Figure S1: Changes (mid-Pliocene minus historical) for mean annual (a) surface temperature (in °C), (b) SST (in °C), and (c) rainfall (in mm·yr⁻¹) as simulated by the global IPSL-CM6A-LR model.

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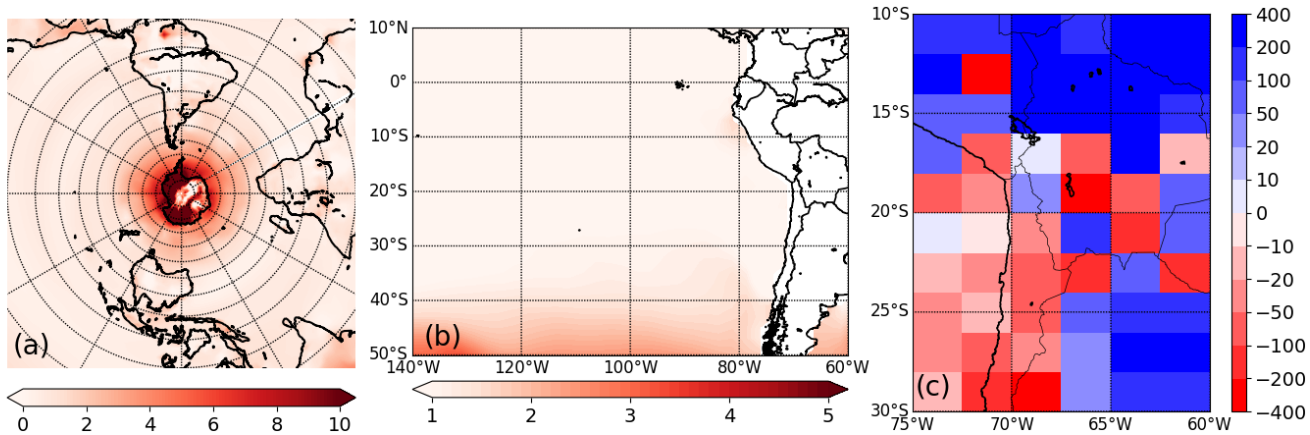
Figure S2: Changes (mid-Pliocene minus historical) for mean annual (a) surface temperature (in °C), (b) SST (in °C), and (c) rainfall (in mm·yr⁻¹) as simulated by the global GISS-E2.1-G model.
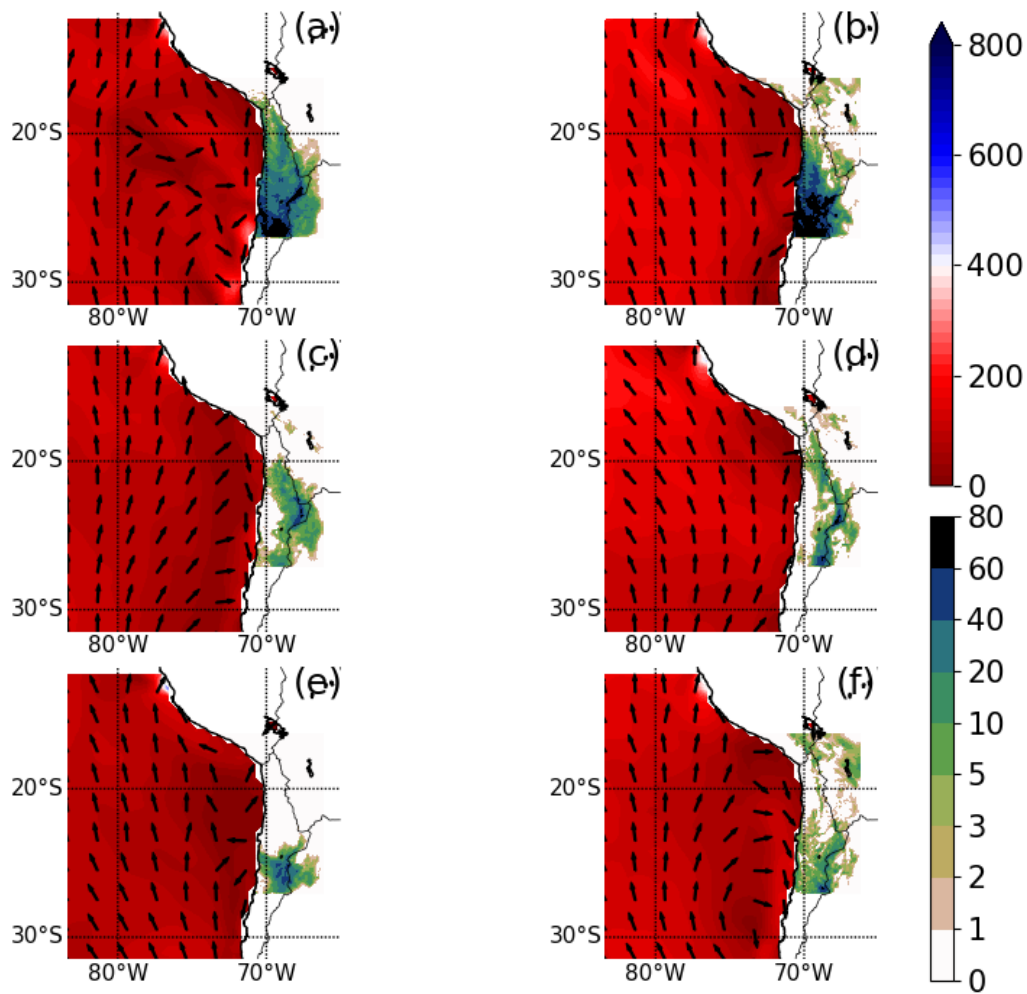
Figure S3: Daily rainfall over land (green-blue shading, in mm·day^{-1}) (obtained for the inner model domain with 10 km resolution) and the lower-level IWVF (below 2000m agl., obtained from the outer model domain with 50 km resolution) over ocean (arrows and red-blue shading, in kg·m^{-1}·s^{-1}) during top winter events in WRF$_{mP}$. (a,b) show events which are among the top events of both, northern and southern Atacama, (c,d) show events which are only among the top events of northern Atacama, and (e,f) show events which are only among the top events of southern Atacama.

