



Rediscovering the Heartland of Cities Early Southern Mesopotamian States in Their Setting through New Field Research

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QD038 - Tell Dlehim (Adams' site no. 1237) from northwest. View of the site with the high terrace complex in the background.

The study of Mesopotamian early urbanism has its roots in Robert McCormick Adams's pioneering research of the 1960s and 1970s. From the holistic approach applied during his long academic career derived the historical narratives still representing the starting point for many recent reappraisals. Adams' surveys in southern Mesopotamia were carried out according to standards and scopes that were unparalleled in their time. The large-scale perspective applied to different regions of central and southern Iraq during over thirty years of fieldwork resulted in seminal works like *The Land behind Baghdad* (1965), *The Uruk Countryside* (1972) and *Heartland of Cities* (1981).

Innovative research methodologies introduced by Adams included the use of aerial photographs for locating sites and mapping traces of ancient water canals in parallel as well as systematic site surveying and recording in order to understand their size, function, and chronology of occupation. The resulting data collected were then discussed within historical, economic, and agricultural narratives among others, and they resulted in a comprehensive interpretation of settlement patterns and hydraulic activities through time.

As a result, the approach introduced by this early research in Iraq paved the way for many new regional projects over the entire Near East. Moreover, since the early 2000s, a new season

of discoveries in Mesopotamia was fuelled by advancements in methodologies of reconnaissance on the ground and the identification of archaeological sites and ancient waterways through a large array of publicly accessible satellite imagery (Hritz 2010; Pournelle 2004; Ur 2013; Wilkinson 2003). These new survey methodologies have shown how the results obtained by Adams could be refined to a greater level of detail, allowing the identification of new archaeological sites and ancient canals (Hritz 2010), as well as a better understanding of the urban shape and layout of many ancient Mesopotamian cities (Hammer 2019).

The QADIS project (which is an abbreviation suggesting the Al-Qadisiyah region) is part of this new research approach: it aims to provide a new, detailed understanding of both the ancient landscape and the layout of early cities of Mesopotamia. In particular, the project was driven by different research questions including:

1. What new evidence can be produced about the development of settlement patterns and hydraulic systems through the use of updated research methodologies in the field of archaeology?
2. As for the early states, how can we better understand the urban setting of the fourth- and third-millennia BCE sites?

To answer to these macro-questions, a three-year project, extending over an area of approximately 1829 km² (fig. 1), was begun in 2016, with six campaigns of two to three weeks each, carried out in January and October of each year between 2016

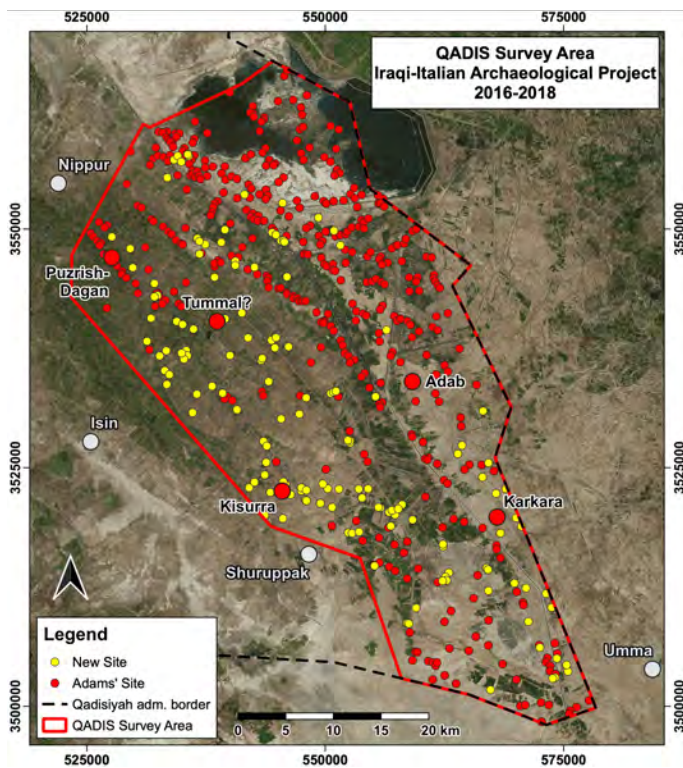


Figure 1. The QADIS survey area.



Figure 2. Launching an aerial survey of the ancient site of Tell Drehem/Puzrishdagan in 2016 using a DJI Phantom 3 drone.

and 2018 (Marchetti, Benati et al. 2019). Our survey area is located at the core of Adams' *Heartland of Cities* and comprises 415 sites dating from later prehistory to the Ottoman period, and it includes some of the most important cities of the Mesopotamian floodplain, including Adab, Puzrish-Dagan, Kisurra, Karkara, and Tummal.

The QADIS Project: Research Design and Methodology

When we started to design the QADIS survey project we noticed the need to update the current understanding of the ancient Mesopotamian cultural landscape as previously theorized (Adams 1981; Wilkinson 2003). Using a multidisciplinary team, our aim was to shed new light on the processes that led to the formation of urban centers in central and southern Iraq beginning in the fourth millennium BCE and their subsequent shrinking and expansion.

Our research design combined a range of techniques, from remote sensing to aerial mapping, from archaeological surface collection to superficial test soundings, from geoarchaeological investigations to the study of epigraphic materials. From this integrated methodology we were hoping to achieve detailed reconstructions of ancient urban landscapes and an updated map of ancient channels and harbors. The area selected by the QADIS project follows the administrative borders of the Qadisiyah region to the south and east, and extends to near Fara/Shuruppak in the west, and Afak in the north. The area provided an ideal setting for applying such an approach for different reasons: (1) It

provides ample available data about settlements and waterways distributed across the entire chronological range of the region; (2) there is evidence of new, unrecorded sites that can expand the existing dataset; (3) there is a wide range of archaeological sites of different sizes and from different periods showing visible structures on the surface; (4) recent intensive looting has dramatically changed the conditions of materials collection on the surface, providing new insights about details of their occupation (e.g., the functional characterization of urban sectors). In fact, the availability of satellite imagery allowed an assessment regarding points 2–4 above prior to our fieldwork.

