Senstivity of the Antarctic surface mass balance to sea surface conditions using MAR

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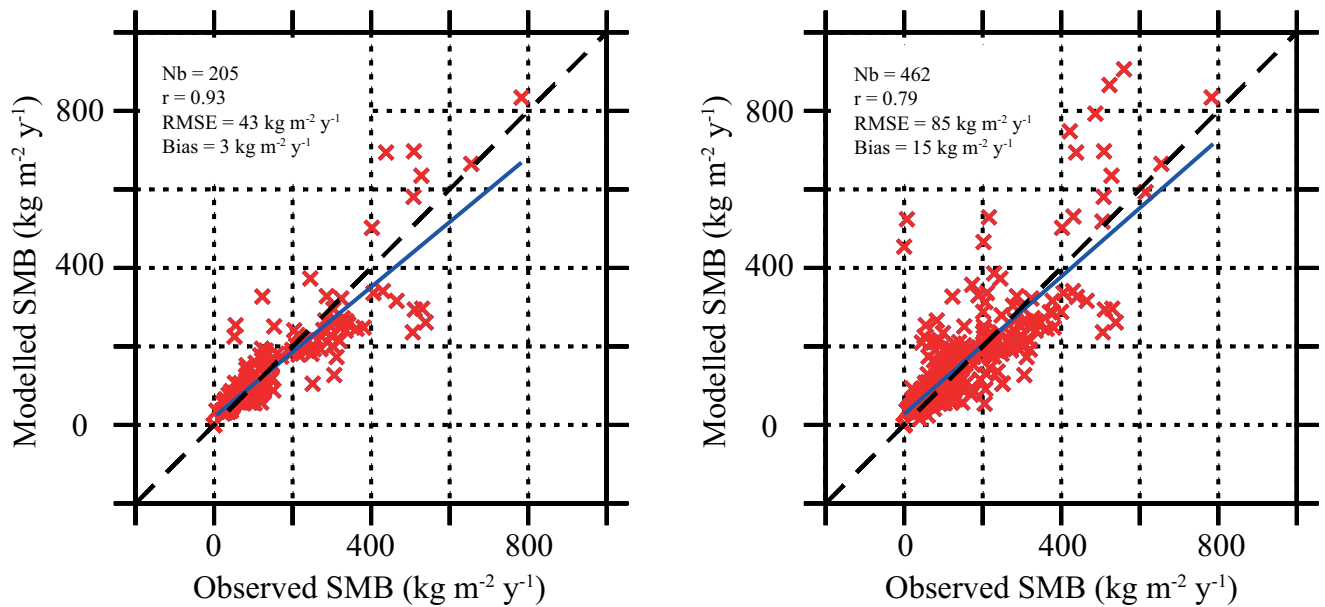
Figure S1. Comparison with SMB from the GLACIOCLIM-SAMBA database over 1950–2015. a) Only grid cells containing more than one observation are conserved for the comparison. b) All grid cells containing at least one observation are used. Bias et RMSE units are kg m^{-2} yr^{-1}.
