

## Marine Aggregates and Prehistory

### Antony Firth

*Head of Coastal and Marine Projects  
Wessex Archaeology  
United Kingdom*

Over the last decade, the companies that dredge aggregates (sand and gravel) from the seas around the UK have taken increasing account of archaeological issues. The process of Environmental Impact Assessment (EIA) provided the initial framework for addressing the implications of marine aggregate for the historic environment in the course of applications for dredging licences. While the EIA framework continues to be of central importance, it has been supplemented by wider initiatives from industry and by the recent availability of substantial resources through the Aggregate Levy Sustainability Fund.

As well as having potential impacts on shipwrecks, marine aggregate dredging has clear implications for prehistoric remains on the seabed. Aggregate companies frequently target sand and gravel that was deposited by rivers in glacial periods when sea-level was up to 130m lower than today. At these times, both after the last (Devensian) glacial maximum and during previous glaciations, there were vast areas of land around the present UK. This land was inhabited periodically by our predecessors, until they were obliged to quit by rising sea-levels. While it was dry land, and while the sea was encroaching, the land supported plant and animal life as well as humans; microscopic evidence of these previous environments can be found within fine-grained sediments laid down at the time, and once-inhabitable land surfaces can be found in and below deposits of peat. Flint artefacts recovered by fishermen, and a small number of *in situ* archaeological sites found close to the shore, strongly suggest that further archaeological material is to be found much further offshore, in the deeper water where aggregate dredging takes place. Furthermore, the aggregate companies are keen to avoid dredging the peats and fine-grained deposits of such potential interest to archaeologists, because this

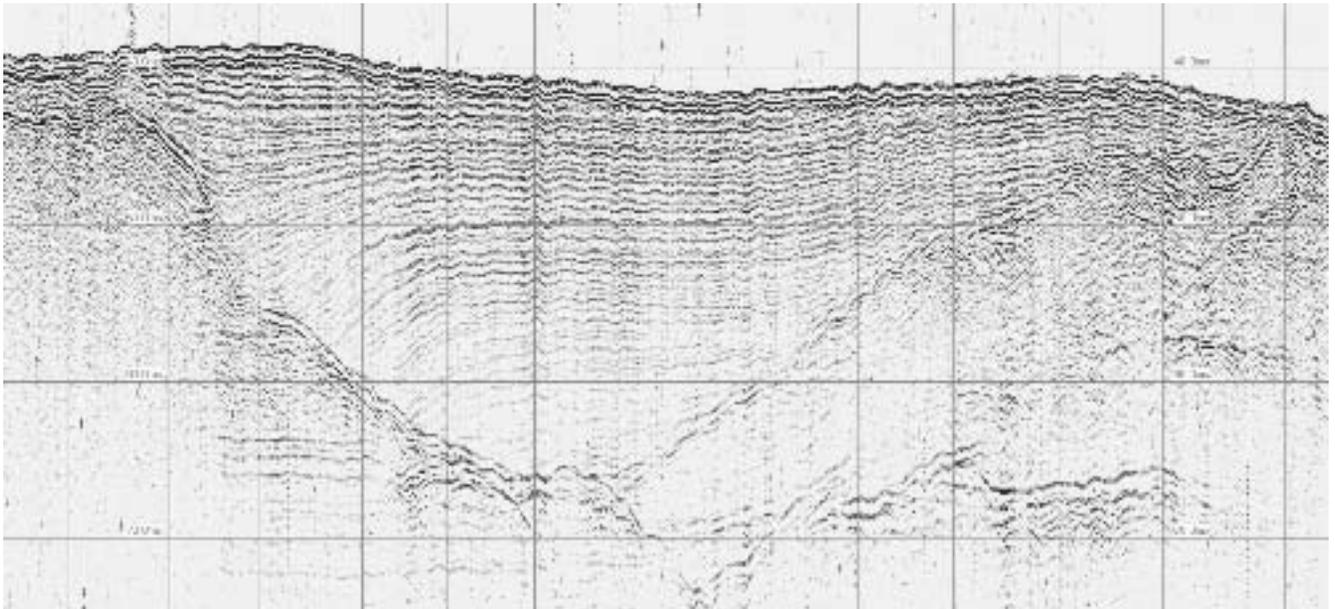
material will contaminate the clean aggregates upon which their business depends. The challenge, therefore, has been to establish whether important archaeological material exists in areas that contain commercially-attractive aggregate deposits, and to develop methods that can enable dredging areas to be assessed and evaluated archaeologically in the course of the EIA process.

