Secret streets of Britain’s lost Atlantis revealed

Information from the National Oceanography Centre and the Dunwich Project

Deep-sea oceanographers have been engaged in the most detailed analysis of the archaeological remains of the lost medieval town of Dunwich, dubbed “Britain’s Atlantis”.

Present day Dunwich is a village 14 miles south of Lowestoft in Suffolk, but it was once a thriving port – similar in size to 14th Century London. Extreme storms forced coastal erosion and flooding that have almost completely wiped out this once prosperous town over the past seven centuries. This process began in 1286 when a huge storm swept much of the settlement into the sea and silted up the Dunwich River. This storm was followed by a succession of others that silted up the harbour and squeezed the economic life out of the town, leading to its eventual demise as a major international port in the 15th Century. It now lies collapsed and in ruins in a watery grave, 3 to 10 m below the surface of the sea, just off the present coastline.

Most scholars agree that Dunwich was most probably the site of a Roman coastal fort, and was certainly a Saxon settlement. Divers from Suffolk Underwater Studies have tried to locate artefacts from the seabed to verify this theory, but so far without success. The size of the original city is unknown, but was sufficiently important to have once been the seat of the first Bishop of East Anglia, and to have received Royal Charters for a Market and a mint. In 1086 Dunwich was one of the ten largest towns or cities in England. The wealth of Dunwich was based on sea trade and fishing. Indeed, the initial demise of the city is as much related to the continual battles to preserve the open harbour as to the physical losses arising from coastal erosion. In the 13th century, the city of Dunwich contained up to 18 ecclesiastical buildings (of which two remain Greyfriars monastery and St James – chapel to the Leper Hospital), a mint, a large guildhall and several large important houses. The population has been estimated at over 5000 at its height, with at least 800 taxable houses, and an area of c.800 acres.

Loss of land at Dunwich is recorded as early as the Domesday book when over half the taxable farmland was lost to the sea between 1066 and 1086. Major losses were subsequently reported in the storms of 1328 and 1347, the latter resulting in the destruction of significant property (c.400 houses) in the low lying portions of the city. The decline of the city continued with losses in 1560 and 1570 such that by 1602 the town was reduced to a quarter of its original size. Further storms in 1740 flattened large areas of the remaining city, so that only All Saints church remained. The loss of All Saints has been well chronicled since it occurred during the early 20th century, finally disappearing over the cliff edge in 1919. As of 2007, a final fragment and a single tombstone of All Saints Churchyard remains, and the south east corner of Greyfriars Monastery wall has started to collapse down the cliff.

Dunwich 2012

The Dunwich 2012 project was funded by English Heritage and the main objectives of the project were to:

- To collate, digitise and interpret existing secondary data to refine the definition of the form and extent of the medieval Dunwich site.
- To better define the northern and eastward extent of the former town and the location and form of any...
existing archaeological structures visible above the seafloor.

- To assess the heritage and archaeological value of existing structures identified on the seafloor through novel deployment of high resolution MBES and DIDSON DH technology at the St Nicholas Church and St Katherine’s Chapel sites.
- To advance EH technical understanding of rapid non-wreck site evaluation through the design and application of an integrated survey methodology.
- To use the historical data to formulate estimates of coastal recession with which to estimate the risk to existing terrestrial heritage at the Dunwich site.
- To interpret and report the new information collected within the project as a basis for site designation and to make the results of the project available to specialist and general audiences, both in England and globally.

All objectives were achieved, and resulted in the creation of the most detailed plan of the existing land and marine archaeology, and the accurate map of the town. The team used a range of new data including coastal views in 17th century pilot charts, descriptions of the town, paintings, photographs, old maps and lidar. In addition the project undertook new magnetometer, Sidescan and Multibeam surveys of the northern area of the site, together with DIDSON acoustic imaging.

Results

Dr. Tim Le-Bas, a sonar acoustics expert based at the UK’s National Oceanography Centre, translated the sonar readings into 3D high-resolution maps.

“These 3D high-resolution maps are the first time we have seen these buildings in 750 years. Not only can we see the remains of the town, we can also measure how the coastal erosion has impacted the buildings over the centuries,” says Dr. Le-Bas.

“Working in the shallows of the North Sea was a challenge of a different dimension; I usually prepare 3D maps of ocean features several miles below the sea surface. Here the issue was that the water, although relatively shallow, was dirty brown due to lots of muddy particles in the water. It was impossible for divers to see the archaeological remains and thus we used ultra-high frequency sonar to view the features.”

Funded and supported by English Heritage, and using advanced underwater imaging techniques, the project has produced the most accurate map to date of the town’s streets, boundaries and major buildings, and revealed new ruins on the seabed (see Fig. 1).

The project was led by the University of Southampton’s Prof. David Sear of Geography and Environment. He worked with a team from the University’s GeoData Institute; the National Oceanography Centre, Southampton; Wessex Archaeology; and local divers from North Sea Recovery and Learn Scuba.

“Visibility under the water at Dunwich is very poor due to the muddy water. This has limited the exploration of the site,” he comments.

“We have now dived on the site using high resolution DIDSON acoustic imaging to examine the ruins on the seabed – a first use of this technology for non-wreck marine archaeology. “DIDSON technology is rather like shining a torch onto the seabed, only using sound instead of light. The data produced helps us to not only see the ruins, but also understand more about how they interact with the tidal currents and sea bed.”

Peter Murphy, English Heritage’s coastal survey expert who is currently completing a national assessment of coastal heritage assets in England, says: “The loss of most of the medieval town of Dunwich over the last few hundred years – one of the most important English ports in the Middle Ages – is part of a long process that is likely to result in more losses in the future. Everyone was surprised, though, by how much of the eroded town still survives under the sea and is identifiable.

