

1 Vængesø: Geology, topography and research history

1.1 Geology and topography

Vængesø is located on the northeast coast of the Helgenæs peninsula, which extends south of Mols on the southern coast of Djursland. Djursland is itself a peninsula, projecting east from the central eastern coast of Jutland (Fig. 1a). Vængesø today is a wetland area, situated between the marine bays of Begtrup Vig and Ebeltoft Vig (Fig. 2). About 10

km to the south lies the northern tip of the island of Samsø and about 14 km to the west is the city of Aarhus.

The Helgenæs peninsula is triangular in outline and measures c. 7 km (N-S) by 4-5 km (E-W – broadest to the north). Its landscape is sharply undulating, reaching heights of c. 50-60 m a.m.s.l. and, in one instance (Ellemandsbjerg), as much as 81 m a.m.s.l.

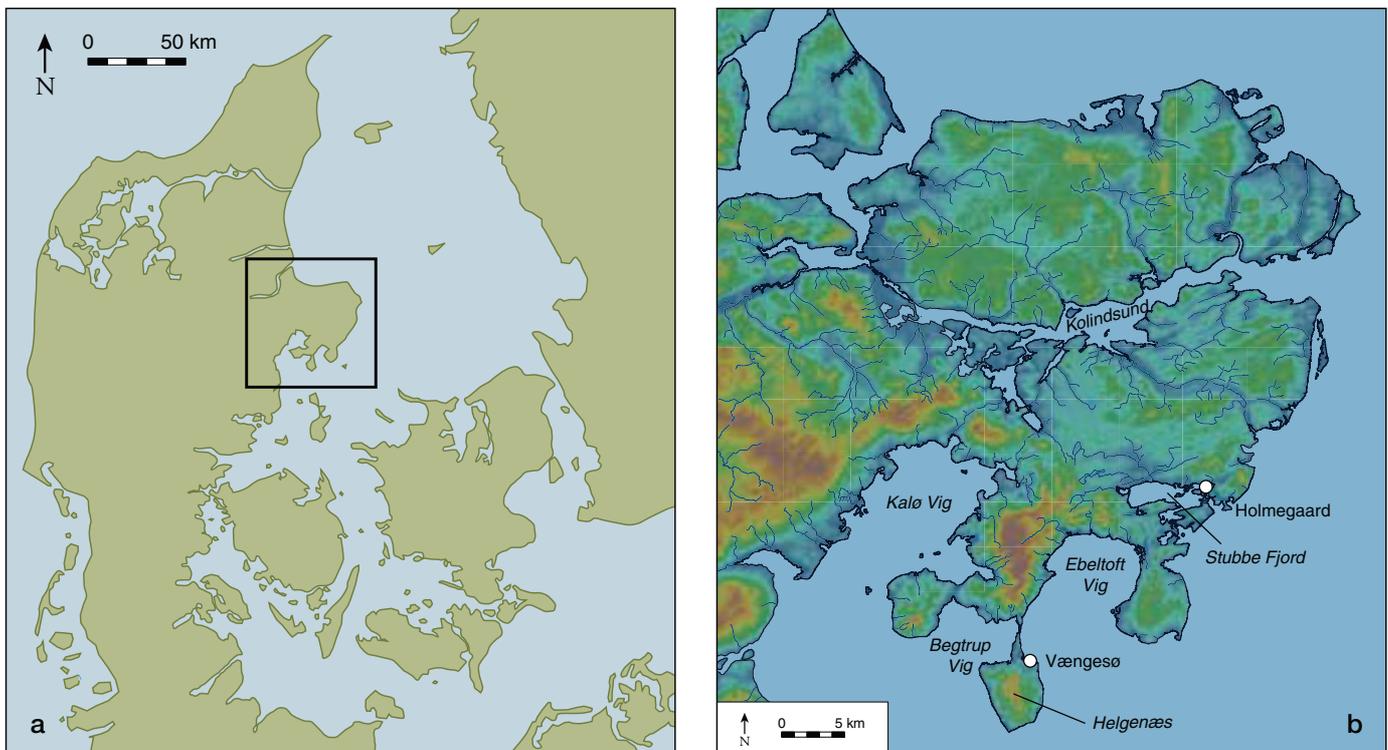


Fig. 1. a) The location of the Djursland peninsula in Denmark. b) The approximate relationship between land and sea on Djursland in Ertebølle (Late Atlantic) times, with the localities of the Vængesø lagoon and Holmegaard marked. Modified after Klassen (2014).

