic		
Wilderness		
Geological and geomorphological		
Other environments (atmospheric, terrestrial [including aquatic, glacial, marine])		
Human health		
Other values/receptors (such as station water supply)		

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OTHER FACTORS TO CONSIDER	
Issue	Comments
Potential for cumulative impacts from other activities or sites	
Interaction with activities of other Parties	
Critical timing (including logistics and operational factors, access, freeze/thaw, breeding cycles, other sensitive times etc.)	
Factors that may influence ability to clean-up without creating greater adverse environmental impacts	
Location of contaminants in relation to ground surface (eg, surface only, completely / partially buried)	
Health and Safety (including human exposure pathways, personal protective equipment [PEP], access restrictions etc.)	
Incident response plans (including those actually implemented at site and existence of relevant Contingency Plans)	
Interim control measures already in place	
Unusual specialist skills, experience or accreditation required for personnel involved in further investigation, sampling and management of site	

MANAGEMENT RECOMMENDATIONS (MAY BE REVISED IF NEW INFORMATION BECOMES AVAILABLE OR CONDITIONS CHANGE)	
Proposed Action	Comments
No Action Proposed <input type="checkbox"/>	
Further Investigation <input type="checkbox"/>	
Contain <input type="checkbox"/>	
Clean-up <input type="checkbox"/>	
Other <input type="checkbox"/>	

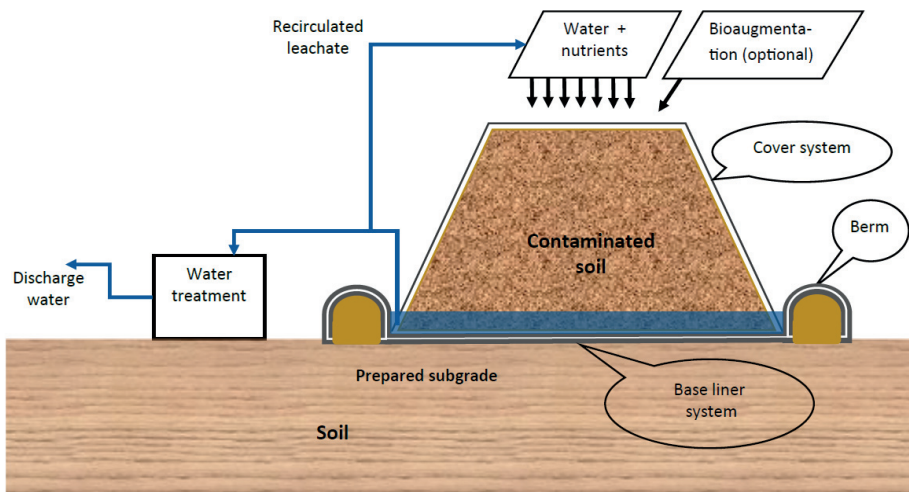
Annex 2

Guidance for Construction and Management of Biopiles for the Bioremediation of Petroleum Hydrocarbon Contaminated Soil in the Antarctic

Definitions

A *biopile* is a purposefully designed mound of soil used to accelerate the degradation of petroleum contaminants. It utilises *bioremediation*, the process of using microbes to degrade contaminants. Biopiles are used in situations where a decision has been made to excavate and treat the contaminated soil above ground. When a composite *liner system* is used, biopiles also have the advantage of isolating the contaminated soil from the environment, thus preventing further environmental impact. Biopiles typically rely on *biostimulation* (the addition of nutrients, and/or oxygen, heat, moisture, organic carbon) to degrade contaminants more rapidly than they otherwise would in the environment. Biopiles may also use *bioaugmentation* (the addition of microbes), although in Antarctica, microbes must be cultivated from the existing native soil microbial population and not imported or introduced.³

Figure 1: Schematic of a biopile



³ The Protocol on Environmental Protection to the Antarctic Treaty, Annex II (Conservation of Antarctic Fauna and Flora) prohibits the introduction of living organisms that are not native to Antarctica, except for specified purposes.

When to use biopile technology

Biopiles are just one of several techniques that can be used to remediate petroleum contaminated soil in Antarctica (1). The decision to use a biopile occurs once a site assessment has been conducted and an environmental risk assessment process has identified the following:

- The presence of contaminant in soil (*eg*, diesel fuel) in the environment at concentrations which pose an unacceptable environmental risk in that location, and/or through migration;
- The contaminant in soil is likely to degrade slowly *in situ*, and an in-ground treatment technique (*eg*, soil vapour extraction, chemical oxidation, electro-kinetic oxidation, or in-ground aeration/nutrient addition) is unsuitable.
 - Examples of factors that affect the suitability of these techniques may include: ground conditions, the distribution of contaminant, limitations or uncertainty of ensuring the remediation treatment reaches the contamination, and/or the environmental risk of applying amendments in an uncontained manner.
- The contaminated soil can be practically excavated.
 - Practicality is site specific but could include: site accessibility (slope, proximity to water bodies, infrastructure and buildings), depth below ground of contaminant, excavation depth, ground conditions (permafrost, groundwater, soil particle size and distribution, bedrock morphology, previous disturbance, etc.) and that excavation activities can be managed such that any re-mobilisation of contaminant is controlled and contained.
- The contaminant is amenable to bioremediation. Commonly used petroleum contaminants found in the Antarctic that are most amenable to bioremediation are diesel, *aviation gasoline* and petrol as opposed to heavier petroleum products such as lubricants;
- Other above ground remediation techniques, such as landfarming, are not suitable (either due to site disturbance, lack of space, wildlife interactions, or the risk of offsite impacts);
- There is a suitable location for the construction of the biopile and its construction will not cause undue environmental impact(s).

Purpose of this document

Whilst there are many existing resources on biopile performance and construction (*eg*, 2), polar environments present unique challenges for biopiles. This document provides guidance for Antarctic biopile construction and maintenance, for the remediation of petroleum contaminated soils.

This non-mandatory guidance is based on Antarctic-specific research and practical experience with biopile construction and operation.

The guidance identifies general considerations and principles, which will support decision making, planning and management, and the conduct of remediation activities using biopile technology. It provides advice on the range of more detailed scientific, technical, design and management issues and adaptations that should be considered when applying this technique. Site specific assessments, environmental impact assessment of proposed remediation activities, and additional research and technical design support will be necessary elements of biopile remediation. Relevant references are provided to support these activities.

This document does not address emergency fuel spill response, contaminated site assessment, sampling design, effects of hydrocarbons on terrestrial, lacustrine or marine organisms, site specific risk assessment, human health risk assessment, or alternative *in situ* and *ex situ* remediation options.

Background

A growing body of research shows remediation of contaminated soil in biopiles under Antarctic conditions can be an effective tool for remediation (3-5). Whilst there are a variety of *in situ* containment techniques (eg, funnel-and-gate permeable reactive barriers), no other *in situ* soil remediation techniques have been successfully used in the Antarctic environment to date. Biopile treatment remains the only publicised *ex situ* remediation technology successfully applied to large volumes of soil in Antarctica (3), other than soil incineration (6).

The length of time required for biopile treatment is dependent upon the climate at the proposed location, and whether additional heat will be applied. In general, it is expected that an unheated Antarctic biopile would require a 3-5 year commitment and resourcing, the specifics of which are discussed in more detail below. The project length will also be determined by the proposed re-use requirements of the soil (*ie*, the extent to which contaminants have degraded and pass quality thresholds) and whether site-specific thresholds or national environmental guidelines are being applied. Reuse options range from highly specific and controlled use for engineering or building purposes to unrestricted re-use and return to the environment, either to the original excavation location or another assessed location.

Process

Steps leading up to construction of an Antarctic biopile

<ol style="list-style-type: none"> 1) Identification of a contaminated site (triggered either by a new fuel release or through a site assessment which has uncovered past contamination): <ol style="list-style-type: none"> a. A site assessment is needed to quantify extent, volume, concentration and type of contaminated material; 2) A risk assessment that concludes that contamination is present at concentrations that pose an unacceptable environmental risk in that location, and/or through migration to other locations, and that soil remediation is required (as opposed to implementing an alternative risk management measure such as containment); 3) An assessment of remediation options and identification of biopiling as the most appropriate treatment technology; 4) Commitment of resources to site excavation, biopile site preparation, design and construction of containment area, and biopiling; 5) Conduct of the Environmental Impact Assessment process and application for relevant approvals and permits from the administering Competent Authority; 6) Detailed biopile project design and planning; 7) Implementation: <ol style="list-style-type: none"> a. Construction b. Operation c. Monitoring d. Re-use e. Decommissioning

Considerations

Contaminant source and soil characterisation	
	<ul style="list-style-type: none"> • Characterise the extent of contamination (eg, contaminant type(s), areal and volumetric extent); • Assess whether the contaminant mass can be practically excavated (eg, consider equipment access, proximity to infrastructure, depth to groundwater); • Assess whether the fuel type is amenable to bioremediation (eg, diesel, aviation gasoline, petrol), or whether it contains heavier petroleum products such as lubricants; • Analyse enough soil samples so that there is adequate statistical confidence around the concentrations of hydrocarbons to be excavated; • Analyse for co-contaminants (eg, metals) as well as expected fuel contaminants (eg, Total Recoverable Hydrocarbons, BTEXN, MAH and PAH's); • Measure soil moisture content, soil texture and type (pH, organic carbon content and nutrient content); • Identify the volatile and soluble components of the contaminant; • When calculating the average starting concentration of hydrocarbons in the biopile, account for volatilisation and homogenisation that will occur during excavation and placement within the biopile (eg, in the order of 50% mass loss depending upon the contaminant type, excavation and homogenisation method, age of the spill, and temperature). <p>Key references: <i>How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites – Chapter IV (Biopiles) – US EPA (2017)</i></p>

Desirable requirements for selection of a biopile site	
	<ul style="list-style-type: none"> • A sufficient area of already disturbed, reasonably flat land not required for other activities for the duration of the project; • Suitable access for environmental monitoring down-gradient or down-wind of the site if required; • Vehicle access to the site for the summer period; • Sufficient distance from wildlife colonies or wallows, pathways or congregation areas (noise disturbance from heavy equipment); • Sufficient distance from watercourses, melt water streams, lakes and/or ocean; • Good solar exposure for passive heating of soil (no steep hills or tall buildings to the north of the site); • Good drainage underneath (or around) the site to minimise seasonal melt water flowing under the biopile and affecting the liner systems or compromising the subgrade integrity (eg, a biopile built on an excavated and backfilled site can experience settlement over subsequent seasons); • Adequate space on the leeward side of the biopile site to remove accumulated snow-drift; • Minimisation of vehicle traffic through the area, particularly when the area is snow covered, so that barrier systems are not damaged; • Characterisation (baseline sampling) of the area to ensure that it is not already contaminated, and to demonstrate the environmental performance of the biopile once decommissioned; • Assess whether the area should be secured for safety, liner protection, inadvertent damage and for the regulation of contaminated soil entering and leaving the biopile remediation site; Ensure personnel present are appropriately trained to maintain and monitor the biopiles; • Proximity to power supply for operational and monitoring equipment.
Considerations for Design and Construction	
Operational lifetime	<ul style="list-style-type: none"> • Hydrocarbon degradation is a temperature limited reaction, therefore, consider using previously collected soil temperature data or meteorological data to model soil temperature to predict project lifespan; • Plan for a longer project time-frame than theoretically calculated, due to project delays (Antarctic operational constraints, weather); • Allocate resources to the construction, monitoring, maintenance, and decommissioning of the biopile for the full project time-frame; • At a minimum, plan for regular visual monitoring of the biopile, berms, liner system, covers and levels of snow/water/ice to loss of containment of contaminated soil or water, or the breakdown of liner/cover material. If the integrity of containment is regularly established, biopiles could be left dormant until additional resources can be deployed for more active biopile operation and management.
Location, orientation and size	<ul style="list-style-type: none"> • Seek to orient the biopiles so that the long axis is parallel to the prevailing wind to minimise the accumulation of snow-drift; • Design the biopile width so that the available heavy machinery (eg, excavator) has sufficient reach such that it does not need to drive on the liner system to place and turn the soil, or alternatively design the biopile to allow heavy vehicle access such that the liner system is not damaged; • Consider options to transport liners to the intended site (weight and size of material rolls).

