Supplementary material

This file contains the supplementary figures noted "Supplement Fig. S1 to S8" in the main body of this paper.
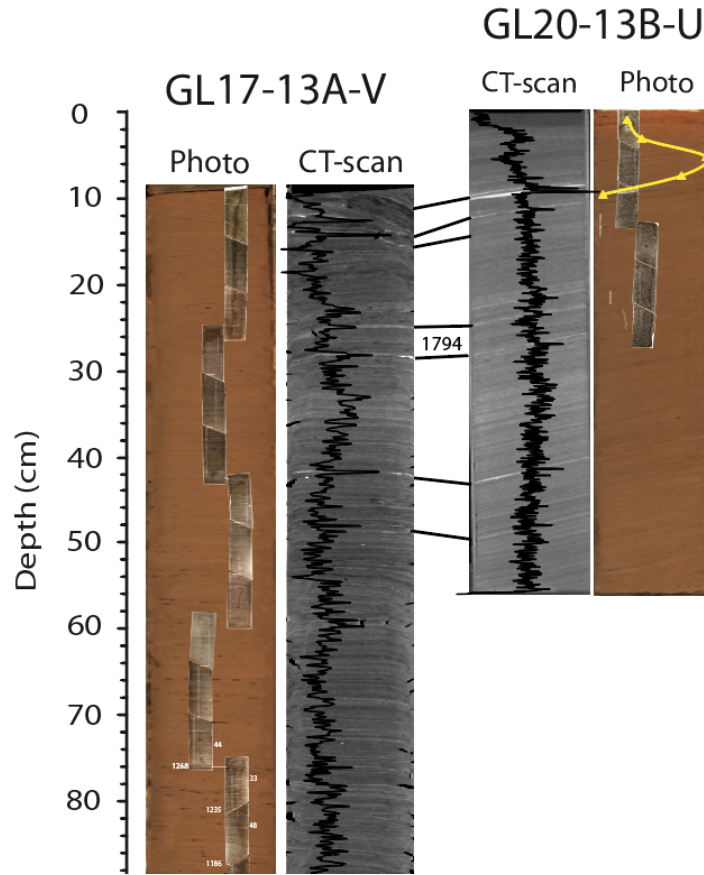
Figure S1. Photographs and CT-scans of the two cores GL-17-13A and GL20-13B. Black lines are the stratigraphic correlations between the two cores established using thick (coarse) distinctive laminations present in both cores. Photographs of the cores are overlapped with scans of thin sections made to counts and measure the varves in these sections. The yellow profile is ^{137}Cs activity variations.