Topographically and environmentally the peninsula is characterised by extreme variation, with the landscape continually alternating between steep-sided hills and small peat- or water-filled hollows. The subsoil consists of fluvio-glacial deposits of sand, gravel and sandy clay. The most common soil type is coarse sand (Fig. 2). Importantly, there are no rivers or large freshwater watercourses on the peninsula.

The waters around Helgenæs are deep by Danish standards – especially to the south and southwest, where they reach a maximum of 56 m. To the east are depths of 12-16 m and a shallower area,

Skadegrund, lies to the southeast (Fig. 2). The coast almost everywhere takes the form of steep erosion slopes, which must have developed during the period of highest sea level in prehistoric times.

The area has risen c. 4-4.3 m since the Stone Age and almost all coasts show clear evidence of heavy marine erosion in the form of high fossil cliffs and broad beach-ridge systems. These are especially evident to the northeast and to the southwest, towards Sletterhage (Jessen 1920, 93; Mertz 1924, 23), and there are areas of raised seabed both to the northwest, southwest and northeast (Fig. 2).

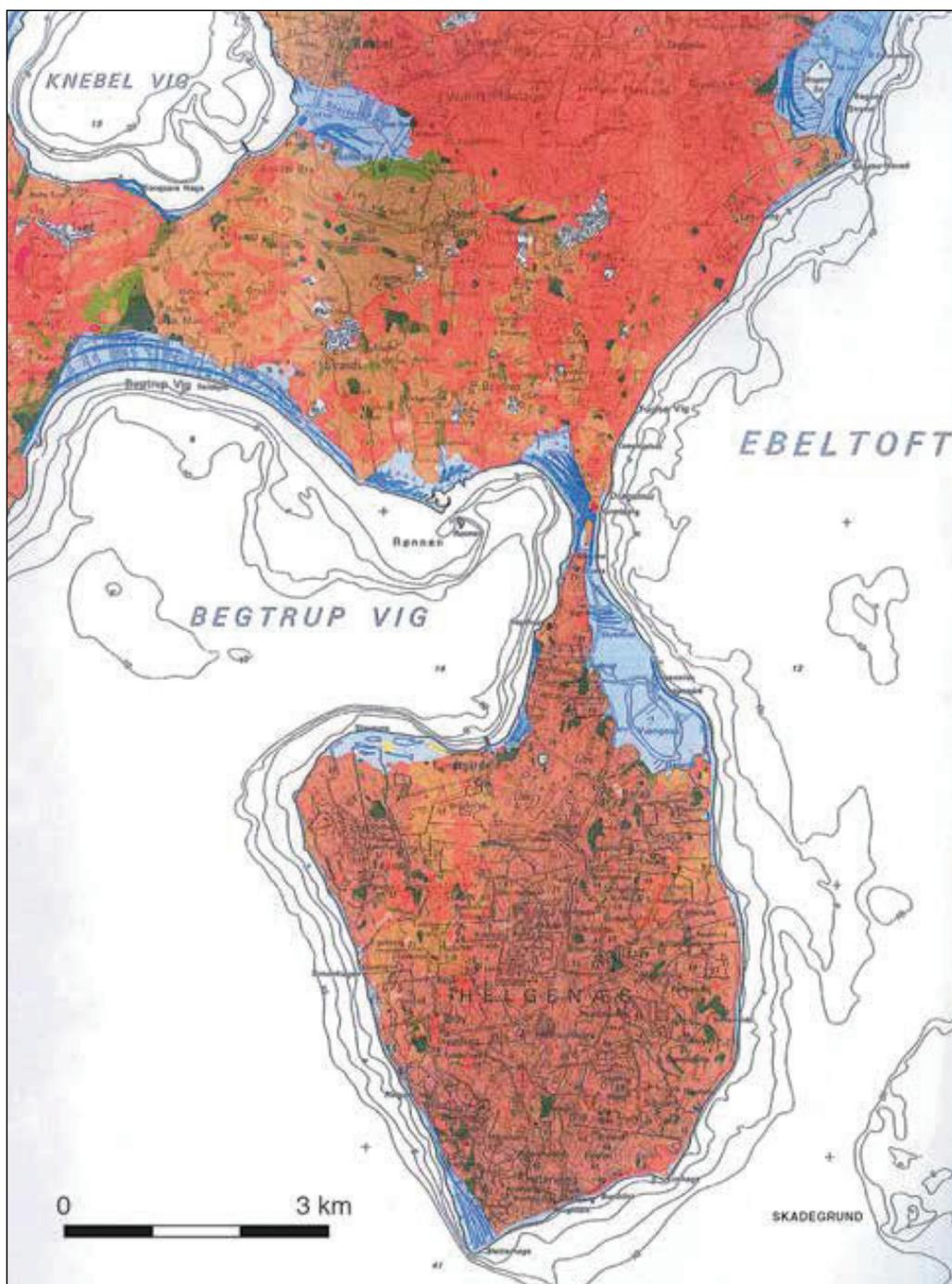


Fig. 2. Soils map for Helgenæs and the southern part of Mols. Marine deposits, raised seabed and beach ridges are shown in blue. Fluvio-glacial sand and gravel are shown in dark brown and red, till is shown in light brown. Freshwater deposits are shown in green. Reproduced with permission from GEUS, Copenhagen.

In prehistory, Helgenæs was at various times (depending on the sea level) separated from, or joined on to, the southern part of Mols by a narrow strip of land running north-south called “Draget”, which consists of several small islands and a system of beach ridges. The islands have steep erosion slopes to the west and, especially, to the east, towards Ebeltoft Vig.

