



Supplement of

A new 1500-year-long varve thickness record from Labrador, Canada, uncovers significant insights into large-scale climate variability in the Atlantic

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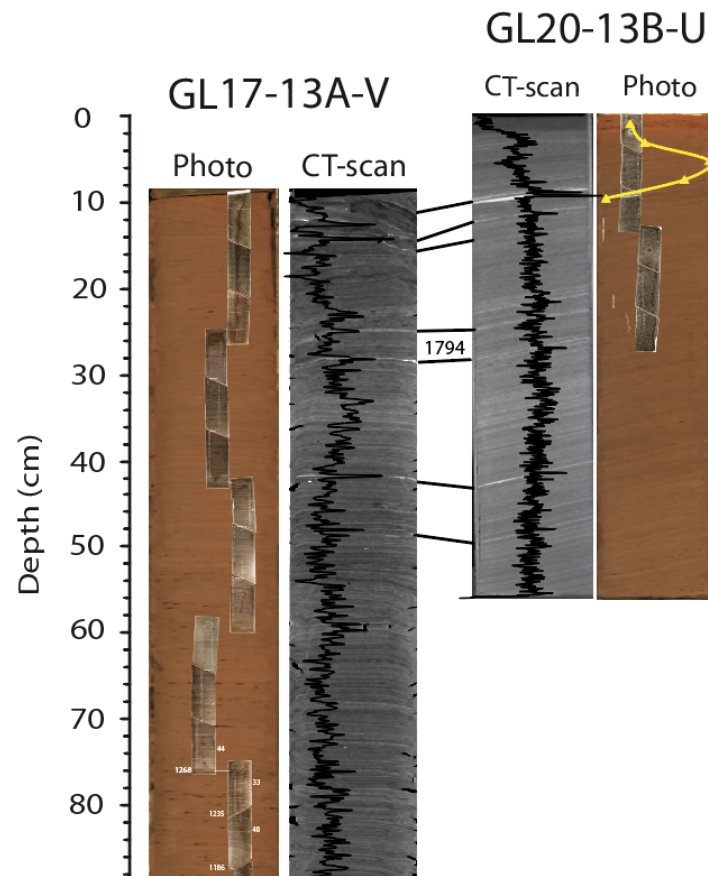


Figure S1: Photographs and CT-Scans of the two cores GL-17-13A and GL20-13B. Black lines are the stratigraphic correlations between the two cores established using thick (coarse) distinctive laminations present in both cores. Photographs of the cores are overlapped with scans of thin sections made to count and measure the varves in these sections. The yellow profile is ^{137}Cs activity variations.

