Supplementary material

Tomás Carrasco-Escaff[1,2], Maisa Rojas[1,2], René Garreaud[1,2], Deniz Bozkurt[2,3], and Marius Schaefer[4]

[1]Department of Geophysics, University of Chile, Santiago, Chile
[2]Center of Climate and Resilience Research, University of Chile, Santiago, Chile
[3]Department of Meteorology, University of Valparaíso, Valparaíso, Chile
[4]Instituto de Ciencias Físicas y Matemáticas, Universidad Austral de Chile, Valdivia, Chile

Correspondence: Tomás Carrasco-Escaff (tcarrasco@dgf.uchile.cl)

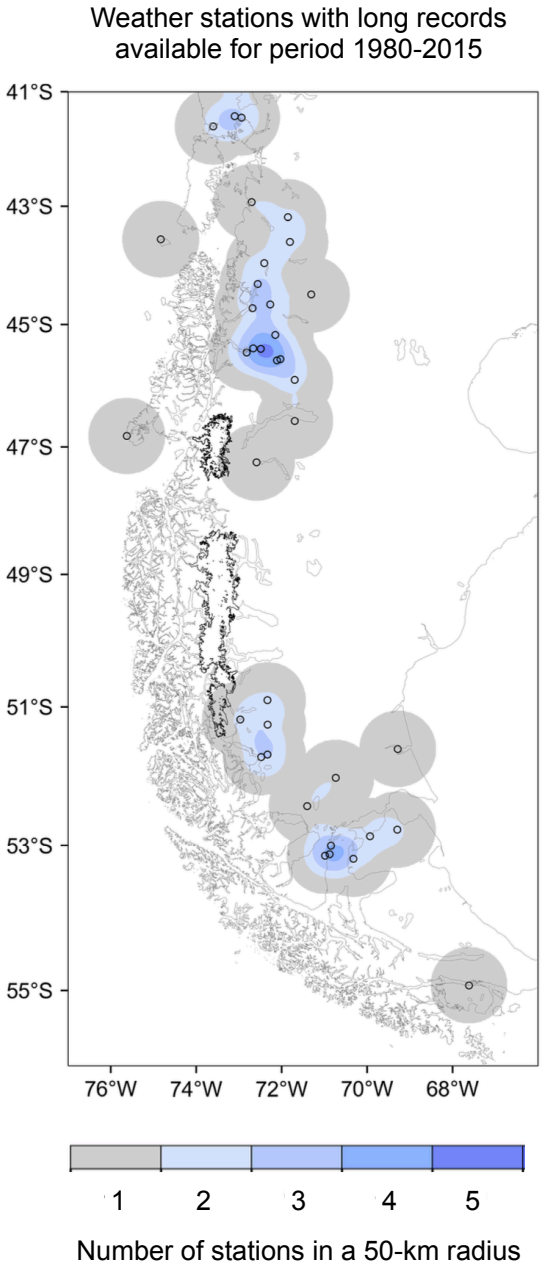

Figure S1. Heat map of weather stations with long records of precipitation measurements. Weather stations that register more than 75% of monthly precipitation data between 1980 and 2015 in Patagonia were used to construct the map. Colors indicate the number of station with long records in a 50 km radius. Data were obtained from the Chilean Weather Service and the National Water Agency.

