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Reconstruction of maximum LIA extent and 20th century volume loss of maritime outlet glaciers, SE – Iceland

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Abstract – Kvískerjajöklar outlet glaciers cover the upper eastern flanks of Öræfajökull stratovolcano, Southeast Iceland. These maritime temperate glaciers have recessed dramatically since their maximum Little Ice Age (LIAmax) extent, from an area of ∼10 km2, to 6.4 km2 in 2010, i. e. ∼37%, an annual average recession rate of 0.03 km2/yr. We estmate the volume loss by subtraction of glacier surface maps. The LIAmax surface map was constructed from geomorphological in-field evidences of the former glacier margins, supported by 1904 topographical maps, aerial photos and maps of 1945, a LiDAR high resolution elevation model from 2010–2011 and various historical documents. The lower part of the LIAmax glacier was reconstructed by a simple ice flow modeling (Glacier Reconstruction Tool (GlaRe) in ArcGIS, by Pellitero et al. (2016). We estimate the volume loss from the 1890 LIAmax to 2010 as 0.47 km3 water equivalent (w.e.) This correspond to an annual average recession of 0.004 km3 w.e. or specific mass loss of 0.5 m/yr.