<p>Subgrade and berms</p>	<ul style="list-style-type: none"> • The properties of the subgrade and berms influence the performance of the liner system. A geosynthetic clay liner (GCL) requires adequate hydration from the subgrade to create a hydraulic barrier and minimise contaminant transport: <ul style="list-style-type: none"> - Assess the particle size/texture of subgrade. If it is too coarse, then it may be necessary to source finer-grade soil for an artificial subgrade or to use a soil retention layer below the GCL; - If possible, grade and/or roll the subgrade to remove angular rocks and minimise the risk of settling; • Subgrade should be graded so that there is a low-point in one corner. Once the base barrier is constructed, this will be the location of a sump to pump snow melt and leachate in the biopile; • Construct berms using uncontaminated soil material from the site. Berms are required to be high enough to contain leachate, and hold anticipated annual and cumulative snow melt. Width and height of soil/gravel berms should be designed on a case-by-case basis according to the required storage volume and at angles consistent with best practice design such that the geomembrane liner performance is not compromised.
<p>Base liner system</p>	<ul style="list-style-type: none"> • Best practice for a base composite liner system mimics a landfill design where the primary barrier is a plastic <i>geomembrane</i> underlain by the secondary barrier, a GCL placed directly on the subgrade; • When multiple GCL panels are used, the panels are overlapped for added protection. Overlaps should be 30 cm and sealed with bentonite slurry as per manufacturer’s installation guidelines; • Standard geomembranes come in 5-8 m widths. Depending upon the size of the containment area, it may be necessary to heat weld the geomembrane, which will require specialist equipment and expertise; • Installation of the flexible geomembranes can be challenging in the corners of berms. Heat welded corners may assist here; • The base liner system should have a protection layer above to reduce damage to the geomembrane (<i>eg</i>, holes from angular rocks or accidental puncture by excavator bucket/ripper or other sharp tools). Best practice for a protection layer is 30 cm of sand. However, in Antarctica, depending on the site, sand may not be available. In these instances, the protection layer may be coarse sand (sterilised and imported), fine-grained soil from the site, or fine-grained contaminated soil; • The protection layer soil is not mechanically turned, but will be in contact with contaminated leachate. If contaminated soil is used as the soil protection layer, it will likely have slower rates of degradation than soil in the active layer of the biopile; • A geotextile is used as a separator between the geomembrane and soil protection layer. Geotextiles with higher thickness and density provide better protection for the geomembrane; • Follow the manufacturer’s installation guidelines to avoid damage or puncture to the liners. <p>Key references:</p> <ul style="list-style-type: none"> • <i>Geosynthetics in Antarctica: Performance of a composite barrier system to contain hydrocarbon-contaminated soil after 3 years in the field</i>

<p>Biopile soil</p>	<ul style="list-style-type: none"> • Excavated soil will typically contain a mixture of coarse and fine particles; • Using an excavator screening bucket (approx. 200 mm mesh size) prior to filling the biopile will reduce the volume of the biopile and enable treatment of the most contaminated soil; • Coarse rock screened out of the excavated soil should be assessed for residual contamination in any adhering soil. Consider water washing the coarse rocks using a tumbling bucket in a water filled, open-topped container to remove adhering soil and contaminants prior to reuse; • Bioremediation rates in soils will vary depending upon the biopile design: soil permeability, pile height, aeration and drainage systems.
<p>Cover system</p>	<ul style="list-style-type: none"> • A cover can be used to prevent off-site contaminant migration (eg, dust) or loss of soil moisture, as well as provide a wildlife barrier; • Permeable covers (eg, geotextiles, canvas) will enable water ingress (snow melt) and egress (evaporation/ablation), as well as air ingress (oxygen required for biodegradation), and also enables wind that gets under the cover to partially dissipate; • Impermeable covers (eg, geomembranes) will prevent water ingress and egress, but depending upon how they are affixed, they may inhibit oxygen diffusion; • Consider how best to fix the biopile covers. Using rocks as weights is manually intensive, but enables covers to be manually removed and replaced easily; • Covers experience significant damage from winds and UV exposure. Coarse soil (ie, exposed rocks) can quickly abrade covers in high winds. Lifespan depends on polymer type, manufacturing techniques and density. In Antarctic conditions, geotextile covers typically last 2-3 years. Two covers may be used to prolong the life of the geotextiles and reduce abrasion; • Geotextiles should be monitored if they are prone to fragmenting to prevent plastic fragments and fibres dispersing into the environment.
<p>Aeration</p>	<ul style="list-style-type: none"> • If the soil is fine-grained and/or an impermeable cover is used, then an aeration system may be required to maintain aerobic conditions; • The aeration system could be designed to blow air (which also allows for humidification if selected) or it could pull ambient air through the biopile (which allows for the capture of volatile contaminants); • Consider the design (including stack height) of any volatile catchment system in relation to anticipated wind speeds; • Aeration pipes are at risk of filling with water/ice if installed too low in the biopile, or removal of annual melt is not carefully managed leading to a cumulative build-up of ice, eventually blocking aeration piping. It is very difficult to remove ice from these pipes. <p>Key references:</p> <ul style="list-style-type: none"> • <i>Biopile Design, Operation, and Maintenance Handbook for Treating Hydrocarbon-Contaminated Soils</i> (von Vahnestock et al., 1997)

Operation and Amendments	
Nutrients	<ul style="list-style-type: none"> • If the soils are nitrogen limited, then it will be necessary to add a nitrogen based fertiliser. Similarly, potassium and phosphorous may also be required; • Calculate additional nutrients required using either a generic (<i>ie, Redfield</i>) or site-optimised ratio; • Inorganic or appropriately sterile organic fertiliser is required to avoid any risks of non-native species or wildlife disease; • Addition of dry fertiliser (powder or granulated) may result in a delay in nutrient distribution depending upon circulation of water and freeze/thaw conditions. Consider the use of liquid fertiliser addition to better mix the nutrients through the contaminated soil, particularly if the soil retains little moisture; • Account for the evaporation of hydrocarbons and be conservative about the addition of nitrogen to avoid soil eutrophication and ammonium/nitrite toxicity; • Be aware that controlled release fertilisers behave differently in freeze-thaw conditions compared to temperate climates (7) and that nutrient capsules may not degrade as rapidly as expected.
Other amendments	<ul style="list-style-type: none"> • If the soil pH is outside the optimum range (6-8), then it may be necessary to use an amendment to adjust the pH; • Depending upon project requirements, other sterile organic or inorganic biopile amendments may be considered, including organic carbon to help retain moisture and provide a substrate for microbial growth; • Possible options for consideration that have not been trialled in Antarctica include: <ul style="list-style-type: none"> - Non-ionic surfactants have been used for bioremediation in laboratory trials, but not in the Antarctic context (8); - If the project is time-limited, then it may be possible to accelerate the process by culturing endemic (hydrocarbon degrading) bacteria and adding to the biopile.
Temperature	<ul style="list-style-type: none"> • Temperature can be increased in the biopile by using a dark coloured geosynthetic cover, and by mechanically breaking up frozen soil early in the summer.
Leachate management	<ul style="list-style-type: none"> • Ideally, the biopile should be designed with a system to pump water (snow-melt and leachate) from the sump; • The water can be recirculated within the biopile using pumps and hoses during summer months, providing that consideration is given to freezing during the Antarctic night. Recirculation aids in maintaining the required soil moisture contents and redistributing nutrients and oxygen thereby aiding bioremediation; • Excess water (more than can be contained within the liner and berms) should be removed and treated to remove any <i>LNAPL</i> and <i>dissolved phase</i> contaminants, as well as dissolved amendments (<i>eg, nutrients</i>); • Excess freezing of water within the containment area may lead to long term loss of storage capacity over several years, reduce biopile temperature and slow remediation processes.
Physical turning	<ul style="list-style-type: none"> • Physical turning of biopile soil using an excavator will aid evaporative hydrocarbon losses, as well as assisting passive solar heat gain in frozen soils; • An excavator is useful to get representative soil samples from the entire biopile, including different depths rather than only the near-surface; • Use of a hydraulic tilt-bucket on the excavator will enable the excavator operator more flexibility when turning the soil. <p>Key references:</p> <ul style="list-style-type: none"> • <i>Nitrogen requirements for maximizing petroleum bioremediation in a sub-Antarctic soil (Cold Regions Science and Technology, 2007)</i>

Monitoring	
Sensors	<ul style="list-style-type: none"> Electronic sensors can be used for monitoring (eg, oxygen, temperature, moisture). Electronic sensors add to cost and complexity, and can be prone to damage. If research is not being conducted in tandem with the remediation, sensor monitoring is probably not required; If sensors are used, and rely upon wires to carry power and/or signal, then they must be placed so that they are not damaged by turning of the soil, and will likely require waterproofing and conduit tubing to protect cables from damage.
Analysis	<ul style="list-style-type: none"> Bioremediation progress can be assessed annually (or more regularly if desired) by taking representative samples from the biopile and analysing for the contaminants of interest; Sample density will depend upon soil heterogeneity and regulatory requirements, but generally one sample per 5m³ (for a 100 m³ biopile) should provide statistically robust results; Field blanks, rinsate blanks and sample duplicates are considered basic Quality Assurance/Quality Control requirements for any analytical sample plan; Sample analytes should consider including: <i>TRH</i>, <i>TRH (SGC)</i>, <i>BTEXN</i>, leachable and more toxic components (eg, <i>1 MN</i>, <i>2MN</i>, <i>1-2-3 TMB</i>); The US EPA software ProUCL can be used to estimate average contaminant concentration at various confidence levels. <p>Key references:</p> <ul style="list-style-type: none"> <i>ProUCL software</i> https://www.epa.gov/land-research/proucl-software Victorian EPA Industrial Waste Resource Guidelines – Soil Sampling http://www.epa.vic.gov.au/~media/Publications/IWRG702.pdf
End Points and Soil Reuse	
	<ul style="list-style-type: none"> The extent of required remediation will be determined by an assessment of residual environmental and/or human health risk of re-using the remediated soil; Reuse options range from highly specific and controlled use for engineering or building purposes to unrestricted re-use and return to the environment; Residual risk should be determined based on: <ul style="list-style-type: none"> the concentration, chemistry, leachability and biological availability of residual fuel and amendments (eg, nutrients), if any, in the soil; the proposed re-use option; the proposed re-use location, and proximity to, and sensitivity of, environmental or human health receptors; any additional management or engineering measures put in place to minimise risk, such as drainage or in-ground containment. Any future land-use or infrastructure changes that will increase the risk profile at the reuse site should be considered. For example: soil reused under a building may meet <i>volatile</i> (human health) risk guidelines. However, removal of the building in the future may expose the soil to increased groundwater flow, and the subsequent mobilisation of <i>soluble</i> contaminants. <p>Key references:</p> <ul style="list-style-type: none"> <i>CRC Care Health Screening Levels</i> https://www.crccare.com/products-and-services/health-screening-levels <i>Ecological Considerations in Setting Soil Criteria for Total Petroleum Hydrocarbons (<C₁₂) and Naphthalene</i> (Environment Protection and Heritage Council, 2003) A framework for Ecological Risk Assessment: General Guidance (Canadian Council of Ministers of the Environment, 1996 and updates).

Decommissioning	
	<ul style="list-style-type: none"> • Remove soil for its intended (assessed) reuse purpose; • Physical removal, transport and long-term staging of the remediated soil may cause an environmental impact via dust or leaching if not appropriately controlled and managed; • Plan for the removal of containment materials (eg, liners and covers) outside Antarctica for proper disposal or recycling; • Liners themselves will likely have adhering soil and minor residual fuel concentrations (adsorbed to liners or within adhering soil) that will result in biosecurity and waste disposal considerations; • Undertake soil sampling within the exposed subgrade to obtain confirmation that the site/subgrade remains uncontaminated, or that contamination levels are below the desired remediation end-point; • Physically rehabilitate modified areas of the biopile site to return to natural landform and aesthetic values; • Record and report as appropriate, and ensure completion of regulatory and environmental approval processes; • Ensure that station and engineering plans are updated with the location and volume of the reused soil with caveats outlining any changes to risk profile documented; • Consider reporting on lessons learned in appropriate Antarctic forums including, for example, COMNAP and the CEP.

Personnel

The design, construction and maintenance of Antarctic biopiles require a variety of specialist and non-specialist personnel, and these may vary according to the clean-up objective and National Antarctic Programme. Likely key roles and responsibilities are identified in the table below.

Contaminant source and soil characterisation	
	<ul style="list-style-type: none"> • Field - Environmental scientist and/or staff with scientific training acting under the instructions of an experienced environmental scientist. • Laboratory – Samples processed and analysed by an appropriately accredited laboratory with expertise in hydrocarbon analysis. • Interpretation – Environmental scientist(s) with experience in the interpretation of hydrocarbon analyses.
Desirable requirements for selection of a biopile site	
	<ul style="list-style-type: none"> • Field - Site visit by personnel planning the biopile, and consultation with key Antarctic programme personnel. • Decision making and approvals – National Antarctic Programme planners/ managers, environmental management and operations personnel, National Competent Authority.

Design and Construction	
	<ul style="list-style-type: none"> • Design – Geotechnical engineer for liner systems, preferably supported by consultation with geotechnical engineer with experience in the installation of liner systems in Arctic/Antarctic environments. • Design - Environmental scientist or remediation professional for aeration, soil and remediation aspects. • Field – Construction personnel supervised or trained by a geotechnical engineer with experience in the installation of liner systems. • Field - Construction personnel skilled in plant operation as required (eg, rolling subgrade, obtaining necessary gradients for drainage, excavation and screening of contaminated soil).
Operation and Amendments	
	<ul style="list-style-type: none"> • Design and Field – Environmental/Remediation scientist to determine type and amount of amendments to use, leachate management, and supervision of implementation/operation. • Field – Station/Antarctic programme personnel can be trained to operate and maintain biopiles by the supervising project manager using standard operating procedures. • Field - Construction personnel skilled in plant operation as required (eg, physical turning).
Monitoring	
	<ul style="list-style-type: none"> • Laboratory – Samples processed and analysed by an appropriately accredited laboratory with expertise in hydrocarbon analysis. • Field and Interpretation – Environmental/Remediation scientist(s).
End Points and Soil Reuse	
	<ul style="list-style-type: none"> • Interpretation - Environmental risk assessment professional. • Decision making and approvals – National Antarctic Programme planners/managers, environmental management and operations personnel, National Competent Authority.
Decommissioning	
	<ul style="list-style-type: none"> • Field - Station personnel can be trained and supervised to decommission biopiles and in the placement of soil in allocated location(s) by the supervising project manager.