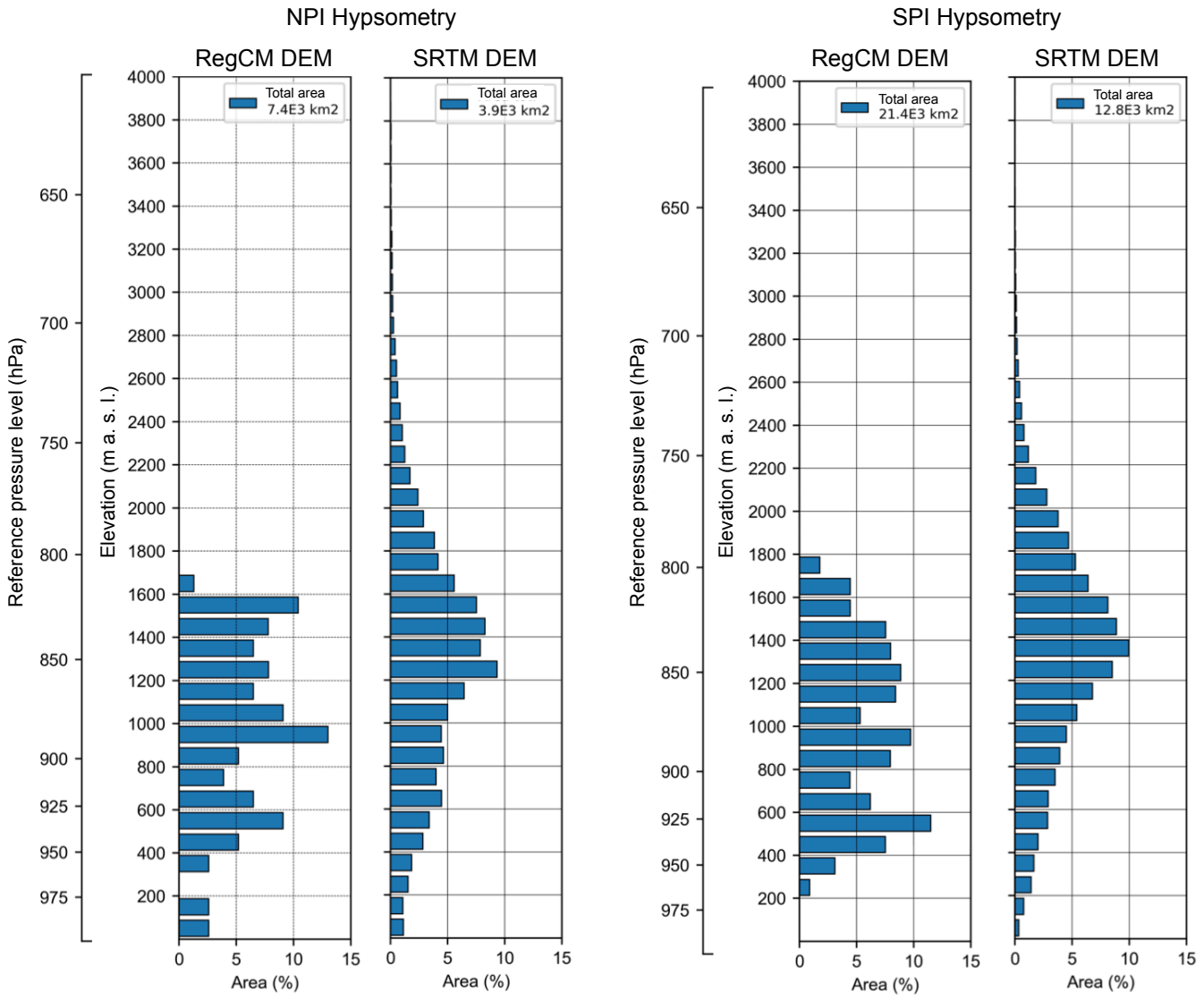

Figure S2. The two leftmost panels show the comparison between the NPI hypsometry obtained from the RegCMv4 DEM (∼10 km spatial resolution) versus the one obtained from the SRTMv3 DEM (∼90 m spatial resolution). The two rightmost panels show the same but for the SPI.