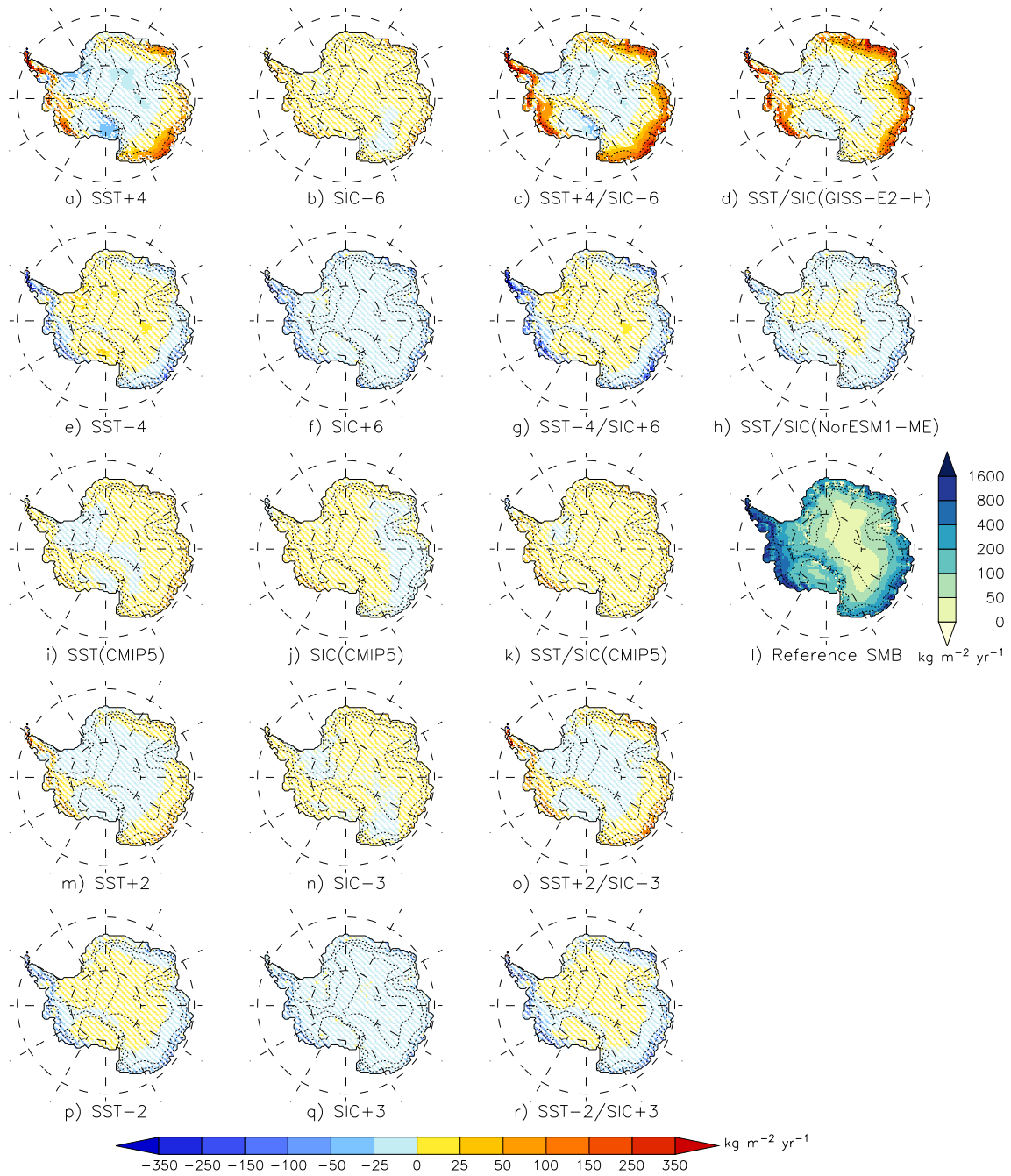
Figure S2. Difference in mean annual SMB (kg m^{-2} y^{-1}) between the reference simulation and (a) SST+4, (b) SIC-6, (c) SST+4/SIC-6, (d) SST/SIC(GISS-E2-H), (e) SST-4, (f) SIC+6, (g) SST-4/SIC+6, (h) SST/SIC(NorESM1-ME), (i) SST(CMIP5), (j) SIC(CMIP5), (k) SST/SIC(CMIP5), (m) SST+2, (n) SIC-3, (o) SST+2/SIC-3, (p) SST-2, (q) SIC+3, (r) SST-2/SIC+2 experiments. Difference less than the interannual variability are considered as non-significant and are dashed. l) Mean annual SMB (kg m^{-2} y^{-1}) simulated by MAR forced by ERA-Interim over 1979 – 2015.
