

acknowledgements (1.) frequency analysis as presented in Figure 5, but with the Hanning window function as provided by the PAST software to analyse the impact of the chosen windowing technique on the resulting frequencies.

(2.) 70 year running mean of the modeled calving flux ($\text{m}^3 \text{s}^{-1}$) from the calving sites at the respective regions; (a) North Greenland: Lon: $70^\circ \text{W} - 0^\circ \text{E}$, Lat: $80^\circ - 85^\circ \text{N}$; (b) North-East Greenland: Lon: $25^\circ \text{W} - 0^\circ \text{E}$, Lat: $70^\circ - 80^\circ \text{N}$; (c) North-West Greenland: Lon: $70^\circ - 50^\circ \text{W}$, Lat: $70^\circ - 80^\circ \text{N}$; (d) South-East Greenland: Lon: $45^\circ - 20^\circ \text{W}$, Lat: $60^\circ - 70^\circ \text{N}$; (e) South-West Greenland: Lon: $60^\circ - 45^\circ \text{W}$, Lat: $60^\circ - 70^\circ \text{N}$; The thick red line displays the ensemble mean of the 5 ensemble members, the thin grey lines correspond to the individual members and the blue line corresponds to the experiment performed without incorporating volcanic eruptions (Same as Figure 7, but for the HIGH(v) (Figure 2) and the LOW(v) (Figure 3) set-up).

(3.) Composite maps of difference between years of enhanced iceberg melt flux ($\text{IMF}(t) > \text{IMF_mean}(t=1, 6000) + 2*\text{stdev}$) and "quiet" periods ($\text{IMF}(t) < \text{IMF_mean}(t=1, 6000) + 1*\text{stdev}$); (a) Iceberg Melt Flux ($\text{m}^3 \text{s}^{-1}$): (b) number of icebergs moving within one grid cell ($\text{nr yr}^{-1} \text{ cell}^{-1}$); non-linear color scheme! Green rectangles correspond to core locations of ??.(Same as Figure 8, but for the HIGH(v) (Figure 4) and the LOW(v) (Figure 5) set-up).