Vængesø must originally have been an open lagoon facing out towards Ebeltoft Vig, but during the course of the Atlantic period, a system of beach ridges developed from north and south, gradually transforming it into a lagoon or sack-shaped inlet. Archaeological investigations at the Vængesø settlements show that the highest sea level must have been c. 3.9-4 m a.m.s.l., which is consistent with the geological estimate mentioned above. For the history of Vængesø over the last 300-400 years, reference is made to a recent account by Vedsted (2014, 38-51). Central to this story is the draining of the area for agriculture in the 19th and 20th centuries. Water recently returned to Vængesø when the area was converted into a freshwater lake – a nature reserve for birdlife.

The Vængesø basin (Fig. 3) is oval in outline with its greatest length (1-1.5 km) in a north-south direction, while its width (to the south) is c. 0.8 km. In the Stone Age it held a small bay or lagoon, the southernmost part of which was cut off and closed towards Ebeltoft Vig by a c. 1 km long barrier. This was formed of two small islands linked by an extended beach ridge connected to Helgenæs to the south. The archaeological evidence shows that this beach ridge must have been formed in Early Atlantic times. To the northeast, there was a c. 1 km wide opening out towards Ebeltoft Vig. This explains the presence opposite this opening, on the ENE coast of Helgenæs, of a high, steep fossil erosion slope, while further to the south, where the coast was more protected by the aforementioned small islands and the beach ridge, the coastal slope quickly reduces in height and becomes less steep. The Core Archive at GEUS (Geological Survey of Denmark and Greenland) contains geological descriptions of a number of cores taken in and around Vængesø, which reveal series of marine deposits of as much as 7-10 m in

thickness. The inlet must therefore have been of considerable depth in the Stone Age, and even though Vængesø was partially closed towards Ebeltoft Vig at this time, it must nevertheless have contained seawater that was sufficiently fresh and nutrient-rich for oyster banks to be formed within it. The presence of kitchen middens has been established in at least five or six locations, with oysters constituting the dominant species. There must therefore have been at least one or more shell banks in Vængesø where Stone Age people could gather these marine invertebrates.