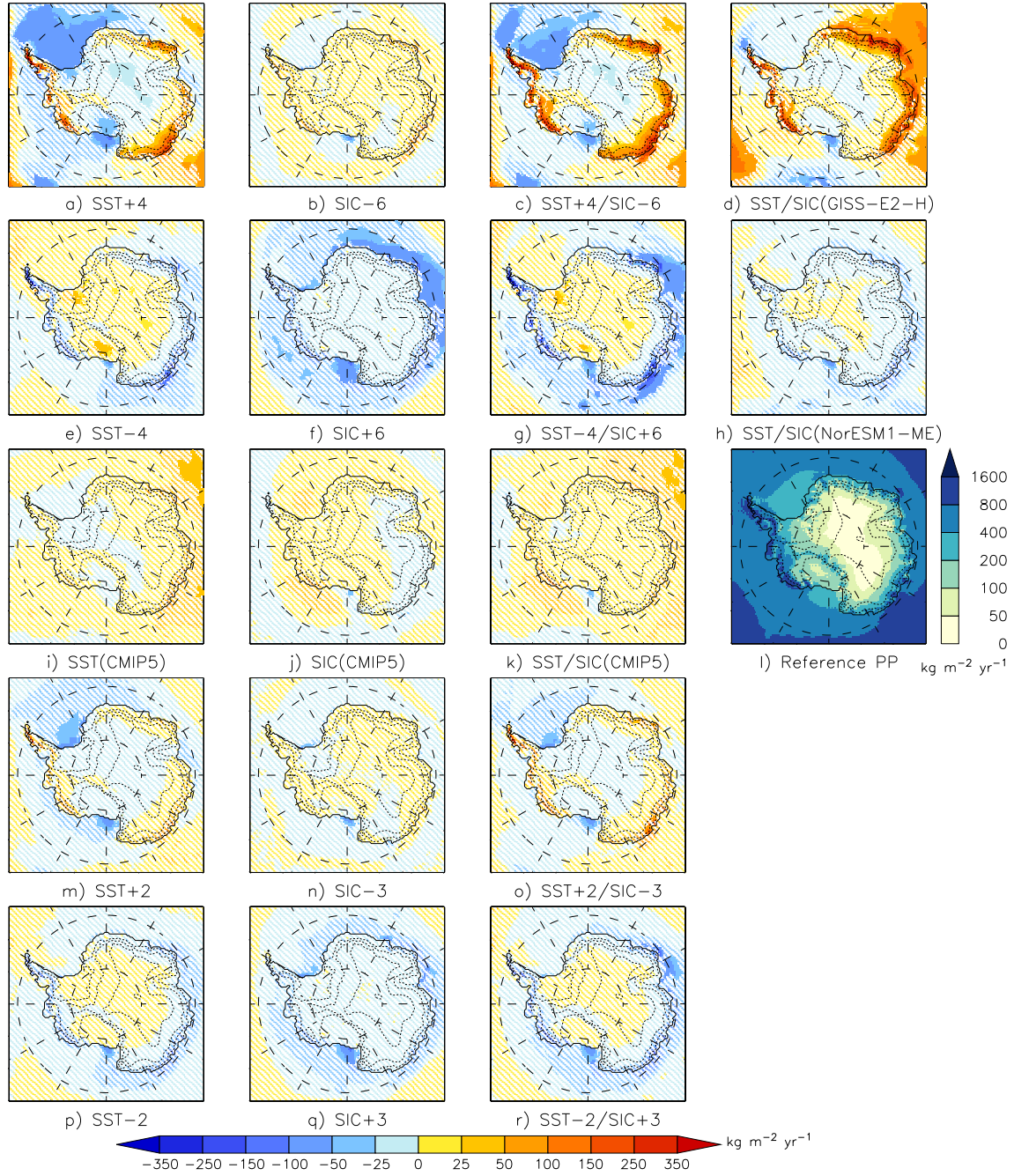
Figure S3. Same as Fig. S2 but for total precipitation (rainfall + snowfall) over the Antarctic ice sheet and the surrounding ocean.
