



Supplement of

Modelling the impacts of historical and future extreme precipitation days on seasonal surface mass balance in the Eastern Canadian Arctic and Greenland

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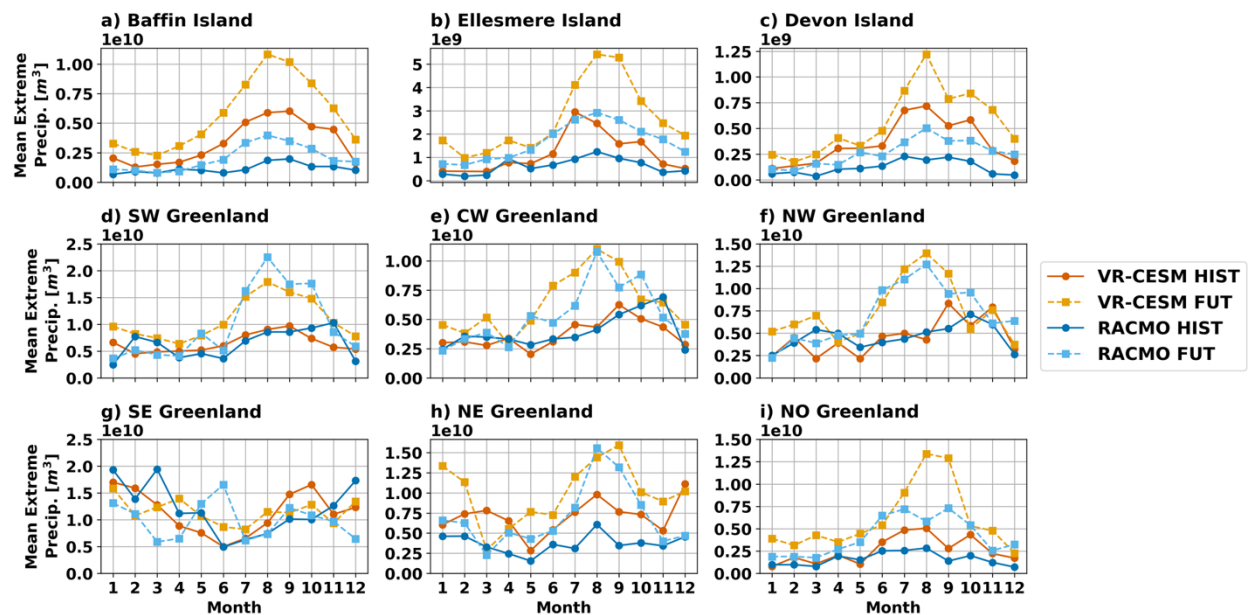


Figure S1. As in Figure 2, but using the regional volume-based extreme precipitation definition, showing the mean monthly volume of extreme precipitation in each subregion.

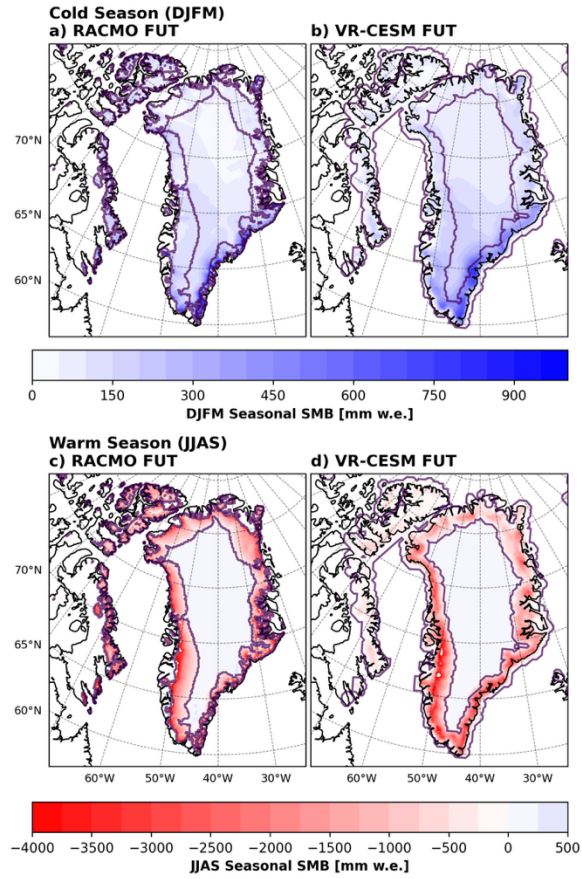


Figure S2. Mean seasonal SMB in the region for the (a-b) cold season (DJFM) and (c-d) warm season (JJAS) for the future period (2080-2098; SSP5-8.5) from RACMO (a, c) and VR-CESM (b,d).