In the Stone Age, the area must have resembled present-day Stavns Fjord and Besser Rev on Samsø. Along the shores of the Vængesø bay/lagoon are between eight and ten coastal settlements from the Mesolithic and Neolithic. These relate in particular to the final part of the Ertebølle culture, but in a few places there are also finds from the slightly earlier Middle Ertebølle period. Further to these are several localities with evidence of Neolithic settlement – especially from the Early Neolithic Funnel Beaker culture. These sites have the character of either kitchen middens (eight examples) or coastal settlements with no shell deposits (the remainder; Fig. 3). Common to all of them is that they are (with the exception of Vængesø III) small in area relative to Ertebølle sites seen elsewhere in Jutland (see Tab. 8). In addition, a large number of axes (core, flake and greenstone axes) have been collected over the years from littoral areas bordering Vængesø and the nearby coast (Fig. 167). Archaeological excavations were carried out at four localities (all kitchen middens) between 1973 and 2005 (Fig. 3). The other localities have not been archaeologically investigated but their existence has been demonstrated by surface collection of artefacts or by test pitting. From a rather wider perspective, it should be pointed out that a number of further Ertebølle settlements have been localised within a short distance of Vængesø, several of which are (archaeologically) contemporaneous with the localities associated with the Vængesø lagoon (see Fig. 3).

Within a 5 km radius of Vængesø today, the proportions of land and sea are c. 37% and 63%, respectively. If this radius is increased to 10 km,