Pictures



Photo 1: Compacted biopile subgrade with earthen berms prior to installing the other components of the composite liner system (geosynthetic clay liner, geomembrane and geotextiles).



Photo 2: Installing GCL (white) and Geomembrane (black).



Photo 3: Geomembrane (black) installed over GCL and berms. Note the heat welded seam running through the centre of the geomembrane showing two panels joined together.



Photo 4: Completed construction of the composite liner system showing geotextile (black) overlaying geomembrane (black/grey) and GCL below.



Photo 5: Protection layer of finer soil placed in biopile containment area.



Photo 6: Manually circulating biopile leachate over soil during summer.



Photo 7: Showing multiple constructed biopiles in operation. Note uncovered for sampling purposes.



Photo 8: Biopiles under snow.

Glossary

Aviation gasoline - Aircraft jet fuel, commonly known as Avgas, Jet A-1, Jet TS-1, ATK (aviation turbine kerosene).

Base liner system - A composite liner system to prevent contaminant dispersal, consisting of a geosynthetic clay liner and geomembrane, covered by geotextile and underlain by an appropriate subgrade.

Berm - A landscaped ridge of earth used to stop the surface flow of water.

Bioaugmentation - A remediation technique which involves adding bacteria and/or fungi to accelerate the biodegradation of contaminants.

Biopile - A biopile is a remediation technology where contaminated soil is placed in a contained mound and soil conditions are modified to enhance microbial degradation of the contaminant. Aerobic microbial activity is typically stimulated within a biopile through aeration and/or mixing, and/or addition of nutrients, minerals, heat or moisture.

Bioremediation - A process that uses living organisms (usually naturally occurring or native) such as plants, bacteria, yeast, and fungi to break down hazardous substances into less toxic or nontoxic substances.

Biostimulation - Modifications to stimulate existing bacteria capable of bioremediation. This can be done by addition of various forms of rate limiting nutrients (*eg*, nitrogen, phosphorous, potassium) and electron acceptors or donors (*eg*, oxygen, carbon).

BTEXN - A commonly used abbreviation for benzene, toluene, ethylbenzene, xylenes and naphthalene compounds, commonly occurring in fuel and crude oil. They are aromatic compounds and have carcinogenic, teratogenic or mutagenic properties.

Ex situ - excavated or removed from its original place. In the remediation context, this usually means removed from the ground.

Geomembrane - a very low permeability and flexible synthetic membrane liner (barrier) that is used to stop advective, and limit diffusive, contaminant transport. Typically made out of high density polyethylene (HDPE).

Geotextile - permeable fabric which, when used in association with soil, have the ability to separate, filter, reinforce, protect, or drain.

GCL - Geosynthetic Clay Liner. A manufactured hydraulic barrier containing bentonite (clay) sandwiched between two geotextiles and held together by needle punching and stitching. The active ingredient in a GCL is a swelling clay (smectite), which typically represents 70-90% of the clay core of the GCL. When the clay comes into contact with water it swells and develops very low permeability (*ie*, high resistance to the flow of liquids and gases).

In situ - In its original place, unexcavated, or unmoved.

Landfarming - The spreading and biostimulation of contaminated soil to stimulate bioremediation, involving soil tilling inside or outside a treatment cell.

LNAPL - A Light Non-Aqueous Phase Liquid is less dense than water and is mostly insoluble in water. It will sit above the water table in the subsurface, as well as ganglia (blobs) in soil voids. An example is petrol (gasoline).

MAH - Monocyclic Aromatic Hydrocarbon. Organic compounds containing only carbon and hydrogen comprised of a single aromatic ring.

PAH - Polycyclic Aromatic Hydrocarbon. Organic compounds containing only carbon and hydrogen comprised of multiple aromatic rings. These occur naturally in petroleum hydrocarbons, coal, crude oil and are released into the air during incomplete burning of fuels, rubbish and organic waste. These can be carcinogenic compounds.

Redfield Ratio - Atomic ratio of carbon to nitrogen to phosphorous (C:N:P) of approximately 117:14:1, often simplified to 100:10:1.

Removal from Antarctica - A technique which excavates soil at source and transports it somewhere else, normally a home country, for disposal or treatment. Normally considered cost prohibitive in the Antarctic context nor a sustainable form of Antarctic remediation.

Subgrade - Earthen material underneath a biopile, typically compacted in order to provide an even, stable, appropriately sloped surface.

Sump - A low point/depression in which to collect liquid.

TRH - Total Recoverable Hydrocarbons. Sometimes used interchangeably with TPH – Total Petroleum Hydrocarbons. Analytical techniques that measure TRH will specify the carbon range of the analysis.

TRH (SGC) - Total Recoverable Hydrocarbons with a Silica Gel Clean up step. The clean-up step is used during analysis to remove natural organic matter or polar metabolites that may be contributing to the quantification of the TRH.

Volatiles - Volatile Organic Compounds (VOCs) are organic chemicals that have a high vapour pressure and readily evaporate at room temperature.

1 MN - 1-Methylnaphthalene, a PAH hydrocarbon compound.

2 MN - 2-Methylnaphthalene, a PAH hydrocarbon compound.

1-2-3 TMB - 1,2,3-Trimethylbenzene, an aromatic hydrocarbon compound.

Annex 3

Guidance for Construction and Management of Permeable Reactive Barriers for the Treatment of Hydrocarbon Contaminated Groundwater in the Antarctic

Definitions

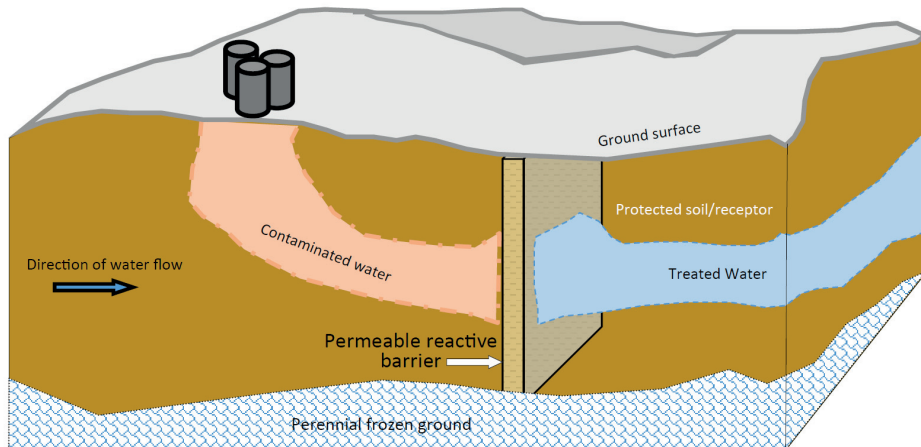
A *Permeable Reactive Barrier* (PRB) is an in-ground groundwater treatment technology designed to prevent the migration of contaminants. PRBs can *adsorb* and degrade hydrocarbons, utilising native microbes to degrade contaminants through a process known as *biostimulation* and *bioremediation* or can be used to adsorb and capture contaminants such as metals and other contaminants not amenable to *biodegradation*, or a mix thereof.

PRBs are used in situations where a decision has been made to control migration of contaminants from a contaminated site, either as (1) a temporary or semi-permanent measure to mitigate further environmental damage while remediation and/or further management options are considered and implemented, or (2) in situations where remediation of the primary contaminant source is not practicable at that time. PRBs can also be installed in ice/snow under certain conditions.

PRBs can either be “funnel and gate” or “continuous wall”. Funnel and gate systems intercept contaminated groundwater using an impermeable “funnel” (also known as “wings”) and direct it towards the permeable “gate”. The gate is designed to treat the contaminated water, resulting in clean water exiting the site. Continuous wall systems forgo the installation of an artificial “funnel” and use a wall of reactive and non-reactive material (“*media*”) to treat contaminated water as it passes through. A variety of groundwater monitoring points and/or sensors may be installed to monitor the PRB’s performance.

This guidance document addresses the use of “funnel and gate” PRBs in the Antarctic for the treatment of hydrocarbon contaminated groundwater.

Figure 1: Schematic showing PRB concept (adapted from US EPA 2002 [1])



Purpose of this document

Whilst there are many existing resources on PRB performance and construction, polar environments present unique challenges for their operation. This document is intended to provide guidance for Antarctic PRB construction and maintenance, specifically for the remediation of petroleum contaminated groundwater, although many of the concepts and design considerations could apply to PRBs used for metals or other organic contaminants (eg, PCBs). This non-mandatory guidance is based on Antarctic-specific research and practical experience with PRB construction and operation.

The guidance identifies general considerations and principles, which will support decision making, planning and management of a contaminated site using PRB technology. It provides advice on the range of more detailed scientific, technical, design and management issues and adaptations that should be considered when applying this technique. Site specific assessments, environmental impact assessment of proposed remediation activities, and additional research and technical design support will be necessary elements of a PRB installation. Relevant references are provided to support these activities.

This document does not address emergency fuel spill response, contaminated site assessment, sampling design, effects of hydrocarbons on terrestrial, lacustrine or marine organisms, site specific risk assessment, human health risk assessment, or alternative remediation options.

When to use PRB technology

PRBs are frequently used in temperate environments as an environmental protection technology to capture and, where possible, degrade contaminants. PRBs will not

remediate the contaminant source, but are specifically employed to prevent off-site contamination. PRBs are one of several environmental management techniques that have been successfully used to reduce the environmental risk associated with fuel spills and petroleum-contaminated soil in Antarctica.

The decision to use a PRB in Antarctic conditions occurs once a site assessment has been conducted and an environmental risk assessment process has identified the following:

- The presence of contaminant in soil and shallow groundwater (*eg*, diesel fuel) at concentrations which pose an unacceptable environmental risk through migration. Common petroleum contaminants used in the Antarctic that have the most mobile and potentially toxic components are diesel, *aviation gasoline* and petrol. Heavier petroleum products such as lubricants are less likely to pose an environmental risk via migration through groundwater;
- The contaminated soil will not or cannot be practically excavated for further remediation or cannot be excavated within a timeframe that might prevent off-site migration.
 - Practicality is site specific but could include: site accessibility (slope, proximity to water bodies, infrastructure and buildings), depth below ground of contaminant, excavation depth, ground conditions (permafrost, groundwater, soil particle size and distribution, bedrock morphology, previous disturbance, etc.).
- The contaminant in soil is likely to degrade slowly *in situ* via *natural attenuation*, and an in-ground treatment technique (*eg*, soil vapour extraction, chemical oxidation, electro-kinetic oxidation, or in-ground aeration/nutrient addition) is also deemed unsuitable.
 - Examples of factors that affect the suitability of these techniques may include: ground conditions, the distribution of contaminant, limitations or uncertainty of ensuring the remediation treatment reaches the contamination, and/or the environmental risk of applying amendments in an uncontained manner.
- If excavation and above ground remediation or an *in situ* remediation option are planned or implemented and there remains an unacceptable environmental risk through migration of contaminated water during remediation activities; or
- There is a suitable location for the construction of the PRB wings and gate, and the PRB can be properly installed (“*keyed in*”) to bedrock or permafrost to minimise the flow of contaminants beneath or around the system.

Background

Natural attenuation of hydrocarbons in Antarctica is generally very slow and can lead to on-going mobilisation and transport of hydrocarbons from a contaminated site for decades to centuries (2). A growing body of research shows that PRBs can be an effective tool for the containment and remediation of contaminated groundwater in Antarctic and subantarctic conditions (3-10).

Typically, a variety of coarse granular *media* are used within the PRB gate. These media are mixed or sequenced within the PRB and serve specific purposes depending on the contaminant to be intercepted. For PRBs used to treat hydrocarbon contaminated water, typical media include sand (for removal of fines), granular activated carbon (to capture hydrocarbons), nutrient amended zeolites or other source of nutrient release (to encourage bioremediation of adsorbed hydrocarbons) and natural zeolites (to capture any excess added nutrients before the water exits the PRB).

The materials used in a PRB gate have a finite lifespan and need to be regenerated or replaced in order to ensure their efficacy. A well designed monitoring programme will inform decisions about when PRB media needs to be replaced (11, 12).

PRBs work on the concept that the barrier is more permeable than the surrounding area, and is therefore the preferential flow path for contaminated water. As a result, although the correct selection of the granular PRB media is important, equally important is the design and monitoring of the PRB itself such that contaminated water preferentially flows to and through the PRB gate over the course of its operational life, and that loss of permeability, either through freezing, clogging or break down of media particle size, is minimised. This includes ensuring the PRB remains unfrozen during times of peak melt and contaminant mobility.

It is expected that design and installation of a PRB in Antarctica would require a two-year commitment, with ongoing resourcing required for annual monitoring. With regular monitoring and periodic changes of the media, PRBs can function effectively for time-spans of several years through to decades.

