

Journal of Geophysical Research: Atmospheres

Supporting Information for

From sea to summit: Investigating the explicit role of SST increase for regional and high-altitude climates in New Zealand

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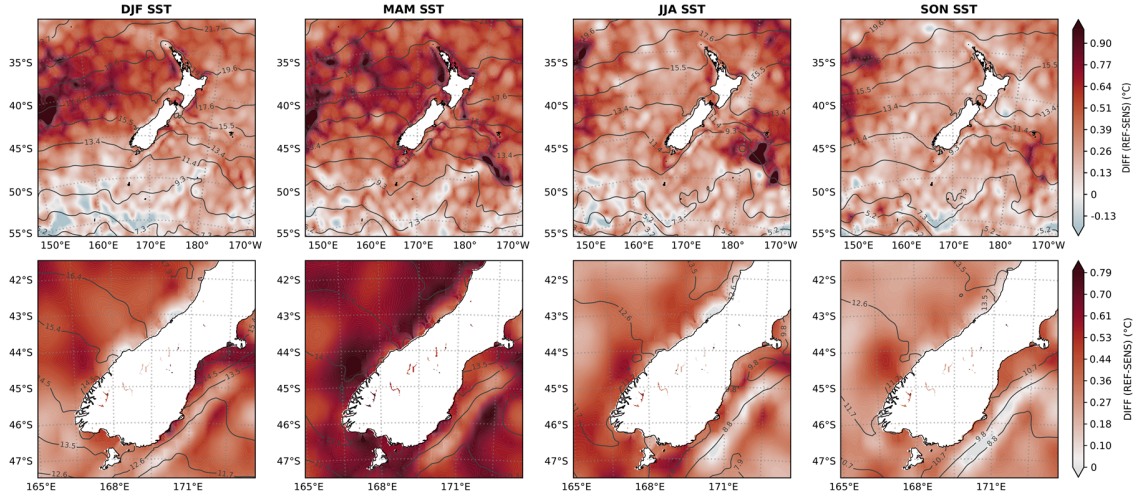


Figure S1. Seasonal SST difference between REF (ocean warming) and SENS (restricted ocean warming) in D1 (top row) and D2 (bottom row) in 2010–2020. The grey contour lines represent the average SST in 1981–2010 in the respective seasons as an absolute reference.

