Supplement of The Cryosphere, 14, 1809–1827, 2020
https://doi.org/10.5194/tc-14-1809-2020-supplement

The Cryosphere Open Access EGU

Supplement of

The added value of high resolution in estimating the surface mass balance in southern Greenland

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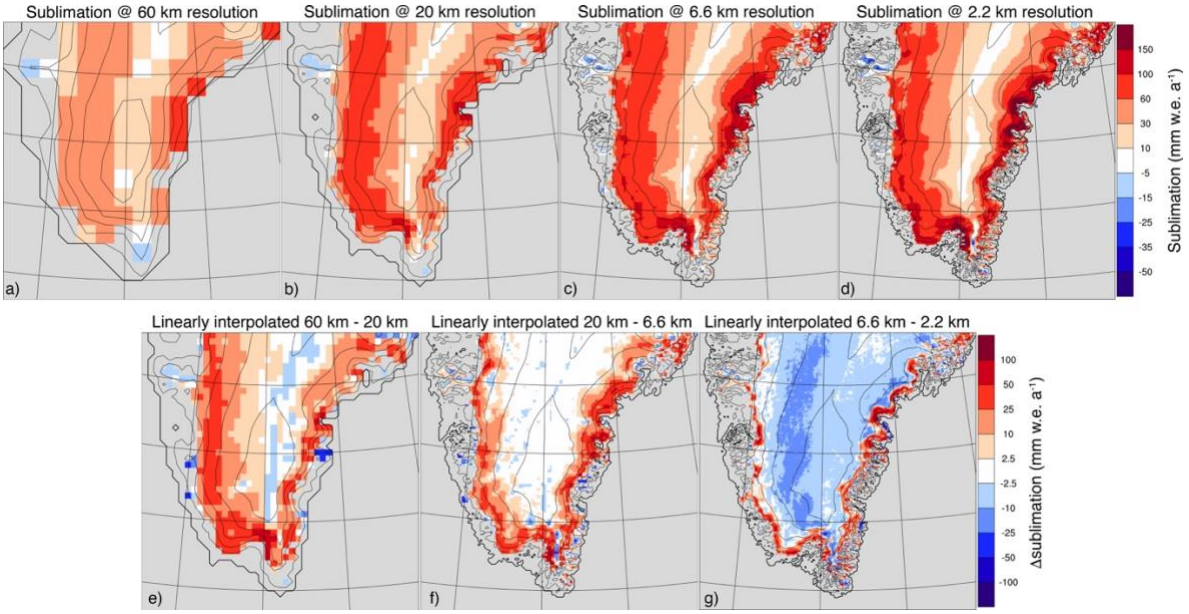

Figure S1: Modelled sublimation at **a)** 60, **b)** 20, **c)** 6.6 and **d)** 2.2 km resolution, respectively. **e)** Difference between linearly interpolated sublimation from 60 km to 20 km resolution and the modelled sublimation at 20 km resolution. **f)** as e), but now for 20 km to 6.6 km resolution. **g)** as e), but now for 6.6 km to 2.2 km resolution.

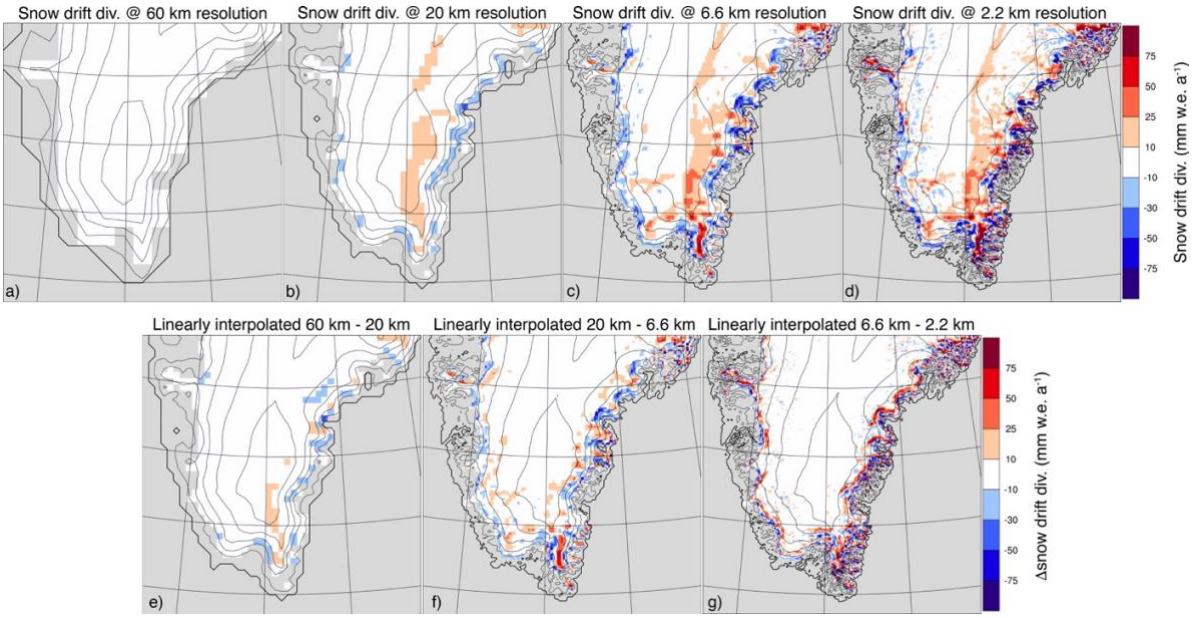

Figure S2: Modelled snow drift divergence at **a)** 60, **b)** 20, **c)** 6.6 and **d)** 2.2 km resolution, respectively. **e)** Difference between linearly interpolated snow drift divergence from 60 km to 20 km resolution and the modelled divergence at 20 km resolution. **f)** as e), but now for 20 km to 6.6 km resolution. **g)** as e), but now for 6.6 km to 2.2 km resolution.

