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Developing an integrated policy for the maritime and coastal heritage of the UAE: a collaborative approach

LUCY BLUE, KRISTIAN STRUTT, PETER SHEEHAN, PETER JACKSON & MARK BEECH

Summary

This paper explores a vision to build capacity and establish an integrated policy for the maritime and coastal heritage of the UAE through the case study of a collaborative coastal survey project. It is recognized that currently none of the GCC (Gulf Cooperation Council) countries has maritime heritage legislation, and there is limited specific maritime expertise within the ministries responsible. In October 2011 the first phase of the Coastal Heritage Project of the UAE was conducted between the Abu Dhabi Authority for Culture and Heritage (ADACH), now known as Tourism and Cultural Authority Abu Dhabi (TCA Abu Dhabi), the Directorate of Heritage Sharjah (Rulers Office/Historic Buildings), the Maritime Archaeological Stewardship Trust (MAST), and Archaeological Prospection Services of Southampton (APSS), at two targeted sites in the UAE. A comprehensive magnetometer survey was conducted on selected areas on Delma Island, Abu Dhabi and of the entire site of Al Khan, Sharjah. Sections of the historic waterfront towns at both sites were surveyed using ground-penetrating radar (GPR), and an initial survey of a series of historic fish traps on the western shore of Delma Island was conducted. The results have generated further collaboration with other Emirates with the intention of conducting similar surveys at other coastal sites of the UAE in 2012 and collating integrated data sets. Workshops are also planned to provide the necessary training in geophysical and maritime techniques for regional heritage departments. This project is the first step towards capacity building, collaboration, and the sharing of expertise in the region.

Keywords: coastal, maritime archaeology, geophysics, collaboration, capacity building

Introduction

In October 2011 the first phase of the Coastal Heritage Project of the UAE was conducted between the Abu Dhabi Authority for Culture and Heritage (ADACH), now known as Tourism and Cultural Authority Abu Dhabi (TCA Abu Dhabi), the Directorate of Heritage Sharjah (Rulers Office/Historic Buildings), the Maritime Archaeological Stewardship Trust (MAST), and Archaeological Prospection Services of Southampton (APSS). Two sites were targeted in the UAE: Delma Island, Abu Dhabi and Al Khan on the Sharjah coast. In January 2012, phase two of the Coastal Heritage Project of the UAE was completed at Al Hisn (Bank Street) in Sharjah (Fig. 1), as part of the Heart of Sharjah project. The third season of the project is planned for October/November 2012. The main focus of this collaborative endeavour to date has been a comparative investigation of targeted late Islamic settlements in the coastal regions of the Emirates of Sharjah and Abu Dhabi. The scope of work envisages a quick and effective methodology integrating a combination of available satellite images, photographic

techniques, archival research, and ancient maps and aerial photographs along with a geomagnetic survey of the sites (magnetometry and ground-penetrating radar [GPR]). An overview of the results of this work will be briefly outlined in this paper.

Project background and objectives

The Coastal Heritage Project of the UAE is driven by an aspiration to develop capacity and awareness of the coastal and underwater heritage of the region. The genesis of the project is rooted in the objectives of MAST, which was set up in 2010 with the broader aim of promoting maritime archaeology and coastal heritage management in the Gulf region. This paper will focus on the progress made in the UAE with regard to acquiring archaeological data and hence expanding our understanding of the coastal archaeology of the UAE, particularly in the late Islamic period, raising awareness of the rich maritime cultural heritage of the region and highlighting the importance of building collaborative partnerships for future coastal heritage endeavours.