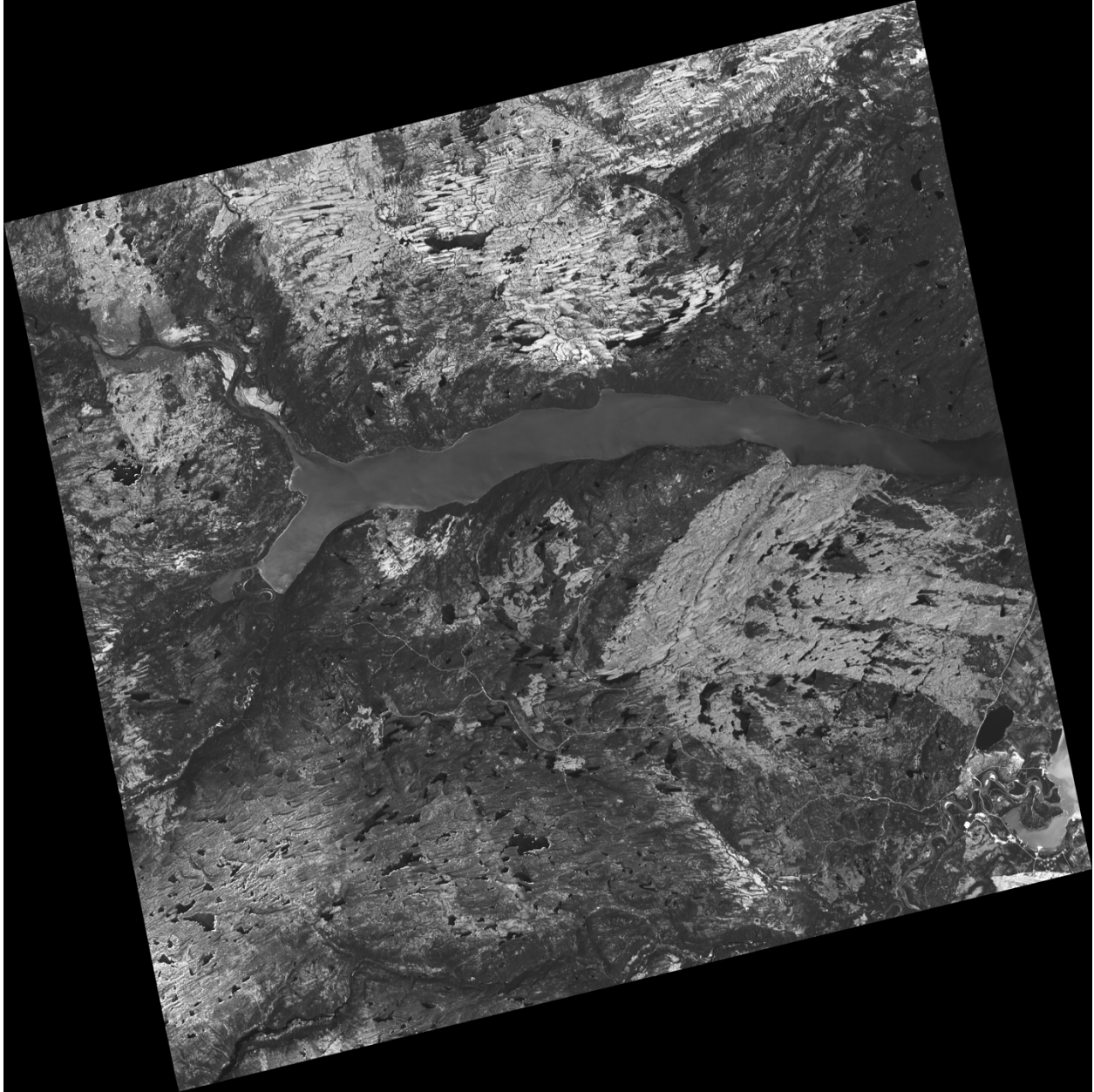


Figure S2: Satellite SPOT-4 image of Grand Lake on May 25, 2006, during the spring discharge condition. (http://ftp.geogratis.gc.ca/pub/nrcan_rncan/image/spot/geobase_orthoimages/s4_06040_5339_20060525/s4_06040_5339_20060525_p10_lcc00.zip)

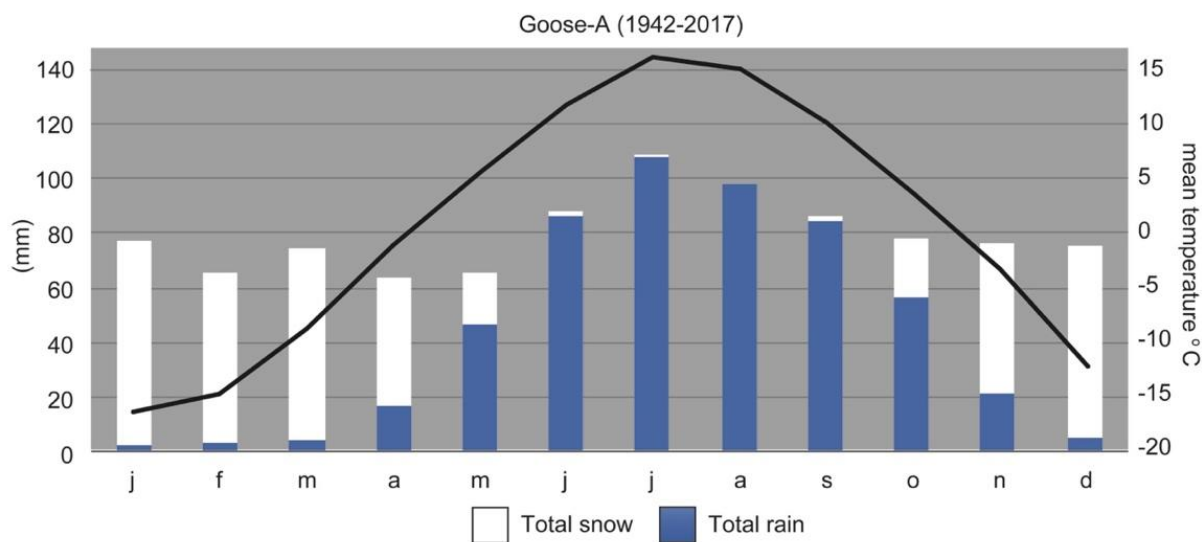


Figure S3: Climograph for the Goose A weather station (8501915).