Process

Steps leading to construction of an Antarctic PRB

- 1) Identification of a contaminated site (triggered either by a new fuel release or through a site assessment which has uncovered past contamination):
 - a. A site assessment is needed to quantify extent, volume, concentration and types of contaminant, including water-borne contamination;
- 2) A risk assessment that concludes that off-site migration of contaminants poses an unacceptable environmental risk;
- 3) An assessment of remediation options and identification of a PRB as the most appropriate technology to minimise continued off-site migration of contaminants;
- 4) Commitment of resources to site preparation, excavation of trenches and a pit for the PRB wings and gate;
- 5) Detailed PRB project design and planning;
- 6) Conduct of the Environmental Impact Assessment process and application for relevant approvals from the administering Competent Authority; and
- 7) Implementation:
 - a. Installation
 - b. Operation
 - c. Monitoring
 - d. Regeneration or replacement of media
 - e. Decommissioning

Considerations

Contaminant source and site characterisation	
	<ul style="list-style-type: none"> • Characterise the extent of contamination (eg, contaminant type[s], areal and volumetric extent); • Characterise contaminant and meltwater flowpaths and flow rates through and exiting the site; • Characterise the condition of frozen ground, seasonal active layer depths, bedrock, and suitability for “keying in” a PRB; • Analyse for co-contaminants (eg, metals, PFAs, BFRs) as well as expected fuel contaminants (eg, Total Recoverable Hydrocarbons, BTEXN, MAH and PAHs).
Desirable characteristics for a PRB site	
	<ul style="list-style-type: none"> • A suitable area to install the PRB wings and gates that adequately captures the contaminated ground-water exiting the site; • Suitable access for environmental monitoring down-gradient of the site; • Vehicle access to the site for the summer period; • Sufficient distance from wildlife colonies or wallows, pathways or congregation areas (noise disturbance from heavy equipment); • Sufficient distance from watercourses, melt water streams, lakes and/or ocean so that installation does not cause greater environmental damage; • Minimisation of vehicle traffic through the area, particularly when the area is snow covered, so that the PRB cage and wings are not damaged; • Ensure personnel present are appropriately trained to maintain and monitor the PRB; • Proximity to power supply for operational and monitoring equipment (may be temporary or permanent).
Design	
Operational lifetime	<ul style="list-style-type: none"> • Plan for a longer project time-frame than theoretically calculated, due to project delays (Antarctic operational constraints, weather); • Design should accommodate treatment capacity of PRB for seasonal “pulses” of contaminated water of potentially high volume and high flow rate; • Allocate resources to the construction, monitoring, maintenance, and decommissioning of the PRB for the full project time-frame; • Plan for the removal of PRB materials (eg, granular media, liners etc.) outside Antarctica for proper disposal or recycling; • At a minimum, plan for regular visual monitoring of the PRB wings and gate. If the integrity and performance of the PRB is established, it could be left to operate passively for several years.
Location, orientation	<ul style="list-style-type: none"> • A PRB, or series of PRBs, should be located and orientated such to maximise catchment of contaminated water from the site.

<p>Design of Funnel/Wings</p>	<ul style="list-style-type: none"> • Wings should include: <ul style="list-style-type: none"> - an impermeable <i>geomembrane</i> or barrier such as High Density Polyethylene (HDPE). It is recommended HDPE is a minimum 2 mm in thickness; - Prefabricated “engineered” drainage material (eg, Megaflo™) or coarse gravel. • Wings should extend to the gate at a minimum gradient of 1:20, with a preference of 1:10; • The ratio of the length of wings to the width of the gate should be less than 10, measured perpendicular to the water flow path; • Wings can be “keyed in” to frozen ground. However, consider the use of concrete (min. 10 cm) at the base of the wing excavation in which to “key in” the impermeable liner to reduce the potential for underflow of contaminated water below the wing if permafrost depth is variable; • Backfill using coarse gravel placed upgradient and fine material downgradient of the wings; • Independently controlled heat trace can be placed along the drainage material of the wings to improve thawing and water flow to the gate during peak melt; • Piezometers and temperature sensors can be placed along the wings to monitor wing temperature, water flow, and obtain water samples for analysis; • Avoid the use of loose materials, such as bentonite, as part of the “keying in” process, as these materials will be washed towards the gate causing clogging and impeding flow.
<p>Design of Gate</p> <p>See Figures 2 and 3</p>	<ul style="list-style-type: none"> • A suitable cage or geofabric that can simultaneously contain selected PRB media while still allowing sufficient permeability and water flow is required. Cage pallets, used for supply transport to/from stations and geotubes (see pictures) have been successfully used in Antarctica; • Identify a location for a sump(s) within and/or upgradient of the gate as it may be required later during the installation for removal of excess water during excavation and gate installation; • Design for the gate to have sufficient gradient to freely drain, to minimise likelihood of water remaining in the gate after seasonal meltwater flow and freezing, thereby causing blockage, freeze/thaw, and breaking of granular media. This also minimises the need for heat trace to be used to maintain hydraulic conductivity; • Coarse gravel should be placed downgradient of the gate to promote flow at the outlet, and to insulate the base of the cage from melting and undermining; • Insulation on the sidewalls and base of the gate is recommended if using heat trace or other means to warm the gate. This reduces warming of surrounding frozen ground and the risk of water bypassing the gate. <ul style="list-style-type: none"> - Insulation wrapped in solvent resistant polymer is recommended as insulation exposed directly to hydrocarbons will deform and degrade. • Design for installation and operation of heat trace if possible. Heat trace allows for warming of the PRB prior to the start of seasonal melt and ensures performance both in maintaining permeability for water flow and treatment as well as improving conditions for bioremediation. <ul style="list-style-type: none"> - If installing heat trace at various depths, it is recommended that heat trace is installed on separate circuits such that if heat trace fails in one area/depth, it can be isolated while maintaining heating of other areas in the cage. - Passive heating options should also be considered. • Consider whether the addition of oxygen, to enhance biodegradation, will be needed. Ports or tubes in which air can be introduced into the PRB are options to consider. <p>Key references:</p> <ul style="list-style-type: none"> • <i>Application of reactive barriers operated in frozen ground (In R. Margesin [ed.]: Permafrost soils. 2009.)</i>. • <i>Design, installation and preliminary testing of a permeable reactive barrier for diesel fuel remediation at Casey Station, Antarctica (Cold Regions Science and Technology, 2013).</i>

<p>Selection of Reactive Media</p>	<ul style="list-style-type: none"> • The selection of reactive material is based on site specific factors and the contaminant of concern; • For PRBs used to treat hydrocarbon contaminated water, typical media include a combination of sequence of the following: <ul style="list-style-type: none"> - sand (for removal of fines); - granular activated carbon (to capture hydrocarbons); - nutrient amended zeolites or other source of nutrient release (to encourage bioremediation of adsorbed hydrocarbons); and - natural zeolites (to capture any excess nutrients before the water exits the PRB). • Other materials known to have been used or trialled in Antarctica include: <ul style="list-style-type: none"> - Zero-valent iron for the removal of heavy metal contaminants. • Consideration should be given to potential toxic effects of materials used, and necessary testing if required prior to deployment to Antarctica; • Any media to be imported to Antarctica should be sterile / treated and inspected to ensure that it is free of non-native species. <p>Key references:</p> <ul style="list-style-type: none"> • <i>Evaluation of a permeable reactive barrier to capture and degrade hydrocarbon contaminants (Environmental Science Pollution Research, 2015).</i> • <i>A permeable reactive barrier (PRB) media sequence for the remediation of heavy metal and hydrocarbon contaminated water: A field assessment at Casey Station, Antarctica (Chemosphere, 2016).</i>
<p>Sensors and Monitoring</p>	<ul style="list-style-type: none"> • Electronic sensors can be used for monitoring (eg, dissolved oxygen, temperature, moisture). Electronic sensors add to cost and complexity, and can be prone to damage. If research is not being conducted in tandem with the remediation, sensor monitoring can be minimised, although temperature monitoring is recommended. <ul style="list-style-type: none"> - It is recommended that, at a minimum, temperature be monitored to ensure ground temperatures on the outside and below the gate are not above 0°C, otherwise there is a risk that water will bypass the gate. • If sensors are used, and rely upon wires to carry power and/or signal, then they must be placed so that they are not damaged by sampling, and will likely require waterproofing and conduit tubing to protect cables from damage.
<p>Considerations for construction and installation</p>	
<p>Timing</p>	<ul style="list-style-type: none"> • Excavation and installation of PRB wing and gate will likely cause mobilisation of contaminants. Reduce environmental risk by: <ul style="list-style-type: none"> - Choosing timing of installation to minimise melt and contaminant liberation. - Designing systems to recover and treat contaminated water and sediment during installation phase.

<p>Installation of Wings</p>	<ul style="list-style-type: none"> • In frozen ground, excavation for the PRB wing requires a trench approximately 1 m wide, although thinner trenching may be achieved in seasonally thawed ground, with suitable trenching bucket; • Ensure wing trench slopes at the suggested minimum gradient of 1:20, with a preference of 1:10; • If a decision is made to use concrete, cover the bottom of the trench with a minimum of 10 cm of concrete. Ensure the concrete is levelled to 1 cm and slopes at the minimum suggested gradient; • Place the HDPE liner along the length of the trench as close to upright as possible. <ul style="list-style-type: none"> - To minimise leaks, if possible, use a continuous length of HDPE or, alternatively, heat-weld sections together (if personnel capability and equipment availability exist). • Wings should be placed so that they run smoothly and evenly (no buckles) so no water pooling (and freezing) occurs; • Place engineered drainage material on upgradient side of HDPE. <ul style="list-style-type: none"> - The engineered drainage material should pass from the tip of the wing, along the wing, along the entire front of the gate and along the other wing to its tip. The base of the drainage material sits level to the reactive material in the gate, not below it. • Place any temperature sensors or piezometers as per developed project specific monitoring plan; • Place coarse rock as backfill around engineered drainage material and along the length and depth of the HDPE, taking care not to puncture HDPE during backfilling.
<p>Installation of Gate</p>	<ul style="list-style-type: none"> • High volumes of water may be encountered during installation and a sump can be installed to pump and manage water during PRB installation. Contaminated water should be managed accordingly; • Excavate at the location of the PRB gate to bedrock or permafrost (depth which has remained frozen longer than two years). The excavation area is recommended to be 20 cm larger than the base of the gate in each direction (front, rear and sides) to allow for installation of auxiliary equipment; • If a decision is made to use concrete, cover the bottom of the trench with a minimum of 10 cm of concrete. Ensure the concrete is levelled to 1 cm and drains to the down-gradient side; • Place insulation, wrapped in solvent resistant plastic, on concrete pad or place on ground level; • Place the gate (cage pallet or alternative) on top of the insulation; • Place and attach insulation along the sides of the gate (perpendicular to flow); • Placement of temperature sensors: <ul style="list-style-type: none"> - Place temperatures sensor beneath the gate or concrete to monitor ground temperatures below the gate during operation; - Place temperature sensors between insulation and gate in order to monitoring temperatures at the base of the PRB; - Place temperature sensors at front and back of PRB to monitor freezing/thawing at gate entrance and exit; and - Place temperature sensors at desired depths with PRB for selected monitoring purposes. • Place HDPE liner along the front of the excavation <i>ie</i>, from the base of the excavation, up along the concrete and insulation and into the front of the modified cage pallet (prevents underflow); • Backfill the front and rear of the gate excavation with coarse material to ground surface; • Fill the sides of the gate excavation with fine material to ground surface.

