

From Physics to Daily Life

Towards a Globally Focused Earth Simulation Centre

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26/09/2014

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Future generations & policy makers would benefit greatly

if society had a clear picture of the various Earth Systems such as

- underlying biogeophysical processes
- causes, effects & consequences
- the impact of human society

It would improve public safety, well-being & sustainability



Time to seriously improve our understanding of

- extreme weather, floods, droughts
- climate change & global warming
- natural capital resource depletion
- energy-food-water security
- disaster risk management
- risk & resilience
- sea level rise



This could be achieved through a Swiss based, CERN-like organisation

but with some differences in the areas of governance & funding:

- NGO, NPO, For the public good
- Public-Private-Partnership
- Funded via philanthropy

Requiring strong collaboration with agencies & universities



Globally focused because many Earth Systems are global and trans-boundary

as well as highly coupled & connected over distance and time ...

- the atmosphere, ionosphere, ozone layer
- oceans, rivers, lakes,
- tectonic plates

These systems are integrated in Nature and should be treated 'holistically' by science



A science-based visual narrative of Planet Earth is needed

revealing data in an intuitive visceral way & thereby improving
civic engagement ...

- using interactive, immersive visualization
- modelling & simulation
- flowing time

And calling on all available data, tools, instruments & experts



Open Science is the best way forward engaging both professional & citizen scientist

especially since public taxes pay for the majority of science

- open data files
- open source code
- open access publishing

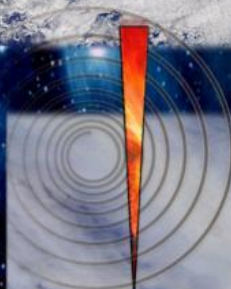
Making full use of HPC, Cloud, Internet, mobile, sensor-networks



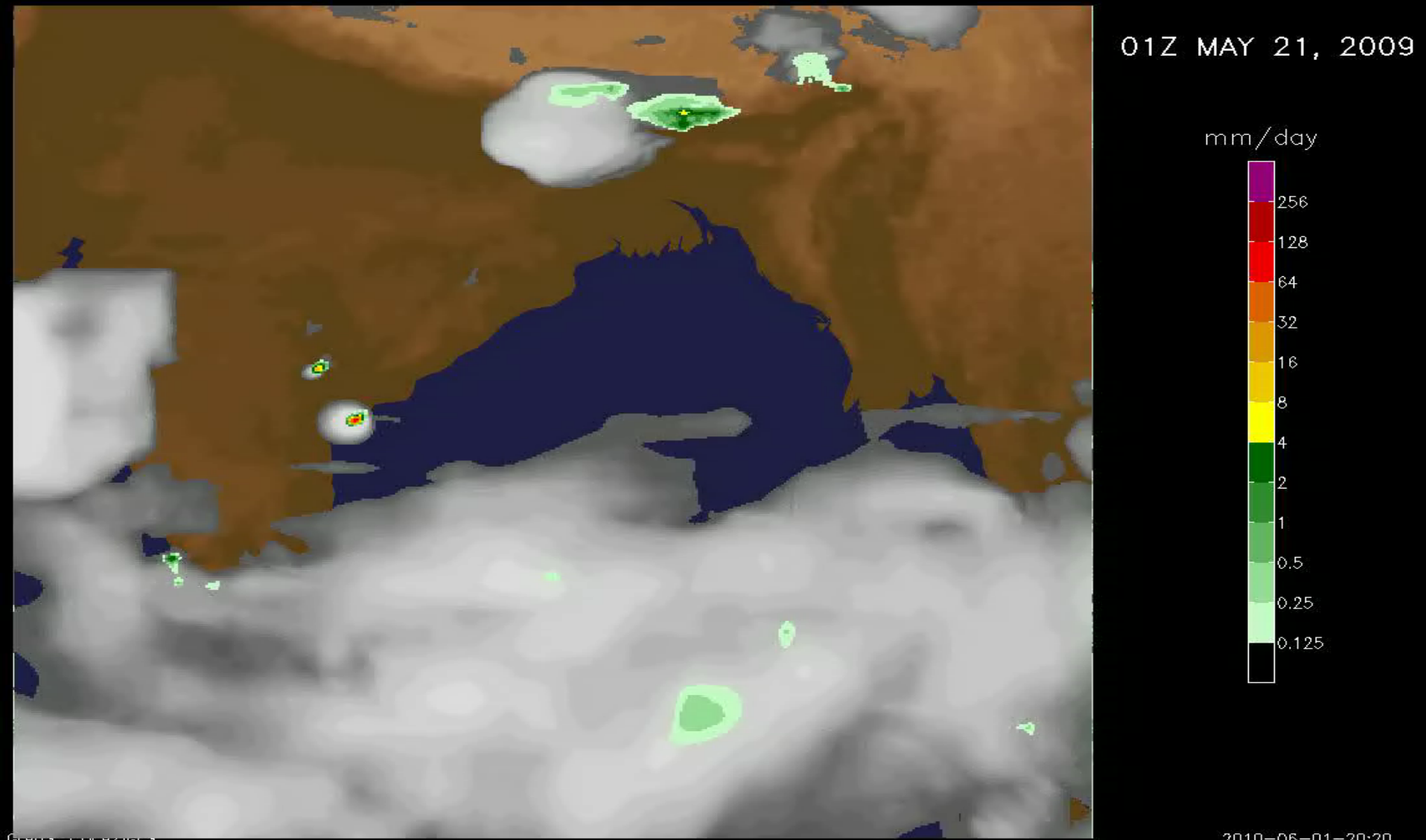
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International Centre for Earth Simulation