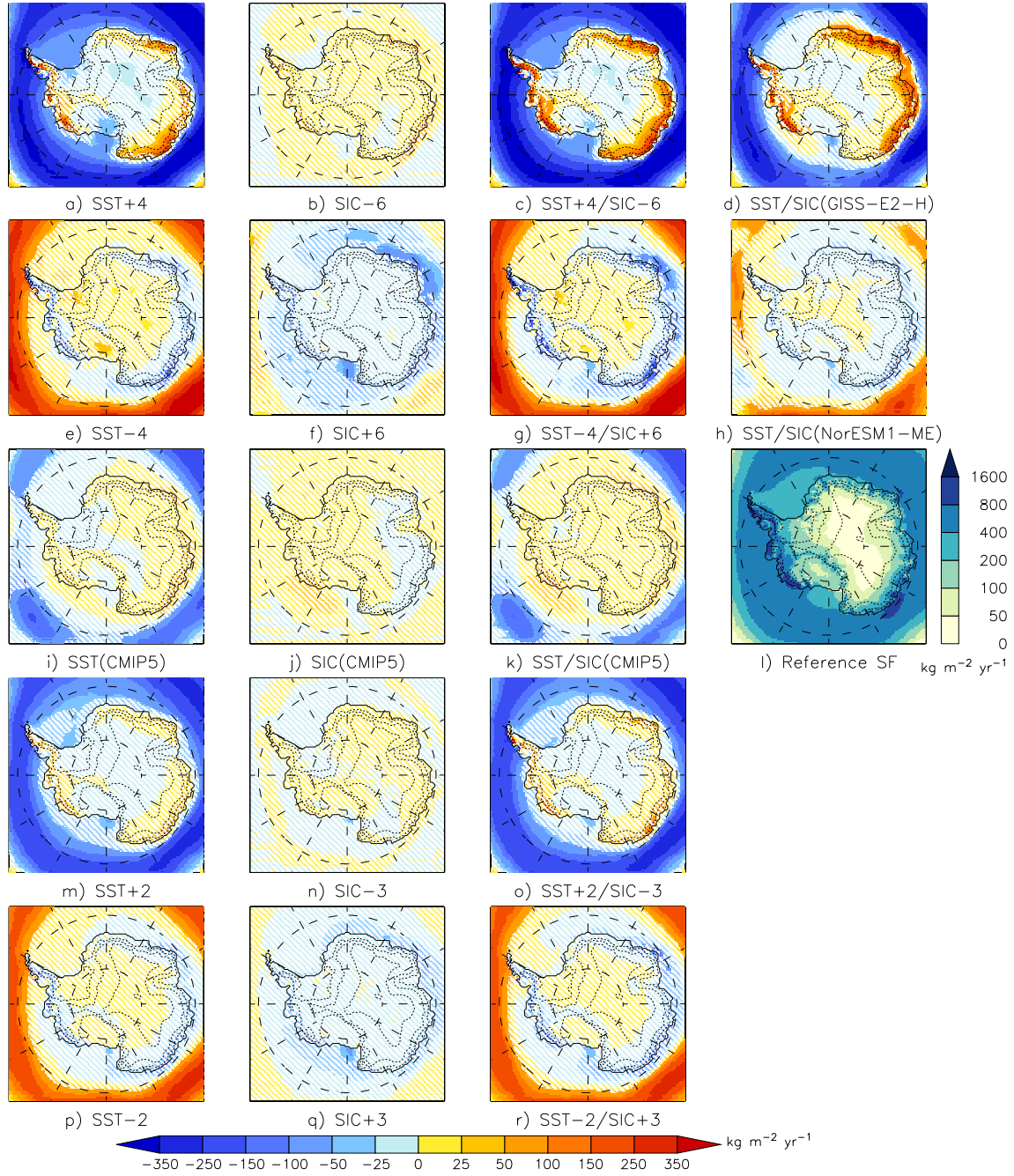
Figure S4. Same as Fig. S2 but for snowfall over the ice sheet and the surroudning ocean.