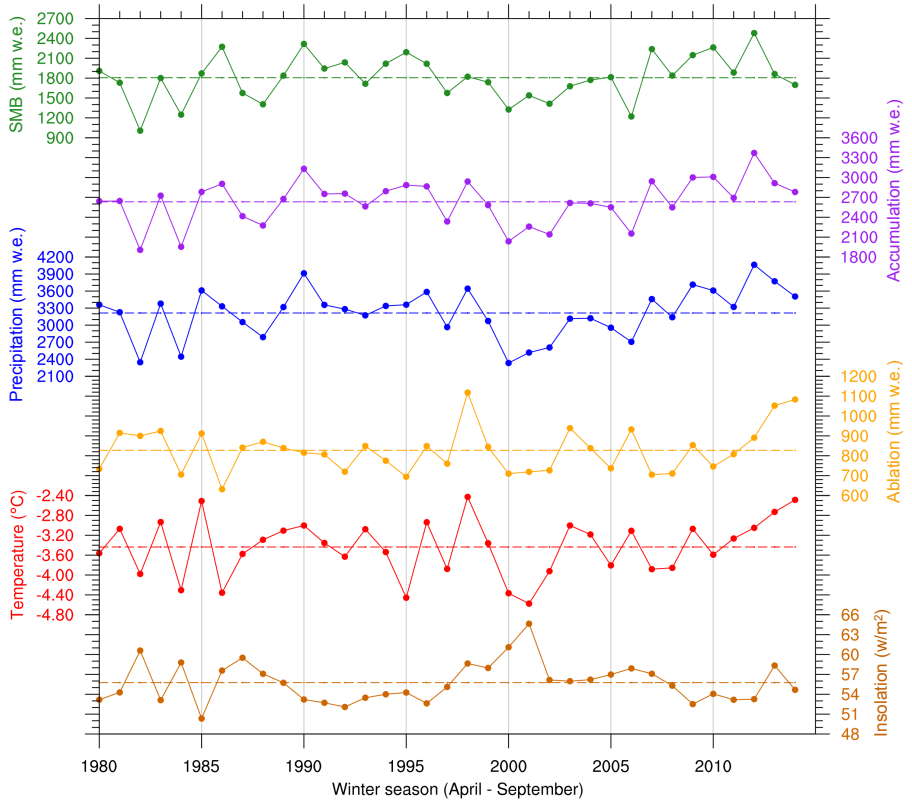

Figure S3. The same as in Fig. 5 but for the winter (April to September).