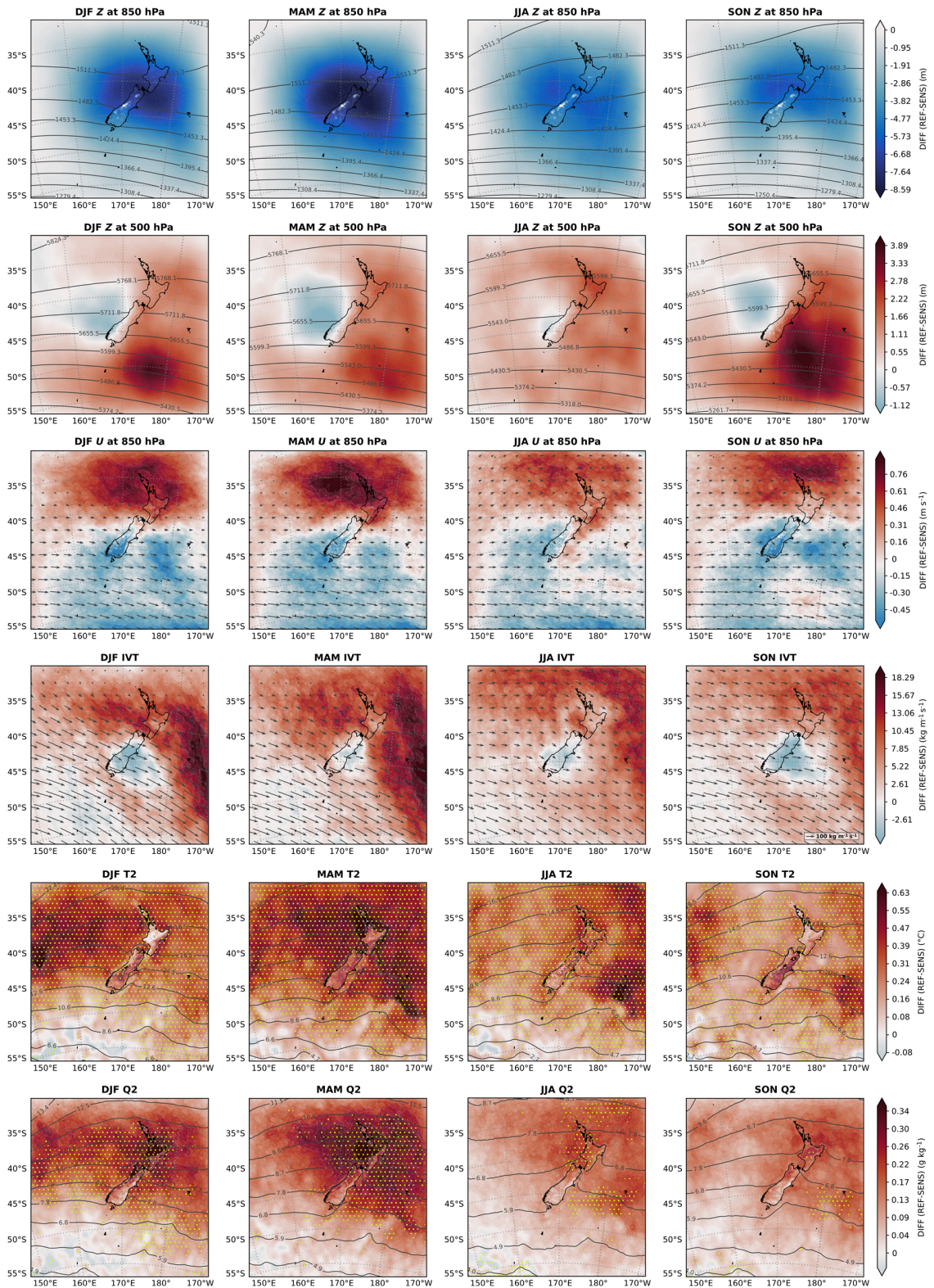


Figure S2. (Continued on next page)