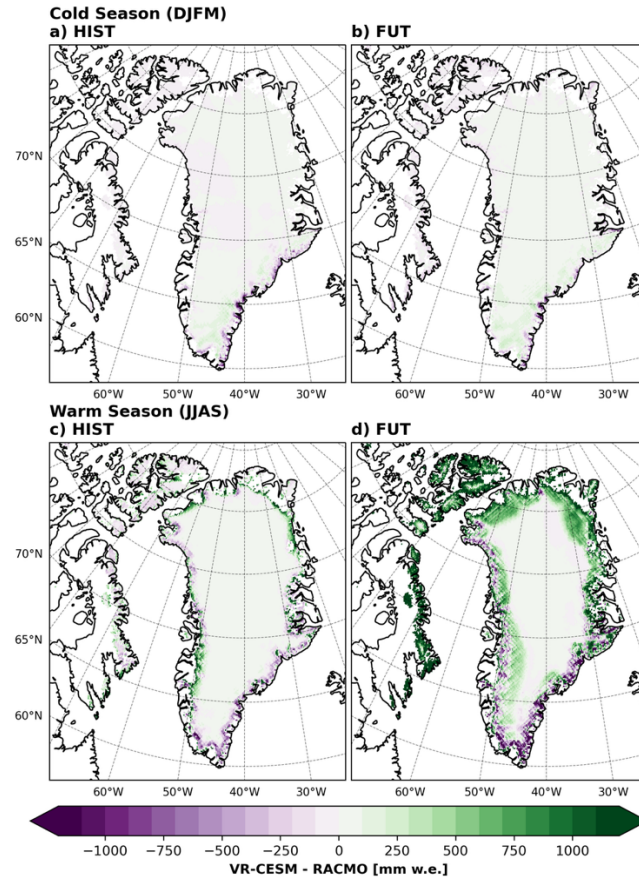


Figure S3. Difference in mean seasonal SMB between VR-CESM and RACMO for the (a-b) cold season (DJFM) and (c-d) warm season (JJAS) in the (a,c) historical period (1980-1998) and (b, d) future period (2080-2098; SSP5-8.5). The green (purple) colours indicate that VR-CESM (RACMO) has a higher seasonal SMB.