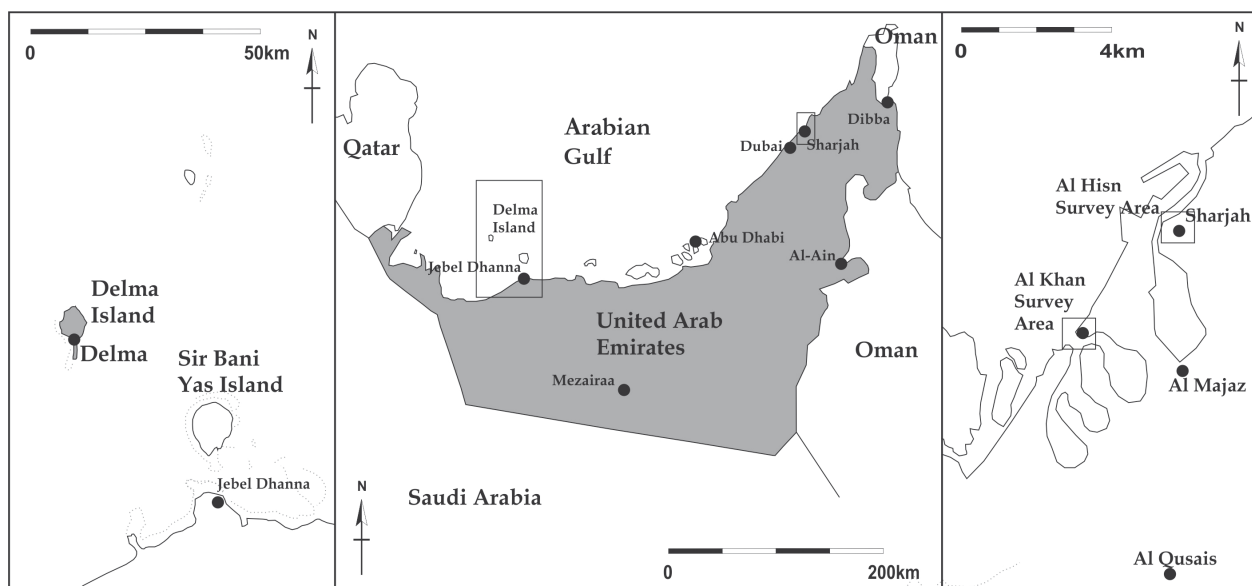


FIGURE 1. A map of the United Arab Emirates, showing the location of the principal survey areas of Al Khan and Al Hisn Avenue, Heart of Sharjah and Delma Island, Abu Dhabi.

Why maritime? For millennia the sea has played a hugely significant role in forming the cultural and historical narrative and identity of the Gulf region. Various projects and publications attest to this critical relationship — the discovery of Neolithic bundle reed boats in Kuwait and Bronze Age ship remains at Ra's al-Jinz in Oman, and the recent work of Birmingham University VISTA identifying palaeo-landscapes of Qatar, as well as countless finds that attest to the wealth of marine resources exploited from the Neolithic period to the historic era, when pearling and the dhow trade sustained maritime communities throughout the Gulf and extended beyond to the Indian Ocean (Al-Said 1991; Beech 2004; Beech & Al Shaiba 2004; Carter & Crawford 2002; Carter 2006; 2012; Charpentier 2002; Connan et al. 2005; Cleuziou 2003; Cleuziou & Tosi 2000; Al-Naimi et al. 2012; Breeze, Cuttler & Collins 2011). These examples highlight only a few of the significant finds recovered from the Gulf, a number of which demonstrate that the region has some of the earliest direct evidence for seafaring discovered anywhere in the world. All this testifies to the important role that the sea played in forming the nations around its shores.

The potential for further enhancing our understanding of the maritime cultural landscapes of the Gulf is enormous but the threats to this resource are even greater. The scale of coastal development in the UAE alone is

immense and it is not difficult to appreciate the potential loss of information with regard to coastal and underwater — particularly near-shore — archaeology that is currently taking place. At the same time there is very limited official recognition of the regions of maritime heritage or its rich maritime cultural resource. Currently the region has very limited expertise relating to maritime archaeology; few of the Emirates have specialist underwater archaeologists within their antiquities departments or authorities, there is no legislation in place that specifically addresses the underwater cultural heritage, and no universities in the region teach maritime archaeology or underwater cultural heritage. So while there is no denying that maritime archaeological projects are ongoing in the region, there is a lack of expertise, experience and, some would argue, interest in maritime heritage.

Arguably more effort has been made to promote the maritime past through the establishment of new maritime museums: the excellent maritime museums in Sharjah and Kuwait, the forthcoming National Museum in Qatar, and ultimately the planned maritime museums in Oman and on Saadiyat Island, Abu Dhabi, are all testament to this (see Beech, Wakefield & Hullo-Pouyat, in press). Thus, on a broader scale the vision or main objective of the current collaboration, and of MAST's work in this region, is to address this lacuna to demonstrate the potential and change perspectives.