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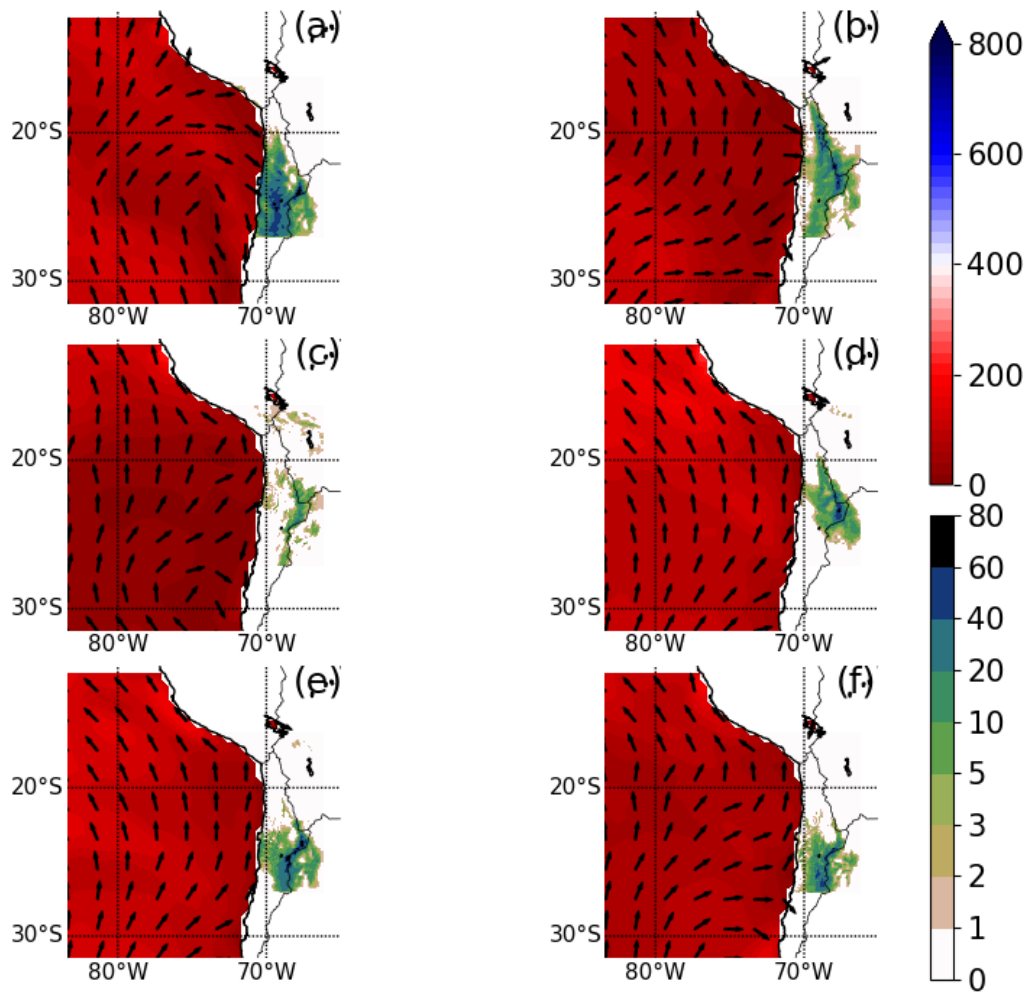
65   **Figure S4: As Fig. S3, but for the top winter events in WRF**hist.