In order to shed further light on the development of the settlement patterns and hydraulic systems, we first created a digital base map integrating geographic data extracted from survey reports and satellite imagery. The latter has recently become increasingly popular among archaeologists, as it provides an unprecedented array of information for the study of ancient archaeological landscapes (Hritz 2010; Pournelle 2003; Ur 2006, 2013; Wilkinson 2003). For our research we employed historical and recent high-resolution satellite imagery (World View, Geoeye, Landsat, SRTM, and Corona) available through free-access online platforms (Google Earth, Bing Maps, USGS, CAST Atlas). By analyzing the morphology of the terrain, including the presence of areas with different colors, or particular visible lines possibly interpreted as ancient structures, we were able to hypothesize the presence of two hundred new potential archaeological sites and several hundred ancient waterways.

Thus, in order to validate this type of preliminary data, we carried out ground-truthing activities, meaning confirming the archaeological evidence on the field. In particular, part of the team carried out random surface collections for determining the chronology and extension of occupation of a site on the basis of the presence of ancient finds on the surface. Thanks to this methodology, 120 out of 200 hypothesized new archaeological sites unidentified as such by Adams, and first singled out by us

New Epigraphic Documents and the Impact of Early Empires

Gianni Marchesi

The QADIS survey project provided a number of new inscribed artifacts. The most remarkable of these finds are two bricks of Ur-Namma from Tell Jidr with a dedication to Ishkur, which confirms the hypothesized identification of Tell Jidr with ancient Karkara. The latter toponym was known from cuneiform sources as the name of the main cultic center of Ishkur, the Sumerian storm god. These inscribed artifacts also allowed us to identify the exact location of the temple of Ishkur in Karkara, the *é-ud-gal-gal(-la)*, “House of the Great Storms,” which was evidently built (or rebuilt) by Ur-Namma.

In addition, two bricks with inscriptions of rulers from the so-called Lagash II Dynasty (Gudea and Ur-Ningirsu II) were also found in Jidr. These somewhat unexpected finds raise the issue of the reuse of building materials in antiquity. According to their inscriptions, the bricks in question were meant to be used for temples located in the cities of Telloh/Girsu and Surghul/Nigen, in the Lagash region. It is conceivable that these bricks were originally set there, and then, after those cities were abandoned, they were removed, transported to Karkara, and reused. The same can be said for two additional Gudea bricks that were collected by the team of Adams in Jidr in a previous survey (Adams and Nissen 1972: 217).

Four bricks with an inscription of Amar-Suen, third king of the Ur III Dynasty, were found at Tell Dlehim, the alleged Tummal of the cuneiform sources (Steinkeller 2001: 66–71). Apart from a single brick that comes from the area of the oval temple (perhaps the temple of Ninlil), all of them were used to build a drain in Sounding A1 (Box 1, figs. 1–2). Since the building of the *ki-a-nag*, “mortuary chapel” of Ur-Namma is the only construction work that Amar-Suen appears to have carried out in Tummal (Steinkeller 2015: 158, n. 81), it is tempting to suggest that the drain in question belonged to this building complex.

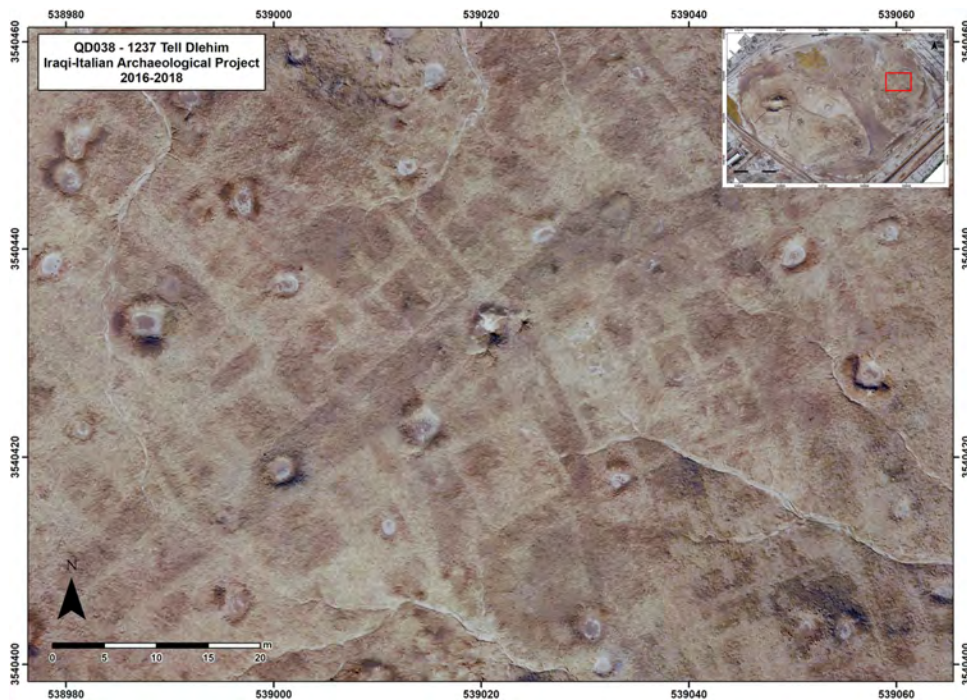
Finally, it should be noted that some sites from our survey, such as Adab and Karkara, which are traditionally regarded as lying in the basin of the Euphrates, lay actually along the course of the Tigris in ancient times. In fact, ancient sources are very clear on this point: The cities of Adab and Karkara were situated along the Idigna, which was what the Sumerians called the Tigris (Steinkeller 2001). To all appearances, the Idigna River flowed much more westward than the present-day Tigris.