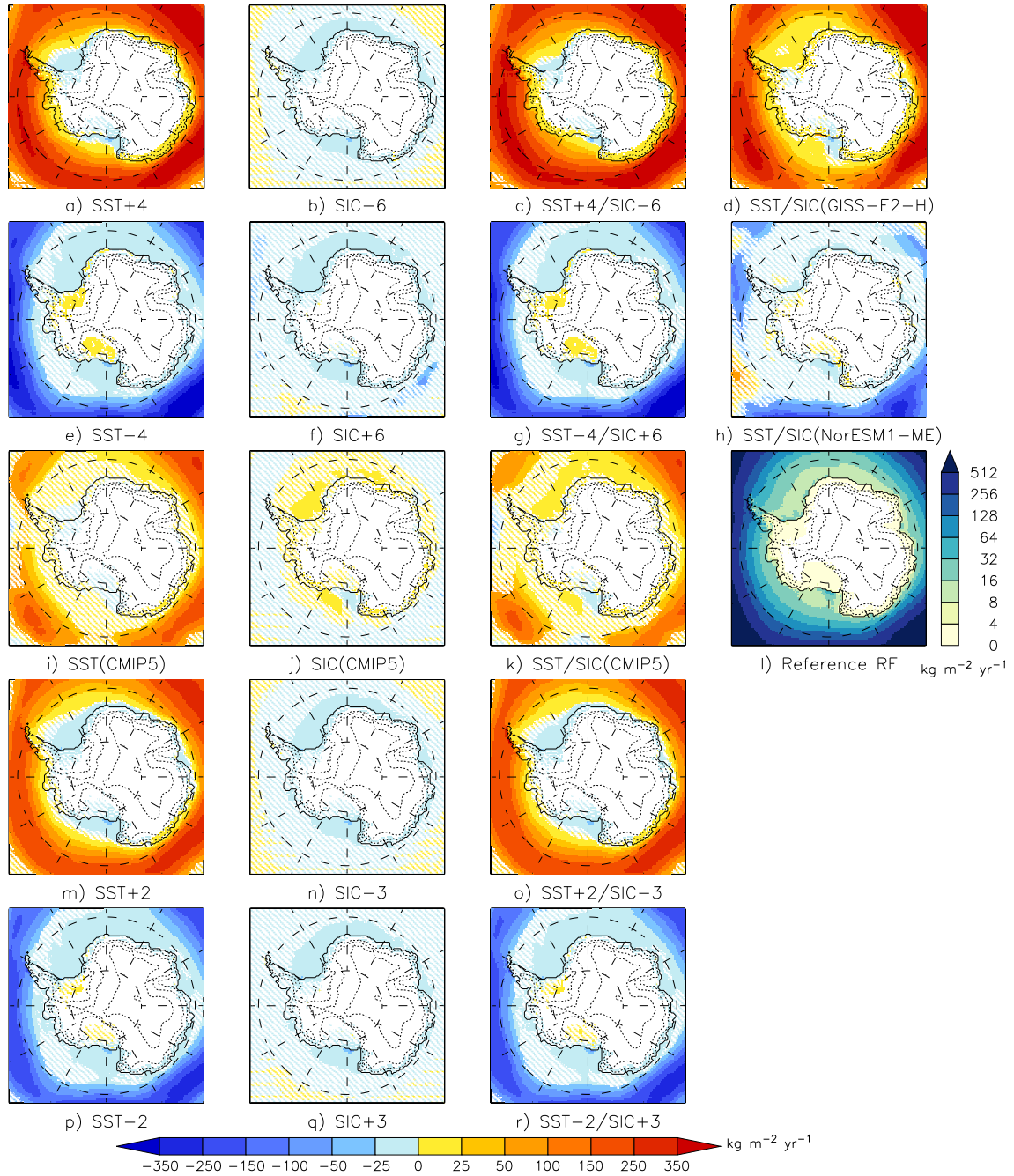
Figure S5. Same as Fig. S2 but for rainfall over the ice sheet and the surroudning ocean. Withe areas over the ice sheet indicates that there is no rainfall.