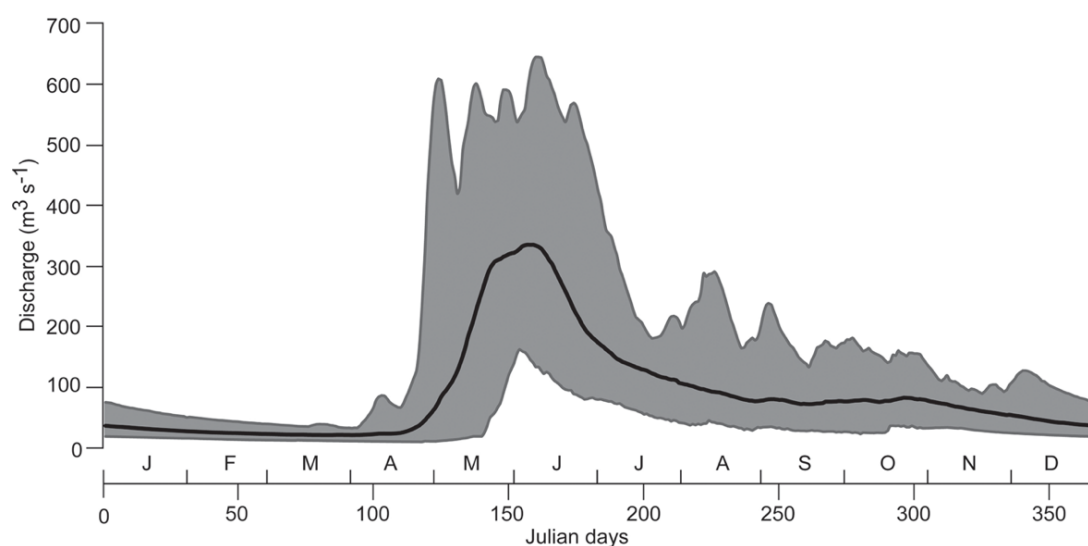


Figure S4: Observed mean daily discharges of the Naskaupi River (hydrometric station 03PB002) for the 1978–2012 period (black line). The grey zone represents the minimum and maximum observed discharges. From Gagnon-Poiré et al. (2021)