The Coastal Heritage Project of the UAE is a first, very positive step, of what we hope will be many future collaborative efforts to raise the profile of maritime cultural heritage in the region, increase expertise and, most importantly, address these issues with those who are ultimately responsible — the government ministries and authorities. Ultimately we need to build capacity through training and education (these projects offer potential for government employees responsible for the coastal heritage to acquire geophysical and maritime training and experience), raise awareness through projects, encourage public dissemination (media, talks, publications), quantify and record the resource, ensure that inventories of sites are integrated within government GIS systems (e.g. <https://geoportal.abudhabi.ae/mapviewer/index.html>), develop policy and legislation, and establish networks of expertise in the region. Thus, the Coastal Heritage Project of the UAE aims to begin to address some of these issues. It is a collaborative project that initially attempts to survey and record coastal sites and ultimately establish an integrated

policy for the maritime and coastal heritage of the UAE.

The Coastal Heritage Project of the UAE: aims, objectives, methodology, and results

The initial scope of the Coastal Heritage Project of the UAE comprises a quick and effective methodology integrating geophysical survey of the sites with a combination of available satellite images, photographic techniques, early maps, and aerial photographs. To date, the main focus of this collaborative endeavour, as stated above, has been a comparative investigation of targeted late Islamic settlements in the coastal regions of the Emirates of Sharjah and Abu Dhabi.

Located some 45 km off the coast of Abu Dhabi, the primary objective of the Delma Island, Abu Dhabi component of the survey was to further enhance our knowledge of the historic town and increase our understanding of the extent and nature of the different forms of archaeology in this part of Delma Island (Fig.



FIGURE 2. *A general view of Al Khan (photograph Lucy Blue).*

1). Delma Island has a long history of settlement from the 'Ubaid period (Beech & Elders 1999; Beech, Elders & Shepherd 2000) to the recent historical pre-oil era (King 2004a; 2004b). The late Islamic settlement on Delma Island was based on pearl diving and trading (King 1998).

Magnetometry and GPR surveys were conducted over selected areas of Delma Old Town and in one of the Islamic cemeteries to the north of the Old Town, as well as the 'Ubaid settlement just south of the Old Town. Here sixth/fifth-millennium BC remains constitute the earliest evidence of settlement on the island in the form of hut dwellings and oyster-shell processing (Beech & Glover 2005: 99; Beech & Shepherd 2001). In addition to the geophysical survey, a small-scale survey of a number of fish traps located just off the western shore of Delma Island was conducted with the use of a Leica Total Station and snorkel survey.

The site of Al Khan, Sharjah relates to a more recent period of the archaeology of the area. It is located on a spit of beach sand situated between the Arabian Gulf and one of the many inlets found along this stretch of the Emirate coastline. The main town of Sharjah, regularly shown on seventeenth-century maps and expanded substantially in the early nineteenth century (Slot 1993), is situated to the

east, with Al Khan formerly an independent fishing village (Fig. 1). The settlement at Al Khan appears largely to date from the twentieth century, in the form of houses and mosques built from coral and beach stone. The specific objective of the survey at Al Khan was to characterize the nature and extent of the historic waterfront site, in relation to the remaining standing structures at the site (Fig. 2). The survey was designed to incorporate mapped evidence of the extant building remains of the old town with the results from the geophysical survey, thus indicating the nature of buried deposits.

The aim of the geophysical survey in the Heart of Sharjah was to apply different geophysical survey methods to map the nature and extent of the archaeological deposits at the site, particularly over the areas of Al Hisn Avenue and the surrounding parking areas, in order to facilitate future interpretation of the remains of the Heart of Sharjah. A further aim was to try and obtain closer physical correlation between evidence of the town's historic footprint that might still remain beneath the ground, and the aerial photograph taken in the 1960s. This should provide important historic detail for urban design and planning within the current Heart of Sharjah master plan. This paper will report only on the results from Delma Island and Al Khan.



FIGURE 3. Ground-penetrating radar being deployed on Delma Island (photograph TCA Abu Dhabi).