*Baked bricks drain from Sounding A1 at Tell Dlehim/Tummal (QD038, Adams 1981: no. 1237), possibly associated with the *ki-a-nag* (“mortuary chapel”) of Ur-Namma built by Amar-Zuena.*



Baked bricks with an inscription of Amar-Zuena, third king of the Ur III Dynasty, Tell Dlehim/Tummal (QD038, Adams 1981: no. 1237).



through remote sensing, were found to be sites. This datum increased the number of known sites in the QADIS area by about 28 percent, from the 415 documented by Adams to 535. We have labeled all the new sites surveyed by the QADIS project with the prefix “QD” followed by a progressive number (001, 002, 003, and so forth).

At the same time, in order better to understand the development of the urban layouts of early Mesopotamian cities between the fourth and third millennia BCE, we first listed all the archaeological sites with a relatively short chronological range of occupation and showed the presence of visible lines on the surface possibly representing buried structures. Eleven sites were thus selected, encompassing the entire chronology of the region from the fourth millennium BCE to the early Islamic period, thus providing a complete picture of the development of the

Figure 3. Extended traces of ancient buildings dating to the Ur III period (2100–2000 BC) caught by drone flight at QD038 Tell Dlehim/Tummal.



Figure 4. Test sounding C at the Early Dynastic I site of Tell Umm al-Fugas (Qd 026; Adams 1981: no. 1096).

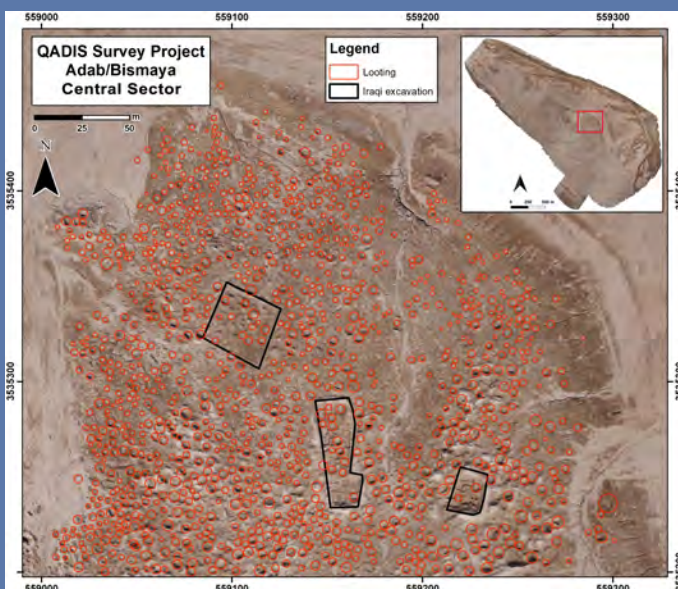
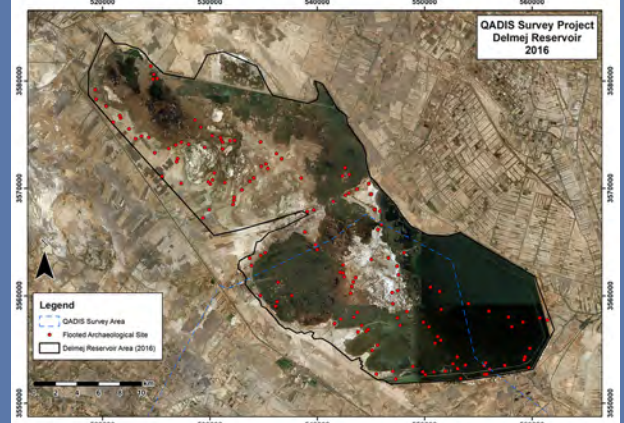
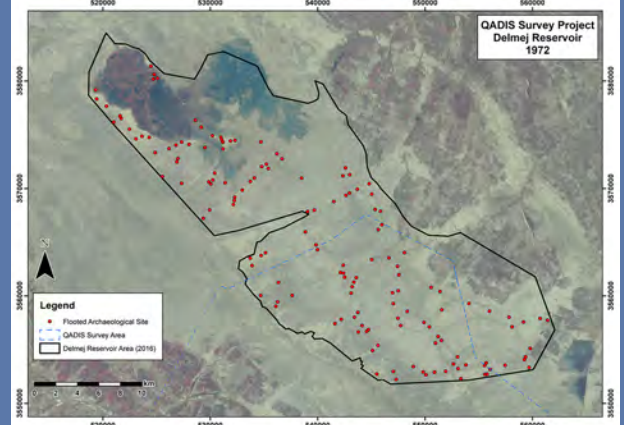
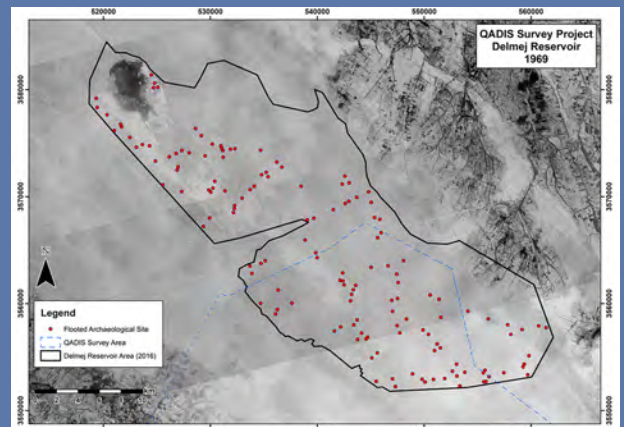
Documenting Endangered Cultural Heritage in Central Iraq

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Over the last few decades the region covered by the QADIS project has witnessed a growing threat to its cultural heritage (Stone 2008, 2015; Marchetti et al. 2018; Marchetti, Curci et al. 2019; Zaina 2019). Damage to archaeological sites and monuments has been inflicted both by public works, including the Delmej artificial basin, which submerged several sites, the construction and cutting of roads, canals, and ditches, as well as the growing reach of cultivation. Moreover, the long, recent political instability has brought with it systematic looting of sites, with differing cycles of intensity (see NEA 78.3, 2015).