Monitoring	
Water Sampling	<ul style="list-style-type: none"> Consider addition of piezometers at front and rear of gate for water level measurement and also as a location for the removal of water samples. The water level measurements can be used to evaluate hydraulic conductivity, whilst the water samples may be used to determine contaminant and/or nutrient concentrations and the inlet and outlet and hence test treatment efficacy.
Material Sampling	<ul style="list-style-type: none"> Identify suitable locations for the removal of reactive media from the reactive gate. Ideally, cores of materials that demonstrate variation with depth to be taken along the length of the barrier gate; These cores may be analysed to determine the concentration of nutrient remaining on the materials and additionally the concentrations of contaminant at these locations. These are important samples to assist in evaluating if the reactive material is close to its end of life.
Tracer test	<ul style="list-style-type: none"> Salt tracer tests may be used to evaluate the residence time and/or whether there is preferential flow or blockages within the gate. This aids in evaluating whether there is sufficient time available for desired reactions to take place and if the barrier is close to its end of life. <p>Key references:</p> <ul style="list-style-type: none"> <i>Hydraulic performance of a permeable reactive barrier at Casey Station, Antarctica (Chemosphere 2014).</i>
Analysis	<ul style="list-style-type: none"> PRB performance can be assessed annually (or more regularly if desired) by taking representative samples from the media throughout the PRB, as well as from water taken at selected locations throughout the PRB (eg, entering, within and discharging) and analysing for the contaminants of interest; Field blanks, rinsate blanks and sample duplicates are considered basic Quality Assurance/Quality Control requirements for any analytical sample plan; Sample analytes should consider including: TRH, TRH (SGC), BTEXN, leachable and more toxic components (eg, 1 MN, 2MN, 1-2-3 TMB); If unsure of which analytes to sample, it is recommended that a sample of the spilled fuel (neat product) be submitted to a specialist laboratory for identification of the most eco-toxic components; The US EPA software ProUCL can be used to estimate average contaminant concentration at various confidence levels. <p>Key references:</p> <ul style="list-style-type: none"> <i>ProUCL software https://www.epa.gov/land-research/proucl-software</i>

End of life/removal	
	<ul style="list-style-type: none"> • PRBs will have a finite operational life that will be determined by: <ul style="list-style-type: none"> - Granular media performance in removing (and, where designed for, the biodegradation of) contaminant is no longer effective. - When permeability through the cage is restricted through freezing, sediment, excessive biofilms or reduction in grain size of granular media such that water no longer flows through the gate. • Regeneration options include: <ul style="list-style-type: none"> - Removal and replacement of new granular media. - <i>In situ</i> regeneration of granular media via ultrasound or electrokinetics. Note, regeneration of material by this method does not resolve permeability issues resulting from freezing or reduction in grain size. • PRBs can be removed when the concentration of contaminant in the contaminated site upgradient of the PRB are no longer assessed as having an unacceptable environmental risk, which could be a result of: <ul style="list-style-type: none"> - active remediation of contaminated soil source upgradient of PRB; - further risk assessment deems risk acceptable (more information on source, pathway, receptor); - natural attenuation; or - potential for PRB as installed to cause further environmental harm (unlikely). • Remove and dispose or recycle PRB materials (eg, granular media, liners etc) outside Antarctica at an appropriate facility; • Physically rehabilitate modified areas of the PRB cage and wings to return to natural landform and aesthetic values; • Record and report as appropriate, and ensure completion of regulatory and environmental approval processes; • Consider reporting on lessons learned in appropriate Antarctic forums including, for example, COMNAP and the CEP; • Any future land-use or infrastructure changes that will change the risk profile used to justify PRB removal should be considered. For example: will meltwater conditions change, or will snow clearing or removal of buildings cause a remobilisation of contaminants to occur? Eg, removal of a building in the future may expose the soil to increased groundwater flow, and the subsequent mobilisation of soluble contaminants. <p>Key references:</p> <ul style="list-style-type: none"> • <i>The electrochemical regeneration of granular activated carbons: A review (Journal of Hazardous Materials (in press).</i>

Personnel

The design, construction and maintenance of Antarctic PRBs require a variety of specialist and non-specialist personnel, and these may vary according to the clean-up objective and National Antarctic Programme. Likely key roles and responsibilities are identified in the table below.

Contaminant source and site characterisation	
	<ul style="list-style-type: none"> • Field - Environmental scientist/engineer and/or staff with scientific training acting under the instructions of an experienced environmental scientist. • Laboratory – Samples processed and analysed by an appropriately accredited laboratory with expertise in the analysis of the contaminants. • Interpretation – Environmental scientist(s) with experience in the interpretation of contaminant data.
Desirable characteristics for a PRB site	
	<ul style="list-style-type: none"> • Field - Site visit by personnel planning the PRB, and consultation with key Antarctic programme personnel. • Field – Assessment of the site hydrology by an experienced geologist, geomorphologist or engineer. • Decision making and approvals – National Antarctic Programme planners/managers, environmental management and operations personnel, National Competent Authority.
Design	
	<ul style="list-style-type: none"> • Design –Engineer/hydrogeologist, preferably supported by consultation with parties experienced in the installation of PRBs.
Construction and Installation	
	<ul style="list-style-type: none"> • Field – Construction personnel supervised or trained by an engineer/environmental scientist with experience in the installation of PRBs. • Field - Construction personnel skilled in plant operation as required (eg, excavation of trenches, obtaining necessary gradients, placement of barriers and permeable gate).
Monitoring	
	<ul style="list-style-type: none"> • Field – Station/Antarctic programme personnel can be trained to monitor and sample PRBs by the supervising project manager using standard operating procedures. • Laboratory – Samples processed and analysed by an appropriately accredited laboratory with expertise in hydrocarbon analysis. • Interpretation – Environmental scientist(s) with experience in the interpretation of contaminant data.
End of Life/Removal	
	<ul style="list-style-type: none"> • Decision making and approvals – National Antarctic Programme planners/managers, environmental management and operations personnel, National Competent Authority. • Field - Station personnel can be trained and supervised to decommission the PRB infrastructure.

Figure 2: Schematic showing typical features of an Antarctic PRB in (A) aerial and (B) side view

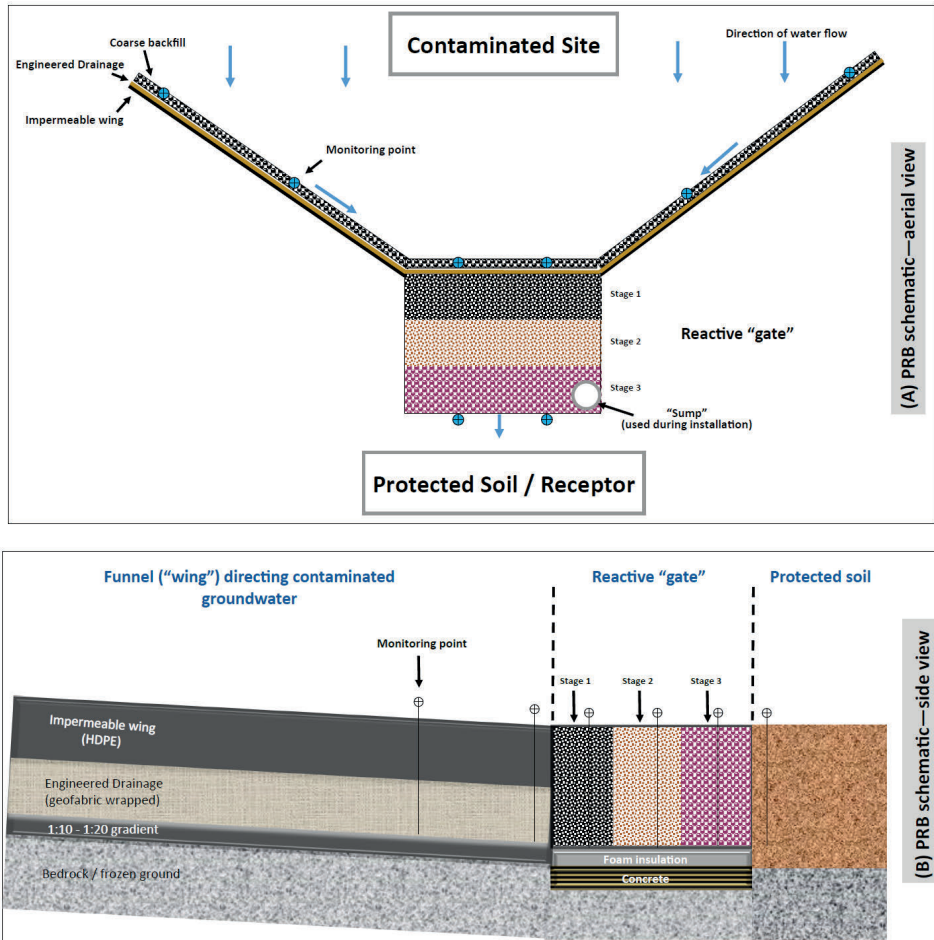
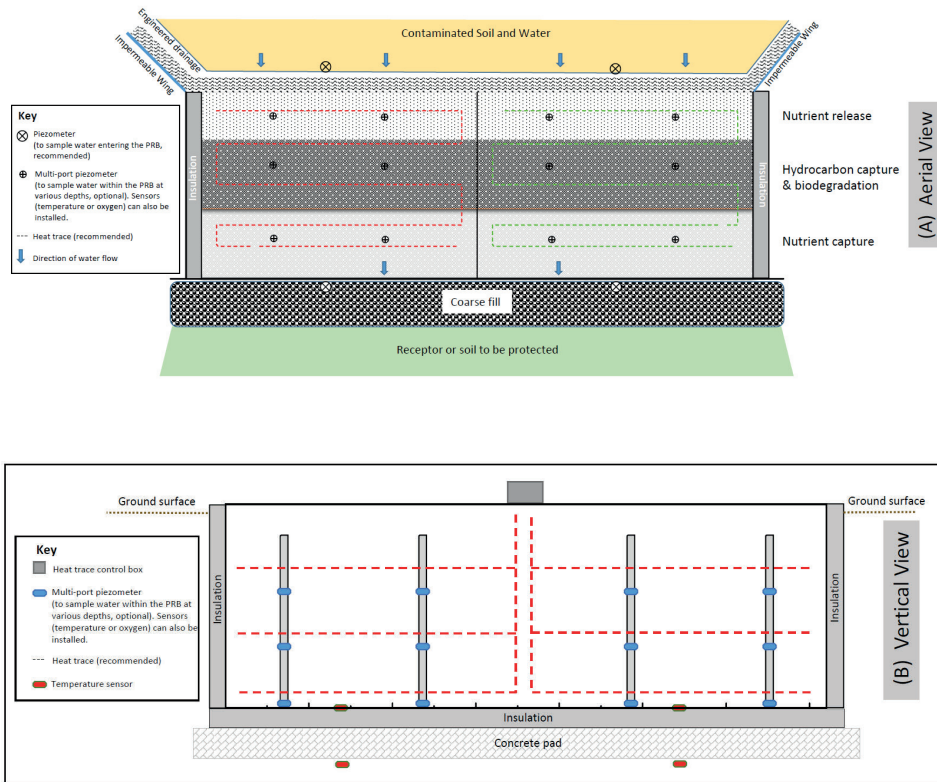


Figure 3: (A) aerial and (B) vertical view showing detailed design considerations for an Antarctic PRB



Pictures



Photo 1: Digging trench for PRB wing in frozen ground.



Photo 2: Installing wings and gate. Note: gate is heavily instrumented for research purposes.

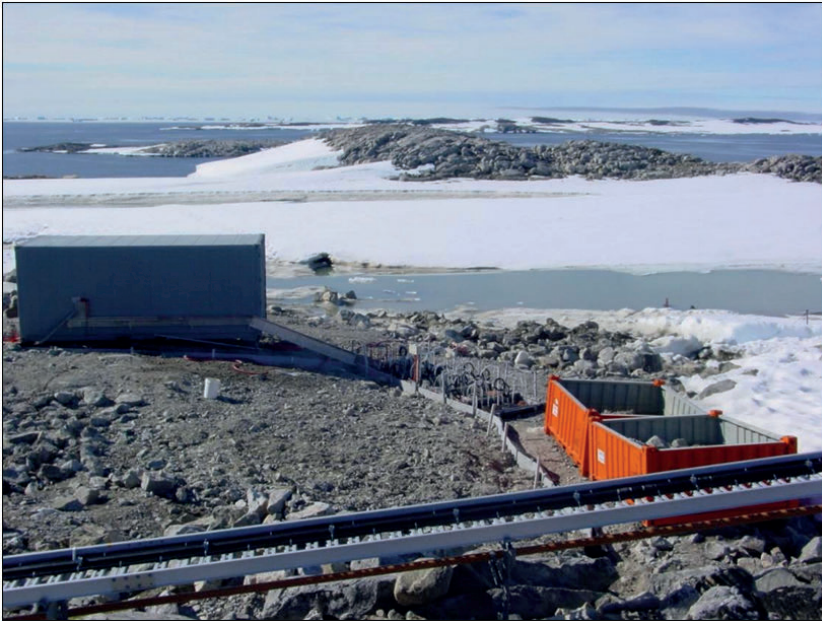


Photo 3: Backfilled wings and gate.



Photo 4: PRB gate being constructed using “cage pallet” showing piezometers (white tubes) for water monitoring and sequenced granular reactive media. Black wire is heat trace to be connected.



Photo 5: Top view of sequenced granular media in PRB. In this instance, showing zeolite (orange), granular activated carbon (black) and nutrient enriched zeolite (white). Water flow is from bottom of picture towards the top.



Photo 6: PRB gate installed using geotube (black fabric). Note: once operational the top covers are closed to prevent granular media dispersing into the environment.



Photo 7: Heavily instrumented gate used for research purposes and trialling a variety of granular media.

Glossary

Adsorb - the retention of a solute by the surface of a solid rather than within its mass.

Aviation gasoline - Aircraft jet fuel, commonly known as Avgas, Jet A-1, Jet TS-1, ATK (aviation turbine kerosene).

BFR - Brominated flame retardant

Biodegradation - the breakdown of intermolecular bonds of organic substances by microorganisms to derive energy.

Bioremediation - A process that uses living organisms (usually naturally occurring or native) such as plants, bacteria, yeast, and fungi to break down hazardous substances into less toxic or nontoxic substances.

Biostimulation - Modifications to stimulate existing bacteria capable of bioremediation. This can be done by addition of various forms of rate limiting nutrients (*eg*, nitrogen, phosphorous, potassium) and electron acceptors or donors (*eg*, oxygen, carbon).

BTEXN - A commonly used abbreviation for benzene, toluene, ethylbenzene, xylenes and naphthalene compounds, commonly occurring in fuel and crude oil. They are aromatic compounds and have carcinogenic, teratogenic or mutagenic properties.

Geomembrane - a very low permeability and flexible synthetic membrane liner (barrier) that is used to stop advective, and limit diffusive, contaminant transport. Typically made out of high density polyethylene (HDPE).