The geophysical techniques deployed

The application of both magnetometry and GPR survey techniques enabled the project to establish the most appropriate method to apply at the sites, and more generally within the Emirates, and also to provide complementary data sets for interpretation of the archaeology of the historic areas of Delma Island, Al Khan, and the Heart of Sharjah (Fig. 3). Results derived from these different techniques are extremely dependent on the geology of the particular area, and whether or not the archaeological remains are derived from the same materials as the surrounding geology.

Magnetometry is a passive technique that uses sensors to measure variations in the strength of the Earth's magnetic field in nanotesla (nT) (Clark 1996; Scollar et al. 1990). GPR survey utilizes an electromagnetic radar wave propagated through the soil to search for changes in soil composition and structures, measuring the time in nanoseconds (ns) taken for the radar wave to be sent and the reflected wave

to return (Conyers & Goodman 1997). The nature of the two techniques and the speed of survey (it is possible to survey 1.5 ha of magnetometry per day compared with 0.3 ha of GPR using current basic instrumentation) mean that magnetometry is usually applied to gain overall coverage of a site or landscape, with GPR being used to target areas of interest revealed by magnetometry. The beach stone and coral construction of many of the structures, in contrast to the surrounding sandy beach deposits, provided good conditions for the GPR; while the presence of pit features, burials, and possible burnt layers in the archaeological record and the need for rapid survey over large areas, provided ideal conditions for the magnetometry. Both approaches at times present limitations, but used in conjunction they can produce excellent complementary results. The integrated application of geophysical survey techniques is attested to in a number of different examples and case studies (Keay et al. 2009; Strutt & Keay 2008) and the range of deposits located at the Delma Island and Al Khan sites provided ample opportunity to apply comparative techniques.



FIGURE 4. *An archive photograph of Delma Old Town (photograph TCA Abu Dhabi).*



FIGURE 5. *The Bayt al-Muraykhi Pearl Merchant's House, which presently houses the Delma Island Museum (photograph TCA Abu Dhabi).*

Delma: the results

The pre-1970 settlement of Delma Old Town consisted of a number of sea stone, coral, and *arish* buildings that are shown in archive photographs (Fig. 4). Only four of these buildings survive above ground, the Bayt al-Muraykhi Pearl Merchant's House (Fig. 5), the Muraykhi Mosque, the Dossari Mosque, and the Mahanadi Mosque (King 2004a; 2004b).

The geophysical survey undertaken in the Old Town was able to identify what appears to be the old shoreline in front of the Pearl Merchant's House as it was before the construction of the present system of roads and coastal reclamation. A view of the settlement gained from archive photographs (Fig. 4), the extant remains of the Pearl Merchant's House, and the excavations to the north of this carried out in the 1990s, are reflected in the magnetometry and GPR survey results. These include a possible structure to the north-west of the Pearl Merchant's House [m1.23], and evidence from both geophysical techniques gives the impression of linear anomalies to

the east [m1.38]–[m1.42]. These anomalies also suggest the continuation of a street or souk running from north-west to south-east. Other linear features were noted in the gardens to the north of the Pearl Merchant's House and the nearby Muraykhi Mosque. These latter features may indicate a second broadly parallel area of the settlement that possibly continues northwards eventually to join the line of features represented in the results from the Old Cemetery [m2.25]–[m2.27], [m2.36]–[m2.38] (Fig. 6).

In the less disturbed and developed area of the Old Cemetery the magnetometer survey results indicated a clear relationship between possible early structures of indistinct date and a later Islamic cemetery. The negative anomalies represent the presence of tombs over the survey area. The results from the higher ground on the northern side of the area also seem to indicate structural remains.

At the 'Ubaid settlement site the presence of modern disturbance, combined with the possible location of prehistoric features, provided a slightly different set of conditions for interpreting the survey results. The site was divided into northern and southern sections by a road and