Through the QADIS project we confronted the current state of affairs by means of intensive fieldwork training for SBAH personnel and activities for raising awareness among local communities, in addition to our core scientific aims. The QADIS area has greatly suffered from illicit digging with 189 archaeological sites out 561 totally or partially looted (Marchetti et al. 2018; Marchetti, Curci et al. 2019). One of the symbols of this catastrophe is the ancient megacity of Adab. During the 2017 and 2018 seasons, we investigated the impact of looting at the site with the aim of updating the previous evidence and training the local authorities in safeguarding methodologies. We integrated different sets of satellite images, subsequently enhanced through drone survey, ground-truthing investigation, and surface scraping at selected spots. The results were stunning: 90 ha of the site had been looted, with more than 18,000 looting pits documented.

The construction of the Delmej water reservoir and the many canalization systems throughout the region had a dramatic impact. The enormous hydraulic infrastructure of Delmej (616 km² in total) is part of a long-term project of economic development carried out between the late 1960s and the early 1970s in the area across the Qadisiyah and Wasit provinces. Almost 210 km² of the current QADIS survey area have been submerged by the Delmej reservoir. By cross-relating multitemporal satellite imagery with Adams's survey (1981), we identified 146 flooded archaeological sites of different dimensions mostly dating from the Uruk, Parthian, or Sasanian periods. The impact of these threats stresses the importance of developing more efficient policies to document and safeguard Iraqi cultural heritage.



Identification through remote sensing of looting holes and trenches at Bismaya/Adab. A detailed view from the central sector of the site.

Multitemporal analysis of the impact of Delmej reservoir on the archaeological sites on the Qadisiyah and Wasit regions.

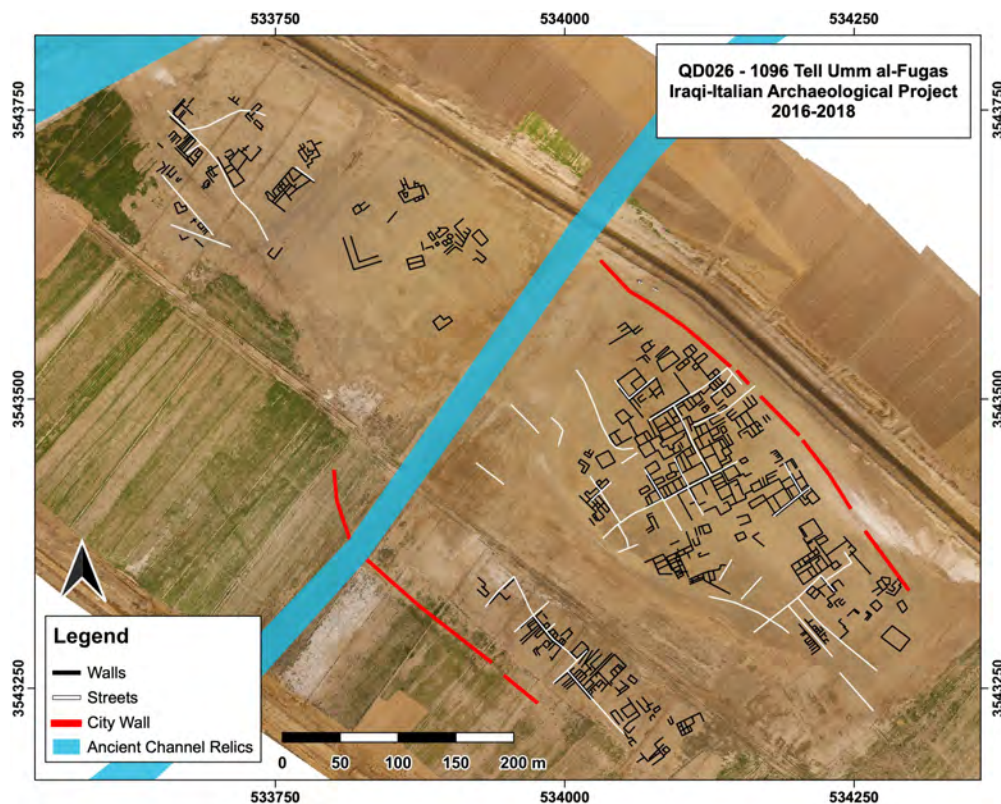


Figure 5. Urban plan of Tell Umm al-Fugas (Qd 026; Adams 1981: no. 1096), and the ancient structures identified through drone flight and ground-truthing.

