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Reconstruction of the White Sea Basin during the late Younger Dryas

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The palaeoenvironments of the White Sea Basin in Northwestern Russia during the late Younger Dryas are poorly understood and partly controversial. To shed light to this problem the glaciofluvial plains and shorelines in the Kalevala End Moraine, west of the White Sea, were studied using geomorphological, sedimentological and ground penetrating radar survey methods. Using these data, the shoreline gradient for the area was determined. The gradient was then used to numerically reconstruct the palaeotopography and the volume and the area of the White Sea Basin during the late Younger Dryas ca. 11500 years ago.

The results indicate that at three sites out of four the glaciofluvial plains represent Gilbert type deltaic sedimentation. These deltas, located several kilometres from each other, formed during the same water level. The numerical reconstruction shows that using the shoreline gradient 0,42 m/km the water body in the White Sea Basin was extensive and relatively deep. The currently onshore areas on the western side of the White Sea and Arkhangelsk area were flooded during the late Younger Dryas. The ice margin terminated partly in the White Sea and partly on dry land. According to the reconstruction the White Sea was connected to the Barents Sea via the Gorlo Strait and separated from the Baltic Basin.