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# Where does the dust deposited over the Sierra Nevada snow come from?

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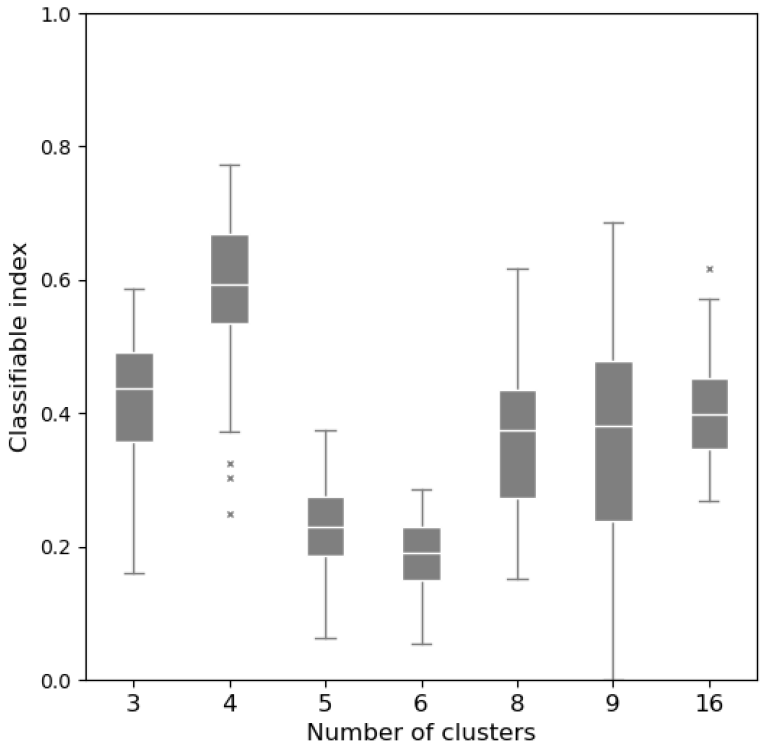

Figure S1 Classifiable index as a function of the number of clusters.