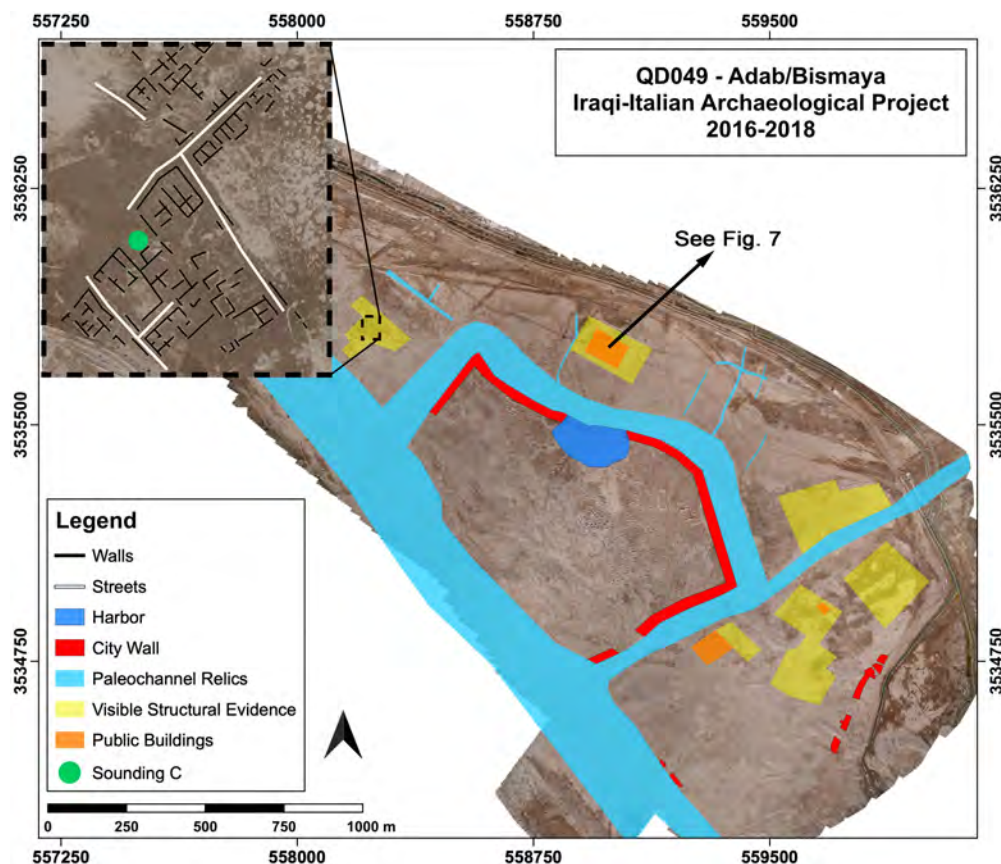


Figure 6. Topographic map of Bismaya/Adab (Qd 049), and the ancient structures identified through drone flight and ground-truthing.

urban layout of ancient Mesopotamian cities through time.

During the six survey seasons, the team of topographers of the QADIS project mapped these eleven sites using DJI Phantom 3 and 4 Pro UAV (Unmanned Aerial Vehicle) also known as drones (fig. 2). Thousands of high-resolution photos with a 3–4 cm per pixel resolution were taken at elevations between 70 and 140 m. Aerial documentation for archaeology using drones has increased in the recent years (see *NEA* 77.3, 2014), allowing an enhanced understanding of archaeological landscapes. The methodology applied by the QADIS team allowed us to hypothesize the presence of entire neighborhoods in ancient cities, in addition to public buildings and city walls (fig. 3). Then, in order to confirm the aerial data, a second team carried out intensive materials collection at these sites. Intensive surface collection was carried out by dividing each of the eleven sites into a grid of sectors of about 50 × 50 m (in the case of the Tell Jidr megasite the grid was 100 × 100 m), also trying to follow the shape of the neighborhoods whenever possible (Marchetti, Benati et al. 2019; Stone and Zimansky 2004). By isolating the surface materials from each sector, we were able to hypothesize the type of activities carried out there in antiquity. For example, clusters of pottery or brick slugs may indicate the presence of kilns, while a high number of storage-ware pottery sherds could be an indicator of some kind of storage activity. In order to confirm the structural evidence hypothesized through drone imagery and get feedback on the evidence collected in the intensive survey, another team carried out fourteen test soundings at selected sites (fig. 4). As a result, test soundings nicely validated the evidence from drones as well as the functional interpretation provided by the study of the materials from the intensive survey.

Tell Jidr: A Parthian Megacity

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On the eastern branch of an ancient bed of the Tigris River at the southeastern end of the QADIS area, lies the largest ruins identified during the Iraqi-Italian QADIS Survey. In the 1970s survey conducted by Robert Adams (1981), Tell Jidr was classified as a mainly Partho-Sasanian city with an extension of more than 200 ha, but we may now fix the maximum settled area at 430 ha.

According to the new research, the ancient city of Tell Jidr is a large, multi-period site stretching 4.4×1.9 km along the eastern bank of one of the main Tigris branches. The analysis of topographic data and the material culture collected show that Tell Jidr/Karkara has been occupied since the fourth millennium BCE reaching a climax in Ur III times (see p. 148 for its historical identification). During the early second millennium BCE, the city seems to have shrunk, only to thrive again in the Kassite period. Material dating from the first millennium BCE is quite rare, while it is during the Parthian and Sasanian periods that Tell Jidr reaches about 430 ha, becoming one of the biggest cities of that time. To the northwest of the Tigris bed there is another, approximately contemporary site, but it has been considered a distinct settlement: The abundant presence of slag hints at production areas.

Remote sensing on satellite imagery revealed a highly complex urban fabric, with several structures and ancient channels still partially visible on the surface. We first identified and mapped the perimeter of the entire site using differential GPS, taking dozens of points. Thanks to successive orthophotogrammetric surveys, we identified and mapped several ground anomalies, like buildings, public spaces, fortifications, and hydraulic works (see box on p. 000(AQ?)). Among other features, several continuous stretches of the well-planned Partho-Sasanian city wall as well as public buildings and fortresses were recognized. Ground-truthing allowed us to refine the remote sensing data greatly, providing a precise chronological framework and allowing us to identify more architectural features. The astounding evidence for diagnostic materials, in part derived from intensive looting and mostly dating from the Parthian period but also from the Sasanian, has been documented both in the lower town and on the northern acropolis. This reconstruction allows us preliminarily to grasp the urban layout of a forgotten capital city of the first millennium CE. The early Islamic period is represented in the southern sector of the site by a walled town with a fortress in its middle.



UAV photo of the northern half of Tell Jidr with the main mound: around it extensive traces of the Parthian fortified settlement are visible. Extensive looting has occurred throughout most of the site.

