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# A 100-year long record of alkenone-derived SST changes by Southeast Greenland

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Sediment core ER07 from Sermilik Fjord by Helheim Glacier in Southeast Greenland was analysed for alkenones to document sea surface temperature (SST) changes over the past 100 years. The alkenone SST values, ranging from 8 to 12°C, contrasts with colder values (0-4°C) obtained from recent hydrographic surveys inside the fjord. We suggest that advection of allochtonous alkenones produced in the warm Irminger Current waters circulating on the shelf likely accounts for this difference. The temperature range of the alkenone-derived record is similar to in situ observations of 8-11°C on the shelf just outside Sermilik Fjord, and its variability over the past 100 years resembles the constructed variability over the shelf using remote instrumental data. This suggests that oceanographic changes on the adjacent shelf are linked to regional changes of the Irminger Current and the East Greenland Current. The subsurface water heat content has previously been suggested as an important control on Greenland outlet glacier stability and underlined by an episode of warm subsurface waters $\sim$ 1940 concurrent with markedly increased calving and retreat of Helheim Glacier. Our results therefore suggest that alkenone-derived SST time series from high-sedimentation rate glacial fjords may provide a new approach for reconstruction of past changes of shelf water properties and variability around Greenland.