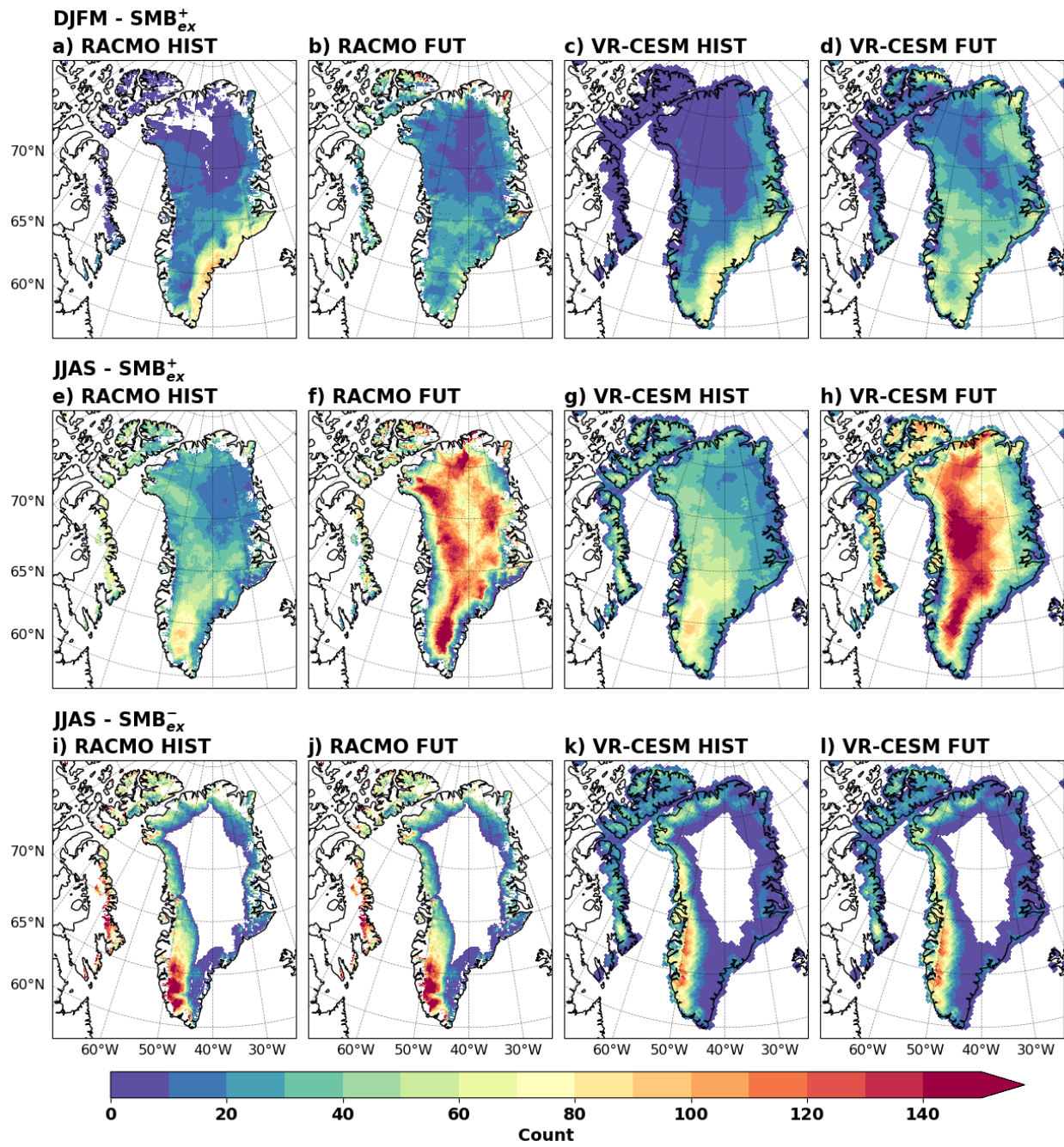


Figure S4. Total number of extreme precipitation days occurring in each grid cell with positive SMB (a-h) or negative SMB (i-l) in the cold season (a-d) and warm season (e-l) in the historical (1980-1998; a,c,e,g,i,k) and future (2080-2098; b,d,f,h,j,l) periods. Counts from RACMO are shown in the first two columns (a-b, e-f, i-j) and VR-CESM is shown in the final two columns (c-d, g-h, k-l).

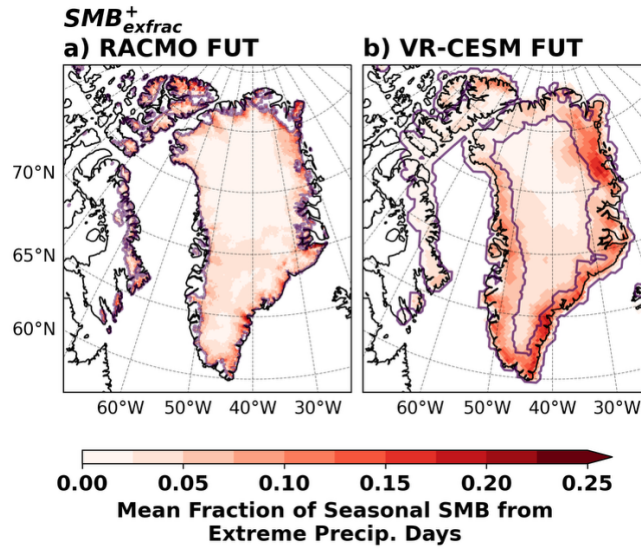


Figure S5. Mean DJFM SMB_{exfrac}^+ for FUT (2080-2098; SSP5-8.5) from (a) RACMO and (b) VR-CESM. The solid purple line denotes the top of the ablation zone for the full simulation period.