Wessex Archaeology (WA) has carried out numerous EIA studies of marine aggregate licence proposals. Initially, aggregate companies were facing the contention that there was uniformly high potential for prehistoric archaeological material across the seabed, and that aggregate dredging was causing untold damage. In WA's early EIA studies, we worked with aggregate companies to understand not only the process of dredging, but also the processes of investigation and monitoring that aggregate companies undertake when prospecting for aggregates and when gauging possible effects relating to other environmental and commercial concerns, such as marine ecology, fishing and sediment transport. It was soon apparent that the aggregate companies had both expertise and data that could be used to inform the assessment of archaeological potential. This initial work often involved reinterpreting geophysical and geotechnical data, and developing models of how sea level change may have affected the landscape. Analogies were also drawn from prehistoric archaeological finds on adjacent coastlines, in the upper reaches of river catchments which – at the time – flowed down through the submerged landscapes that are now being targeted for marine aggregates.

These early studies helped to localise areas of archaeological potential and provide them with context. They also showed that in many instances the aggregates being targeted were adjacent to areas of archaeological potential, but the aggregates themselves were likely to contain only derived archaeological material that had been repeatedly eroded and re-deposited, rather than *in situ* material of higher importance. Other conclusions could be drawn, notably how



**Figure 1: One frame from the digital animated reconstruction of a Mesolithic landscape, based directly upon geophysical and palaeo-environmental data from the ALSF Seabed Prehistory project**



Figures 2 & 3: Shallow seismic section through an infilled palaeo-channel in about 30m of water, off the coast of Sussex

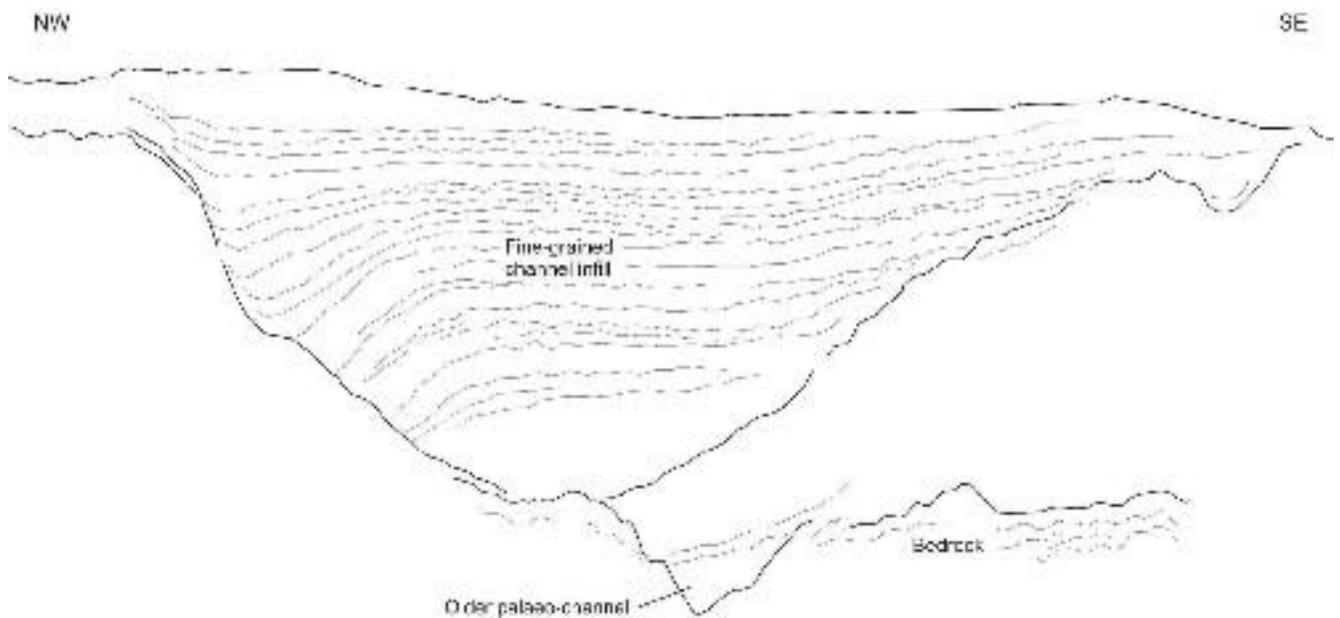


Figure 4: Flints thought to have been struck by humans, recovered in grab-samples from the English Channel

complex the sequences of deposition, erosion and inundation could be, and how limited our understanding was. It was also clear that while data obtained for prospecting or ecological purposes could be reinterpreted, the data would be even more useful if archaeological objectives could be incorporated into surveys from the start. Also, our assessments were largely hypothetical, as we lacked direct evidence of prehistoric land surfaces, or of their supposed inhabitants.