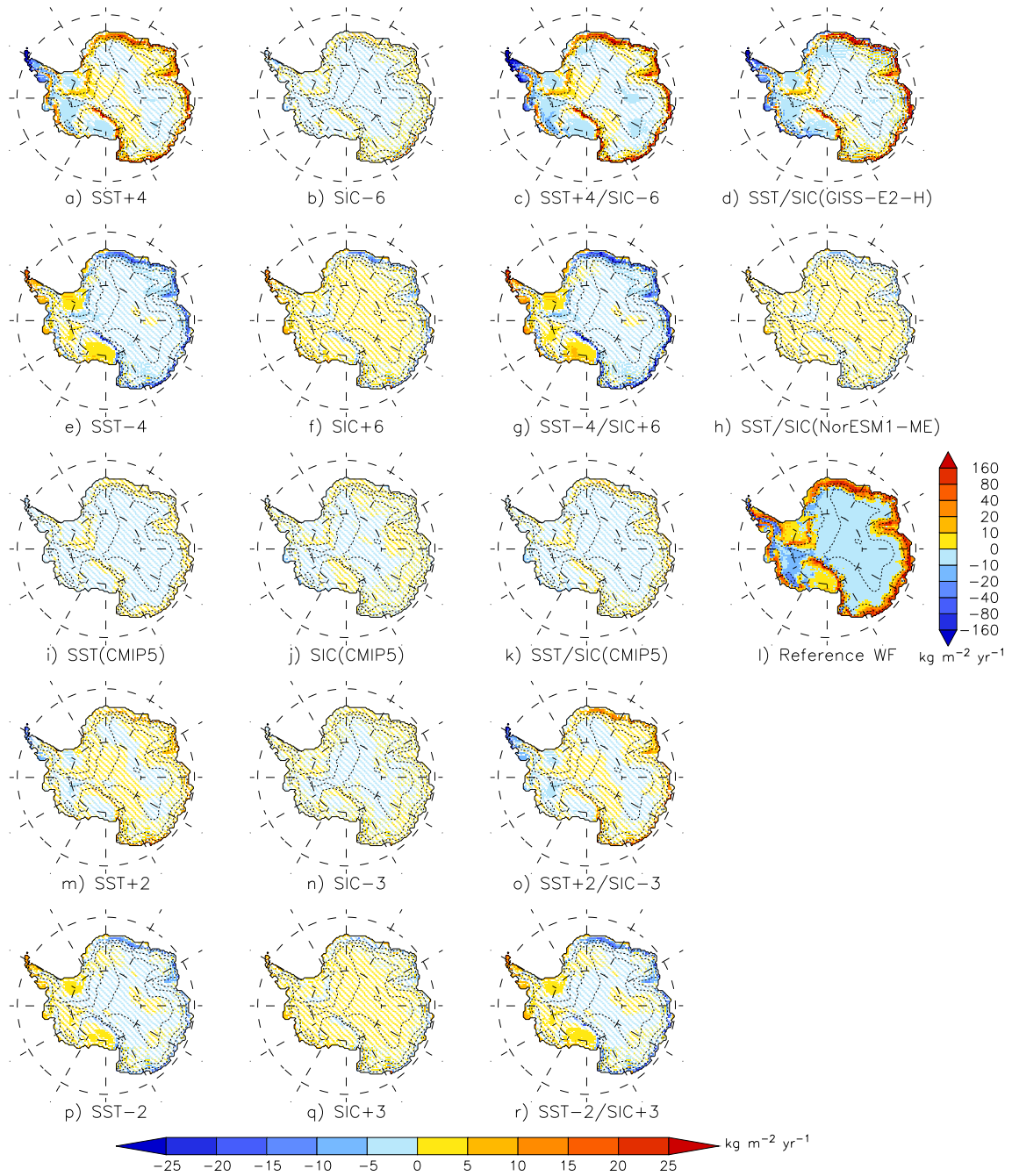
Figure S6. Same as Fig. S2 but for waterfluxes (sublimation mines deposition) at the ice sheet surface. Positive fluxes indicates sublimation while negative fluxes are representative of deposition processes.