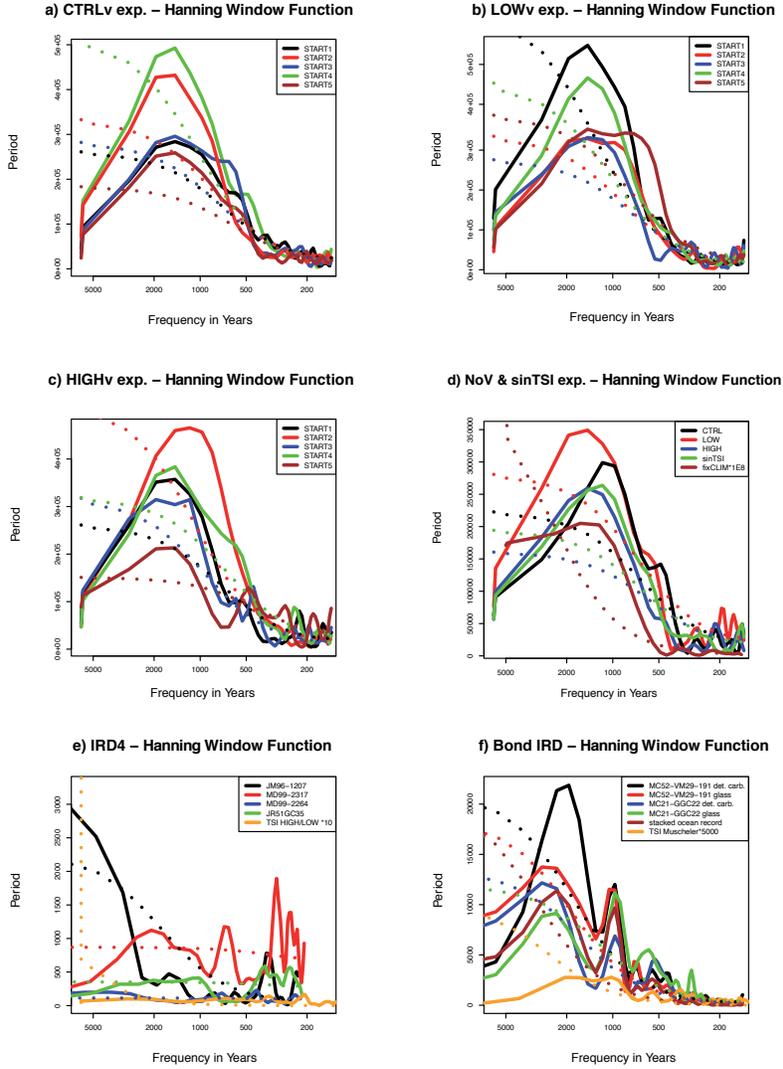


Figure 1: Frequency analysis of model results (70 year mean values because the resolution of the Bond data is 70 years) and IRD data using the PAST software; (a) CTRLv members; (b) LOWv members; (c) HIGHv members; (d) CTRL/LOW/HIGH, sinTSI and fixCLIM experiments; (e) IRD4: cores JR51GC35, MD99-2269, JM96-1205, MD99-2317 and Past4Future TSI reconstruction; (f) Bond IRD: IRD records presented in Figure 2 of Bond et al. (2001) and TSI reconstruction presented in Bond et al. (2001, Fig. 3b); all Bond (2001) data is from ftp://ftp.ncdc.noaa.gov/pub/data/paleo/contributions_by_author/bond2001/bond2001.txt; logarithmic x-axis

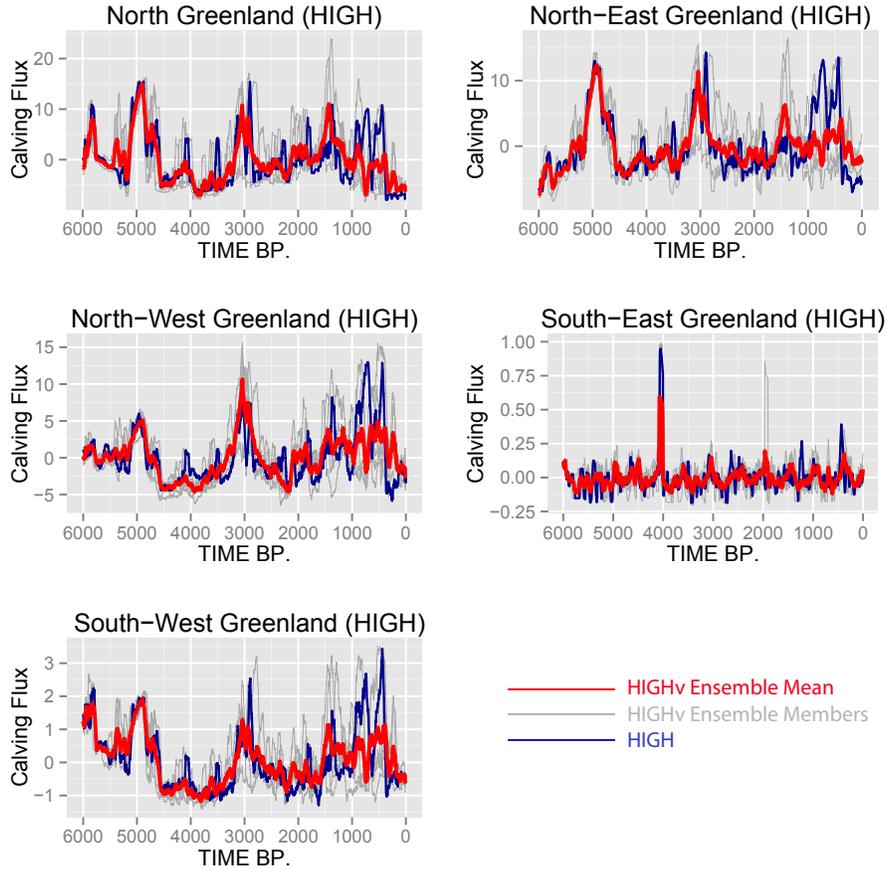


Figure 2: HIGH(v) experiments: 70 year running mean of the modeled calving flux ($\text{m}^3 \text{s}^{-1}$) from the calving sites at the respective regions; **(a)** North Greenland: Lon: $70^\circ \text{W} - 0^\circ \text{E}$, Lat: $80^\circ - 85^\circ \text{N}$; **(b)** North-East Greenland: Lon: $25^\circ \text{W} - 0^\circ \text{E}$, Lat: $70^\circ - 80^\circ \text{N}$; **(c)** North-West Greenland: Lon: $70^\circ - 50^\circ \text{W}$, Lat: $70^\circ - 80^\circ \text{N}$; **(d)** South-East Greenland: Lon: $45^\circ - 20^\circ \text{W}$, Lat: $60^\circ - 70^\circ \text{N}$; **(e)** South-West Greenland: Lon: $60 - 45^\circ \text{W}$, Lat: $60^\circ - 70^\circ \text{N}$; The thick red line displays the ensemble mean of the 5 ensemble members, the thin grey lines correspond to the individual members and the blue line corresponds to the experiment performed without incorporating volcanic eruptions.

