

Stratigraphic correlation for the IODP Expedition 347 – toward an integrated Baltic Sea Basin stratigraphy

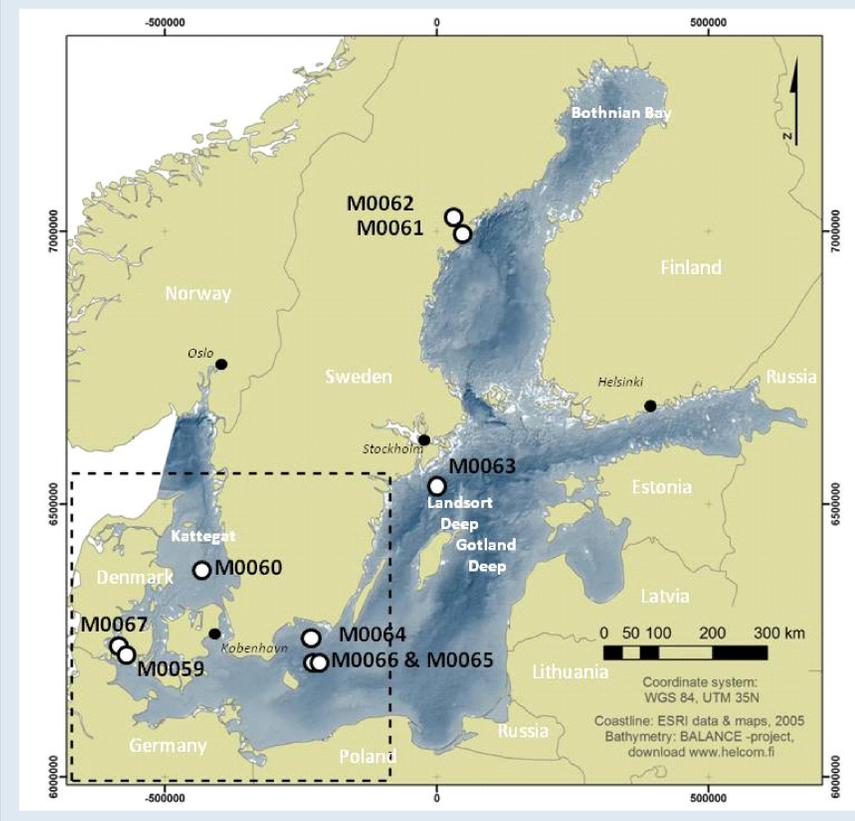
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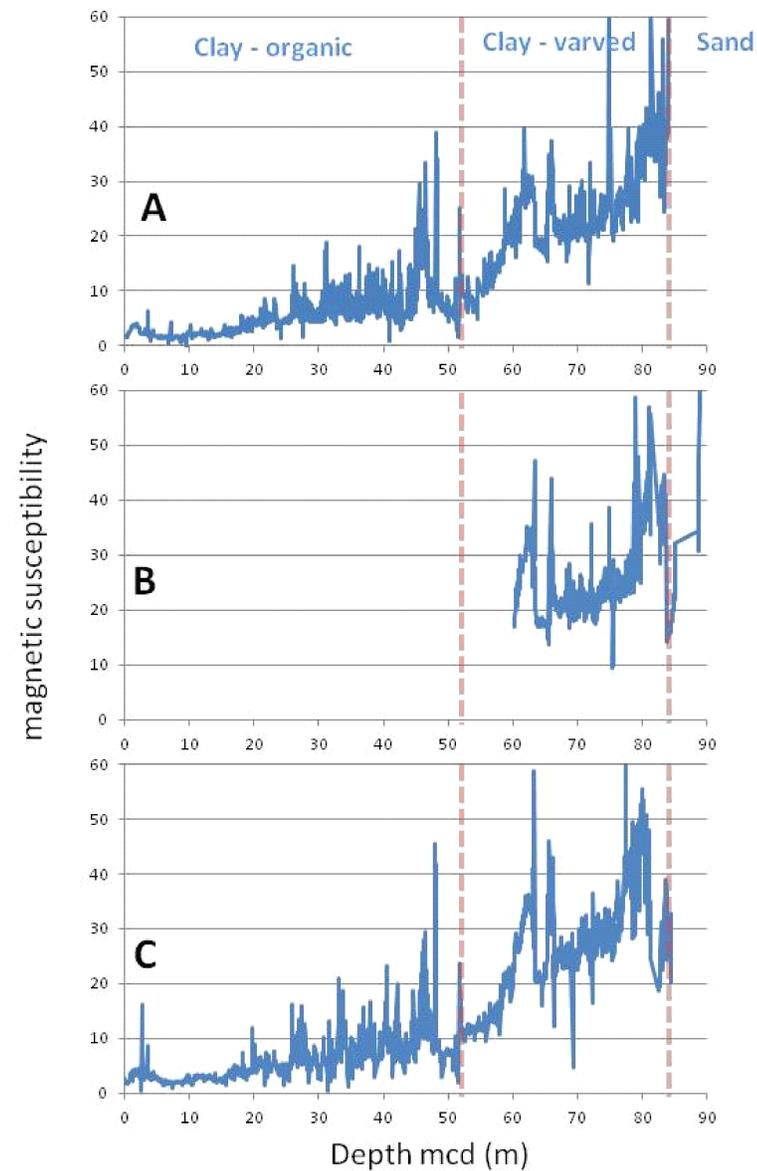
The IODP Expedition 347