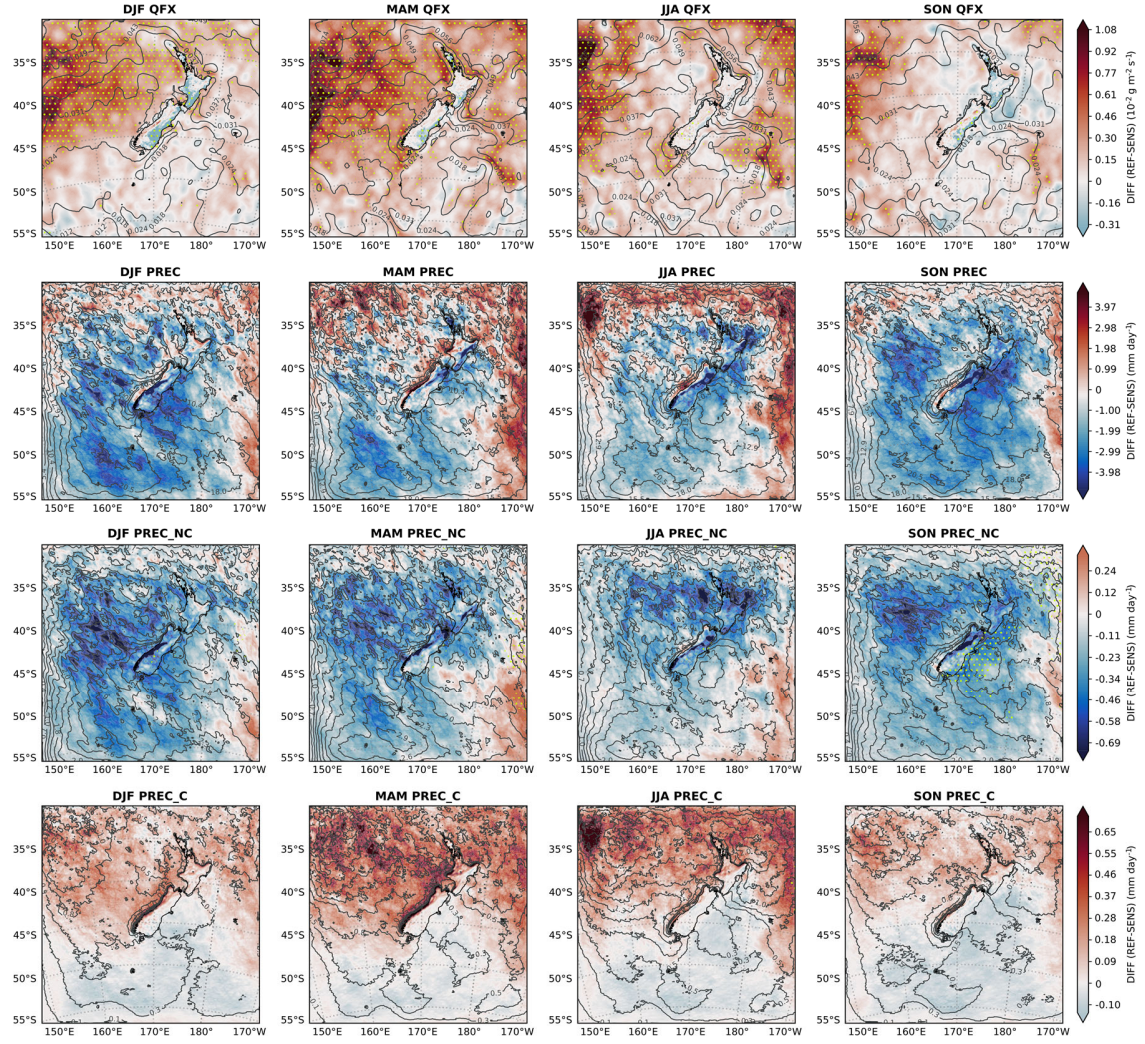


Figure S2. (Continued) Seasonal response of atmospheric variables in D1 to SST warming in 2010–2020 (from top to bottom): lower and mid-tropospheric geopotential height (Z), low-level u -wind speed, column integrated water vapor transport (IVT), 2m air temperature (T_2), 2m specific humidity (Q_2), upward moisture flux at the surface (QFX), and total, stratiform and convective precipitation (PREC, PREC_NC and PREC_C, respectively). The grey contour lines and arrows indicate the state of the variables over ocean areas in SENS as an absolute reference. The yellow dots highlight regions with significant ($p \leq 0.05$) responses.