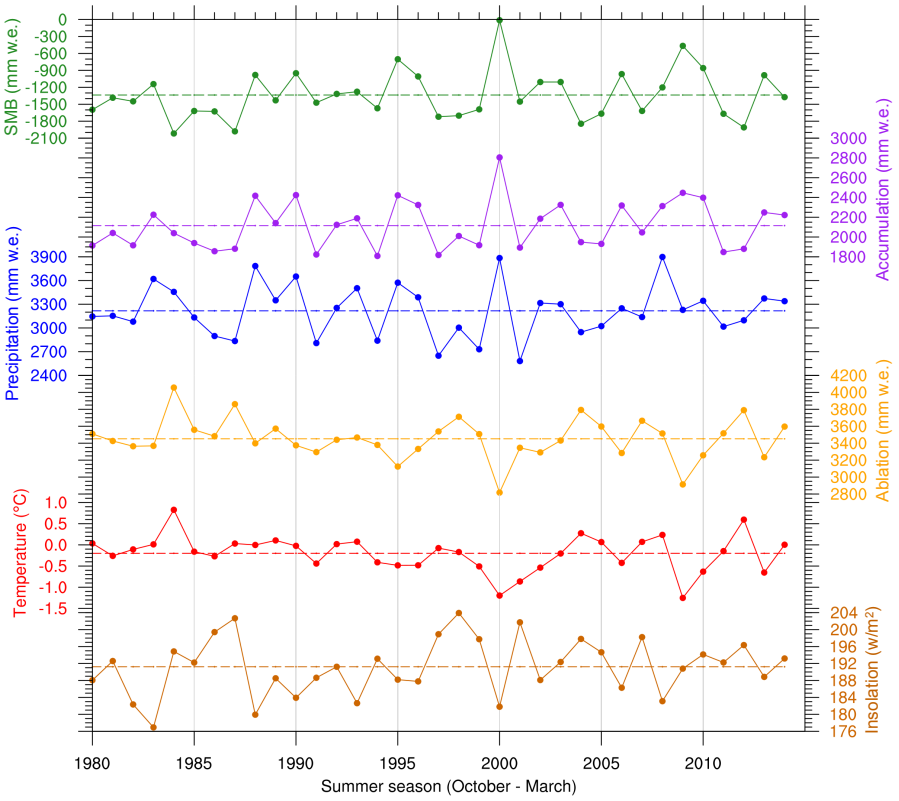

Figure S4. The same as in Fig. 5 but for the summer (October to March).

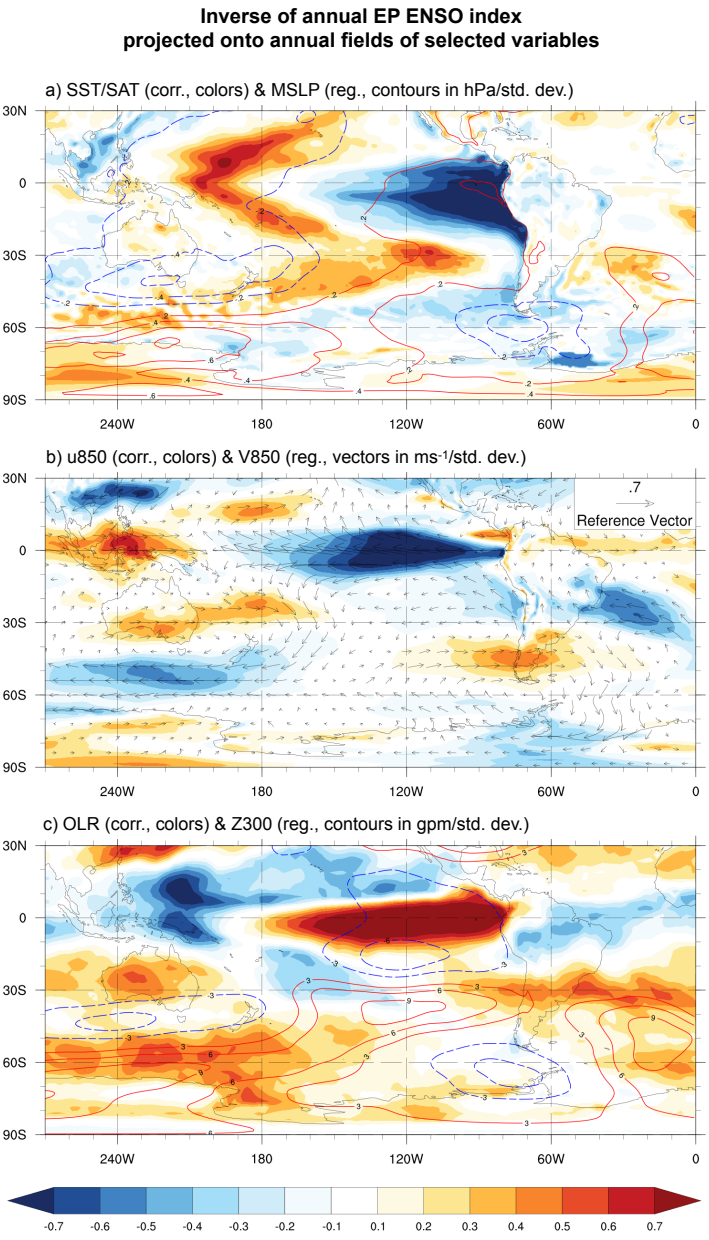

Figure S5. The same as in Fig. 9 but for the inverse of the annual EP ENSO index.