The IODP Expedition 347 – “Baltic Sea Paleoenvironment” completed in September – November 2013 (offshore phase) was the 5th and the final mission-specific platform (MSP) expedition of the Integrated Ocean Drilling Program. The onshore phase of the expedition was completed in January – February 2014. The expedition used a geotechnical drillship, the Greatship Manisha equipped with a Geoquip Marine coring rig, to core and wireline-log several sub-basins within the Baltic Sea, aiming to produce new information on the history of the Baltic Sea and climate change during the last glacial cycle.

During the IODP Expedition 347 – altogether over 1900 meters were successfully drilled at 9 Sites (M0059 - M0067) in the Lille Belt, Kattegat, Ångermanälven Estuary, Landsort Deep, Hanö Basin and Bornholm Basin with core recovery of 1622.76 m (expansion adjusted core recovery of 91.46%).



M0059



Magnetic susceptibility, Site M0059 (Holes A, B and C)



The Greatship Manisha

Stratigraphic correlation

Stratigraphic correlation consisted of: (1) ensuring the maximum core recovery on site, (2) seismic-core (sedimentary facies) correlation and (3) generating composite depth scales and splice records to each site. Correlation between seismic profiles and cores used a simple estimation sound velocity vs. sediment type. Acquired depth was tested by comparison with major core surfaces, downhole logs, and the Multi-Sensor Core Logger (MSCL) data (density and magnetic susceptibility). The data integration required preliminary interpretation of sedimentary units, seismic velocity values measured for each unit and comparisons with physical property boundaries.

To obtain a complete sedimentary record, multiple adjacent holes were cored with an offset in depth of 0.5-1.5 m between cores from different holes. The continuity of recovery was assessed by generating composite sections that align prominent features in physical property data from adjacent holes. With the information gained from Fast Track Multi-Sensor Core Logger (MSCL) data, it was possible to adjust the coring plan before moving to a new hole, to ensure that intervals missing in previous cores could be recovered from an adjacent hole.

To align similar features in physical (geological) properties between different holes (or even different sites), MSCL physical property measurements were correlated (using Correlator software), to create a composite depth (mcd) scale. When possible, the mcd scale was checked against downhole logging data. Splice records were generated by selecting sections from adjacent holes to avoid core gaps or disturbed sediment, resulting in a continuous record. This formed the basis for onshore sediment sampling and post-cruise research.