Simulation of wind, cloud & weather systems



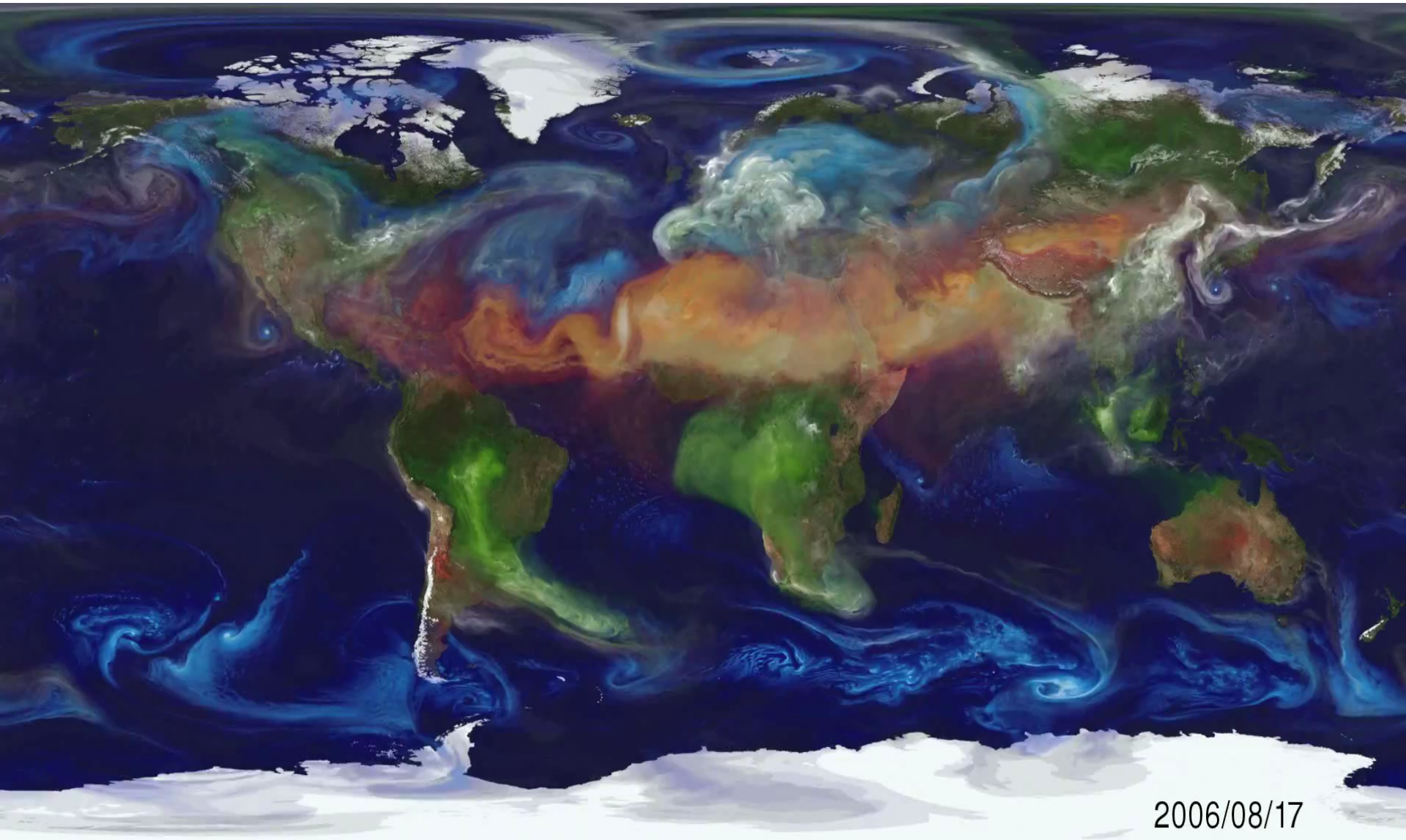
GRAS, COLA/IGLS



29/09/2014

Courtesy NICAM Japan

Simulation of global aerosol transportation



2006/08/17



29/09/2014

Courtesy NASA Center for Climate Simulation

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Simulation of ocean eddy currents