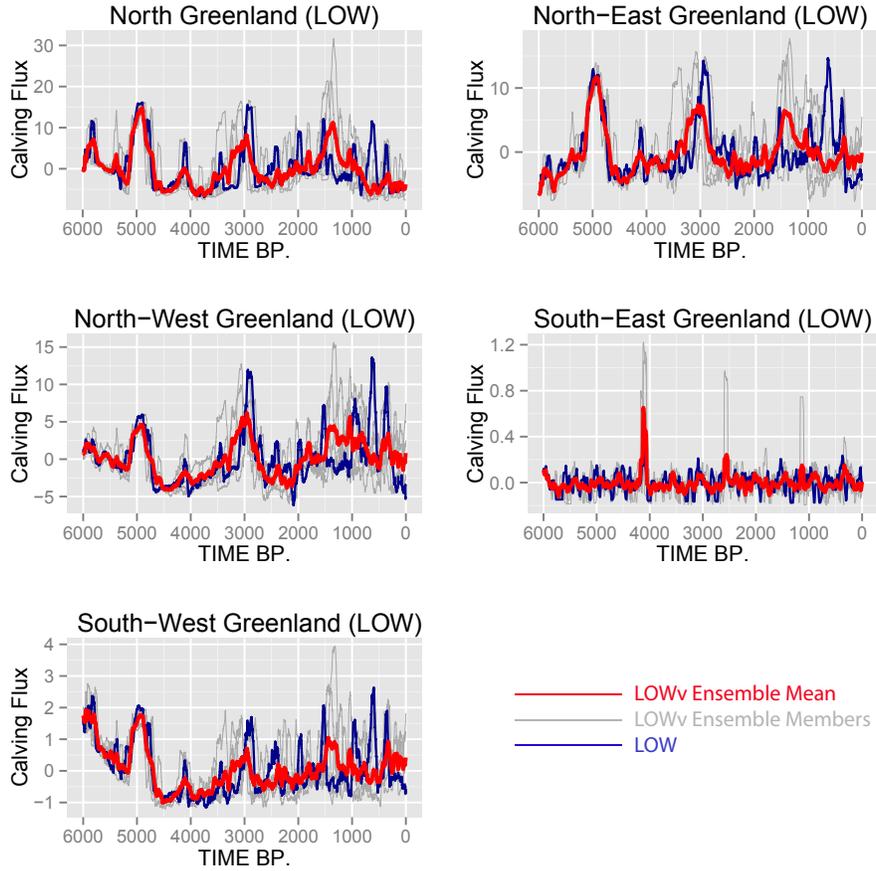


Figure 3: LOW(v) experiments: 70 year running mean of the modeled calving flux ($\text{m}^3 \text{s}^{-1}$) from the calving sites at the respective regions; **(a)** North Greenland: Lon: $70^\circ \text{W} - 0^\circ \text{E}$, Lat: $80^\circ - 85^\circ \text{N}$; **(b)** North-East Greenland: Lon: $25^\circ \text{W} - 0^\circ \text{E}$, Lat: $70^\circ - 80^\circ \text{N}$; **(c)** North-West Greenland: Lon: $70^\circ - 50^\circ \text{W}$, Lat: $70^\circ - 80^\circ \text{N}$; **(d)** South-East Greenland: Lon: $45^\circ - 20^\circ \text{W}$, Lat: $60^\circ - 70^\circ \text{N}$; **(e)** South-West Greenland: Lon: $60 - 45^\circ \text{W}$, Lat: $60^\circ - 70^\circ \text{N}$; The thick red line displays the ensemble mean of the 5 ensemble members, the thin grey lines correspond to the individual members and the blue line corresponds to the experiment performed without incorporating volcanic eruptions.

