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Lacustrine sediments at Kriegers Flak, southwestern Baltic Sea, and its implications for the MIS 3 glaciation history in southwest Scandinavia

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The glaciation history of southwestern Scandinavia during Marine Isotope Stage 3 (MIS 3 60-25 ka BP) is not fully understood, especially not the timing and maximum ice extent of glacial advances through the Baltic depression. In this study, sediment cores from Kriegers Flak in the southern Baltic Sea have been analyzed and subdivided into four lithostratigraphic units. Above the Cretaceous limestone is a lower diamict succession, which is followed by the Kriegers Flak beds, a *c.* 10 m thick clay sequence with occasional organic deposits, including peat. On top follows an upper diamict succession interlayered with sorted sediments and overlain by an upward coarsening sequence with molluscs. The Kriegers Flak beds contain thin beds of organic deposits, gyttja and peat, in the middle part of the sequence, and radiocarbon ages of 34-35 ^{14}C kyr BP (*c.* 39-41 cal kyr BP) from such organic horizons indicate that the Kriegers Flak beds were deposited during the middle part of MIS 3. The shift from clay to peat and back to clay suggest that this part of the Baltic was a lacustrine basin with markedly fluctuating water levels. Such a basin would not exist if the Baltic basin was connected to the Kattegat through an open Esrum/Alnarp valley as has previously been suggested. Here an alternative model is presented: the Esrum/Alnarp valley was initially closed during the middle part of MIS 3 causing a damming of the Baltic basin and only later opened by glacial erosion, probably by the Klintholm advance that streamed through the Baltic. The new findings from Kriegers Flak strengthen the concept of a very dynamic Scandinavian Ice Sheet during the last glaciation, with repeated advances during MIS 3.