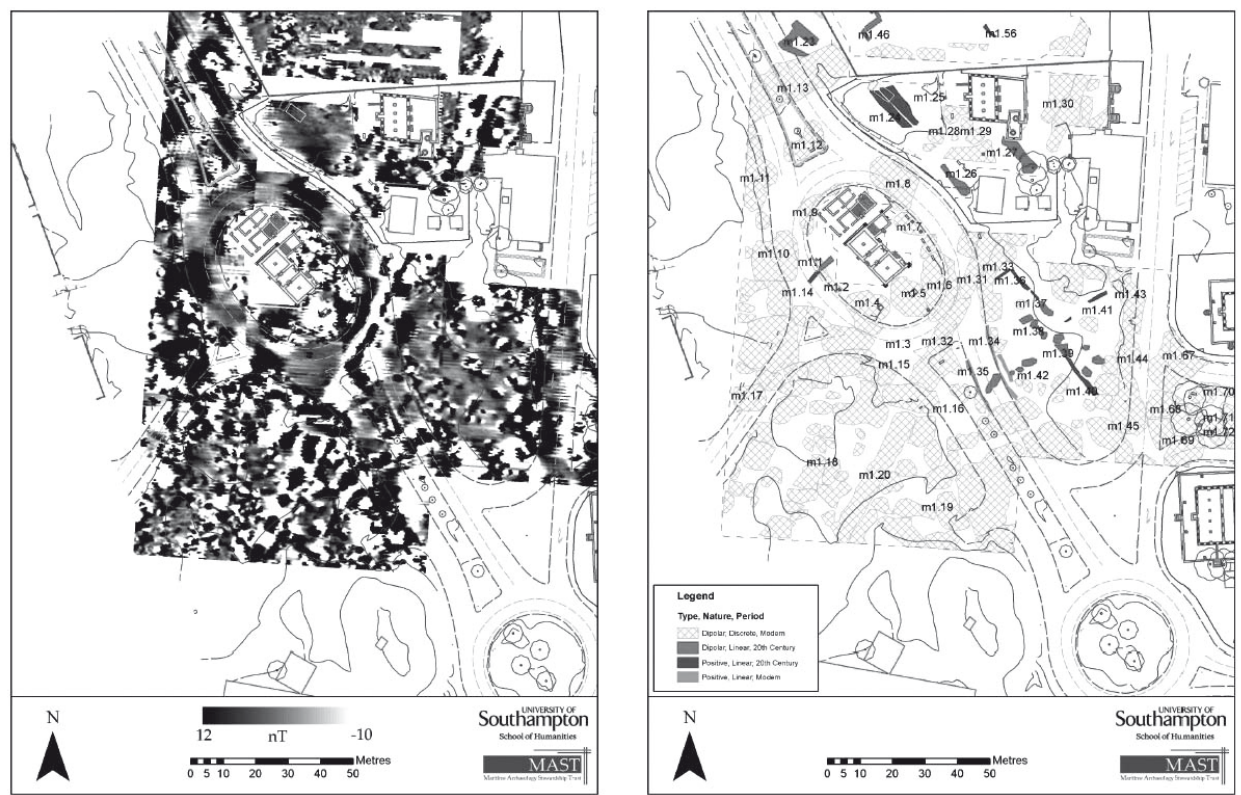


FIGURE 6. Results of the magnetometer survey of Delma Old Town, illustrating the collected data and interpretation plot as noted in the text.