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Courtesy NASA/JPL

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Simulation of the global conveyor belt



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Courtesy NASA Goddard Space Flight Center

The Southern Ocean from Encounter Bay



1802: Nicolas Baudin & Matthew Flinders



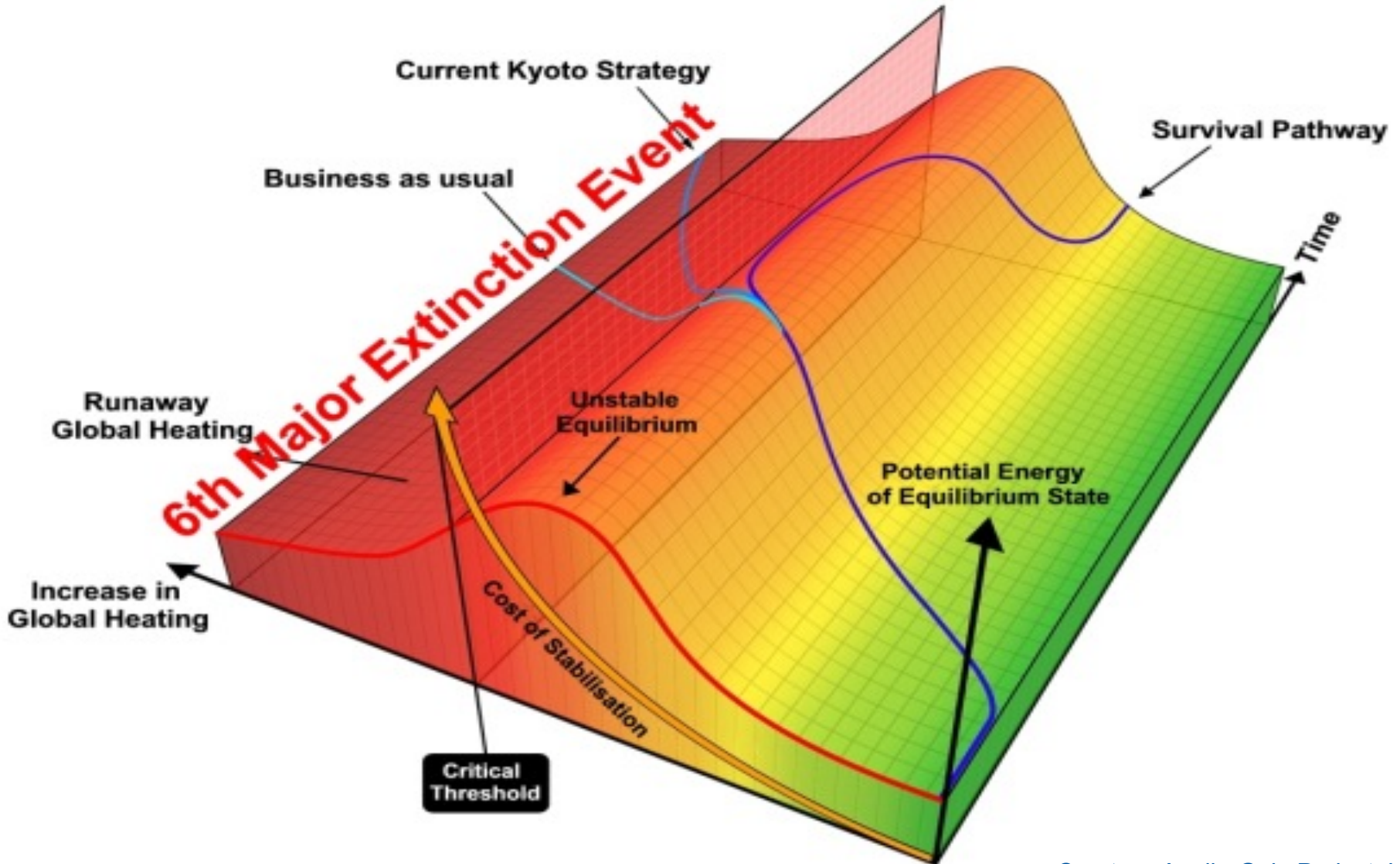
Simulation of Antarctic ice flows



Asteroid impacts



ICES and the looming planetary boundaries





**Helping guide the successful transformation of human society
in an era of rapid climate change and frequent natural disasters.**

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- 5 advisors
- 15 experts
- 12 nationalities
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- an active website: www.icesfoundation.org