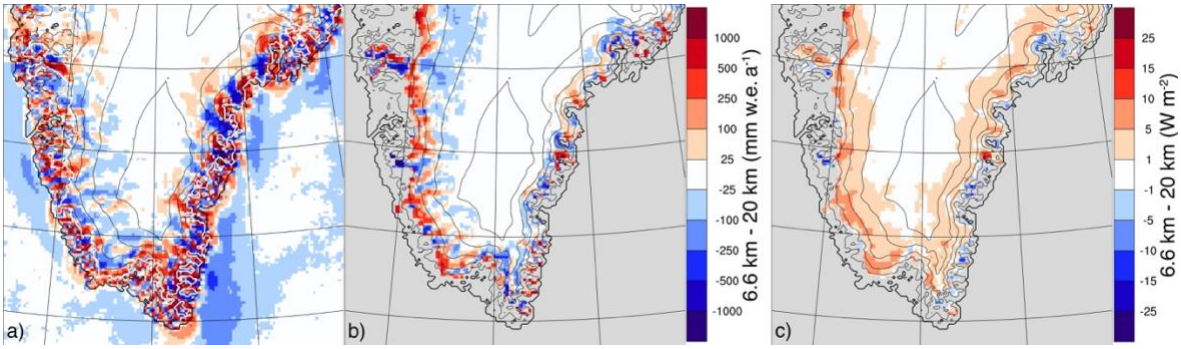

Figure S3: Differences in the mean **a)** precipitation, **b)** runoff and **c)** sensible heat flux between the 6.6 and 20 km simulations. The sensible heat flux is positive if pointed towards the surface. The 20 km results are mapped on the 6.6 km grid using bilinear (a) and statistical downscaling (b, c), respectively.

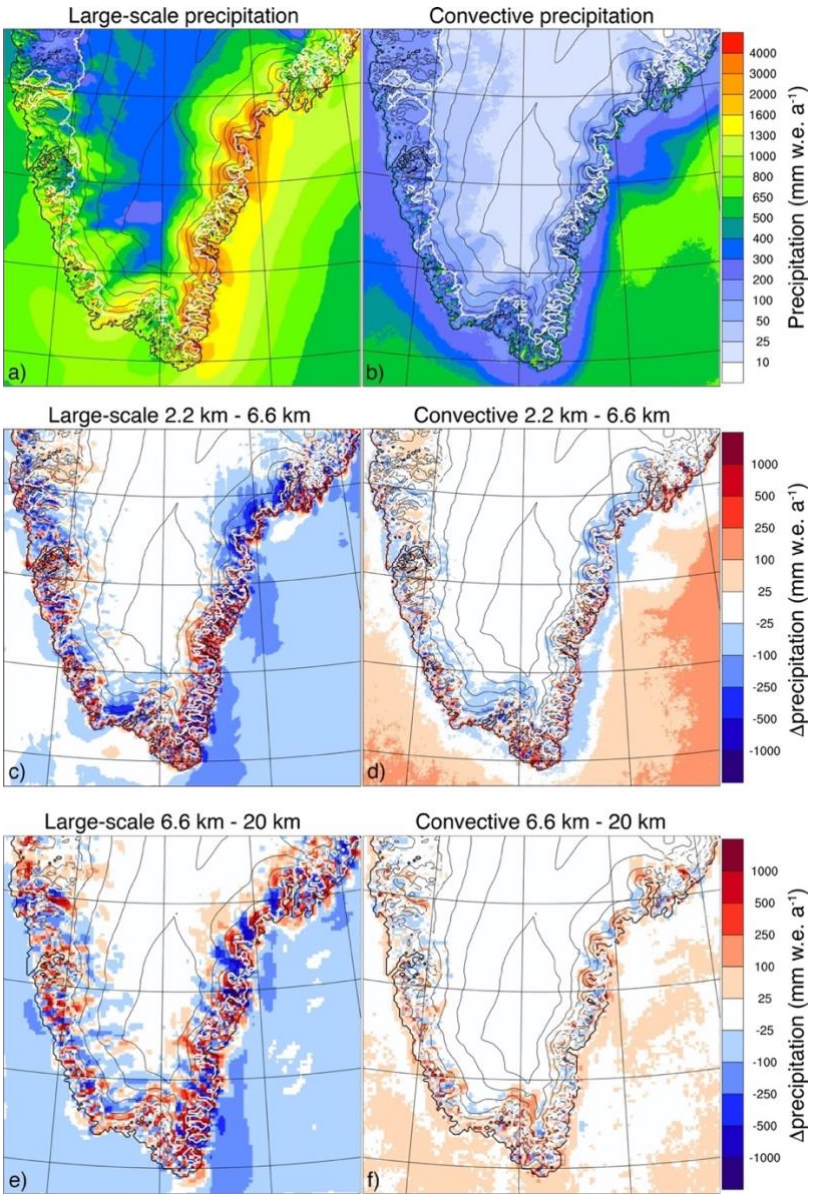

Figure S4: Modelled **a)** large-scale and **b)** convective precipitation by the 2.2 km resolution simulation. Difference between the modelled **c,e)** large-scale and **d,f)** convective precipitation by the **c,d)** 2.2 and 6.6 km resolution simulation and **e,f)** 6.6 and 20 km resolution simulation, respectively. Model data from the 6.6 km simulation are linearly interpolated.