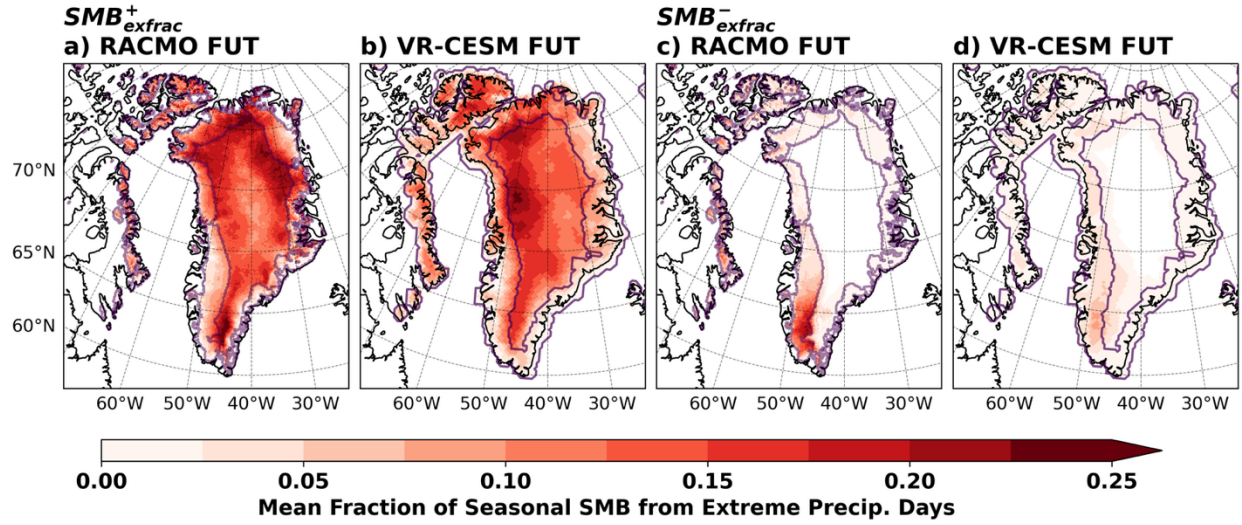


Figure S6. Mean JJAS (a-b) SMB_{exfrac}^+ and (c-d) SMB_{exfrac}^- for FUT (2080-2098; SSP5-8.5) from (a,c) RACMO and (b,d) VR-CESM. The solid purple line denotes the top of the ablation zone for the full simulation period.

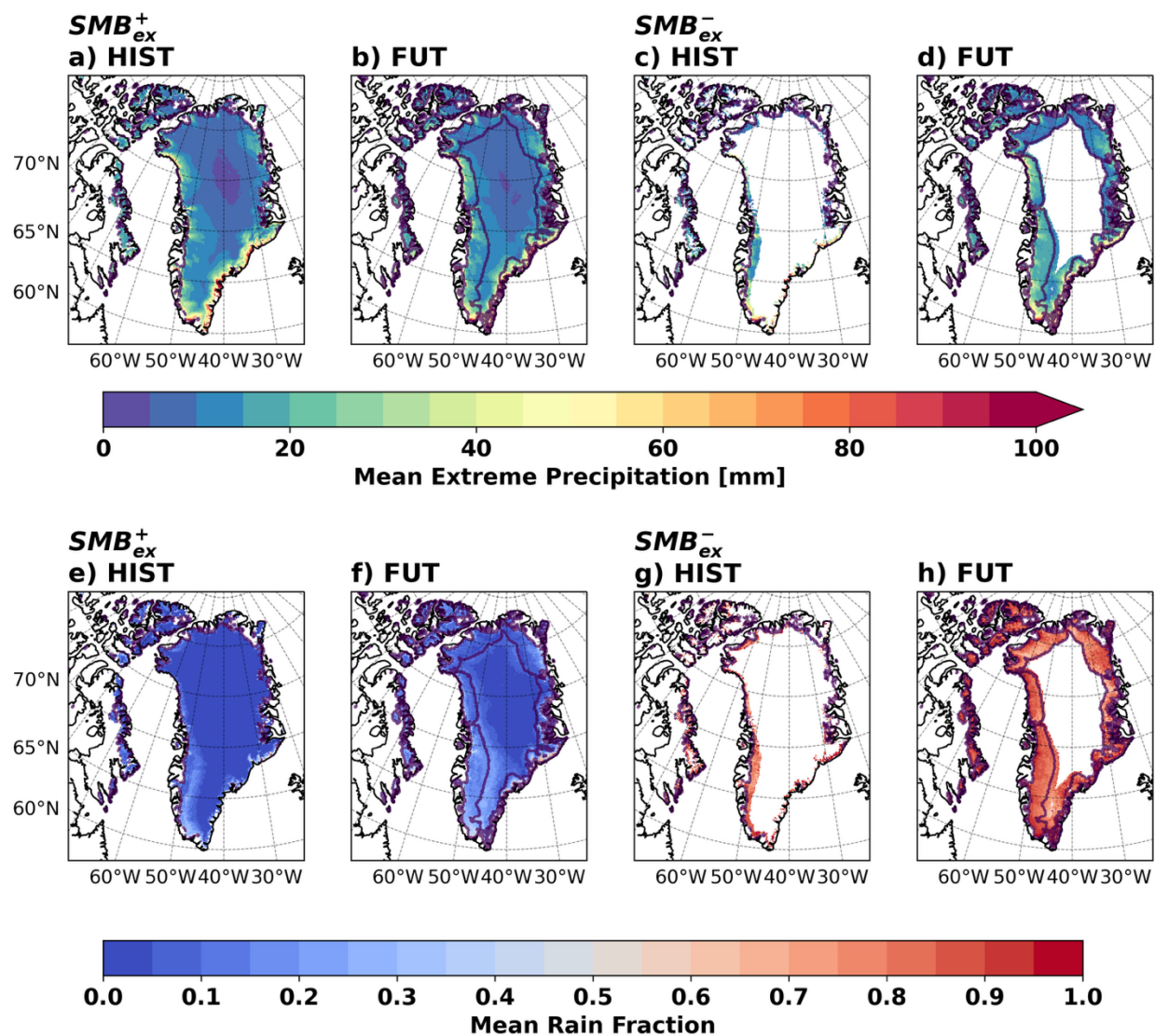


Figure S7. Mean extreme precipitation (a-d) accumulations and (e-h) rain fraction in HIST (1980-1998; a,c,e,g) and FUT (2080-2098; b,d,f,h) for SMB_{ex}^+ (a-b, e-f) and SMB_{ex}^- (c-d, g-h) from RACMO. The solid purple line denotes the top of the ablation zone for the full simulation period.