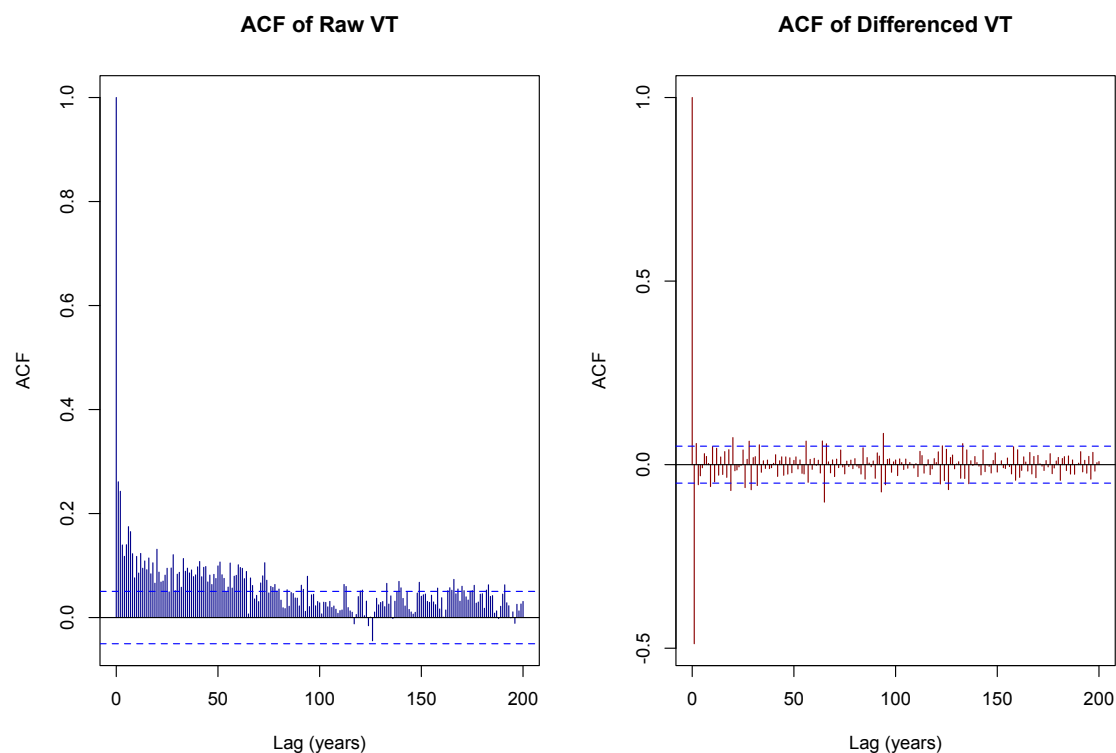


Figure S5: Autocorrelation functions (ACF) of the original and differenced varve thickness (VT) record from Grand Lake over the past 1,500 years. The ACF of the original VT series (left panel) shows positive autocorrelation at short lags, with values remaining above the 95% confidence bounds at least until 60 years lag. This indicates the presence of low-frequency persistence, likely related to long-term climate variability. In contrast, the ACF of the first-differenced VT series (right panel) displays values that mostly fall within the 95% confidence bounds, consistent with white noise. This suggests that the autocorrelation observed in the original series is primarily driven by long-term trends rather than cyclic behaviour.