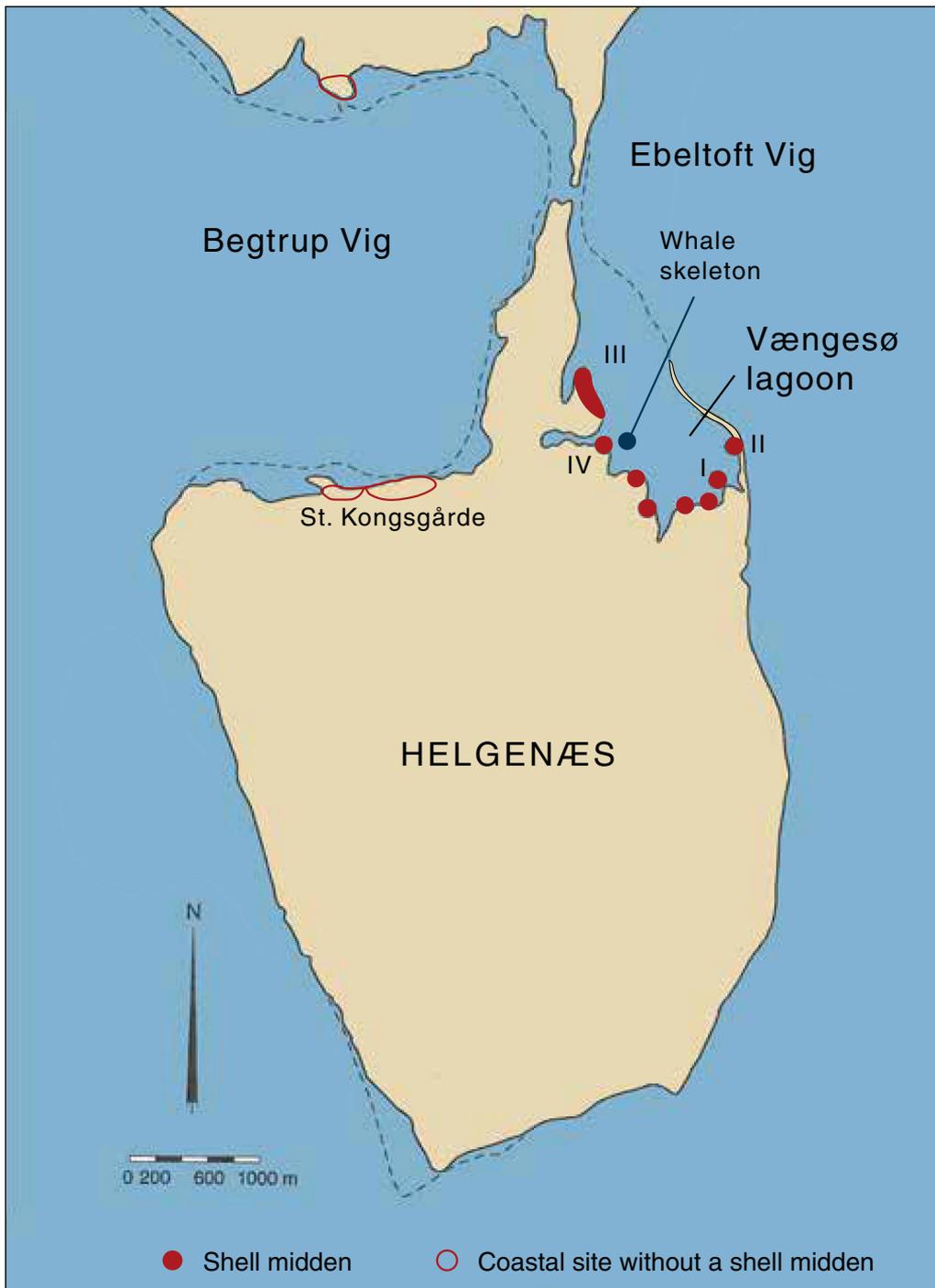


Fig. 3. Map of Vængesø and Helgenæs, showing known Stone Age settlements (predominantly from the Late Ertebølle culture) and the find spot for a whale skeleton dating from the Early Bronze Age.

these proportions change to c. 31% land and c. 69% sea. The situation was probably roughly the same in the Stone Age, as no great changes in land and sea area have occurred since prehistory. This means that two thirds of the local area comprised marine biotopes. The 5 km zone is dominated by shallow coastal marine waters, but the resource area within the 10 km zone also includes open sea, represented by all of Begtrup Vig and Ebeltoft Vig, with water depths of 12-16 m, as well as a large part of southern Mols (Fig. 2). From this, it is clear that marine biotopes must have played an important

role relative to the subsistence economies of these settlements. In topographic and environmental terms, they therefore differ from contemporary Ertebølle coastal sites where marine biotopes generally only constituted around 30-50% of the local area. As a consequence, the Vængesø sites do not match any of the recognised criteria relating to the topographic location of coastal settlements of the Ertebølle culture on mainland and must therefore be more closely associated with the group of localities found on “outer islands” (Andersen, S.H. 1998, 24).

1.2 Research history

A.P. Madsen of the National Museum of Denmark visited Helgenæs in 1897 and undertook a minor excavation in a small kitchen midden on a little holm (former islet) at the southern end of Vængesø (subsequently referred to here as Vængesø I; Fig. 4). This investigation revealed that the kitchen midden consisted of a shell layer with a maximum thickness (at the foot of the holm) of c. 40-50 cm and almost exclusively comprised of oyster shells (*Ostrea edulis*), with a few shells of cockle (*Cerastoderma edule*) and, sporadically, periwinkle (*Littorina littorea*). There was also a good quantity of flint debitage and a number of blades and cores, as well as borers and 17 flake axes, plus a few marrow-split bones. In 1920, the skull of a fin whale (*Balaenoptera* sp.; identified by H. Winge) was found during ploughing about 100 m out in the marine sand and shingle layers off the southwestern shore of Vængesø. The rest of the whale skeleton was not located and excavation conditions did not permit a clear investigation of the finds circumstances. The discovery attracted a good deal of attention because, during excavation of the cranium, some Stone Age tools were found “in the vicinity” (eight flakes and two greenstone axes of Ertebølle type as well as three flakes). It was then (see Ch. 5.5) interpreted as remains associated with the butchering of a stranded whale in Ertebølle times (Nordmann 1936, 127-128). In 1991, the whale skull was radiocarbon dated to 1205-945 BC cal (1 σ ; K-5661: 2890 \pm 80 bp), i.e. the transition between the Early and Late Bronze Age. This showed that there was no chronological association between the whale skull and the Ertebølle tools found nearby (information on the date kindly provided by P.V. Petersen, National Museum of Denmark).