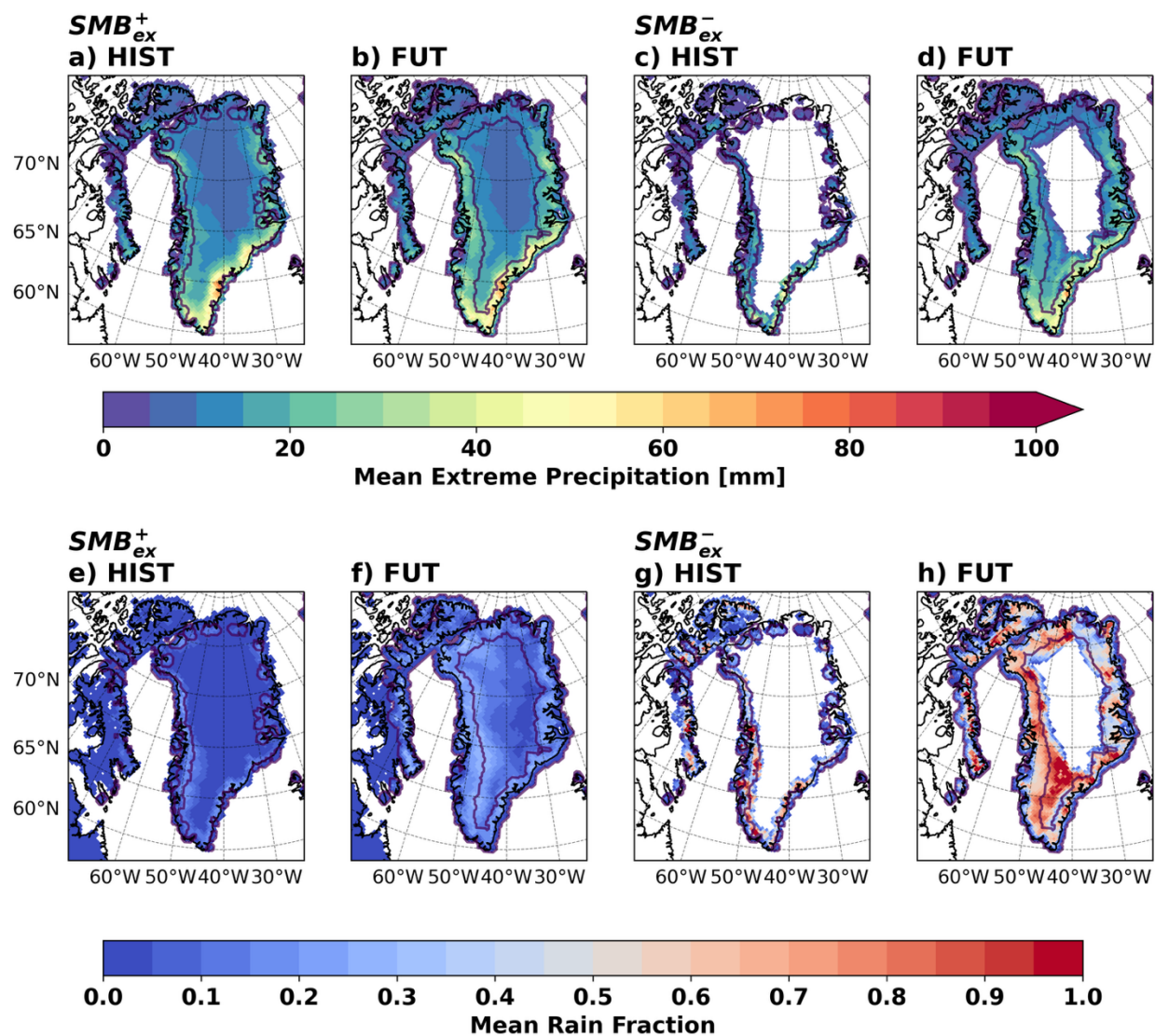


Figure S8. As in Figure S7, but from VR-CESM.

