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Late Quaternary ice sheet extents in northeastern Germany inferred from surface exposure dating

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We determined in situ cosmogenic ^{10}Be ages for 11 boulders on the Hoher Fläming ice marginal belt and 5 boulders on the Gerswalder Moraine, a recessional moraine of the Pomeranian Phase in northeastern Germany. Samples were processed and analysed at the Laboratoire National des Nucléides Cosmogéniques, France. Surface exposure ages were calculated using the CRONUS-Earth online ^{10}Be exposure age calculator and a constant production rate model. No corrections were made for erosion or possible snow cover.

Previous time estimations for the deposition of these moraines along the southern margin of the Scandinavian Ice Sheet (SIS) are mostly based on geomorphology and stratigraphy, and on few radiocarbon dates and three recently published surface exposure ages (using cosmogenic ^{10}Be) in the case of the Pomeranian Phase.

Our new exposure ages range from 21.2 $\pm$ 1.6 ^{10}Be ka to 136.1 $\pm$ 7.4 ^{10}Be ka for the Hoher Fläming ice marginal belt. The wide range of exposure ages may reflect episodic ice marginal belt modification due to intensified erosion by meltwater channeled in the Baruther Urstromtal, accompanied by long-lasting denudation processes like solifluction and aeolian deflation. For the Gerswalder Moraine, our exposure ages range from 12.0 $\pm$ 0.7 ^{10}Be ka to 15.5 $\pm$ 1.1 ^{10}Be ka. Excluding the youngest sample (BER-97-03), we calculated an error-weighted mean age of 14.9 $\pm$ 0.6 ^{10}Be ka (n = 4), in good agreement with previously published data. These results further establish the position of the southern margin of the SIS in northeastern Germany during the Gerswalder phase a recessional phase of the Pomeranian Phase.