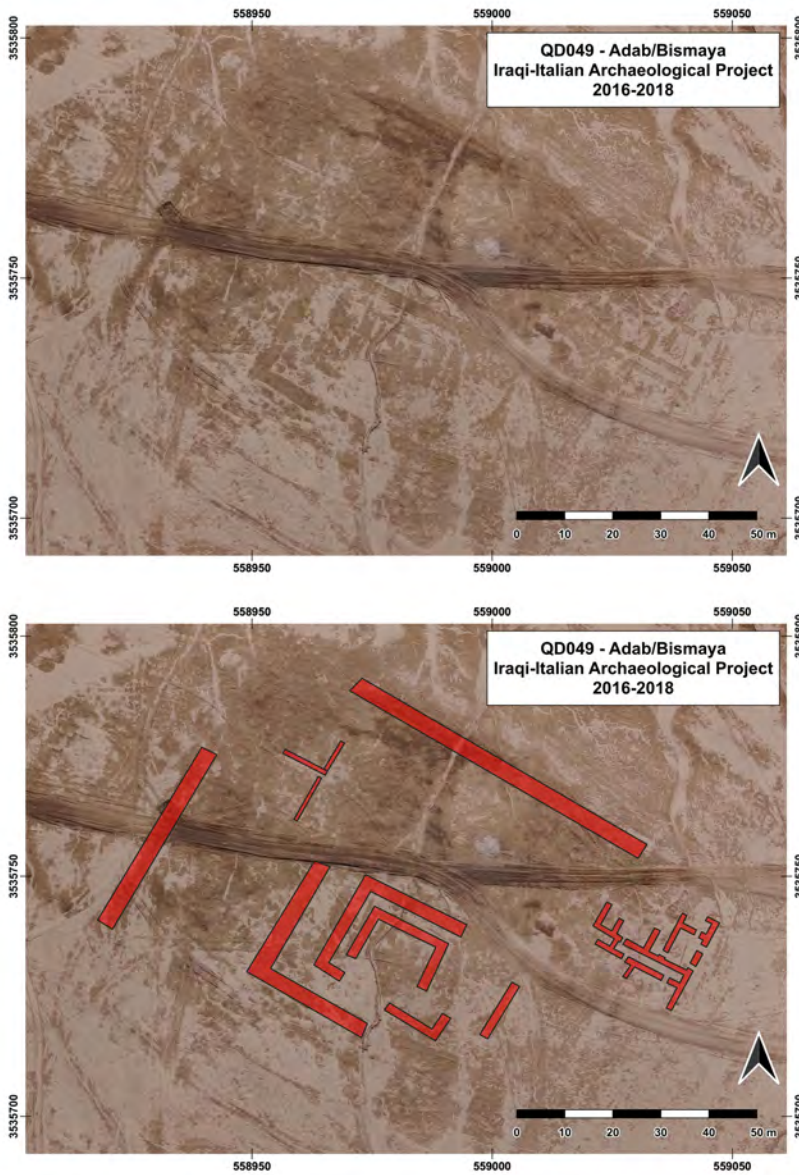


Figure 7. Hypothetical reconstruction of the newly discovered palace at Bismaya/Adab (Soundings A and B).

At the same time, a team of geoarchaeologists investigated the ancient hydraulic landscape of the region. More than twenty boreholes have been dug in the QADIS survey area. Thanks to this methodology we were able to confirm the presence of new channels and harbors at several sites including Bismaya/Adab (QD049), Drehem/Puzrish-Dagan (QD015), and Tell Dlehim/Tummal (QD038; Marchetti et al. 2017; Marchetti, Benati et al. 2019).

Urban Centers of Early South Mesopotamia in New Detail

Available data for the study of early Mesopotamian urbanism are quite scanty: At Warka/Uruk we know the ED I circuit of the city walls and the layout of its cultic and administrative compounds of Kullab and Eanak (Heinz 2014); at Tutub/Khafajah, and in part at Tell Agrab/Khattam (Delougaz and Lloyd 1942), the excavators provided similar evidence. Excavated single monuments provide no more than a glimpse into dominant features of ancient cityscapes,

such as, for the protohistoric phase at Tell Uqair/Urum, Jemdet Nasr/NI.RU; while for the ED period we have the terrace temples of Tell Ubaid/Nutur and Tello/Girsu, the palaces of Abu Sharein/Eridu and Tell Ingharra/Kish (Margueron 1982), the temples of Al Hiba/Lagash, Tell Senkere/Larsa, and Nuffar/Nippur Inanak and North Temple, and the walled cities of Abu Salabikh and Fara/Shuruppak with their houses and temples. The best extensively excavated example is Umm al-Aqareb, featuring a monumental temple, an administrative center, and residential architecture.

For the Ur III to Old Babylonian periods, available information is of greater usefulness. The Eninnu temple of Girsu and its temenos; Ur with the Nannar cultic compound, the residential quarters and city walls; the Tell Asmar/Eshnunak palace with the city walls and the houses; and the temple of Shara at Jokha/Umma and its neighboring house quarters are good examples, mainly dating to the Ur III phases. At Ishchali/Nerebtum, Tutub, Tell Harmal/Shaduppum, Khirbet Diniye/Haradum and Tell Abu Duwari/Mashkan Shapir (Stone 2007) we possess good information for the following phase on the urban shape of lesser cities, the top tier ones being instead represented by Larsa, Ur, and Ishan Bahriyat-Isin (Heinz 2014). This was the state of our knowledge when a new era for Mesopotamian archaeology began a decade ago.

A first step forward was provided by Elizabeth Stone (2014) who revealed new visible features at Nutur, Kish, Abu Shahrein/Eridu, Lagash, Eshnunak, and Umm el-Fugas (fig. 5) through high-resolution satellite imagery. The need for ground control, however, was made clear by our own survey of the latter site, which supplied more fine-grained details about this 31 ha, ED I site, including the roads and waterways network, the presence of city walls, and the distribution of large-scale architecture in the central-southwestern part.

To the mid- to late ED period we can now assign site QD75b, the settlement to the northeast of Tell Abu Hatab/Kisurra, and the megacity of Bismaya/Adab (460 ha, fig. 6) with its thick fortification walls and port facility. The Akkadian period is best represented by the outskirts of Adab—where a large palace and a house quarter visible in drone imagery (fig. 7), were exposed and dated by us through scraping in 2017—and at sites such as Tell Ahmar/QD64b where a dwelling quarter with its streets is visible on the surface. Umm al Hafriyat/Mashkan-Ili-Agade QD033, probed in 1977 by Gibson (1977–78), does not provide information in this respect because of extensive looting.