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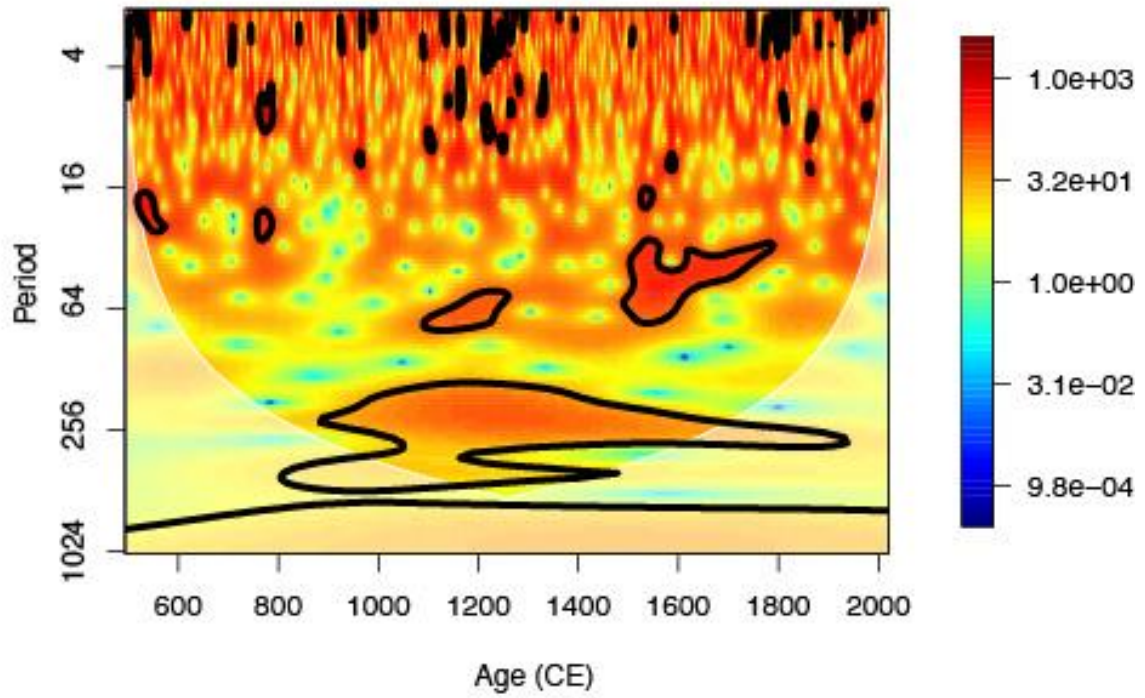
15 **Figure S2. Wavelet analysis on the log-normal varve thickness at Grand Lake showing two periods of greater**
16 **multidecadal variability around 1050-1250 C, and 1500-1800 CE.**

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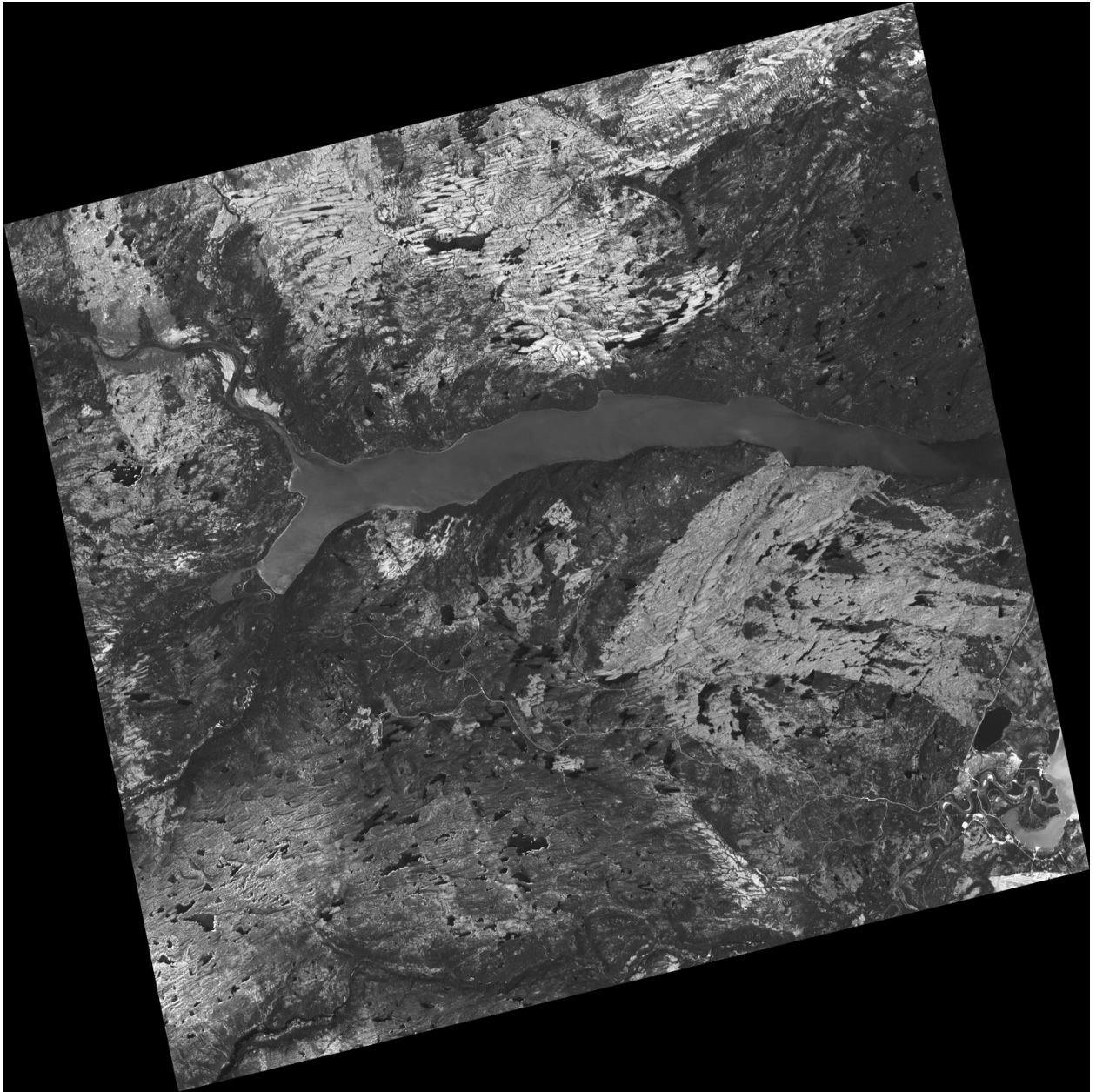
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19   **Figure S3. Satellite SPOT-4 image of Grand Lake on May 25, 2006, during the spring discharge condition.**