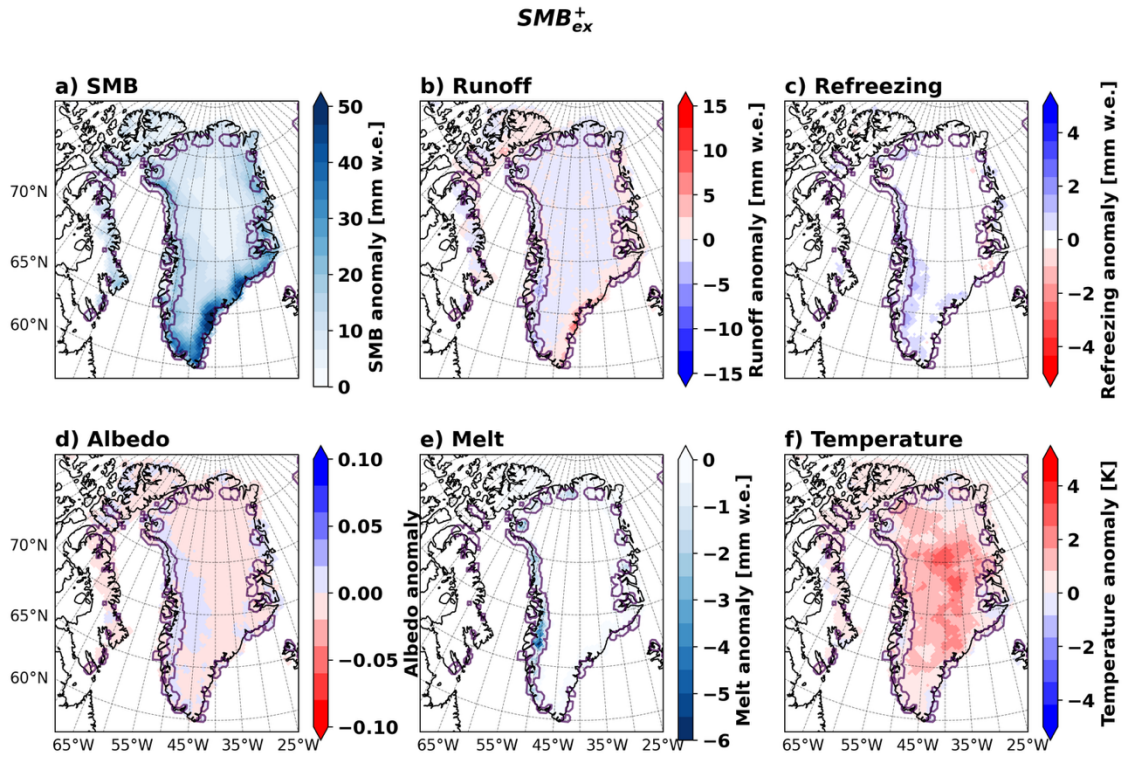


Figure S9. Mean anomalies on positive SMB JJAS extreme precipitation days in the historical period (1980-1998) from VR-CESM. Anomalies are calculated for the extreme precipitation day relative to ± 15 days. (As in Figure 9, but for VR-CESM)