In situ - In its original place, unexcavated, or unmoved.

Key-in - in the context of construction or geotechnical engineering used here, to fix or attach liner, wing or gate system into underlying bedrock, frozen ground or ice such that water flow around or beneath such systems is minimised.

Media - in the context of PRBs, coarse granular material used to adsorb contaminants, release and recover nutrients or amendments, encourage bioremediation, and/or filter fine particles from groundwater.

MAH - Monocyclic Aromatic Hydrocarbon. Organic compounds containing only carbon and hydrogen comprised of a single aromatic ring.

Natural Attenuation - a reduction in mass, toxicity, mobility, volume or concentration of contaminants in soil or groundwater by a variety of physical, chemical, or biological processes without human intervention.

PAH - Polycyclic Aromatic Hydrocarbon. Organic compounds containing only carbon and hydrogen comprised of multiple aromatic rings. These occur naturally in petroleum hydrocarbons, coal, and crude oil and are released into the air during incomplete burning of fuels, rubbish and organic waste. These can be carcinogenic compounds.

PFAs - Per- and polyfluoroalkyl substances (PFAs) are a group of manufactured chemicals. Compounds resistant to heat, water, and oil. There are many types of PFAs, with the best known examples being perfluorooctane sulfonate, known as “PFOS”; perfluorooctanoic acid, known as “PFOA”; and perfluorohexane sulfonate, known as PFHxS.

Sump - A low point/depression in which to collect liquid.

TRH - Total Recoverable Hydrocarbons. Sometimes used interchangeably with TPH – Total Petroleum Hydrocarbons. Analytical techniques that measure TRH will specify the carbon range of the analysis.

TRH (SGC) - Total Recoverable Hydrocarbons with a Silica Gel Clean up step. The clean-up step is used during analysis to remove natural organic matter or polar metabolites that may be contributing to the quantification of the TRH.

1 MN - 1-Methylnaphthalene, a PAH hydrocarbon compound.

2 MN - 2-Methylnaphthalene, a PAH hydrocarbon compound.

1-2-3 TMB - 1,2,3-Trimethylbenzene, an aromatic hydrocarbon compound.

References

- US EPA (2002). Economic Analysis of the Implementation of Permeable Reactive Barriers for Remediation of Contaminated Ground Water.
- Snape I, Ferguson SH, Harvey PM, and Riddle MJ (2006). Investigation of evaporation and biodegradation of fuel spills in Antarctica: II—Extent of natural attenuation at Casey Station. *Chemosphere* (63) 89-98.
- Snape I, Morris CE and Cole CM (2001). The use of permeable reactive barriers to control contaminant dispersal during site remediation in Antarctica. *Cold Regions Science and Technology* (32) 157-174.
- Filler DM, Snape I, and Barnes DL (2008). *Bioremediation of Petroleum Hydrocarbons in Cold Regions*. Cambridge University Press.
- Gore DB (2009). Application of reactive barriers operated in frozen ground. In R. Margesin (ed.): *Permafrost soils*. Pp. 303-319. Berlin: Springer.
- Mumford KA, Rayner JL, Snape I, Stark SC, Stevens GW and Gore DB (2013). Design, installation and preliminary testing of a permeable reactive barrier for diesel fuel remediation at Casey Station, Antarctica. *Cold Regions Science and Technology*.
- Mumford KA, Powell SM, Rayner JL, Hince G, Snape I and Stevens GW (2015). Evaluation of a permeable reactive barrier to capture and degrade hydrocarbon contaminants. *Environmental Science Pollution Research* (22):12298–12308.
- Camenzuli D & Freidman BL (2015). On-site and in situ remediation technologies applicable to petroleum hydrocarbon contaminated sites in the Antarctic and Arctic. *Polar Research* 34.
- Freidman B, Terry D, Wilkins D, Spedding T, Gras S, Snape I, Stevens G, and Mumford KM (2017). Permeable bio-reactive barriers to address petroleum hydrocarbon contamination at subantarctic Macquarie Island. *Chemosphere* (174).
- Satham TS, Stark SC, Snape I, Stevens GW and Mumford KA (2016). A permeable reactive barrier (PRB) media sequence for the remediation of heavy metal and hydrocarbon contaminated water: A field assessment at Casey Station, Antarctica. *Chemosphere*: 368-375.
- Mumford KA, Rayner JL, Snape I, and Stevens GW (2014). Hydraulic performance of a permeable reactive barrier at Casey Station, Antarctica. *Chemosphere* (117) 223–231.
- McQuillan, R, Stevens GW, and Mumford KA (2018). The electrochemical regeneration of granular activated carbons: A review. *Journal of Hazardous Materials*, *in press*.

Site Guidelines for Visitors

The Representatives,

Recalling Resolutions 5 (2005), 2 (2006), 1 (2007), 2 (2008), 4 (2009), 1 (2010), 4 (2011), 4 (2012), 3 (2013), 4 (2014), 2 (2016) and 1 (2018), which adopted and updated lists of sites subject to Site Guidelines for Visitors (“Site Guidelines”);

Believing that Site Guidelines enhance the provisions set out in the Guidance for those organising and conducting tourism and non-governmental activities in the Antarctic annexed to Recommendation XVIII-1 (1994);

Confirming that the term “visitors” does not include scientists conducting research within such sites, or individuals engaged in official governmental activities;

Noting that Site Guidelines have been developed based on the current levels and types of visits at each specific site, and aware that Site Guidelines would require review if there were any significant changes to the levels or types of visits to a site;

Believing that the Site Guidelines for each site must be reviewed and revised promptly in response to changes in the levels and types of visits, or in response to any demonstrable or likely environmental impacts;

Desiring to keep the list of sites subject to Site Guidelines and the Site Guidelines up to date;

Recommend to their Governments that:

1. Torgersen Island, Arthur Harbor, southwest Anvers Island; Yankee Harbour; Half Moon Island; and Snow Hill Hut be updated in the list of sites subject to Site Guidelines annexed to this Resolution, and that the Site Guidelines for those sites, as adopted by the Antarctic Treaty Consultative Meeting (“ATCM”), be added to the Site Guidelines;

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2. the Secretariat of the Antarctic Treaty (“the Secretariat”) update its website accordingly;
3. their Governments urge all potential visitors to ensure that they are fully conversant with and adhere to the relevant Site Guidelines; and
4. the Secretariat post the text of Resolution 1 (2018) on its website in such a way that makes clear that it is no longer current.

List of Sites Subject to Site Guidelines

Site Guidelines	First Adopted	Latest Version
1. Penguin Island (Lat. 62° 06' S, Long. 57° 54' W)	2005	2005
2. Barrientos Island - Aitcho Islands (Lat. 62° 24' S, Long. 59° 47' W)	2005	2013
3. Cuverville Island (Lat. 64° 41' S, Long. 62° 38' W)	2005	2013
4. Jougla Point (Lat. 64° 50' S, Long. 63° 30' W)	2005	2013
5. Goudier Island, Port Lockroy (Lat. 64° 49' S, Long. 63° 29' W);	2006	2006
6. Hannah Point (Lat. 62° 39' S, Long. 60° 37' W)	2006	2013
7. Neko Harbour (Lat. 64° 50' S, Long. 62° 33' W)	2006	2013
8. Paulet Island (Lat. 63° 35' S, Long. 55° 47' W)	2006	2018
9. Petermann Island (Lat. 65° 10' S, Long. 64° 10' W)	2006	2013
10. Pleneau Island (Lat. 65° 06' S, Long. 64° 04' W)	2006	2013
11. Turret Point (Lat. 62° 05' S, Long. 57° 55' W)	2006	2006
12. Yankee Harbour (Lat. 62° 32' S, Long. 59° 47' W)	2006	2019
13. Brown Bluff, Tabarin Peninsula (Lat. 63° 32' S, Long. 56° 55' W)	2007	2018
14. Snow Hill Hut (Lat. 64° 21'50'' S, Long. 56° 59'31'' W)	2007	2019
15. Shingle Cove, Coronation Island (Lat. 60° 39' S, Long. 45° 34' W)	2008	2008
16. Devil Island, Vega Island (Lat. 63° 48' S, Long. 57° 17' W)	2008	2018
17. Whalers Bay, Deception Island, South Shetland Islands (Lat. 62° 59' S, Long. 60° 34' W)	2008	2018
18. Half Moon Island, South Shetland Islands (Lat. 62° 35'24'' S, Long. 59° 55'13'' W)	2008	2019
19. Baily Head, Deception Island, South Shetland Islands (Lat. 62° 58' S, Long. 60° 30' W)	2009	2013
20. Telefon Bay, Deception Island, South Shetland Islands (Lat. 62° 55'27'' S, Long. 60° 39'47'' W)	2009	2018
21. Cape Royds, Ross Island (Lat. 77° 33' 11'' S, Long. 166° 10' 7'' E)	2009	2009
22. Wordie House, Winter Island, Argentine Islands (Lat. 65° 15' S, Long. 64° 16' W)	2009	2009
23. Stonington Island, Marguerite Bay, Antarctic Peninsula (Lat. 68° 11' S, Long. 67° 00' W)	2009	2009
24. Horseshoe Island, Antarctic Peninsula (Lat. 67° 49' S, Long. 67° 18' W)	2009	2014
25. Detaille Island, Antarctic Peninsula (Lat. 66° 52' S, Long. 66° 48' W)	2009	2009
26. Torgersen Island, Arthur Harbor, southwest Anvers Island (Lat. 64° 46.39' S, Long. 64° 04.55' W)	2010	2019
27. Danco Island, Errera Channel, Antarctic Peninsula (Lat. 64° 44' S, Long. 62° 36' W)	2010	2013
28. Seabee Hook, Cape Hallett, Northern Victoria Land, Ross Sea, Visitor Site A and Visitor Site B (Lat. 72° 19' S, Long. 170° 13' E)	2010	2010
29. Damoy Point, Wiencke Island, Antarctic Peninsula (Lat. 64° 49' S, Long. 63° 31' W)	2010	2013

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Site Guidelines	First Adopted	Latest Version
30. Taylor Valley Visitor Zone, Southern Victoria Land (Lat. 77° 37.59' S, Long. 163° 03.42' E)	2011	2011
31. North-east beach of Ardley Island (Lat. 62° 13' S; Long. 58° 55' W)	2011	2011
32. Mawson's Huts and Cape Denison, East Antarctica (Lat. 67° 00'31'' S; Long. 142° 40'43'' E)	2011	2014
33. D'Hainaut Island, Mikkelsen Harbour, Trinity Island (Lat. 63° 54' S, Long. 60° 47' W)	2012	2012
34. Port Charcot, Booth Island (Lat. 65° 04'S, Long. 64° 02'W)	2012	2012
35. Pendulum Cove, Deception Island, South Shetland Islands (Lat. 62°56'S, Long. 60°36' W)	2012	2018
36. Orne Harbour, Southern arm of Orne Harbour, Gerlache Strait (Lat. 64° 38'S, Long. 62° 33'W)	2013	2013
37. Orne Islands, Gerlache Strait (Lat. 64° 40'S, Long. 62° 40'W)	2013	2013
38. Point Wild, Elephant Island (Lat. 61° 06'S, Long. 54° 52'W)	2016	2016
39. Yalour Islands, Wilhelm Archipelago (Lat. 65° 14'S, 64° 10'W)	2016	2016
40. Astrolabe Island (Lat. 63° 17'S, Long. 58° 40'W)	2018	2018
41. Georges Point, Rongé Island (Lat. 64° 40'S, Long. 62° 40'W)	2018	2018
42. Portal Point (Lat. 64° 30'S, Long. 61° 46'W)	2018	2018

Visitor Site Guidelines Assessment and Review Checklist

The Representatives,

Recalling Resolutions 5 (2005), 2 (2006), 1 (2007), 2 (2008), 4 (2009), 1 (2010), 4 (2011), 4 (2012), 3 (2013), 4 (2014), 2 (2016), 1 (2018) and 7 (2019), which adopted and updated lists of sites subject to Site Guidelines for Visitors (“Site Guidelines”);

Believing that Site Guidelines enhance the provisions set out in the Guidance for those organising and conducting tourism and non-governmental activities in the Antarctic annexed to Recommendation XVIII-1 (1994);

Confirming that the term “visitors” does not include scientists conducting research within such sites, or individuals engaged in official governmental activities;

Noting that Site Guidelines have been developed on the basis of the current levels and types of visits at each specific site and aware that Site Guidelines would require review if there were any significant changes to the levels or types of visits to a site;

Believing that the Site Guidelines for each site must be reviewed and revised promptly in response to changes in the levels and types of visits, or in response to any demonstrable or likely environmental impacts;

Desiring to keep the list of sites subject to Site Guidelines and the Site Guidelines up to date;

Recognising the need for a consistent approach to the review of existing Site Guidelines and for the assessment of sites for new Site Guidelines and to this end welcoming the development of a checklist to assist in the process of reviewing existing site guidelines and assessing sites for new guidelines;

Recommend that their Governments:

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1. encourage the dissemination of the Site Guidelines for Visitors checklist which is annexed to this Resolution, and its use by those conducting assessments of Site Guidelines for Visitors; and
2. request the Secretariat of the Antarctic Treaty to post the checklist on its website.

