

# Early Human Dispersals and Submerged Landscapes

On 7 June 2012, volume 486, Nature published a comment from SPLASHCOS members in its correspondence section under the title 'Migration: value of submerged early sites', in response to an editorial news feature published on 3 May 2012, entitled 'Special Issue: Peopling the Planet'.

Our comment pointed out the neglect of the submerged landscape in their coverage of early human dispersals, and was published in abbreviated form with three signatories, to meet with Nature guidelines.

The original article on 'Peopling the Planet' was published in Nature 485, 23 (03 May 2012) doi:10.1038/485023a.

The text of the comment as abbreviated and published in Nature 486, 34 (07 June 2012; doi:10.1038/486034a), is given below, followed by the full version of the comment and the full list of signatories.

## ABBREVIATED COMMENT

Your articles on human dispersal in the late Pleistocene epoch (Nature 485, 23; 2012) overlook the significance of now-submerged archaeological sites on the continental shelf during this period (126,000–11,000 years ago). It is wrong to assume that these were completely destroyed by the sea and that the interpretation of human movements must rely on proxy data, such as DNA or evidence from islands.

More than 3,000 prehistoric sites on the seabed have been found and mapped, and in some cases excavated. They range in age from 500,000 to 5,000 years old, and at locations from the present-day shoreline out to a depth of 130 metres. These sites were extensive, often located on key travel routes and more attractive than arid hinterlands to human settlers.

Marine archaeologists have recovered in-context stone artefacts, animal remains and human fossils from such sites. Some materials, including food remains, organics, bone, DNA and plants, are better preserved underwater than on land.

Questions of early human dispersal will not be resolved until continental shelves are fully investigated — spurred by advances in modern oceanographic technology (see <http://splashcos.org>).

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## FULL COMMENT

The Editorial features in Nature (**485**, 7396, p. 6, and p.23-35) concern human diffusion and migration to all continents of this planet during the last 200 thousand years or so, and address the competing theories of rapid coastal migration and continental land-based dispersal. The articles imply that data that would logically determine the correctness or otherwise of much of this speculation is submerged on the continental shelf, due to post-glacial rise of sea level, and that it is therefore necessary to rely instead upon modern human DNA, the very small quantities of fossil hominin DNA, and the “proxy” data from islands that were inhabited at an early date.

The clear but unspoken assumption is that prehistoric archaeological sites on the exposed continental shelf during the glacial periods have all been destroyed by marine transgression, and cannot be found or studied.

This assumption is incorrect.

More than 3000 submerged seabed prehistoric sites have been found, mapped, reported, and in many cases sampled and excavated by professional archaeologists during the last 40 years<sup>1-6</sup>. This is an established research discipline with hundreds of researchers working globally, publishing in refereed literature, and publishing major monographs and edited volumes with academic publishers<sup>7-13, 28-32</sup>.

Submerged prehistoric sites with anthropogenic deposits surveyed and sampled in stratigraphic context have been published from periods dating from 1 million years ago<sup>14</sup>, through the last two glacial cycles, 400,000-20,000 years ago, and many hundreds of submerged sites during the last marine transgression<sup>1,4,6</sup>. The evidence demonstrates how the continental shelf to a depth of the order of 50-130m was occupied by terrestrial species as a fertile living area for much of the last million years<sup>15-18</sup>. These inhabited coastal zones provided a natural environment for coast-wise migration without the necessity for boats. Submerged prehistoric hominin sites have been found and mapped from the shoreline out to 130m depth, and off the coasts of Germany, Sweden, Norway, Denmark, Netherlands, UK, France, Italy, Greece, Israel, Turkey, Bulgaria, USA, Canada, Japan, South Africa, and Argentina<sup>19-24</sup>. Submerged seabed deposits of Pleistocene terrestrial fauna have been found off the coasts of many other countries, including Spain, China and Chile<sup>25</sup>.

So far no submerged prehistoric site more than 5000 years old has been found off the coast of India, but the importance of this potential source of data has been addressed by one of us in 2004<sup>26</sup>.

The Nature Editorial Features quoted above are distorted in balance by ignoring the existence of prehistoric data from the continental shelf, and by implying that no such data exist, and that they cannot be found or interpreted. In fact the sites do exist, and often exhibit better preservation of organics, bone, seeds, DNA, and food remains than on land<sup>27</sup>.

In the USA, NOAA has recently established a Submerged Landscapes Programme; agencies in the UK and Netherlands have agreed on a North Sea Prehistoric Research Framework; and the European COST programme is supporting the 4-year SPLASHCOS project (<http://splashcos.org>) as a trans-domain Action bringing together over 200 scholars and scientists from 23 countries to study the submerged prehistory of the European

continental shelf, which is known to have added as much as 40% to the prehistoric land area of Europe.

The answers to many of the questions presented in the Nature Editorial Features will not be fully resolved until the relevant prehistoric archaeological sites and landscapes preserved on the continental shelf have been identified and studied by professional archaeologists and marine geoscientists. Modern oceanographic technology makes it easier and cheaper every year to detect seabed prehistoric sites and ancient landscapes, and new multi-national and multi-disciplinary collaborations and new projects are underway to exploit these opportunities. Further progress should in due course provide the data necessary to replace the current reliance on guesswork or proxy data of unproven reliability.

Ironically, in the same issue (*ibid.* p.6), Nature published an article on the poor scientific methodology demonstrated by the past conflicts between Clovis-first and pre-Clovis archaeological theories in North America. The lack of acknowledgement of the essential contribution now being made to understanding human origins by study of the seabed submerged record shows a similar lack of recognition of well-founded new data.

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