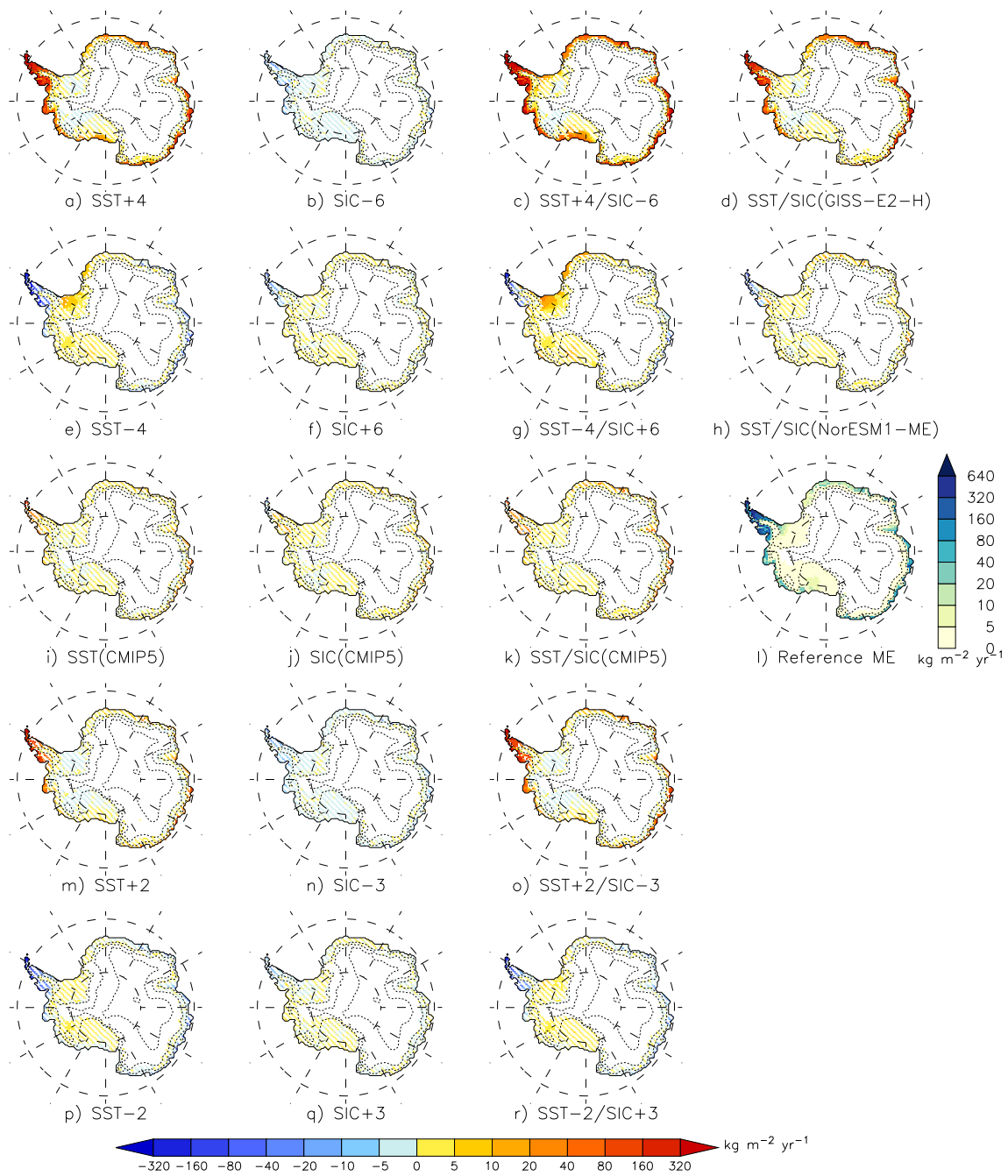
Figure S7. Same as Fig. S2 but for meltwater production at the surface. Withe areas over the ice sheet indicates that melt never occurs.