Site Guidelines for Visitors Checklist

Prior considerations

For existing sites, reviewers should examine the existing guidelines prior to visiting the site and identify site-specific aspects that should be examined prior to the site visit. The information to compile may include:

- Level of visits during the last five years and identified trends of growth, decrease, stability. (IAATO data on visitor numbers, and any information held by national programmes/governments as appropriate).
- Report of incidents/ accidents during the last five years (any information held by national programmes/governments as appropriate).
- Type of visitor activities that have been carried out in the area (guided walk, small boat cruising, kayak, etc.).

For new sites, reviewers should compile information on the site ahead of a visit. The information to compile may include (in addition to the above):

- Information about the environmental values present in the area (information held by national programmes/governments as appropriate: scientific papers, travel guides, etc.).

Questions		Reviewers Comments
Latitude/Longitude Position Include GPS coordinates specifying the place where it was referenced (ex: xx°xx'xx'' S, xx°xx'xx''W – landing area or HSM Point, etc.)		
Key Features What are the key features of the site? Why would someone wish to visit the site? Try to stick to two or three features.		
Topography and geology A physical description of the site. Background material can be used to describe the wider site but reviewers should note the specific nature of the site.	Overview of site	
	Description of landing beach(es)	
	Description of the site geology	
Wildlife List all fauna identified. Where possible, identify whether species are breeding there. Use common and scientific names.		
Vegetation List all flora present at the site. Use common names.		

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Questions		Reviewers Comments
Historical/ Cultural/ Scientific activities List of all human presence with specific location and details of condition.	Any HSM should be noted with specific reference to condition.	
	Historical and archaeological remains that aren't HSMs.	
	National Programme activity <i>ie</i> , reclusive or stores.	
	Scientific equipment present at site, incl. what it is and who it belongs to, if known.	
Visitor Impact Is there any obvious evidence of visitor impact? For example damage/graffiti to Historic sites; erosion caused by paths; abandoned waste; marks left on geology.		
'Visitor Pressure' descriptions Where on the site are there likely to be visitor pressure impacts? This could be a path or landing zone too close to fauna or flora; path impacts; non-permanent installations impacts; use of UAVs impacts; or dangerous areas.	Risks to the Environment.	
	Risk to visitor safety.	
Landing area (with GPS coordinates) Safe, appropriate. Is it accessible?	Approach, are there rocks/shoals?	
	Is there a heavy concentration of wildlife on the beach?	
	Is there an appropriate route from the landing beach to the primary visitor area?	
Restricted zones	Are any areas inappropriate for visitors to enter?	
	What is the rationale for this exclusion?	
	What is the exact area and how can it be identified? GPS data.	
	Are any ASPAs/ASMAs located nearby? (Are the boundaries easily identifiable?)	
Seasonality Are any seasonal factors likely to affect visits to the site? (<i>ie</i> , wildlife breeding season, snow accumulation in early season).		

Annex: Site Guidelines for Visitors Checklist

Questions		Reviewers Comments
<p>Visitor Numbers What does the suggested visitor number limit mean for the number of ships (and ship capacity) visiting per day?</p>	Does the size of the site limit visitor numbers?	
	Does the concentration and/or spread of wildlife limit visitor numbers?	
	Do geological considerations limit visitor numbers?	
	Would visitors disrupt scientific activities?	
	Would the number of visitors per day impact an HSM?	
	What would a reasonable number of visitors to the site be per day?	
<p>Distances from flora and fauna Should additional restrictions (beyond the standard 5 metres) be imposed?</p>		
<p>Proposed walking routes Are there specific routes that should be taken or avoided across the site? Free roaming and guided areas.</p>		
<p>Behaviour ashore Are there any site-specific issues that should be noted in site guidelines? Are there any cautionary notes to highlight? Considerations should include the protection of visitors, <i>ie</i>, health and safety concerns as well as protection of the site and its flora/fauna.</p>		
<p>Site Map The majority of information mentioned in the guidelines should be included in the map, including GPS data of the landing area. For existing sites, reviewers should assess the accuracy of the existing map. For example, are restricted areas and wildlife areas accurately marked? Do additional details need to be added? Is all relevant detail in site guidelines included in the map? Is it consistent with other more recent site guideline maps?</p>		
<p>Photographic evidence Illustrated photo-maps should be used to assist in on-site interpretation of the provisions of the Site Guidelines. For existing sites, appropriate, up-to-date photos of the site should be taken and where appropriate added to the guidelines. New photos should not replace old photos if the older versions provide a better representation of the site.</p>		

Site-specific review for existing sites

Reviewers should examine the existing guidelines prior to visiting the site and identify site-specific questions that should be examined.

Questions	Reviewers Comments

Scientific Committee on Antarctic Research’s Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica

The Representatives,

Recalling that sub-paragraphs (iv) and (v) of Article 3.2 (b) of the Protocol on Environmental Protection to the Antarctic Treaty (“the Environment Protocol”) provide that activities to be undertaken in Antarctica “shall be planned and conducted so as to avoid . . . detrimental changes in the distribution, abundance or productivity of species or populations of species of fauna and flora” and “to avoid . . . further jeopardy to endangered or threatened species or populations of such species,” respectively;

Recalling that Annex II to the Environment Protocol sets out specific mechanisms to protect Antarctic species;

Recognising that broad and extensive consultation has been undertaken in the review and revision of the non-mandatory Scientific Committee on Antarctic Research’s (“SCAR”) Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica, including with policy makers, environmental managers and scientific experts;

Recalling that the Antarctic Treaty Consultative Meeting (“ATCM”) has also adopted specific measures to manage human disturbance of Antarctic fauna and flora;

Recommend that their Governments:

1. endorse the non-mandatory Scientific Committee on Antarctic Research’s (“SCAR”) Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica (“the Code of Conduct”); and

2. consider the Code of Conduct for dissemination and encouragement of adoption when planning and undertaking work that involves the use of animals in Antarctica.

SCAR’s Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica

Background

1. This Scientific Committee on Antarctic Research (SCAR) Code of Conduct (CoC) provides guiding principles to the scientific community conducting research involving animals. Moreover, this CoC provides the ethical framework and details the responsibilities of Antarctic investigators, institutions, and the animal ethics committees overseeing the research, and outlines individual and institutional accountability. Importantly, the code applies throughout an animal’s involvement in research activities, including transport (from capture to processing site, as well as to a laboratory or housing facility), housing/husbandry (this may be from minutes to many months), the procedure the animal is subject to, and provisions for the animal at the completion of their use.

2. This Code of Conduct should be read in concert with Annex II of the Protocol on Environmental Protection to the Antarctic Treaty, which provides guidance on the killing, capturing and handling (“taking”) of native fauna and aims to provide guidance on the interpretation of Article 3 paragraph 6 of this Annex. Additional, taxon-specific guidelines also exist.^{1 2 3 4}

3. Specific provisions are not required for other invertebrate taxa (with the exception of cephalopods), except for the general principles of ethical use of animals and very specific requirements in the case of species listed as Vulnerable or a higher endangerment category in the IUCN red lists (<https://www.iucnredlist.org/>). Cephalopods should be treated in ways that are consistent with the guidance in this CoC.

Introduction

4. This CoC was developed in recognition that humans have a moral obligation to respect all living animals and to have due consideration for their capacity for pain and suffering. However, the CoC also recognises that experimental and observational research can require interactions with animals and can be undertaken when there is a reasonable expectation that the results will provide a significant advance in scientific

¹ Gales, N. J., Bowen, W. D., Johnston, D. W., Kovacs, K. M., Littnan, C. L., Perrin, W. F., Reynolds, J. E. and Thompson, P. M. (2009), Guidelines for the treatment of marine mammals in field research. *Marine Mammal Science*, 25: 725-736. doi:10.1111/j.1748-7692.2008.00279.x.

² Sikes, R.S. (2016) Guidelines of the American Society of Mammalogists for the use of wild mammals in research and education, *Journal of Mammalogy*, 97: 663–688, <https://doi.org/10.1093/jmammal/gyw078>.

³ Fair, J.M., Paul, E.P. and Jones, J. (eds) (2010) Guidelines to the use of wild birds in research. Third Edition. The Ornithological Council. Washington D.C.

⁴ O’Brien CE, Roumbedakis K and Winkelmann IE (2018) The Current State of Cephalopod Science and Perspectives on the Most Critical Challenges Ahead from Three Early-Career Researchers. *Front. Physiol.* 9:700. doi: 10.3389/fphys.2018.00700.

knowledge or be of overall benefit for the species involved, its habitat, its ecosystem, or for the betterment of humanity.

5. This CoC is consistent with the principle of the 3R's principle (Replace, Reduce and Refine⁵), recognising the need to use an appropriate number of animals for experimental and other scientific purposes with the aim of minimising numbers (3R's Reduce) whenever practical, in particular, by seeking and encouraging the use of alternative measures (3R's Replace).

6. The CoC encourages the use of procedures that minimise pain, suffering, distress or lasting harm. When unavoidable, these should be kept to a minimum (3R's Refine).

7. Recognising the existence of national animal welfare legislation, this CoC is intended to support and supplement existing legal frameworks. Although this CoC may not supersede national legislation, it brings important information on the specifics of Antarctic wildlife and Antarctic research. One of the unique features, and great strengths, of Antarctic research is that it involves researchers from different nations. For animal research, this means that there are varying degrees of legal responsibilities and requirements for ethics training and even for the nature of work that is permitted. One of the aims of this SCAR CoC is to provide a set of guidelines for all Antarctic research that involves the use of animals. Where no national legislation exists, we strongly urge researchers to adhere to principles in this SCAR CoC.

Code of Conduct

8. The advancement of biological knowledge and the development of improved protection of the health and well-being of humans, animals, and habitat, can require intrusive observation, manipulation, experimentation on live animals, and occasionally killing animals (cf. point 14). This is particularly the case in studies involving fish, where often large numbers of individuals are captured, manipulated and euthanised at the end of the experiment. In contrast, the hands-on use of birds and mammals in Antarctica is principally concerned with the capture, temporary handling and/or restraint (usually a few minutes but possibly a few days to a month), for application of data recording or transmitting devices, blood sampling or light biopsies, and marking temporarily or with permanent ID tags or tattoos. Heavy, invasive experiments or procedures on these taxa, such as those found in biomedical research, are rare in Antarctica, and most of the research on birds and mammals is conducted in the field of ecology, ecophysiology and behaviour, where it usually is important to allow the animal subject to continue to interact with its environment as naturally as possible. As is the case elsewhere and in parallel to mandatory environmental impact assessments, experimentation should only happen once a cost/benefit analysis has been undertaken by an ethical review committee with an independent membership. The benefits must be maximised, and the costs in terms of animal use and suffering must be minimised.

⁵ Zurlo, J., Rudacille, D., & Goldberg, A. M. (1996). The three Rs: the way forward. *Environmental health perspectives*, 104(8), 878-80.

9. Physical ID tags (*eg*, bands applied to highly streamlined penguins' flippers) have been shown to impair survival and/or reproduction, ultimately affecting population growth rates, and compromising the scientific utility of their use. Evaluation of the use of physical ID tags in wildlife research must be considered, in particular the balance between the need for an appropriate sample size for demography studies and the potential impacts.

10. When considering the use of tracking devices to be attached temporarily to individuals (*eg*, radio tracking tags, satellite tags, GPS-GSM tags), one needs to consider the weight and size of the tags. There are existing guidelines (*eg*, devices attached to the back of flying birds should ideally not weigh more than 3% of the bird's body mass); and species-specific evaluation to minimise impact should be undertaken.

11. Procedures should be designed, where practicable, to follow the 3R's principle of Replacement, Reduction and Refinement; noting that "replacement" is often not available in studies that are concerned with the study of the whole animal, especially when studies concern animals moving freely in their environment.

12. The animals used should be of an appropriate species and health, ensuring the minimum number required to obtain scientifically valid results. Power analysis or simulations to estimate the sample sizes necessary to statistically address a question, bearing in mind the feasibility of the experiment in the field, should always be undertaken in advance of any work.

13. Researchers should never fail to treat animals as sentient, and ensure proper care to avoid or minimise discomfort, distress, or pain as ethical imperatives. Investigators should assume that procedures that would cause pain and suffering in human beings could cause pain and suffering in other animals. Investigators also have the responsibility to ensure that they are following best practice and, if not already designed, that their methods are available to the broader research community for peer-evaluation (recommendation to follow the guidelines in PREPARE (<http://journals.sagepub.com/doi/full/10.1177/0023677217724823>) and ARRIVE (<https://norecopa.no/3r-guide/the-arrive-guidelines>)).

14. Surgical procedures with animals that may cause more than momentary or minimal pain or distress should be performed with appropriate sedation, analgesia, or anaesthesia and postoperative analgesia in accordance with accepted veterinary practice. Investigators should consider carefully the use of anaesthesia in their experiment, as such a procedure is not without risk. This should be performed only by trained or experienced personnel.