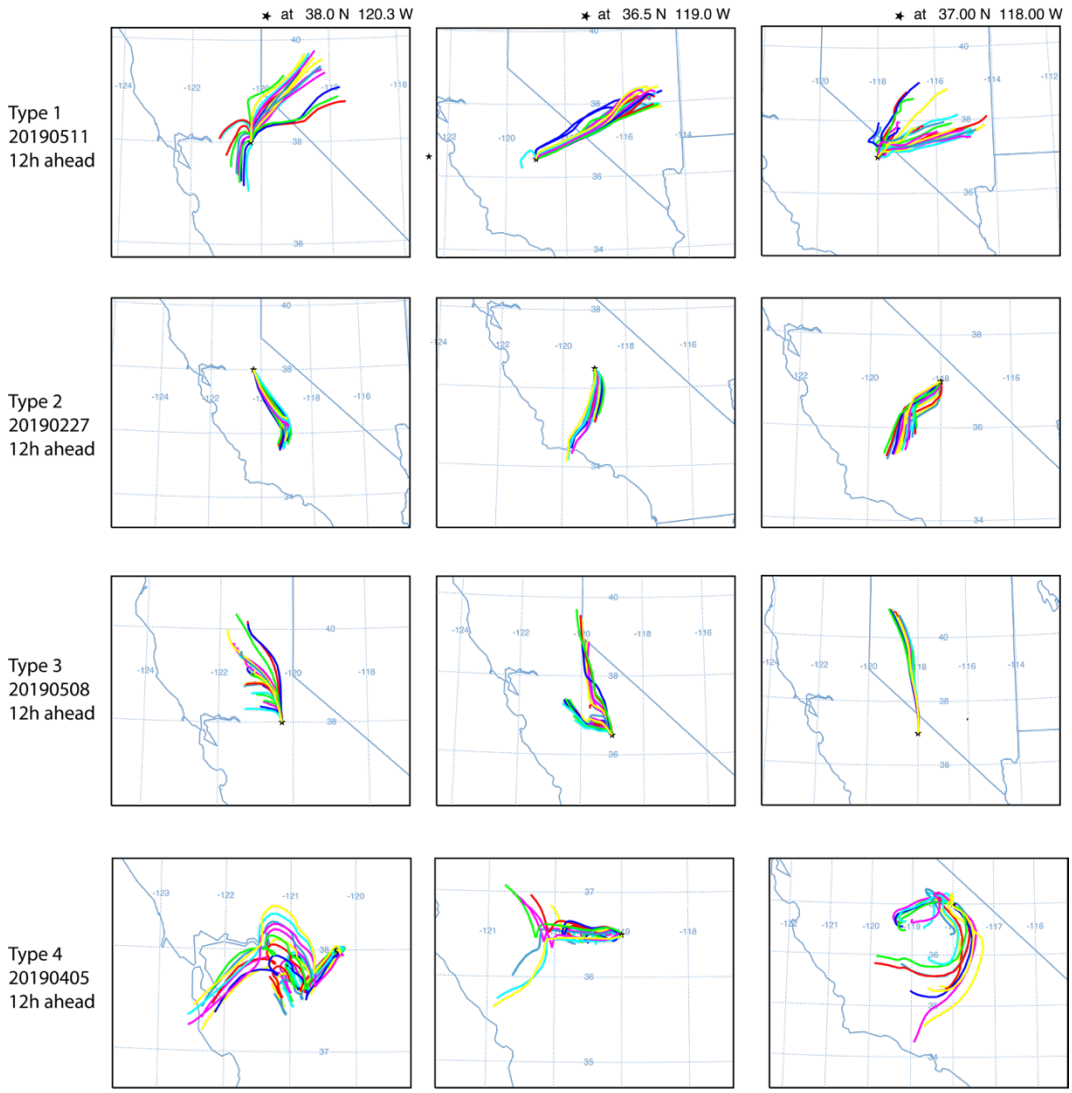


Figure S2 12-hour backward trajectories of the air masses reaching the three sites in the central (left column), south (middle column) and eastern (right column) Sierra Nevada on typical days of four SOM types. The air mass back trajectory data was obtained using the hybrid single-particle Lagrangian integrated trajectory (HYSPLIT) model from the National Oceanic and Atmospheric Administration (NOAA). Air mass back trajectories were calculated at 1000 m above ground level.

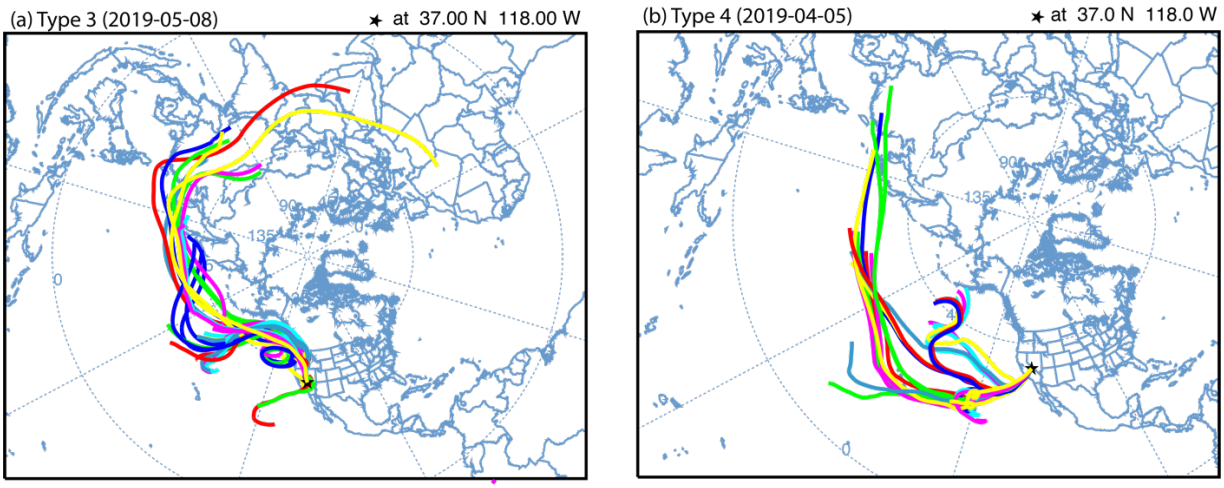


Figure S3 7-day backward trajectories of the air masses reaching the east Sierra Nevada site on typical days of type 3 (a) and type 4 (b). Air mass back trajectories were calculated at 3000 m above ground level.