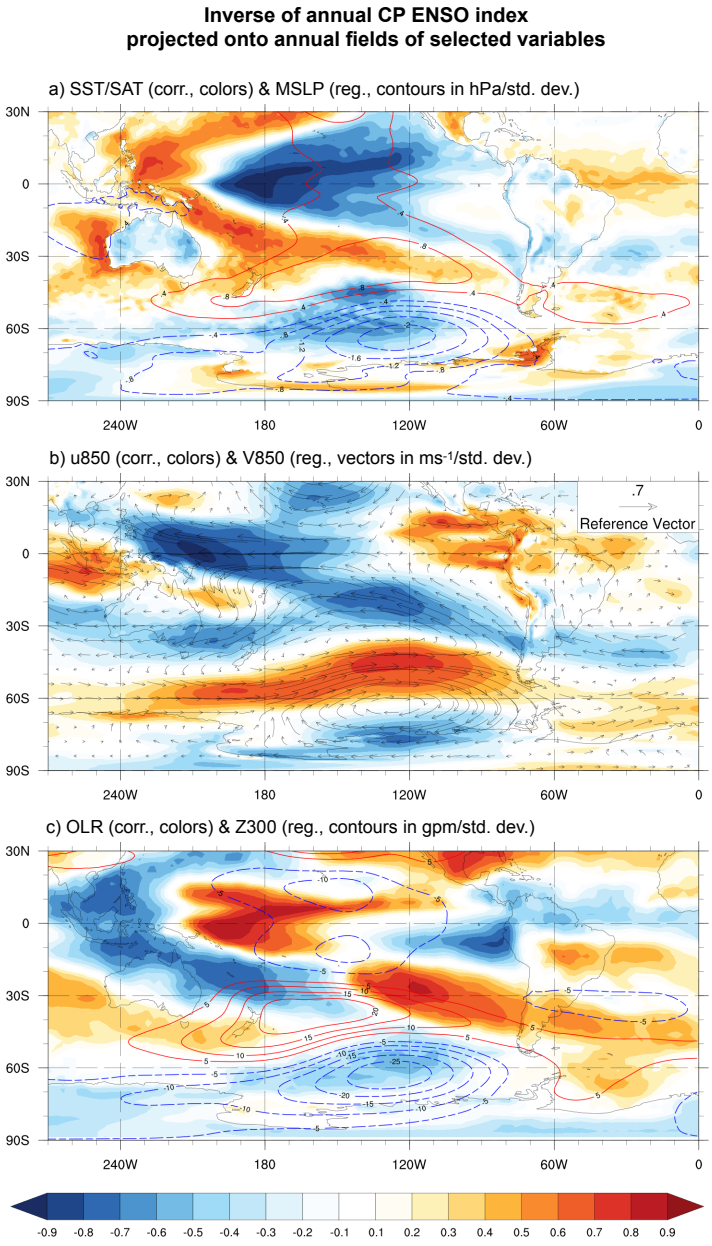

Figure S6. The same as in Fig. 9 but for the inverse of the annual CP ENSO index.