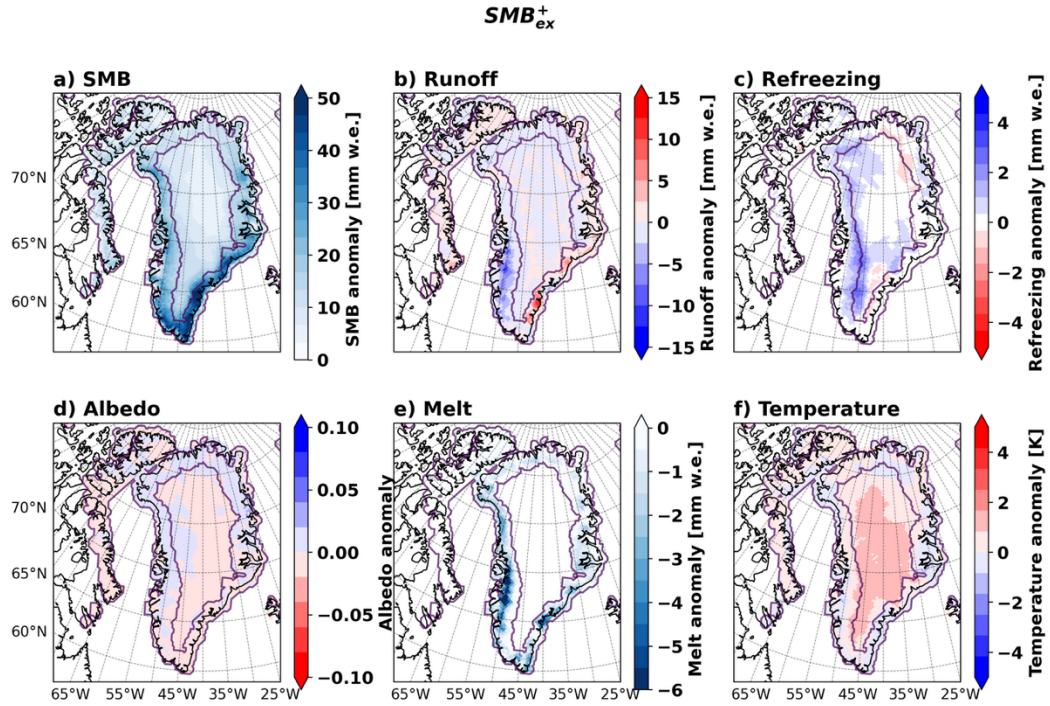


Figure S10. As in Figure S9, but for future positive SMB JJAS extreme precipitation days. (As in Figure 10, but for VR-CESM)

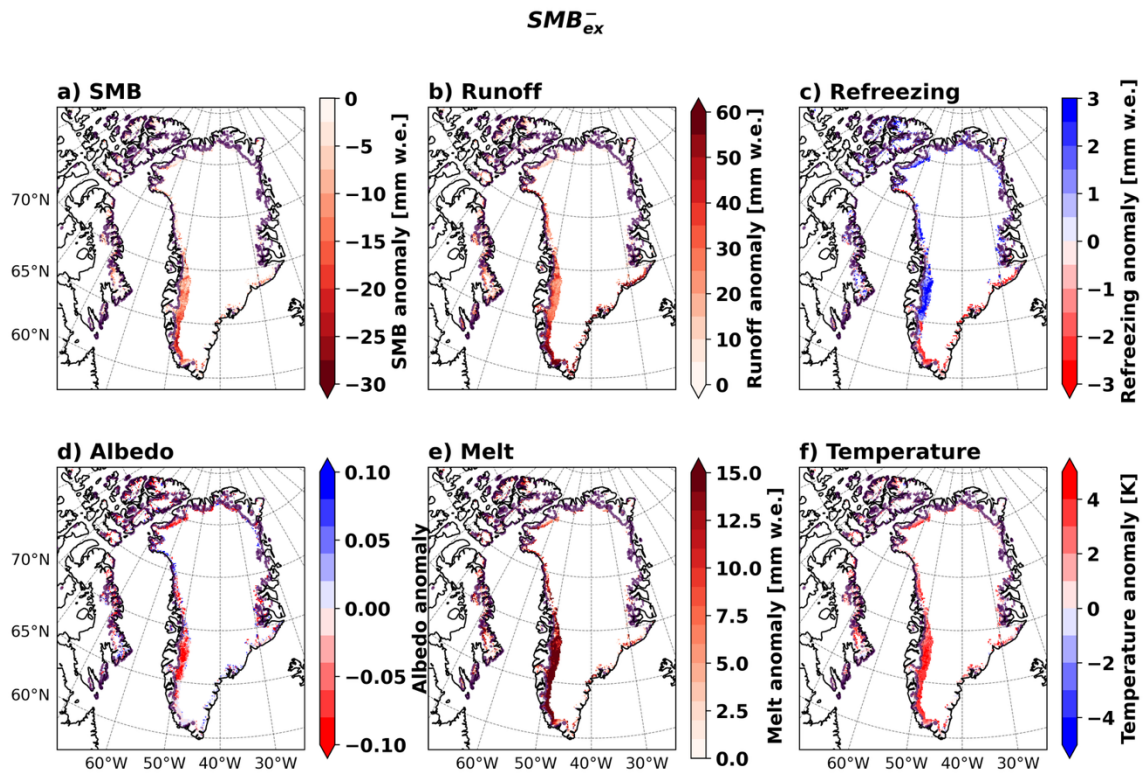


Figure S11. As in Figure S9, but for historical negative SMB JJAS extreme precipitation days from RACMO.