20   **(http://ftp.geogratis.gc.ca/pub/nrcan_rncan/image/spot/geobase_orthoimages/s4_06040_5339_20060525/s4_0604**
21   **0_5339_20060525_p10_lcc00.zip)**

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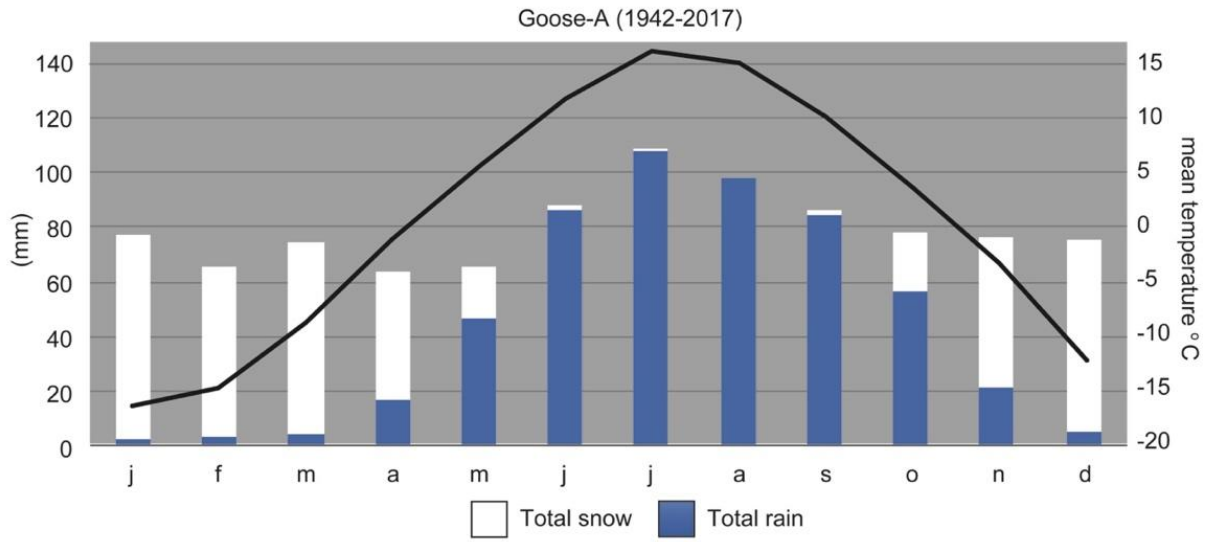
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24   **Figure S4. Climograph for the Goose A weather station (8501915).**

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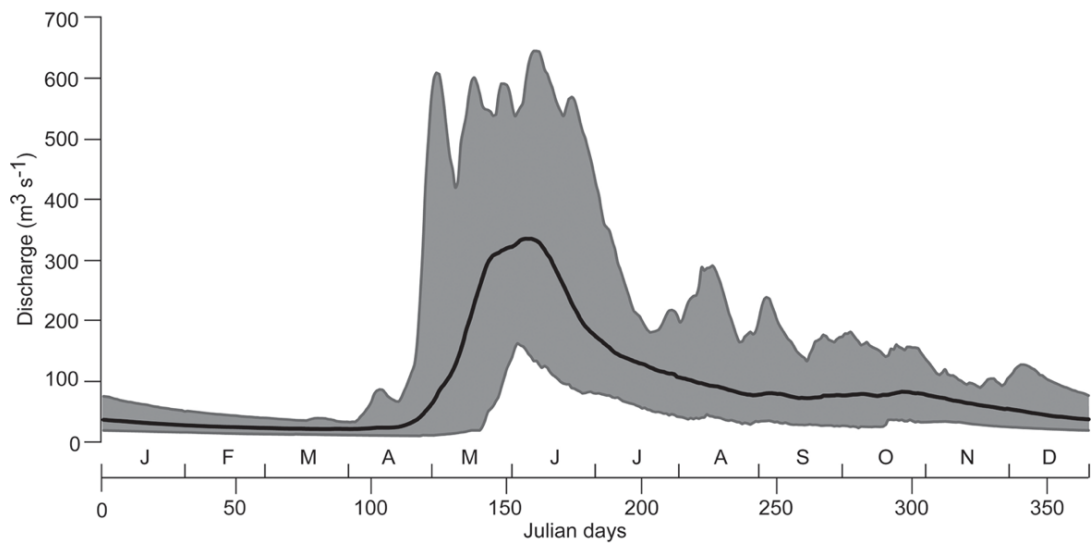