Whilst we cannot stop the forces of nature, we can ensure what is significant is recorded and our knowledge and memory of a place doesn’t get lost forever.”

Professor Sear and his team have developed techniques that will be valuable to understanding submerged and eroded terrestrial sites elsewhere.

The project to survey the underwater ruins of Dunwich, the world’s largest medieval underwater town site, began in 2008. Six additional ruins on the seabed and 74 potential archaeological sites on the seafloor have since been found. Combining all known archaeological data from the site, together with old charts and navigation guides to the coast, it has also led to the production of the most accurate and detailed map of the street layout and position of buildings, including the town’s eight churches (see Fig. 3).

Commenting on the significance of Dunwich, Professor Sear says: “It is a sobering example of the relentless force of nature on our island coastline. It starkly demonstrates how rapidly the coast can change, even when protected by its inhabitants.”
"Global climate change has made coastal erosion a topical issue in the 21st Century, but Dunwich demonstrates that it has happened before. The severe storms of the 13th and 14th Centuries coincided with a period of climate change, turning the warmer medieval climatic optimum into what we call the Little Ice Age.

"Our coastlines have always been changing, and communities have struggled to live with this change. Dunwich reminds us that it is not only the big storms and their frequency – coming one after another, that drives erosion and flooding, but also the social and economic decisions communities make at the coast. In the end, with the harbour silting up, the town partly destroyed, and falling market incomes, many people simply gave up on Dunwich."

**Project summary**
In summary the project has compiled and digitally captured all available maps, charts and pilot books for the section of coastline at Dunwich. These have been screened and evaluated in terms of their accuracy and information content. These were used to reconstruct the limits of the town, and to determine the position of the historic coastline at different times back to 1587.

Team members on the project have applied Coastal Change Analysis (CCA) and Bathymetric Change Analysis (BCA) to a) forecast the position of the coastline in 2050 and 2100, b) hindcast the coastline back to 1000 A.D., and c) determined the synoptic and local changes in coastal morphology around the Dunwich town site.

Geophysical survey of the northern harbour area of the town together with detailed survey of the existing major ruins on the seabed have been undertaken. This included magnetometer, Sidescan sonar, Multibeam and DIDSON acoustic imaging. Constraints at the time of survey restricted DIDSON survey to one of the two sites specified in the project design.

All existing land-based archaeological data has been collated and integrated with the CCA forecasts of cliff position to determine the heritage at risk to coastal retreat. This has identified between 6 and 14 sites at risk between 2012 and 2080. A list of recommended future work at the site has been compiled on this basis.

All available marine geophysical and diver survey data has been collected and used to identify the extent and type of marine archaeology over the town site. This data has been integrated with BCA to identify risks to marine heritage. A list of recommended future marine archaeology survey at the site has been compiled on this basis.

The topography and geography of the medieval town has been reconstructed as the basis for defining the boundaries of the site that are expected to contain most of the archaeological heritage on land and in the marine environment. Although the boundaries are contestable, they provide a basis for any future consideration for heritage protection of the site.

The project team evaluated the use of DIDSON acoustic imaging sonar for use on the Dunwich town site. They compared both quantitative and qualitative outputs from all geophysical
survey techniques. The DIDSON system provides additional valuable qualitative data on the environment and archaeology of a site, and can provide quantitative data that is statistically similar to Sidescan and Multibeam data.

**Findings**

Some of the highlights of the project’s findings are:

- Identification of the limits of the town, which reveal it was a substantial urban centre occupying approximately 1.8 km² – almost as large as the City of London.
- Confirmation the town had a central area enclosed by a defensive, possibly Saxon earthwork, about 1 km².
- The documentation of ten buildings of medieval Dunwich, within this enclosed area, including the location and probable ruins of Blackfriars Friary, St Peter’s, All Saints’ and St Nicholas Churches, and the Chapel of St Katherine.
- Additional ruins which initial interpretation suggests are part of a large house, possibly the town hall.
- Further evidence that suggests the northern area of the town was largely commercial, with wooden structures associated with the port.
- The use of shoreline change analysis to predict where the coastline was located at the height of the town’s prosperity.

**Conclusion**

The results of the Dunwich project are important for several main reasons.

- These are the first formally identified mediaeval structures identified by geophysical survey in UK coastal waters.
- The project has demonstrated the preservation of larger medieval stone structures in the coastal zone, and their close proximity to their original locations after up to 500 years of submergence.
- The survey confirms the existence of church ruins from the former medieval town of Dunwich, and pinpoints their precise position. They suggest that other church structures are likely to exist beneath the sand banks inshore and over the eastern half of the town.
- The survey has demonstrated the value of integrated cartographic and geophysical survey as a means for locating and identifying maritime heritage from former medieval settlements located in sites of poor visibility and medium energy coastal environments. This opens up the challenge of how to legislate for the protection of non-wreck heritage in the coastal zone, and offers the potential for exploring the 250+ other sites located around the southern north sea basin.
- Finally, the outputs from the project, have been used to develop new learning materials in support of the Dunwich Museum trust and to promote a wider understanding of the story and investigation of Dunwich. (Professor Sear’s full report can be found at: www.dunwich.org.uk)

**Update**

A new diver survey of the Dunwich town site is to be undertaken in June 2013 using DIDSON technology. The aim is to obtain high resolution images of the new sites discovered in the most recent 2012 survey. Attention will focus on the new ruins near St Peters Church, and on some ruins in the northern harbour area.

Contact Kim Marshall-Brown, National Oceanography Centre, kxm@noc.ac.uk