The Ur III period is best represented by the monumental temples of Tell Jidr/Karkara (Storm

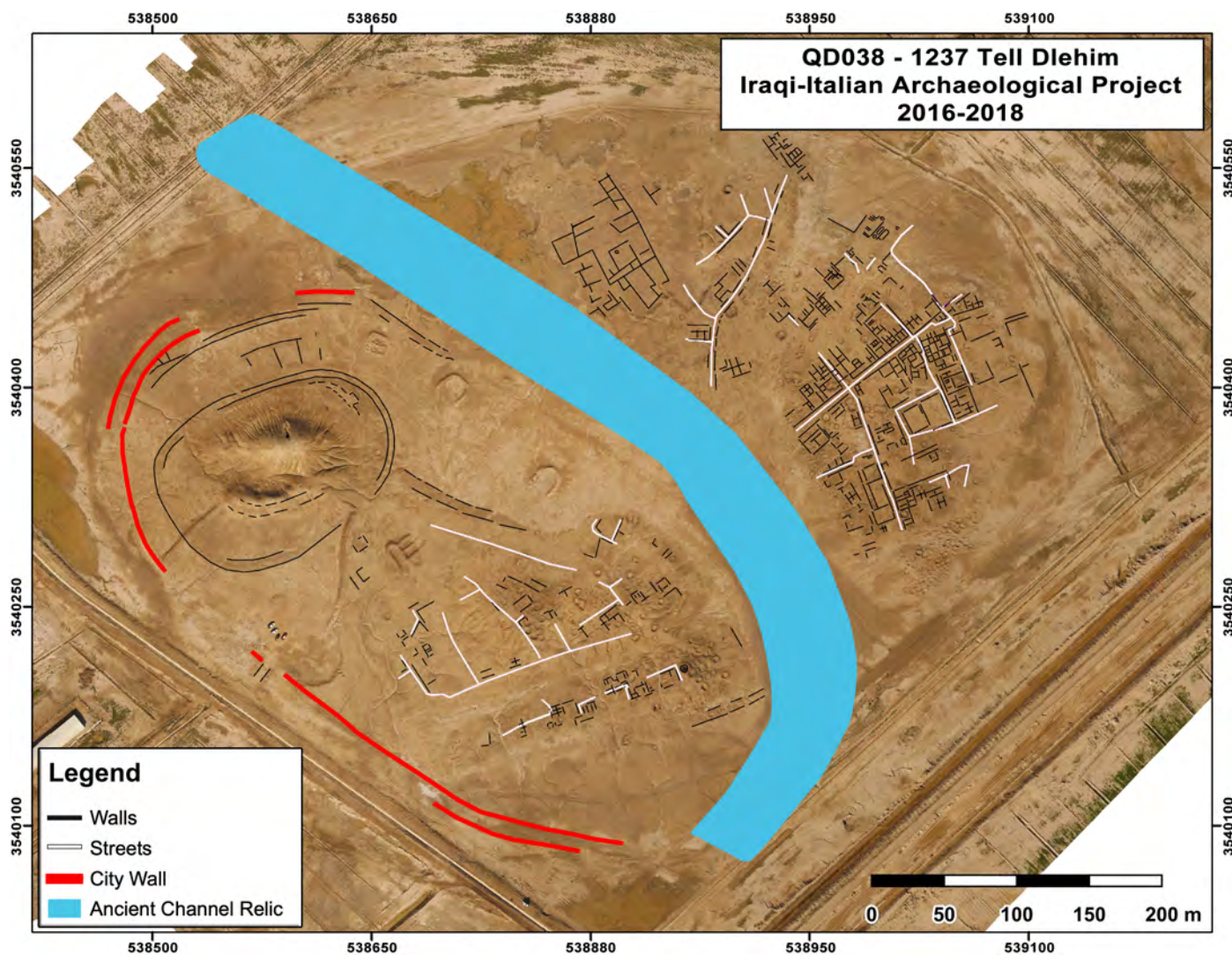


Figure 8. Urban plan of Tell Dlehim/Tummal (QD038, Adams 1981: no. 1237), and the ancient structures identified through drone flight and ground-truthing.

God temple by King Ur-Nammu), Tell Drehem/Puzrish-Dagan (terrace with a courtyard temple by King Amar-Suen) and Tell Dlehim/Tummal (oval temple with central terrace, also by King Amar-Suen; fig. 8). At the two latter sites, we have documented on the surface the circuit of the city walls, official and domestic architecture (fig. 9), and the ports and the canals bisecting those cities. Kisurra supplies a significantly complete layout of an Old Babylonian site. All these data, once elaborated, combine in supplying a new picture of the organization and development of the urban layout of early Mesopotamian cities.

Developing Fourth- and Third-Millennia BCE Land- and Waterscapes

The 2016–2018 campaigns provided fresh results for the study of archaeological landscape. We discovered 120 new sites and several hundred channels and river beds from different periods, and we attempted to set these into the historical development of that landscape. The late fourth-millennium BCE (fig. 10a) cultural landscape shows a well distributed settlement pattern with

small centers located along a complex network of major rivers and many small tributary channels. In particular, three water systems can be reconstructed for this phase: two branches of the Tigris in the northern part of the survey area and the Euphrates at the southern border. The majority of sites' size are limited to few hectares, with only four sites in the range between 10 and 40 ha, thus suggesting a low level of hierarchization (Marchetti, Benati et al. 2019).

Between the Uruk and the Jemdet Nasr periods (fig. 10b), a gradual shift southward is observed, with the northern branch of the Tigris almost abandoned. This trend is accompanied by a reduction of small sites, while urban cores, such as Nippur, Shuruppak, and Umma emerge. The newly collected evidence coupled with recent archaeological reassessment (Wilkinson, Rayne, and Jotheri 2015) suggests that a levee-based system, consisting of central longitudinal waterways and spur channels, was already developing during the fourth millennium BCE in the area between Nippur and Adab. Human manipulation of the natural water resources was in its early stages and ancient communities probably mostly relied on levee-breach strategies



Figure 9. A newly discovered Isin-Larsa monumental building (Sounding B) at Tell Dlehim/Tummal (QD038, Adams 1981: no. 1237). The cultic terrace is visible in the background.

or crevasse splays for irrigating fields instead of artificial canals (Rost 2017; Wilkinson, Rayne, and Jotheri 2015).