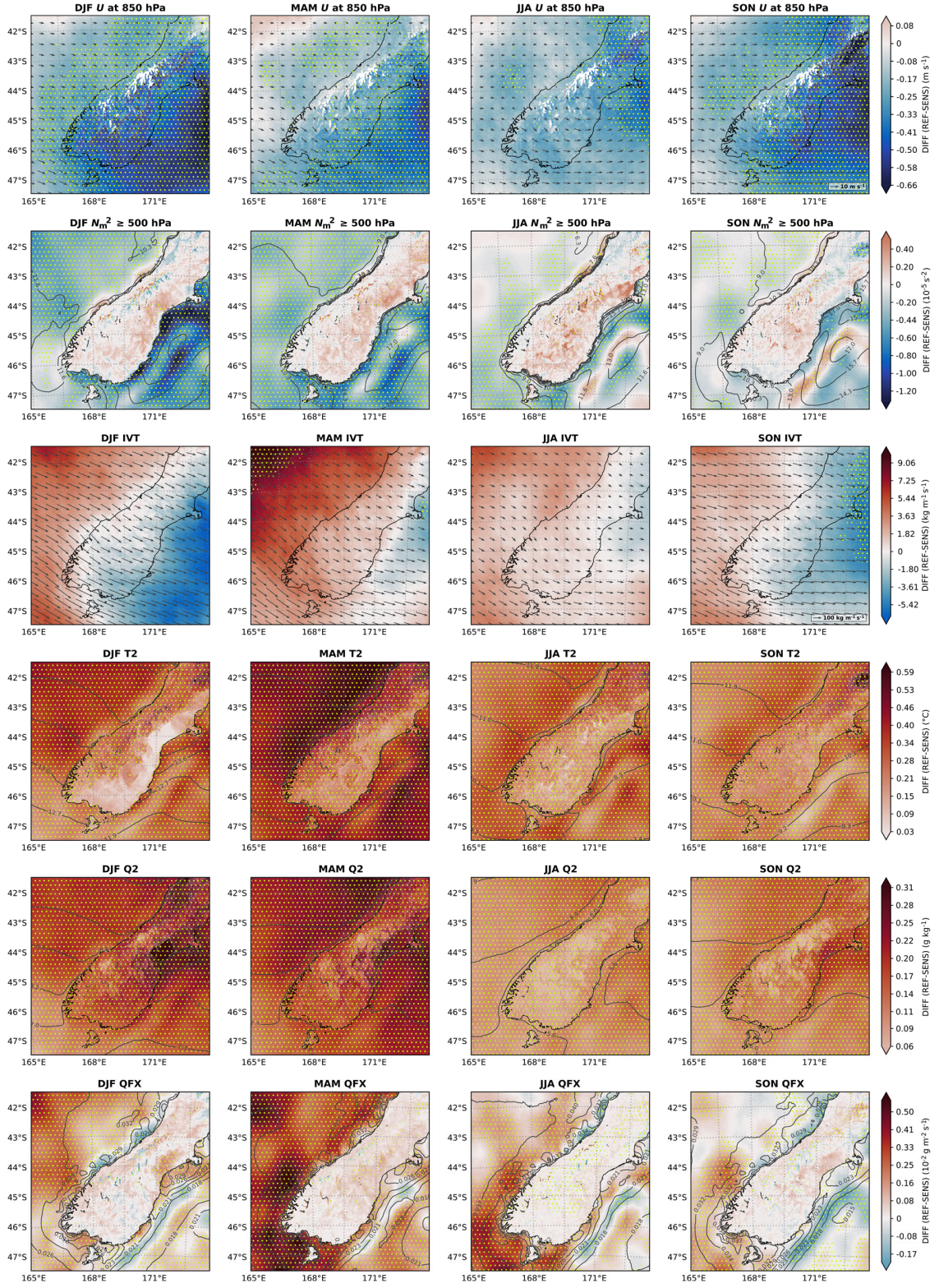


Figure S3. (Continued on next page)