At this point, the association representing the majority of marine aggregate companies the British Marine Aggregate Producers Association (BMAPA), took the initiative of seeking to spread the good archaeological practice being developed by some aggregate companies across the whole of the industry. BMAPA, in partnership with the heritage agencies (the Royal Commission on the Historical Monuments of England (RCHME) later incorporated into English Heritage) commissioned a series of strategic projects which included the preparation of (*Marine Aggregate Dredging and the Historic Environment: Guidance Note*) (BMAPA and English Heritage, April 2003).

While the Guidance Note was being prepared, a major fund for strategic research became available. In an effort to encourage more sustainable use of terrestrial and marine aggregate resources, the UK Government introduced a tax on aggregates known as the Aggregates Levy. A part of this tax was directed to sustainability projects, by way of the Aggregates Levy Sustainability Fund (ALSF). Among the agencies responsible for distributing the ALSF were English Heritage and the Minerals Industry Research Organisation (MIRO). Round 1 of the ALSF ran from 2002 to 2004, and among projects relating to prehistoric material on the seabed were two WA projects, *Artefacts from the Sea*, using funds administered by English Heritage, and *Seabed Prehistory*, using funds administered by MIRO. *Artefacts from the Sea* sought to enhance national and local records of previous prehistoric finds made at sea or on the coast, to provide a firmer basis for understanding the context and importance of any archaeological material found in offshore aggregate dredging areas. As part of the project, almost 300 prehistoric artefacts collected by a fisherman, Michael White, were catalogued for the first time. The *Seabed Prehistory* project sought to improve the application of geophysical and geotechnical survey methods commonly used by the aggregate industry, so that better archaeological results could be obtained. A study area off the Sussex coast was subject to very high resolution sub-bottom profiling, to vibrocoring and to benthic grabbing, followed by digital processing, paleo-environmental analysis and scientific dating. As well as generating important methodological conclusions, the

project identified a Mesolithic landscape dating to c. 9000 BP in about 30m of water some 12km offshore, immediately adjacent to an aggregate dredging area. Systematic benthic grabbing of 100m x 100m cells in the same area recovered a small number of flints that are thought to have been struck by humans.

The *Seabed Prehistory* project has continued in Round 2 of the ALSF, which runs from 2004 to 2007, using funds administered by English Heritage and MIRO. As well as additional grabbing in the original study area off Sussex, which has recovered peat and charcoal as well as more probable human-struck flints, geophysical and geotechnical surveys are being carried out 50km offshore in the Eastern English Channel, off Great Yarmouth in East Anglia, and off the Humber Estuary in the southern North Sea. The Round 2 ALSF project has also included the development of a computer animation of the Mesolithic landscape off Sussex, drawing directly from the data acquired in Round 1, both as a means of public outreach, and as an interpretative device.

Following on from the Guidance Note, BMAPA and English Heritage have recently introduced a Protocol for Reporting Finds of Archaeological Interest, to make it easier for aggregate industry staff on wharves and vessels to report the things that they find. The Protocol acts as a safety net for discoveries that were not anticipated in the course of EIA, but it also helps to increase archaeological understanding throughout the aggregate industry. A Protocol Awareness Programme, involving visits by archaeologists to aggregate workers throughout England to give guidance on how to identify, handle and store artefacts, has recently started with the support of the ALSF.

Collaboration with the aggregates industry has enabled advances in methods and knowledge relating to the prehistory of the seabed around the UK that could hardly have been imagined just a decade ago. Significant scientific discoveries are being made whilst improving the sustainability of continued aggregate dredging. In many respects, the UK aggregate industry has led the way in showing how marine archaeology can be accommodated within commercial activity, and the lessons learned have spilled into other sectors such as offshore renewable energy. These are exciting times, and the best is yet to come.

### Further Reading

BMAPA and English Heritage (2003) *Marine Aggregate Dredging and the Historic Environment: guidance note*. British Marine Aggregate Producers Association and English Heritage, London.

<http://www.wessexarch.co.uk/projects/marine/bmapa/index.html>