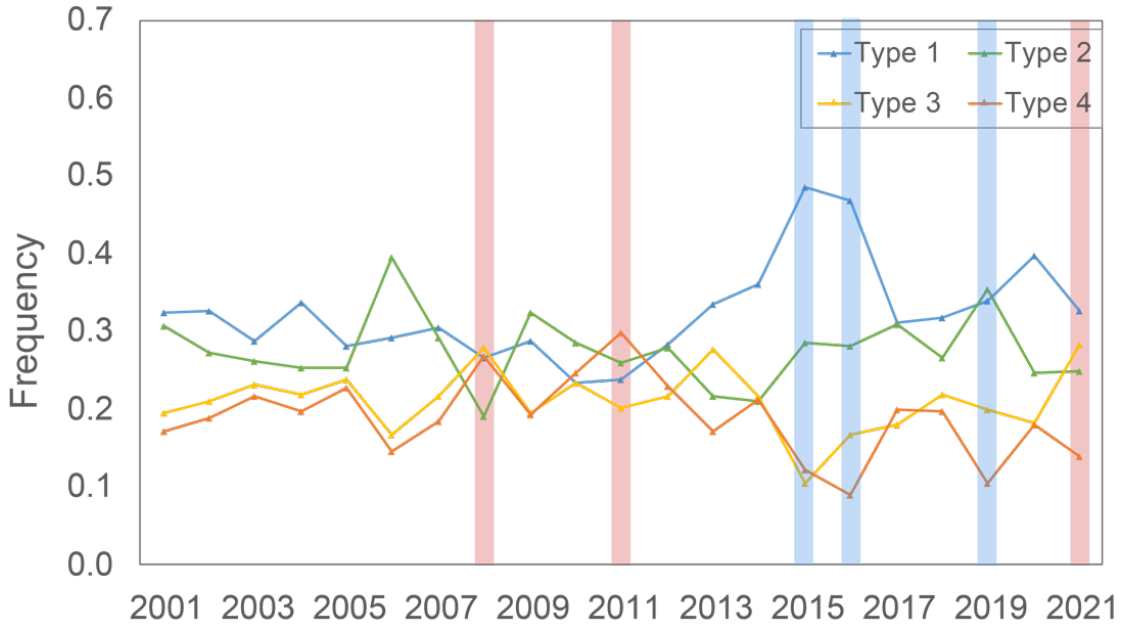


Figure S4 The frequency of each type during 2001-2021. The red bars denote La Nina years while the blue bars denote El Nino years.