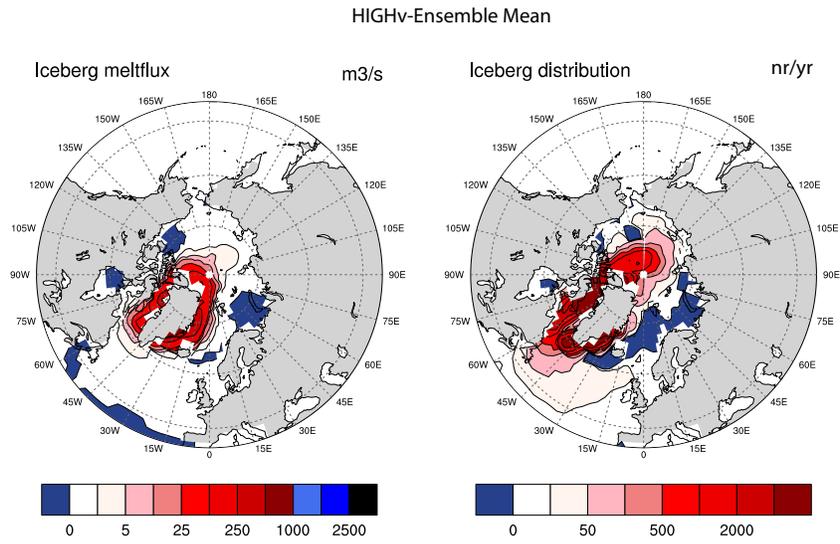


Figure 4: HIGHv-ensemble mean: Composite maps of difference between years of enhanced iceberg melt flux ($IMF(t) > IMF_{mean}(t=1, 6000) + 2 \cdot stdev$) and "quiet" periods ($IMF(t) < IMF_{mean}(t=1, 6000) + 1 \cdot stdev$); **(a)** Iceberg Melt Flux ($m^3 s^{-1}$); **(b)** number of icebergs moving within one grid cell ($nr yr^{-1} cell^{-1}$); non-linear color scheme! Green rectangles correspond to core locations of ???. Only the CTRL set-up is shown (LOW(v)/HIGH(v) results can be found in the supplementary information).

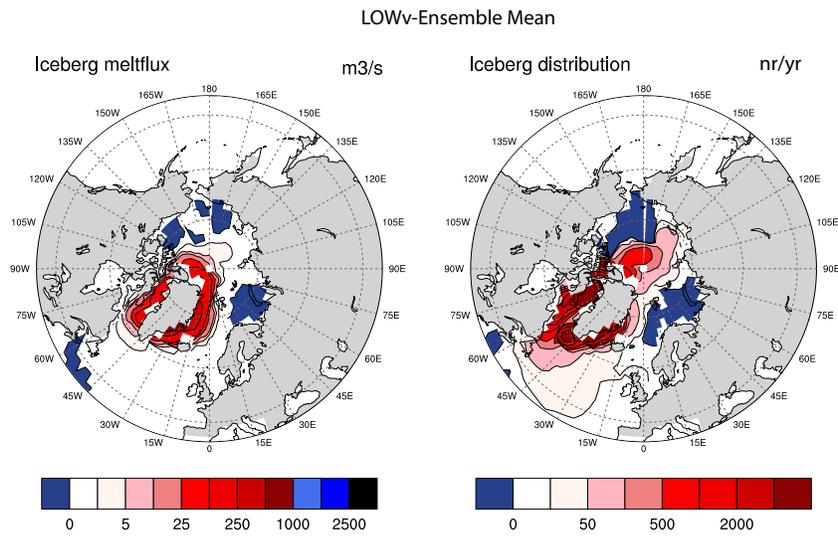


Figure 5: LOWv-ensemble mean: Composite maps of difference between years of enhanced iceberg melt flux ($IMF(t) > IMF_mean(t=1, 6000) + 2*stdev$) and "quiet" periods ($IMF(t) < IMF_mean(t=1, 6000) + 1*stdev$); **(a)** Iceberg Melt Flux ($m^3 s^{-1}$): **(b)** number of icebergs moving within one grid cell ($nr yr^{-1} cell^{-1}$); non-linear color scheme! Green rectangles correspond to core locations of ???. Only the CTRL set-up is shown (LOW(v)/HIGH(v) results can be found in the supplementary information).