The numerous settlements that now lie beneath the arable fields of the Vængesø area have attracted the attention of many amateur archaeologists, and market gardener Poul Poulsen, of Borup on Helgenæs, has been particularly active in this respect. Poul Poulsen has carried out extensive field-walking and surface collection of artefacts over the last 20-30 years – predominantly on the

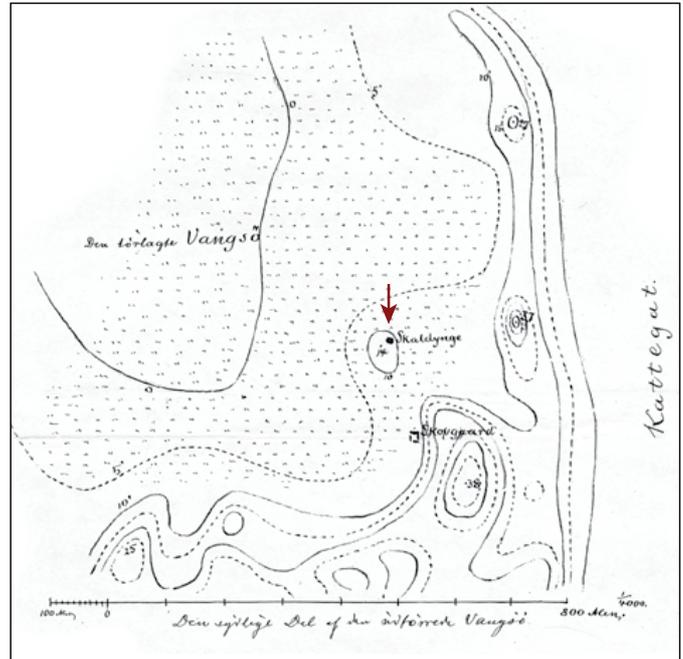


Fig. 4. The southeastern part of Vængesø, showing the Vængesø I settlement (arrowed). After an original from 1897 by A.P. Madsen (in the archives of the National Museum of Denmark).

sites around Vængesø, but also over a large part of northern Helgenæs. These activities resulted in a large collection of archaeological artefacts which is now held by East Jutland Museum. Without fear of exaggeration, it can be said that this area is probably one of the most intensively surveyed areas in Denmark and, in addition to the settlements, a significant number of single finds have been recorded around Vængesø (see Fig. 167).

As the individual Stone Age settlements did not function in isolation, but formed part of social and economic complexes with other settlements, I have found it both relevant and interesting to carry out regional projects aimed at illuminating some of these links, where possible. This work has taken place at Norsminde Fjord (Andersen 1976) and later around the former Bjørnsholm Fjord in northwest Himmerland (Andersen in prep.). Similar investigations have also been undertaken in smaller areas, where the limited size of the localities makes it easier to obtain a sharper picture of settlement function and subsistence economy. This was one of the reasons that Vængesø was selected as a suitable area for an investigation of the aforementioned type.

In addition to the investigation of the whale skull outlined above, archaeological excavations have been undertaken on numerous occasions at several Stone Age settlements: Vængesø I: total excavation of a settlement surface with kitchen midden (excavation in plan by the National Museum of Denmark and Moesgaard Museum in 1974); Vængesø II: excavation of a section trench and settlement sur-

face with kitchen midden (excavation in plan and in section by Moesgaard Museum 1975 and 1979); Vængesø III: excavation of a settlement surface with kitchen midden (excavation in plan by Moesgaard Museum and East Jutland Museum in 1998-2004); Vængesø IV: excavation of three minor sections through kitchen midden (excavation in section by Moesgaard Museum in 1976).