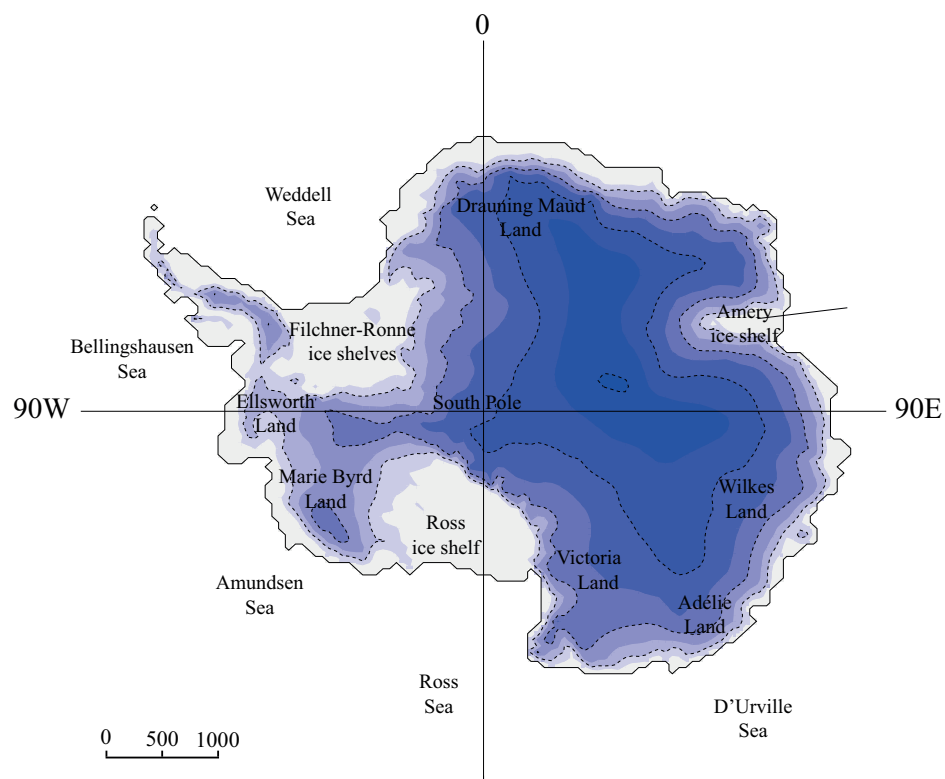
Figure S8. The Antarctic ice sheet and surrouding seas. Elevation contours are shown every 1000 m.

Table S1. Top: Annual mean integrated (Gt yr^{-1}) and standard deviation (Gt yr^{-1}) total precipitation (rainfall and snowfall), snowfall and rainfall ver the whole AIS (including grounded and not grounded ice) for the reference simulation (1979–2015). Bottom: Difference of annual mean total precipitation (rainfall and snowfall), snowfall and rainfall (Gt yr^{-1} and %) between each sensitivity test and the reference simulation (1979–2015). Anomalies larger than the inter-annual variability are considered as significant and are displayed in bold.

Mean (Gt y^{-1})	Total precipitation	Snowfall	Rainfall
Reference	2678 ± 110	2658 ± 109	20 ± 3
Anomaly (Gt y^{-1})	Total precipitation	Snowfall	Rainfall
SST-4	-64	-61	**-3**
SST-2	-89	-85	**-4**
SST+2	+50	+45	**+5**
SST+4	**+162**	**+137**	**+25**
SIC+6	**-170**	**-166**	**-4**
SIC+3	-107	-104	**-3**
SIC-3	+25	+28	**-3**
SIC-6	+91	+93	-2
SST-4/SIC+6	**-136**	**-133**	**-3**
SST-2/SIC+3	**-129**	**-125**	**-4**
SST+2/SIC-3	**+133**	**+126**	**+7**
SST+4/SIC-6	**+344**	**+304**	**+40**
SST/SIC-Nor	-105	-102	**-3**
SIC-CMIP	+36	+35	+1
SST-CMIP	+80	+79	+1
SST/SIC-CMIP	+105	+104	+1
SST/SIC-GIS	**+368**	**+353**	**+15**