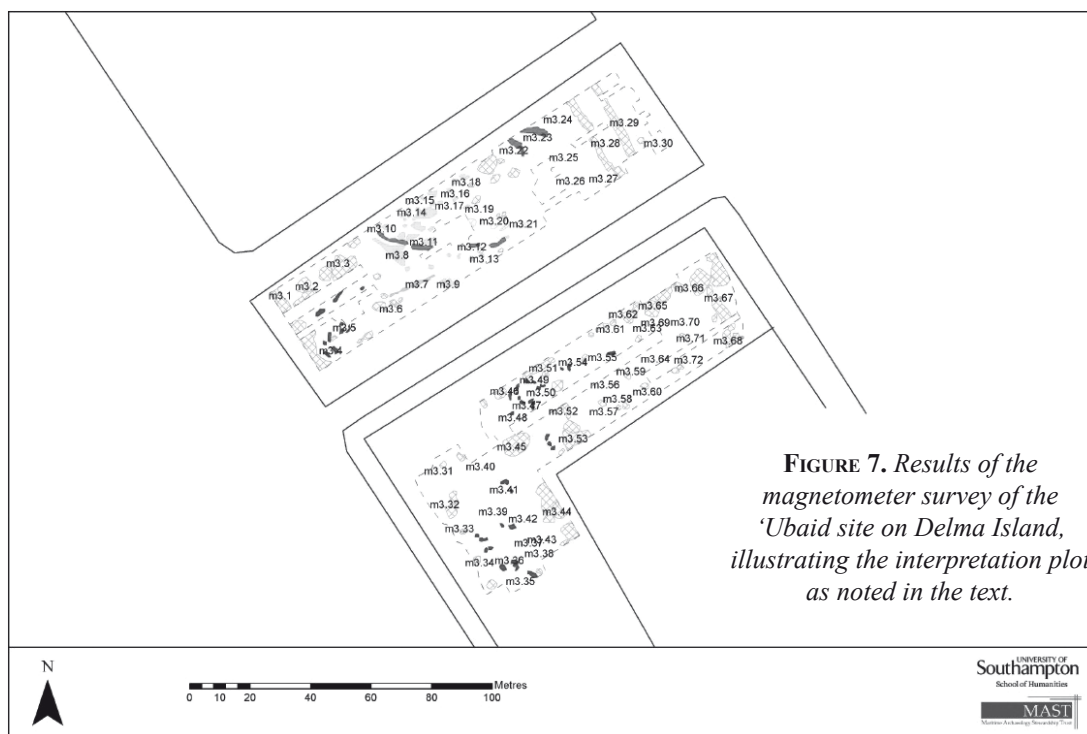


FIGURE 7. Results of the magnetometer survey of the 'Ubaid site on Delma Island, illustrating the interpretation plot as noted in the text.

a large wall. In the northern area strong linear features suggesting the boundary of an Islamic-period cemetery, and negative features orientated in a north-west to south-east direction, suggesting tombs, gave a clear indication as to the later development of the area. Fainter positive anomalies probably indicate excavated features filled with anthropogenic material, such as ceramics, burnt deposits, or other debris. In the western portion of the garden area to the south, a rough circle of features [m3.46], [m3.47], [m3.49] seems to indicate possible burnt deposits (Fig. 7). These features are located in close proximity to the trenches excavated in the compound in the 1990s, where occupation layers and a curvilinear formation of post holes were discovered (Beech & Elders 1999; Beech, Elders & Shepherd 2000; Beech & Shepherd 2001; Beech & Glover 2005: 99). The spread of readings for the area would suggest that further curvilinear and sub-circular features are present, although the resolution of the survey and the relative size of the post holes would preclude their being represented as discrete features. The geophysical results from this area confirm and add to interpretations

of Neolithic finds made in the 1990s and were further enhanced by the surface discovery of a Neolithic flint arrowhead.

Following previous observations and preliminary photographic recording of fish traps along the west coast of the island in 1996 by Mark Beech (2003), it was decided to undertake further more detailed recording of the extant fish-trap features during the 2011 field season. The objective of this work was to record the fish traps in more detail, monitor their preservation, and try to ascertain the date of their construction and use.

Stone fish traps (known locally as *al hadra* and *al meskar*) essentially consist of medium-sized, roughly hewn, unworked fragments of limestone and beach rock (*farush*). These features were erected on the seabed in the inter-tidal zone, in the manner of a dry-stone wall with no evident bonding material visible. 'Intertidal fish-traps are artificial barriers that trap fish through the rise and fall of the tide.... The morphologies and technologies of such traps vary widely and relate to the shore and tidal regime' (Breeze, Cuttler & Collins 2011).



FIGURE 8. A fish trap on the west coast of Delma Island (photograph Mark Beech).