15. In some cases, diving animals (penguins, seals) naturally have deep apnoeic responses and sedation can prevent them from returning to a normal breathing pattern. Resuscitation procedures, including pharmaceuticals when appropriate, should be available to ventilate the lungs or stimulate recovery in cases of respiratory distress. Expert observers and monitoring equipment should be used to monitor the depth of anaesthesia. Special attention should be paid to thermoregulatory problems during

handling of endotherms (“warm-blooded” animals). For example, birds and seals can overheat to death within seconds or suffer from hypothermia. Also, ectotherms/“cold-blooded” animals (such as fish or cephalopods) should be protected from hyper and hypothermia.

16. As seabirds often feed their nestlings by regurgitating food contained in their guts and can spontaneously regurgitate when stressed, specific attention should be paid to accidental suffocation when individuals are handled or confined for research purposes.

17. Animals that would otherwise suffer permanent pain, distress, discomfort, or disablement should be euthanised at the end of an experiment. Evaluation of the use of euthanasia must be carefully considered in the context of the level of future disablement in a given species that has been manipulated for scientific purposes. Diagnosis must be made on a species-by-species basis and only after consultation with professionals (as ethical permits often request) and people well experienced with the target species. It may also be necessary to consider euthanising offspring that are not independent (*eg*, seabirds that have not fledged and pinnipeds that have not weaned) when their provisioning parents have themselves been euthanised or killed accidentally. To prevent unnecessary euthanasia, this CoC encourages field researchers to publish observations of disabled individuals (*eg*, limb damage, etc.) performing normal activities, especially those actively reproducing. Such observations may provide a more informed framework for evidence-based decision making when considering euthanasia.

18. When animals need to be euthanised for research purposes, this should be performed in a way that minimises stress and pain. This includes minimising the time that animals are held before they are euthanised. For example, fish collected in trawls should be dealt with immediately, unless they are used in chronic studies where fish need to be alive and in good condition.

19. The best possible living conditions (temperature and oxygenation of the water especially) should be maintained, and monitored, for animals held in captivity for scientific purposes. Note that the best possible living conditions sometimes can appear to be counter-intuitive: floors and walls of the holding facility should have no structure that can catch claws, flippers, or wings; low temperature should be maintained to avoid heat stress; provision should be made so that the animal, especially a bird, does not become coated in its own faeces. For aquatic species sustaining the water quality, and the appropriate temperature, oxygen, and salinity levels is important. The presence, sight or smell of other animals can agitate rather than comfort in some cases, and for some species, individuals may be best held in isolation. Enclosure roofs can prevent the sight of aerial predators or passing humans.

20. When working with animals engaged in reproduction, measures must be taken to ensure the protection of the offspring (keeping eggs, pups or chicks warm and safe from predators) and of the nesting/breeding space. Following an experiment, particular attention should be paid to avoid desertion by the parents, especially when working on breeding, colonial birds.

Annex: SCAR's Code of Conduct for the Use of Animals...

21. Specific attention should be paid to signs of weakness/illness when animals are released after having been handled, and when feasible, released animals should be monitored until they are independently mobile.

22. Personnel should be trained in the proper and humane treatment and concern for animals under their care, as well as receive a minimum level of training in animal welfare legislation and permitting requirements. A culture of care should be established and encouraged. Exchange at international level on ethical issues should also be promoted (cf. Concordat of Openness on animal welfare <http://concordatopenness.org.uk> for an example) and how to communicate about these issues with a large audience.

Reducing Plastic Pollution in Antarctica and the Southern Ocean

The Representatives,

Noting the increasing level of both macro-plastic (>5 mm) and micro-plastic (<5 mm) found in the Antarctic Treaty area;

Aware of the current lack of plastics monitoring data to inform decision-making;

Conscious of their responsibility to protect the Antarctic environment and dependent and associated ecosystems;

Acknowledging that the majority of plastic found in Antarctica originates from outside of Antarctica;

Nevertheless wishing to minimise plastic pollution in Antarctica;

Recalling Articles 1 and 6 of Annex III and Article 5 of Annex IV to the Protocol on Environmental Protection to the Antarctic Treaty;

Recommend that their Governments:

1. encourage all persons under their jurisdiction organising or conducting tourist or other non-governmental activities in the Antarctic Treaty area and National Antarctic Programmes to eliminate personal care products containing micro-plastic beads in the Antarctic Treaty area;
2. identify and exchange information with other Parties on methods that should be implemented to reduce micro-plastic release from wastewater systems;

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3. support greater monitoring of plastic pollution in Antarctica using developing standards and comparative methodologies, particularly near areas of human activity;
4. invite the Scientific Committee on Antarctic Research (“SCAR”) to report as new information emerges that quantifies plastic pollution and details the risks to Antarctic species and communities; and
5. consider the issue of micro-plastic release in connection with any possible future revisions of Annexes III and IV to the Protocol on Environmental Protection to the Antarctic Treaty.

Hydrographic Mapping of Antarctic Waters

The Representatives,

Recalling and noting the continued validity of Recommendation XV-19 (1989) and Resolutions 1 (1995), 3 (2003), 5 (2008), 2 (2010) and 5 (2014), which contain general provisions regarding cooperation on hydrographic surveying and charting of Antarctic waters;

Considering that reliable hydrographic data and nautical charts are essential for safe maritime operations and the protection of the marine environment;

Noting that the collection of accurate bathymetric data will improve navigational safety and support a range of other applications, including scientific research, management and monitoring of the marine environment, hazard and risk assessment, search and rescue activities and operational activities;

Concerned to ensure progress on hydrographic mapping and bathymetric data collection for Antarctic waters to minimise the risk of harm to people, ships, and the environment within the region;

Acknowledging the efforts of the International Hydrographic Organization (“IHO”) Data Center for Digital Bathymetry (“DCDB”), the Nippon-Foundation General Bathymetric Chart of the Oceans (“GEBCO”) Seabed 2030 project and the IHO Crowdsourced Bathymetry Data Working Group;

Recognising the role of the IHO Commission on Antarctica in the coordination of hydrographic surveying and nautical charting in the Antarctic region, and the value of cooperating with the Scientific Committee on Antarctic Research (“SCAR”), the Council of Managers of National Antarctic Programs (“COMNAP”), the International Association of Antarctica Tour Operators (“IAATO”) and other relevant expert bodies;

Recommend that their Governments:

1. give priority to reviewing existing bathymetric data holdings and collecting new bathymetric data in the Antarctic region by:
 - a. encouraging their national programme vessels and other vessels under their jurisdiction, including non-governmental vessels, as appropriate, to:
 - i. review existing bathymetric data holdings for inclusion, either directly or through their national hydrographic office, in the IHO DCDB;
 - ii. undertake hydrographic and bathymetric data collection on all their Antarctic voyages, as practicable;
 - iii. utilise IHO guidelines where appropriate, including the IHO Publication B-12 – *IHO Guidelines on Crowdsourced Bathymetry*;
 - iv. share all data collected with the IHO DCDB, through their national hydrographic office, where applicable, or directly;
 - b. encouraging cooperation between national research institutions and mapping institutions/authorities on hydrographic surveying and charting in the Antarctic region to ensure the use of basic hydrographic survey guidelines in order to secure the highest value of collected data for the widest possible (re)use;
2. recommend that Parties endeavour to find additional resources for improving hydrographic surveying and charting in the Antarctic region; and
3. encourage those Parties who are also Parties to the Convention on the Conservation of Antarctic Marine Living Resources (“CCAMLR”) to consider possible actions to ensure that fishing vessels and vessels undertaking CCAMLR research operating in the CCAMLR Convention area, which are under their respective jurisdiction, undertake hydrographic and bathymetric data collection on all their Antarctic voyages, as practicable.

SCAR's Sixtieth Anniversary and the Role of SCAR in Providing Scientific Advice to Support the Work of the Antarctic Treaty System

The Representatives,

Recalling the role of Scientific Committee on Antarctic Research (“SCAR”) in initiating, developing and coordinating high quality international scientific research on Antarctica and the Southern Ocean as well as the role of the Antarctic region in global systems;

Acknowledging the significant and longstanding contribution that SCAR has made to support the Antarctic Treaty system;

Warmly congratulating SCAR on its sixtieth anniversary;

Recalling that the Antarctic Treaty promotes freedom of scientific investigation in Antarctica and cooperation toward that end;

Recalling also the designation of Antarctica as a natural reserve devoted to peace and science;

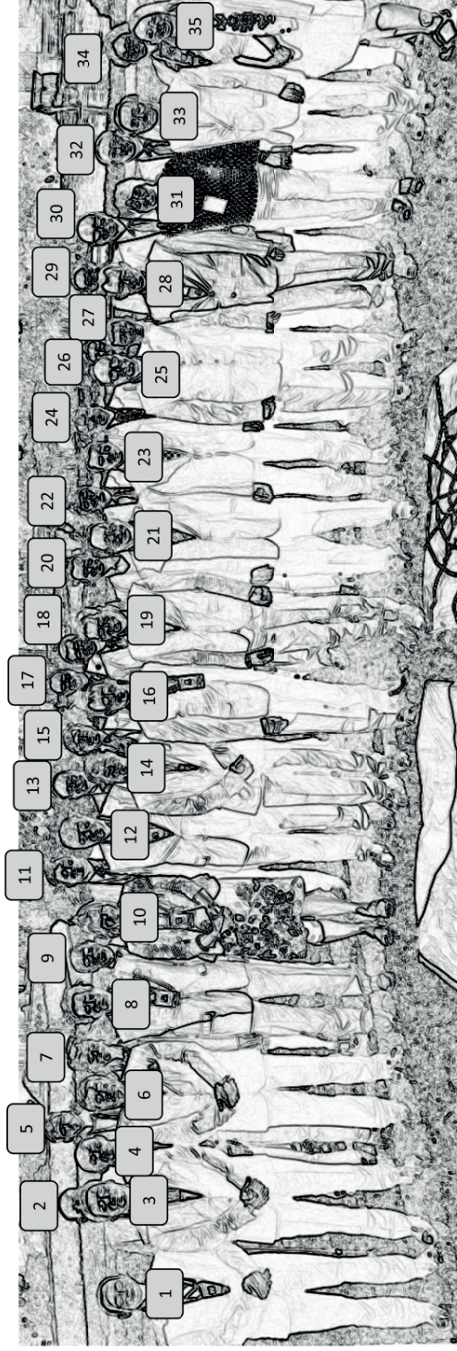
Acknowledging the unique opportunities Antarctica offers for scientific monitoring of and research on processes of global as well as regional importance;

Recognising also the fundamental importance of scientific research to support the work of the Antarctic Treaty Consultative Meeting (“ATCM”) and the Committee on Environmental Protection (“CEP”);

Recommend that their Governments:

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1. acknowledge with gratitude SCAR's enduring and crucial role in providing objective and independent scientific advice to support and inform the work of the ATCM and the CEP;
2. promote to their nations the extraordinary benefit to humankind from science in, from and about Antarctica and the Southern Ocean;
3. reaffirm their support for scientific investigations in the region, including through the development of an appropriately-resourced scientific workforce for the future;
4. continue to encourage, facilitate and support scientific exchanges and open access to scientific outcomes and data;
5. enhance collaborations with SCAR in its important facilitation role for Antarctic and Southern Ocean science, and provider of scientific advice to the Antarctic Treaty system and disseminating Antarctic science to other international fora; and
6. encourage the ATCM and the CEP to continue its cooperation with SCAR on issues related to the protection of the Antarctic environment, including, but not limited to, Antarctic biodiversity, area protection and management and the implications of climate change for Antarctica.



1 Juan Carlos Tapia (Ecuador), 2 Tilman Hochmüller (Germany), 3 Ricardo Montenegro Coral (Colombia), 4 Vladimir Loginov (Belarus), 5 Timo Palo (Estonia), 6 Camilo Sanhueza (Chile), 7 Liisa Valjento (Finland), 8 Máximo Gowland (Argentina – Tourism Working Group Chair), 9 Daniel Castillos (Uruguay), 10 Jane Rumble (United Kingdom), 11 Dmytro Cheberkus (Ukraine), 12 Roberto Seminario (Peru), 13 Alexey Dronov (Russian Federation), 14 Muthalagu Ravichandran (India), 15 David Agnew (CCAML), 16 Petr Válek (Czech Republic), 17 Pavel Kapler (Host Country Secretary), 18 Benhur Viana (Brazil), 19 Martin Smolek (Czech Republic - ATCM Chair), 20 René Lefeber (Netherlands), 21 Eyan T. Bloom (United States), 22 Danail Chakarov (Bulgaria), 23 Konrad Marciniak (Poland), 24 Lisolomzi Fikizolo (South Africa), 25 Albert Lluberas (ATS), 26 Sandrine Barbier (France), 27 Nasaruddin Abd Rahman Rahman (Malaysia), 28 Bård Ivar Svendsen (Norway), 29 Lisa Kelley (IAATO), 30 Francisco Aguilera Aranda (Spain), 31 Manuela Sidoroff (Romania), 32 Yongsheng Li (China), 33 Atsushi Iwasaki (Japan), 34 Jana Newman (New Zealand), 35 Therese Johansen (Norway – Legal and Institutional WG Chair). Absents: Christian de Lannoy (Belgium), David Taillefer (Canada), Pier Francesco Zazo (Italy), You Kijun (Republic of Korea), José Carlos Caetano Xavier (Portugal), Rolf Carman (Sweden), Furgler Dominik (Switzerland), Inam Ilknur (Turkey).