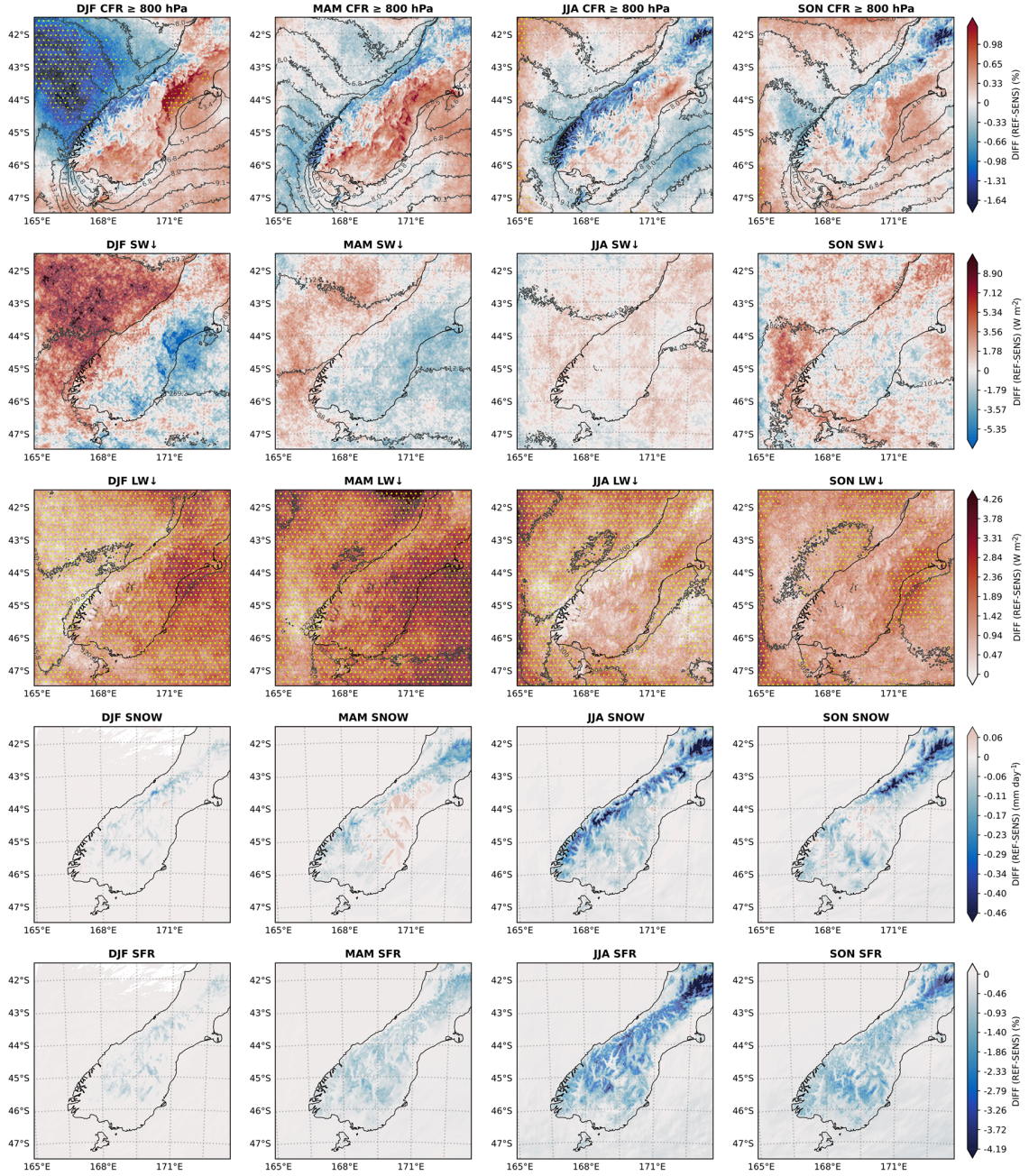


Figure S3. (Continued) Seasonal response of atmospheric variables in D2 to SST warming in 2010–2020 (from top to bottom): low-level wind speed (U), column-mean (≥ 500 hPa) unsaturated moist Brunt-Väisälä-Frequency (N_m^2), column integrated water vapor transport (IVT), 2m air temperature (T_2), 2m specific humidity (Q_2), upward moisture flux at the surface (Q_{FX}), low-level cloud fraction (CFR), incoming shortwave radiation (SW^*), incoming longwave radiation (LW^*), snowfall (SNOW), and solid fraction of precipitation (SFR). The grey contour lines and arrows indicate the state of the variables over ocean areas in the respective seasons in SENS as an absolute reference. The yellow dots highlight regions with significant ($p \leq 0.05$) responses.