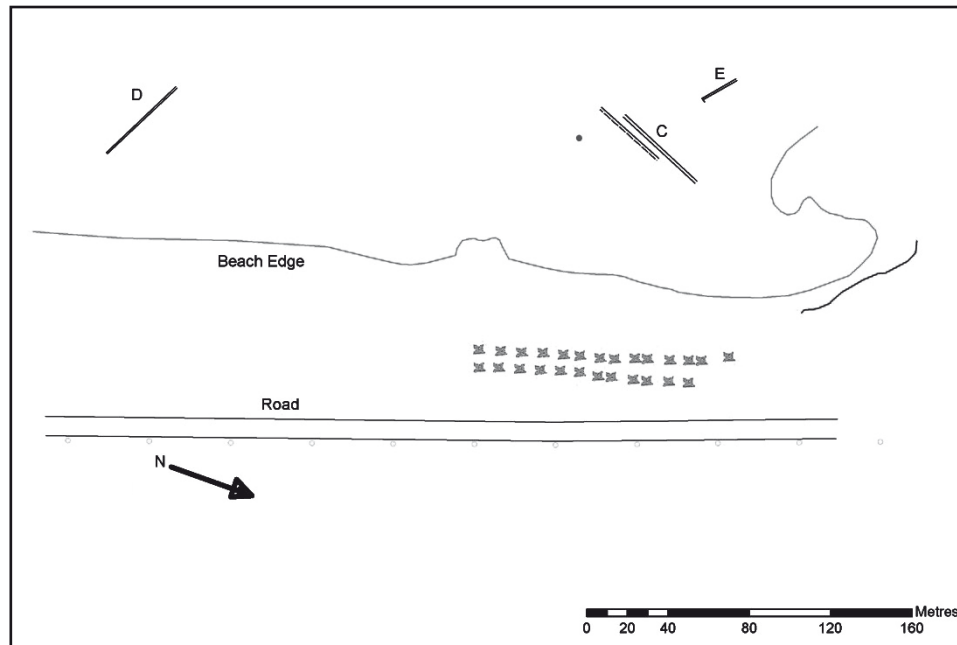


FIGURE 9. *A plan of fish traps and enigmatic stone structures recorded on the west coast of Delma Island.*

Work along the west coast of Delma Island was conducted over two days when the point of the tide was most favourable. An initial reconnaissance revealed that the two most northerly structures identified in the 1990s (Fig. 8; see also Beech 2003: 294, figs 1–2) had since been buried under sand. This was caused by coastal modifications in the late 1990s and the subsequent build-up of sediment to the south as a result of longshore drift. The two southerly features (fish traps C and D) were, however, still visible although submerged in some 0.5 m of water. On further inspection, a fifth feature (fish trap E) was also discovered. The fish traps were all planned with a Total Station and a number of features were noted (Fig. 9).

Sharjah, Al Khan

The majority of structures at the settlement of Al Khan appear to date from the twentieth century, in the form of houses and mosques built from coral and beach stone. Many of the structures associated with the settlement were still present in the 1960s, when an aerial photograph of the settlement was taken by the British Royal Air Force (RAF). It shows a pattern of settlement formed around several quarters of house and walled garden properties, all located on slightly different alignments. Several important

buildings, including those of the principal mosque and the largest house, are located on completely different alignments to the surrounding structures. Presently only a small proportion of the buildings represented in the RAF photographs still remain standing. These include two watchtowers, the principal mosque, two smaller mosques, the fortified Sheikh's house, and other masonry houses in various states of repair.

The layout of the buildings of Al Khan was broadly illustrated in the results of the magnetometry. The alignments of structures, in particular those close to the eastern confines of the site and in the denser occupation of the central part of the settlement, indicate the general alignments of the settlement. It is interesting to note the extension of possible structures running eastwards and northwards from the fenced area away from the core of the settlement, indicating that the settlement continues beyond the modern fence line. Within the tighter constraints of the settlement in the vicinity of the mosque and principal house, the small areas covered by the magnetometry did locate some evidence of buried structural remains. The internal walls and other possible features seem to suggest further rooms and internal courtyard divisions. The magnetometer survey results also suggest that the density of settlement at Al Khan declines in the westernmost portion on the spit of beach



FIGURE 10. Results of GPR survey at Al Khan, showing the processed data and interpretation plot.

deposits, closest to the inlet and the western tower. Some evidence of possible structures is visible but many of the features seem to be derived from modern disturbance and new infrastructure. It is possible that more ephemeral building structures existed in this area of the site; this idea is supported by the fact that archival photographs show *arish* buildings. Overall however, interpretation of the magnetometry was hindered by the proliferation of noise caused by modern ferrous material at the site.