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27   **Figure S5. Observed mean daily discharges of the Naskaupi River (hydrometric station 03PB002) for the 1978–**
28   **2012 period (black line). The grey zone represents the minimum and maximum observed discharges. From**
29   **Gagnon-Poiré et al. (2021)**

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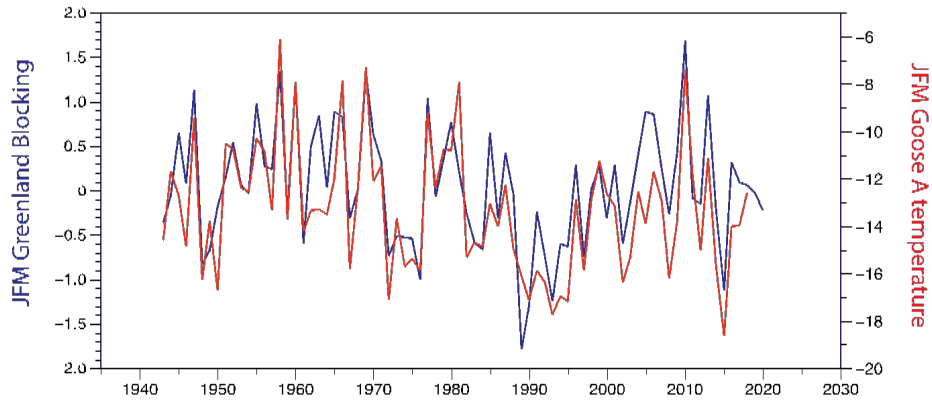
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38 **Figure S6. Correlation between the JFM Greenland Blocking index (Hanna et al., 2016) and Goose A temperature.**