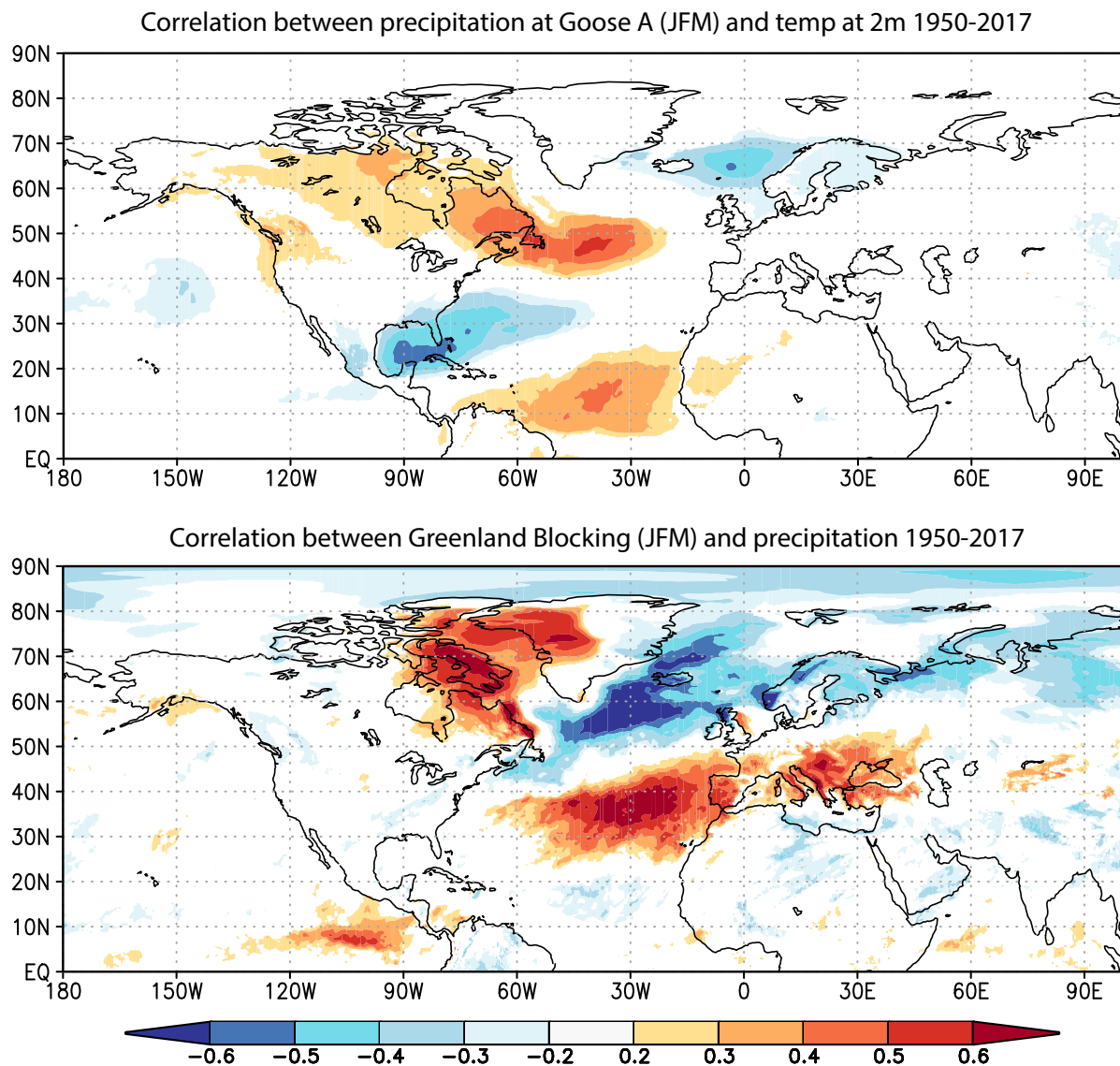


Figure S6. Greenland Blocking index correlated to temperature (above) and precipitation (lower). The region of Labrador is markedly influenced by the GBI.

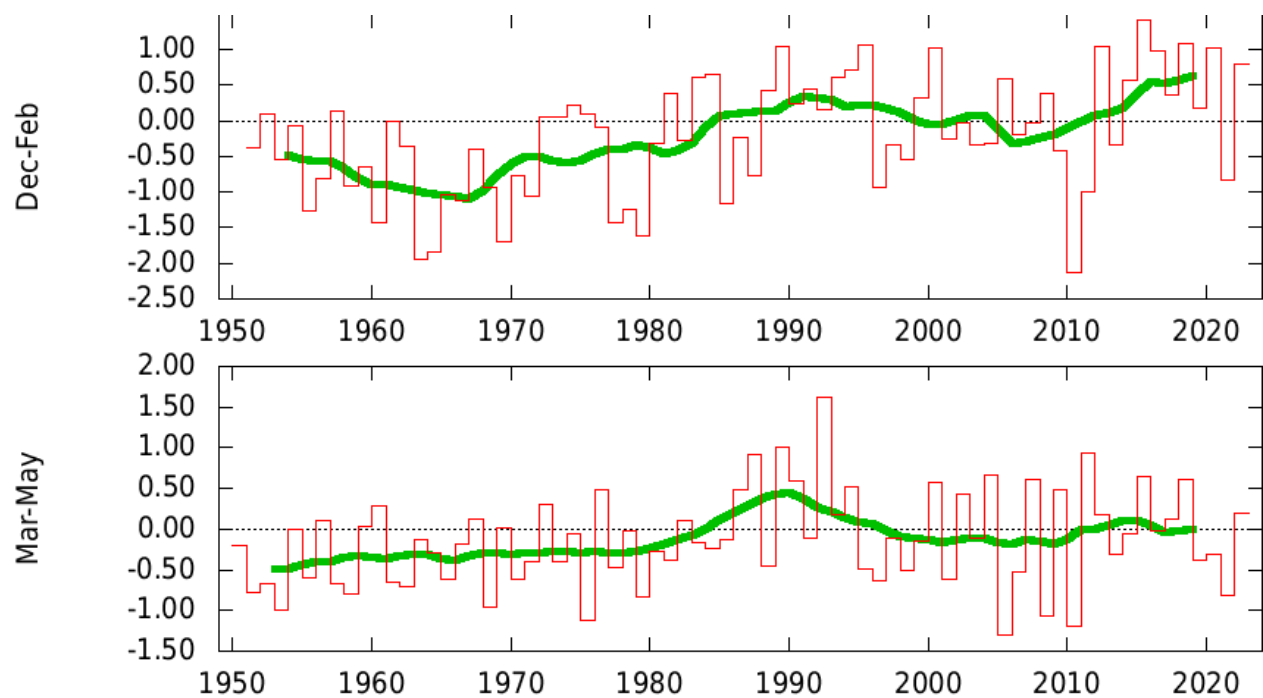


Figure S7. Winter North Atlantic Oscillation Pattern since 1950. The thick green line is a 10-year running average.