The targeted GPR survey provided some further insight into a section of the settlement, located immediately to the north and east of the smaller mosque at the site. The GPR survey was the most appropriate technique for locating the beach stone and coral structures at Al Khan. The different slices elaborated from the surveyed GPR profiles indicate at first glance the presence of high-amplitude walls and lower-amplitude courtyard and open areas. Comparison with evidence such as the 1960 RAF aerial photograph, however, suggests that the story may be more complex. The results demarcate walls (Fig. 10/A), possibly suggesting areas of *in situ* masonry, and other areas where material has been robbed out leaving a trench of looser fill (Fig. 10/B). The full extent of the narrow structure to the north of the mosque can be made out as a series of small rooms (Fig. 10/C). The presence of a building or walled garden immediately to the east of the mosque, in an area that is now void of any extant buildings, can also be seen (Fig. 10/D). It is apparent from the application of GPR at the site that it provides the most coherent results in terms of the actual dimensions of buried structures, and suffers less from the proliferation of noise caused by modern ferrous material.

Preliminary results of the Coastal Heritage Project of the UAE: proposals for the future

First developed around fishing communities, sites such as Al Khan and Delma frequently went on to form the basis of substantial coastal conurbations that were critical to the subsequent urban development of the UAE. Clearly these are just two of many such sites in the region and we need to undertake further enquiries of comparative sites. The surveys of these three sites, however, have gone some way to further the understanding of the nature of the urban environment and development in these coastal regions, and has contributed to a more holistic comparative appreciation of the role and development of these coastal settlements with respect to the maritime development of the region.

The specific methodology employed provides valuable evidence of what is buried beneath the surface in a relatively rapid and thoroughly non-destructive fashion. This has obvious advantages for the rapid documentation and management of historic sites that can help inform urban planning and heritage policy for future site development. In the process of undertaking these surveys, representatives of TCA Abu Dhabi and the Directorate of Heritage Sharjah were exposed to and trained in the use of terrestrial geophysical equipment.

The results have also generated further collaboration with other Emirates, with the intention of conducting similar surveys at other coastal sites of the UAE in the future and collating integrated data sets. Besides the core project members, the following institutions were present at a meeting held in the Sharjah Archaeological Museum in January 2012 to discuss future collaboration: ICCROM-Sharjah Regional Conservation Centre; National Museum of Ra's Al Khaimah; Architectural Studies Section, Dubai Municipality; Directorate of Antiquities, Sharjah; Sharjah Museums; and the American University of Sharjah. These institutions are keen to extend collaborations on similar projects in the region in the future, and to establish a single GIS database across the UAE.

Besides field and research projects, the collaboration also hopes to host a series of workshops that will aim to provide the necessary training in geophysical and maritime techniques to the regional heritage departments and authorities. ICCROM as the Centre for Study and Preservation and Conservation of Cultural Property, focuses on training in the survey and documentation of buildings and in this capacity recognizes the benefit of the development of specific skills pertaining to geophysical and maritime survey techniques, as well as site management. MAST and APSS are currently in discussion with ICCROM regarding the development of training courses at the new ICCROM-Sharjah Regional Conservation Centre. The American University of Sharjah has also recently set up the Gulf Coastal Ecosystem Research Center (www.aus.edu/news/article/211/aus_board_of_trustees_approves_three_research_centers), which is keen to develop links with team members of the Coastal Heritage Project of the UAE.

Collaboration is also being extended across the Gulf region encouraged by the Sub-Regional Meeting for the Gulf on the Convention on the Protection of the Underwater Cultural Heritage, Manama, Bahrain (16–17 October 2012). This UNESCO sub-regional meeting, gathering participants from Bahrain, Kuwait, Oman,

Qatar, Saudi Arabia, the United Arab Emirates, and Yemen, aims to discuss the development of underwater archaeology in the region, capacity building, research, cooperation, and encourages the implementation of the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage (see www.unesco.org/new/en/media-services/single-view/news/sub_regional_meeting_for_the_gulf_on_the_convention_on_the_protection_of_the_underwater_cultural_heritage/).

Finally, further projects are planned for the coming year, with the third season of the Coastal Heritage Project of the UAE due to go ahead on the islands of Abu Dhabi and the east coast of Sharjah in autumn 2012. Although it is early days and the results compiled to date are limited, we do perceive this project as the first step towards capacity building, collaboration, and the sharing of expertise in the region, and one that hopes to realize a more sustained future for the maritime cultural heritage of the region.

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