



Weichselian ice dynamics in the SW sector of the Baltic Sea

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Significant progress was made in dating of Weichselian sediments in the south-western sector of the Scandinavian Ice Sheet (SIS) in Sweden, Denmark and Germany. Most ages are based on luminescence dating of glaciofluvial and glaciolacustrine sediments, and cosmogenic nuclide exposure dating of glacial boulders. The increasing number of numerical data gives new insights into the timing of various glacial, glaciofluvial and glacial processes (Hughes et al., 2016). In Germany, the traditional names of ice advances like Brandenburg, Frankfurt and Pomeranian advance pretend a synchronous formation of ice marginal positions over some distance, not taking into consideration the varying ice dynamics at the distal part of the SIS. In this study, we review existing data and present a revised model of Weichselian ice dynamics in the SW sector of the Baltic Sea.

During the early MIS3, according to the present knowledge, the Ellund-Warnow advance marks the first expansion of glaciers during the Weichselian into the SW Baltic Sea area. But it is only lithostratigraphically documented in western Mecklenburg and in parts of Schleswig-Holstein.

During late MIS 3, the ice attained the maximum extent within the Oder lobe (Brandenburg advance) and reached into Denmark (Klintholm advance) (Hardt et al., 2016). Nevertheless, there is no evidence that Bornholm, the Rønne Bank as well as Rügen were overridden by ice at that time; instead glaciofluvial and glaciolacustrine sediments were deposited in ice dammed lakes. The area shaped by the maximum ice advance of the Oder lobe, dated to 32-28 ka, is mainly characterized by meltwater sediments and erosional channels, which are in accordance with the assumption of a fast flowing ice of an outlet glacier. Distinct terminal moraines are missing. Thus, various sedimentary environments existed in close neighborhood in the southwestern Baltic Sea basin and the surrounding areas, shedding new light on ice dynamics.

The ice advance in correspondence with the global LGM at about 22-20ka, named Pomeranian advance in NE Germany, (Lüthgens & Böse 2011, Lüthgens et al. 2011), was likely characterized by slower moving ice, which can be deduced from the boulder-rich and distinct end moraines in northern Brandenburg, Mecklenburg-Vorpommern and in Schleswig-Holstein. Isochronic ice cover is also documented in the Baltic Sea basin and Denmark.

The configuration and dynamics of the SIS in its southwestern part was therefore very different during the MIS 3 and MIS 2 ice advances, influenced by climatic parameters, and the topography of the Baltic Sea basin and adjacent areas.

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