The third millennium BCE sees the appearance of city-state systems in southern Mesopotamia. The QADIS survey results indicate the Tigris River between Adams's site 1421 and Umma as the political core of the region in the early third millennium BCE (Marchetti, Benati et al. 2019). During ED I (ca. 2900–2700 BCE), the area was newly densely populated with large sites sometimes exceeding 40 ha (fig. 10c). The subsequent period (ED II–III, ca. 2700–2350 BCE) is characterized by a shift in the settlement strategies with a decrease in the number of small sites counterbalanced by an increase of size for major urban centers (fig. 10d). Cities like Nippur, Adab, Umma, Shuruppak, Karkara, QD120, and Adab now dominate the urban landscape of the region.

The end of the third millennium BCE marks the emergence of the Akkadian and Ur III empires (fig. 10e–f). Possibly as a result, in the QADIS region settlement strategies are now mostly reoriented towards the major waterways. We observed a dramatic decrease of sites connected to the Euphrates branch south of Nippur, and the almost complete abandonment of the area between Shuruppak towards Umma. Sites now cluster along the southern Tigris branch with Nippur, Adab, and Umma as the main urban sites.

Detailing the Heartland of Cities

The integrated approach and the multiple research aims of the QADIS survey project allowed to improve our understanding of the formation and development of urban centers and their impact on landscape in the so-called Heartland of Cities area between the fourth and third millennia BCE.

These new results are particularly relevant for several hotly debated topics. Among them, the discovery of 120 new archaeological sites provides new data for the study of settlement patterns in the region through time, while the study of the organization of ancient Mesopotamian cities will benefit from the documentation of the urban layout of both ancient capital cities and villages. Another major research topic regards the evolution of the hydraulic system in southern Mesopotamia: indeed, the documentation of over 700 new channels and of some of the earliest harbors provides new insight for the study of the anthropogenic transformation of landscapes in the region.

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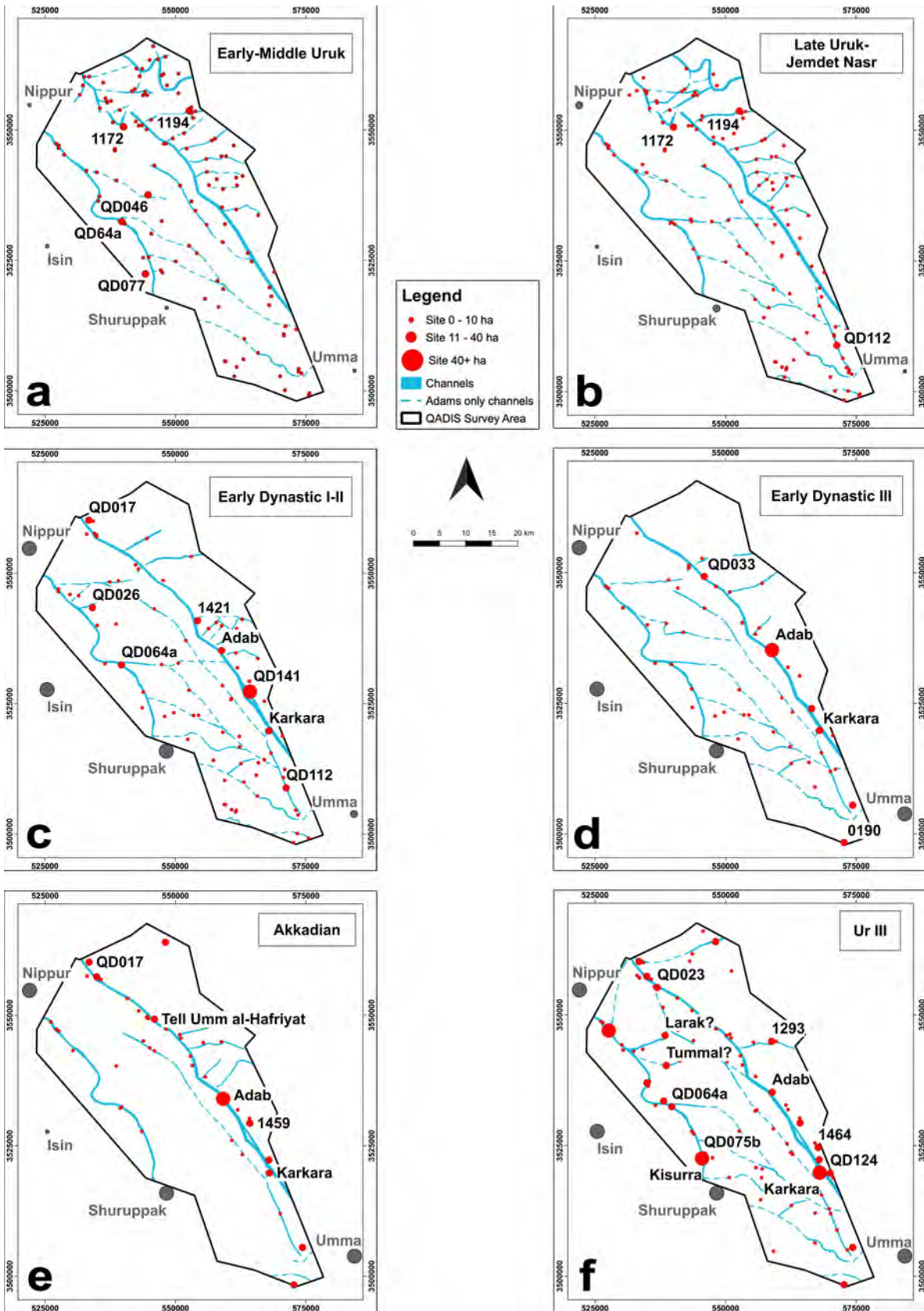


Figure 10. Preliminary reconstruction of settlement patterns in the QADIS region during the earlier periods (integrated with data from Adams 1981; Adams and Nissen 1972): (a) Early–Middle Uruk; (b) Late Uruk–Jemdet Nasr; (c) Early Dynastic I; (d) Early Dynastic II–III; (e) Akkadian; (f) Ur III.

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