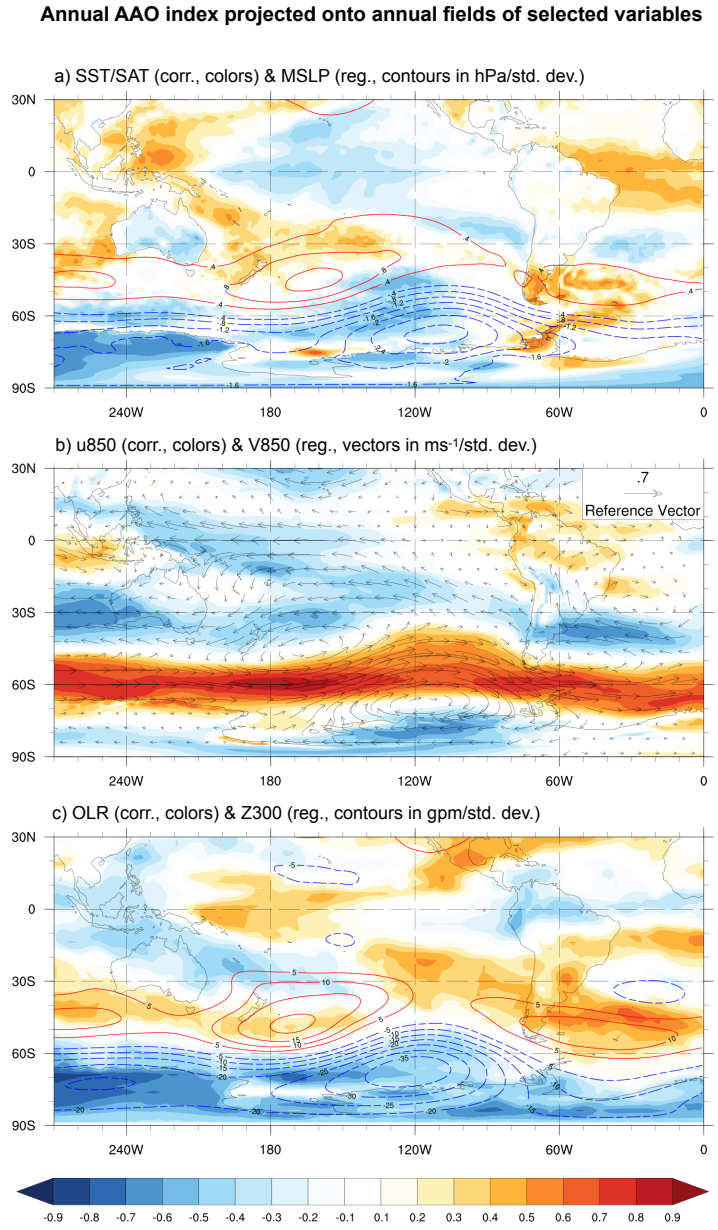

Figure S7. The same as in Fig. 9 but for the annual AAO index.

Standard deviation	SMB	Accumulation	Ablation	Precipitation	Temperature	Insolation
Units	mm w.e.	mm w.e.	mm w.e.	mm w.e.	ºC	Wm^{-2}
Annual	537	403	272	536	0.37	4
Winter	331	333	112	425	0.57	3
Summer	428	237	238	327	0.42	7

Table S1. Standard deviations of the annual (April to March), winter (April to September) and summer (October to March) time series of the spatially averaged modeled fields.

Winter corr.	SMB	Accumulation	Ablation	Precipitation	Temperature	Insolation
SMB	1.00	-	-	-	-	-
Accumulation	0.94^{*}	1.00	-	-	-	-
Ablation	-0.15	0.18	1.00	-	-	-
Precipitation	0.86^{*}	0.97^{*}	0.32	1.00	-	-
Temperature	0.18	0.46^{*}	0.84^{*}	0.61^{*}	1.00	-
Insolation	-0.57^{*}	-0.59^{*}	-0.05	-0.66^{*}	-0.48^{*}	1.00

Table S2. Correlation (Pearson's r coefficient) between pairs of winter (April to September) time series of the spatially averaged modeled fields. (*) Statistically significant value at a significance level of 5%.

Summer corr.	SMB	Accumulation	Ablation	Precipitation	Temperature	Insolation
SMB	1.00	-	-	-	-	-
Accumulation	0.90^{*}	1.00	-	-	-	-
Ablation	-0.90^{*}	-0.62^{*}	1.00	-	-	-
Precipitation	0.64^{*}	0.83^{*}	-0.31	1.00	-	-
Temperature	-0.70^{*}	-0.40^{*}	0.86^{*}	0.05^{*}	1.00	-
Insolation	-0.61^{*}	-0.58^{*}	0.51^{*}	-0.76^{*}	0.08	1.00

Table S3. Correlation (Pearson's r coefficient) between pairs of summer (October to March) time series of the spatially averaged modeled fields. (*) Statistically significant value at a significance level of 5%.