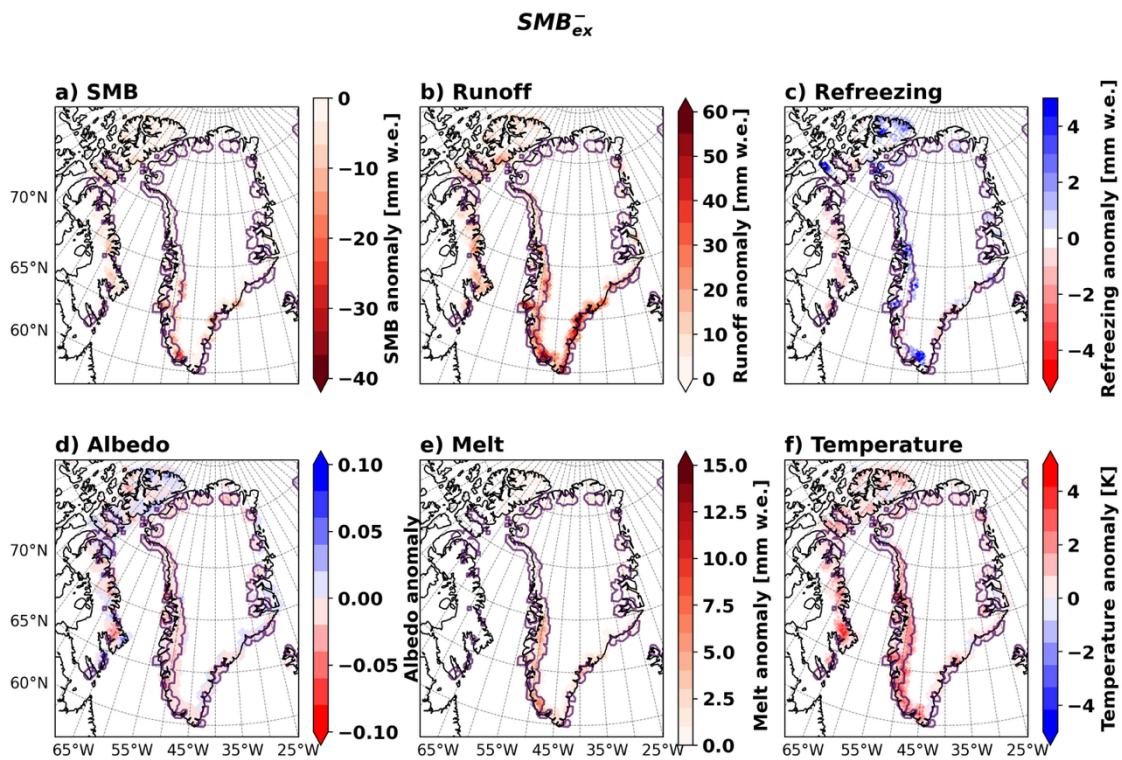


Figure S12. As in Figure S9, but for historical negative SMB JJAS extreme precipitation days from VR-CESM.

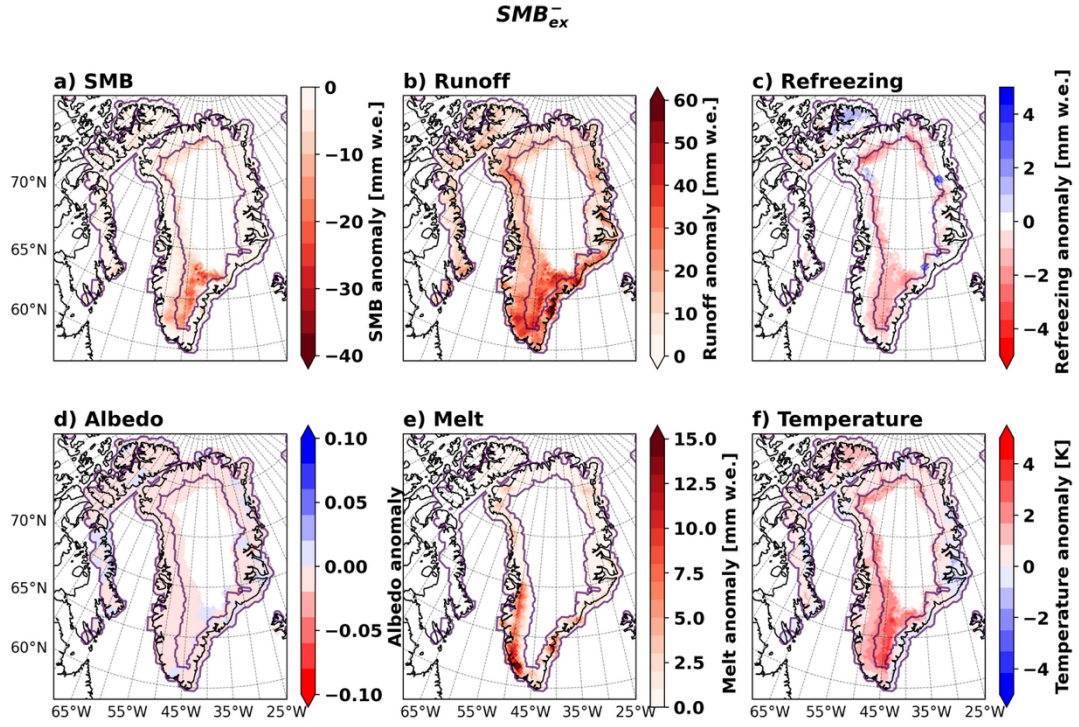


Figure S13. As in Figure S9, but for future positive SMB JJAS extreme precipitation days. (As in Figure 11, but for VR-CESM.)