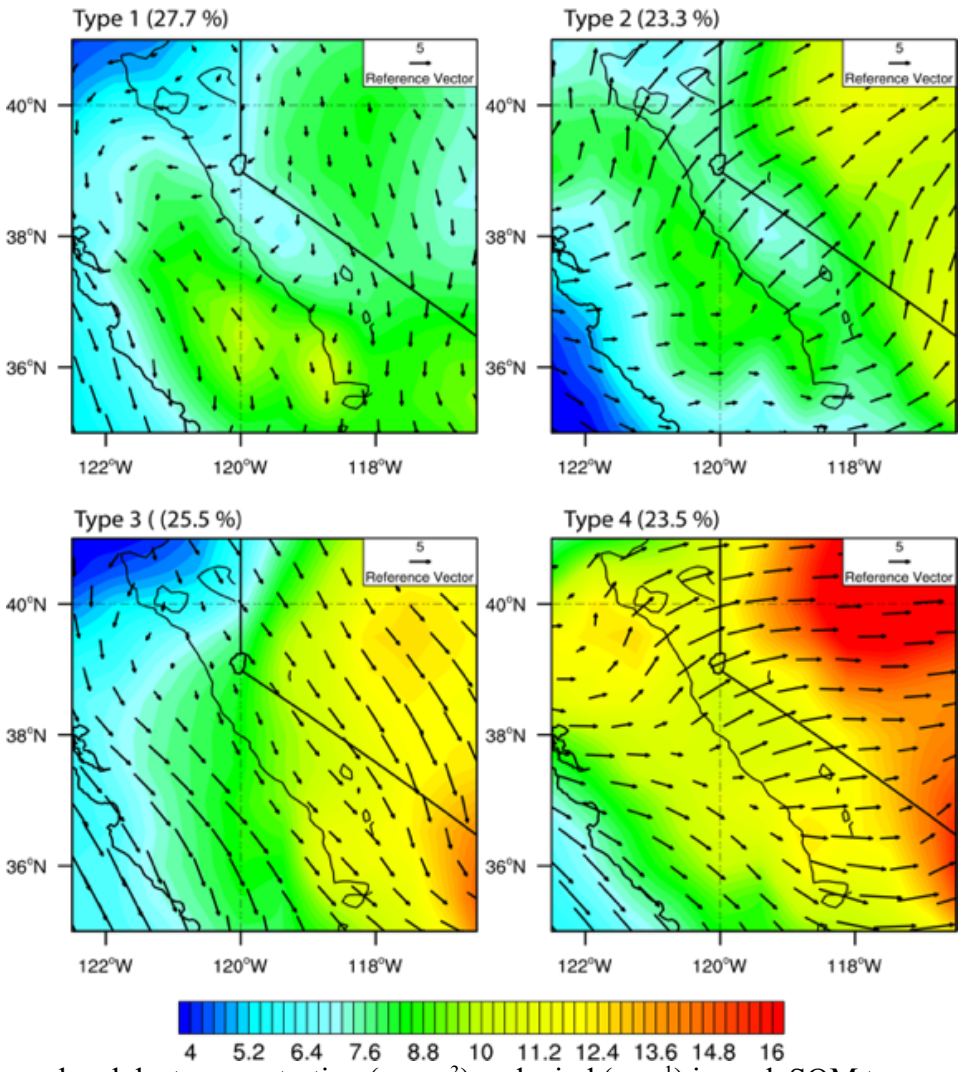


Figure S5 Low-level dust concentration (ug $m^{-3}$) and wind (m $s^{-1}$) in each SOM type averaged over La Niña years (2008, 2011, 2021). The numbers on the top right of subplots denote the frequency of each type.