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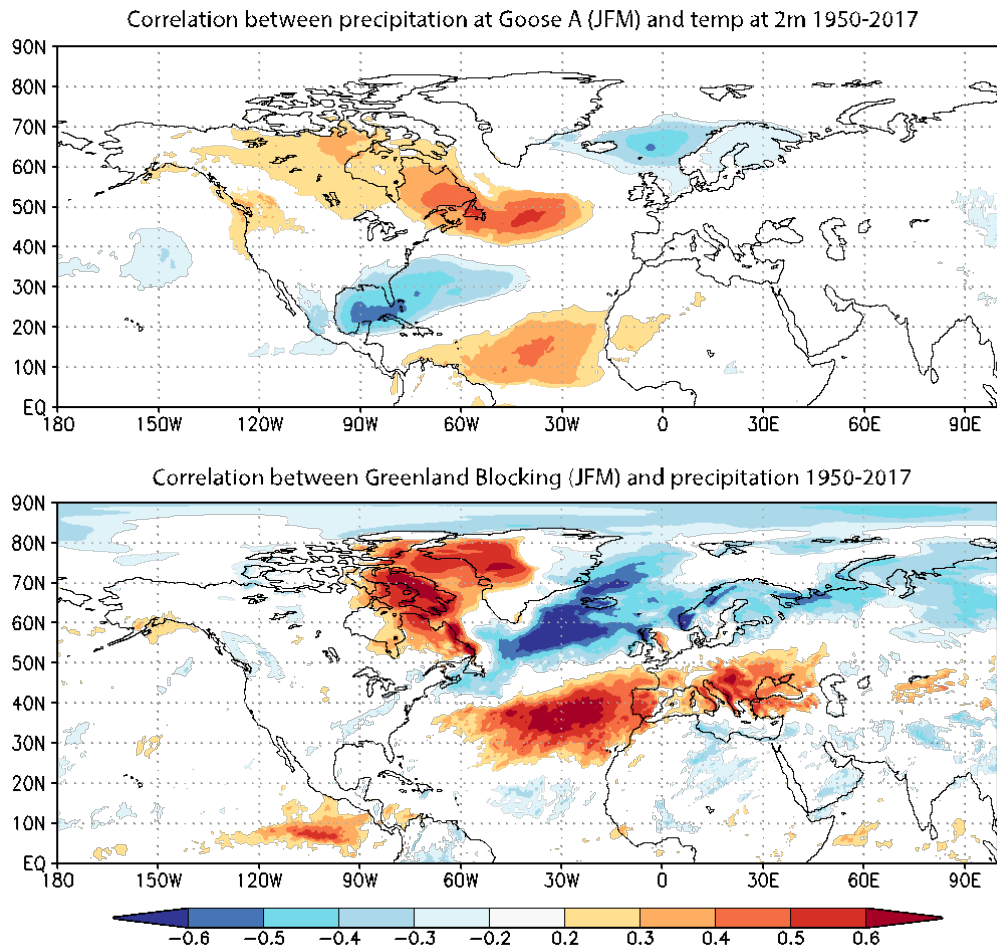
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42 **Figure S7. Greenland Blocking index correlated to temperature (above) and precipitation (lower). The region of**
43 **Labrador is markedly influenced by the GBI.**

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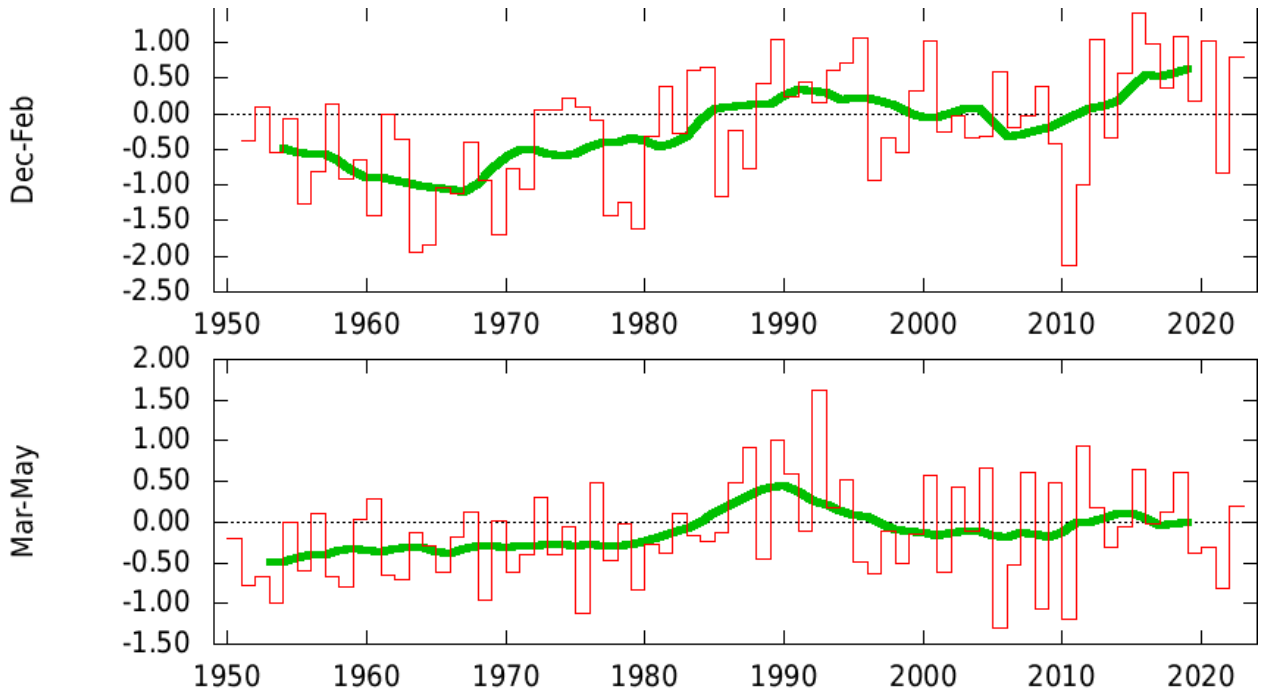
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49 **Figure S8. Winter North Atlantic Oscillation Pattern since 1950. The thick green line is a 10-year running average.**