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Marine 3-D seismic investigation of a late Ertebølle settlement in Wismar Bay (SEAMAP-3D case study)

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Advances in personal computer and GPS technology in the last decade moved marine seismic 3-D technology into reach of engineering and archaeological geophysics. We have developed a very high resolution 3-D seismic system that allows for fast, large scale and routine archaeological prospection in very shallow water (> 0.5 m).

We present a case study based on results from the youngest survey conducted off the western shore of Poel Island (Wismar Bay, Mecklenburg Western Pomerania, Germany): Since 1998 investigations on Stone Age settlements took place in this area discovering more than 20 new sites with different degrees of preservation. These are submerged due to sea level rise in the Baltic Sea. The investigation focussed on "Timmendorf-Nordmole I", a coastal settlement of the late Ertebølle culture. The subsistence was based mainly on marine resources, well-documented by e.g. bone points of fishing spears, fragments of log boats and a large number of fish bones, sea mammals and birds. Accelerator radiocarbon dates of e.g. wooden implements show that the site dates to the period from 4400 until 4100 calBC.

Seismic horizons document the slightly sloping sandy seafloor sheeting abraded glacial till towards the shore. Seawards the till constitutes a system of synclines. Sedimentary infill suggests a limnic environment until inundation. Several local anomalies are caused by biogenic gas rising from organic layers covering the deeper till. Disturbance of the seafloor horizon and scattering coda clearly indicate former excavation pits. We also identified shallow anomalies of unknown origin (depth $<$ 1m) that show an undisturbed seafloor.