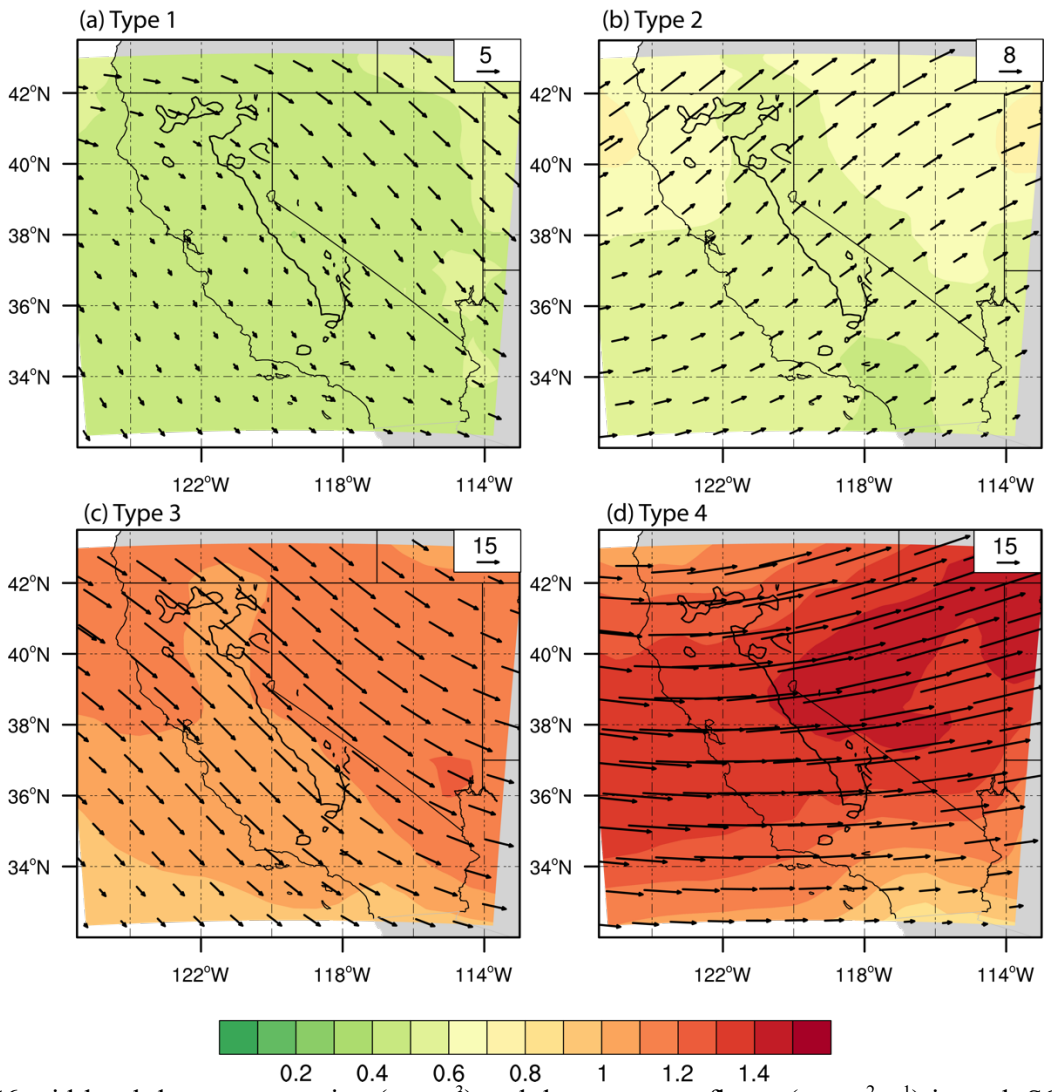


Figure S6 mid-level dust concentration (ug $m^{-3}$) and dust transport fluxes (ug $m^{-2}$ $s^{-1}$) in each SOM type averaged over La Niña years (2008, 2011, 2021).

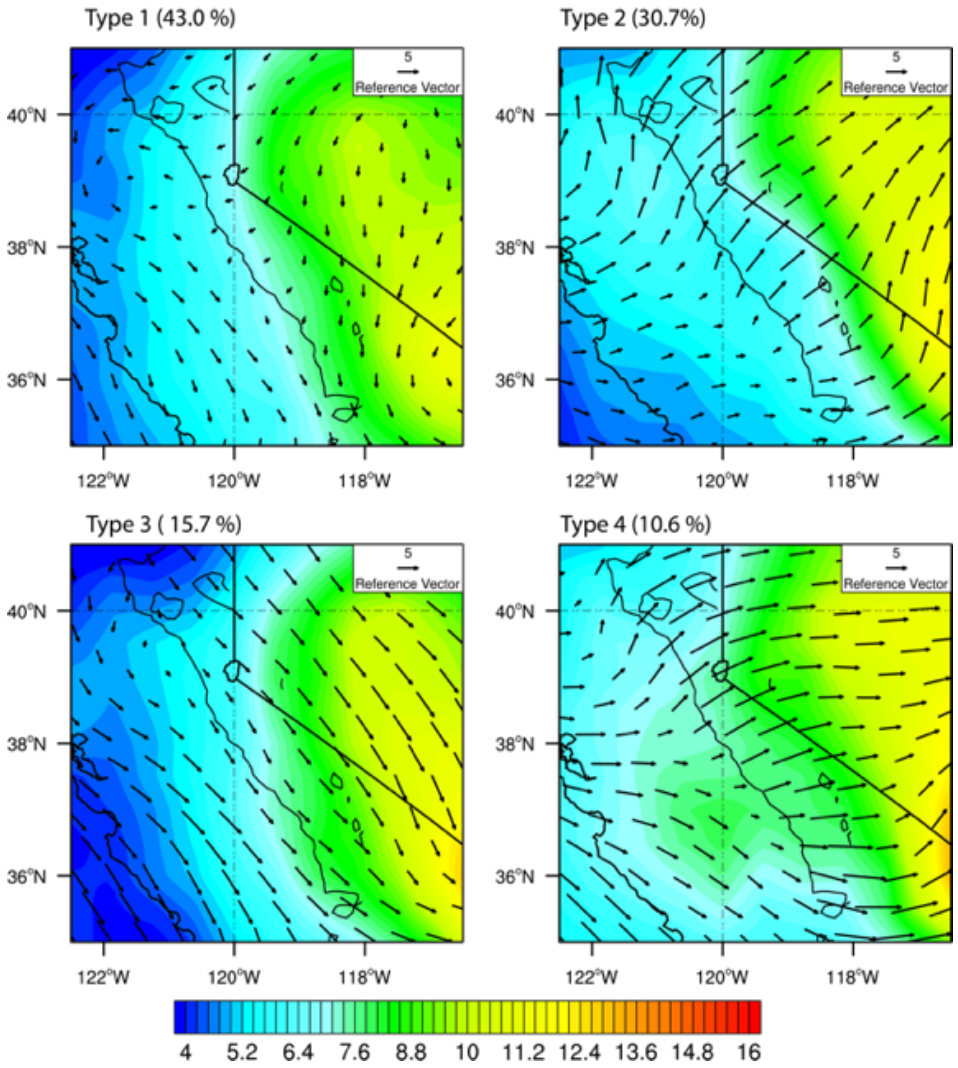


Figure S7 Same as Figure S5 but for the average of three El Nino years (2015, 2016, and 2019)

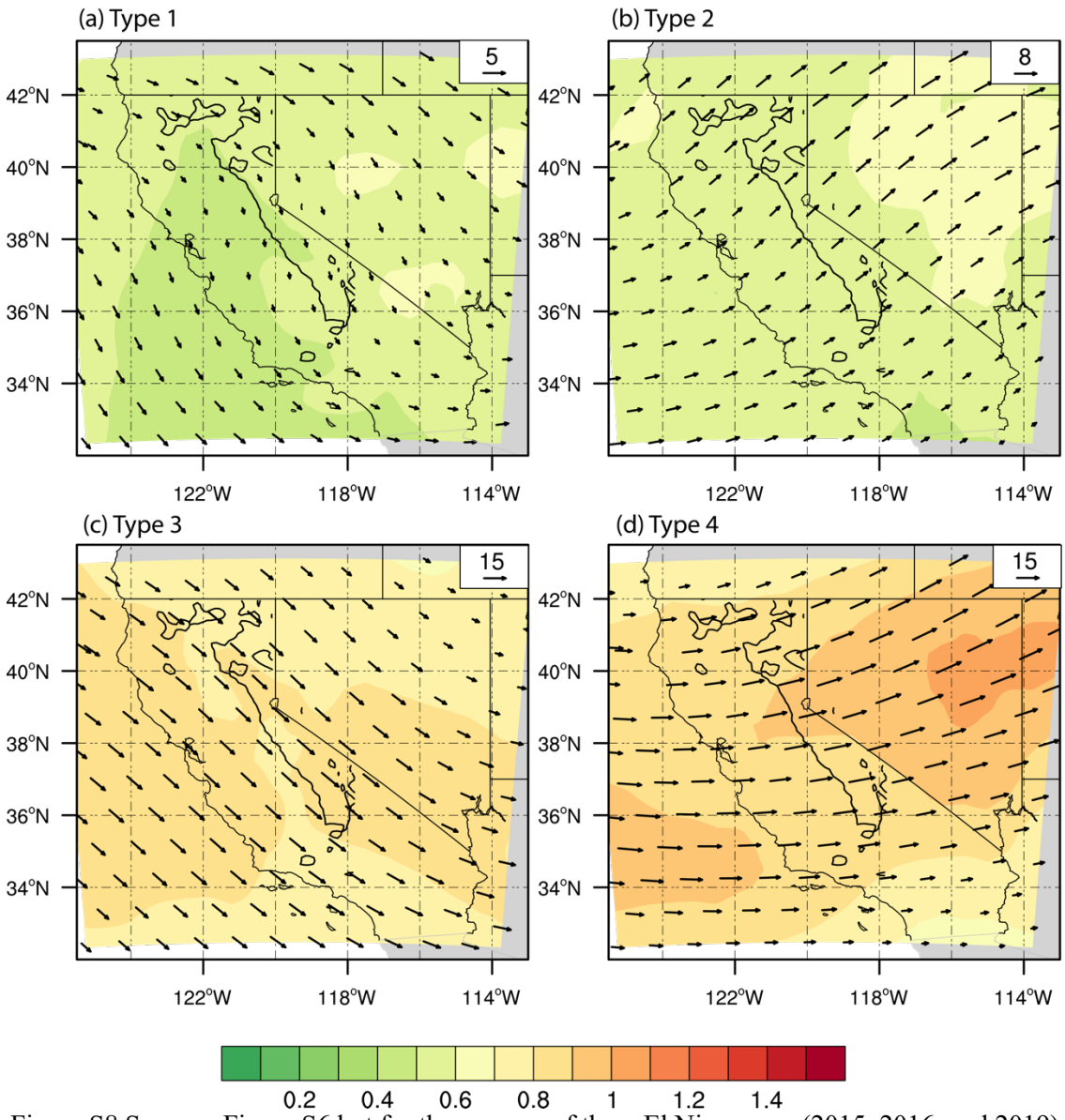


Figure S8 Same as Figure S6 but for the average of three El Nino years (2015, 2016, and 2019)