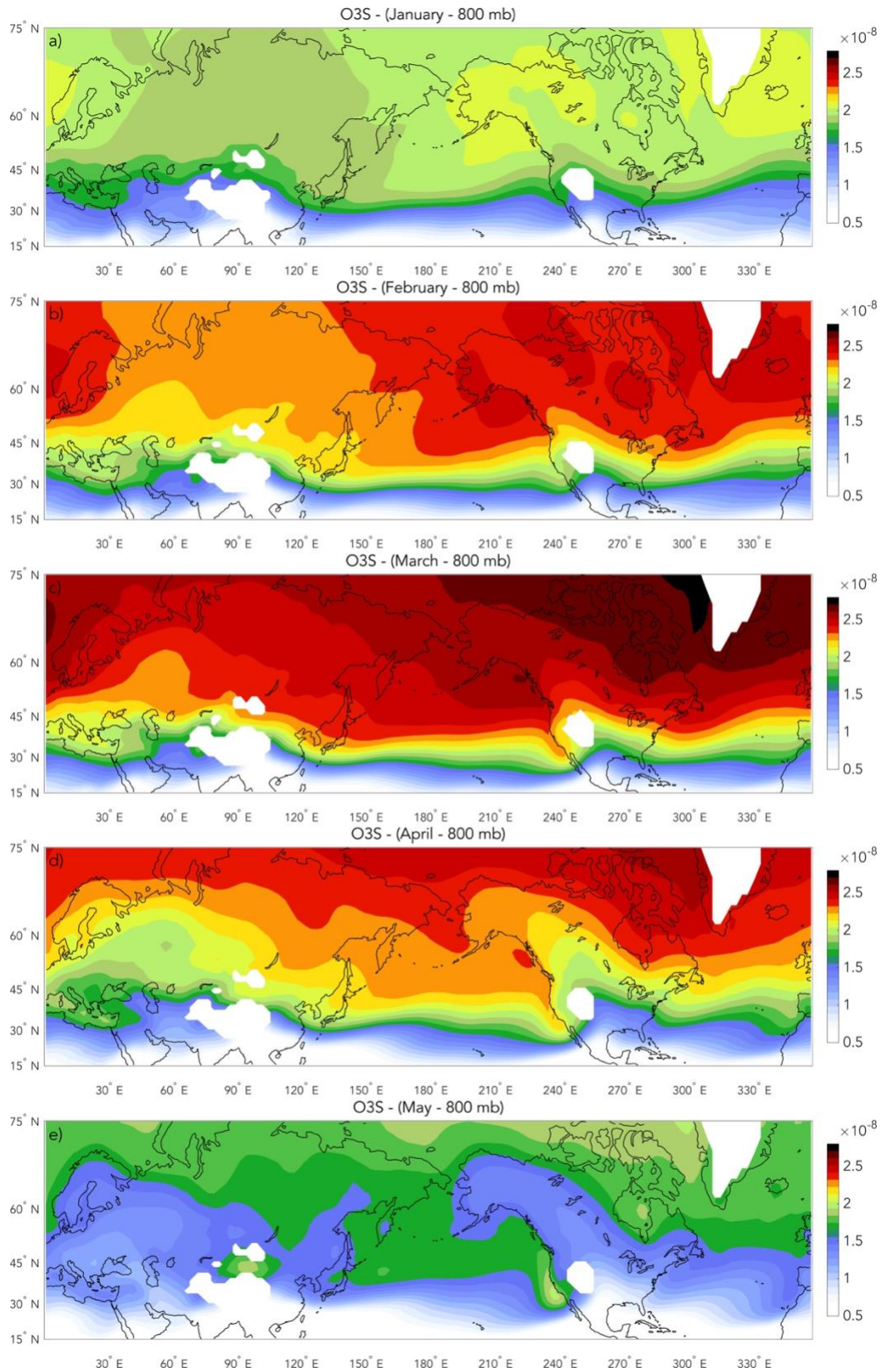
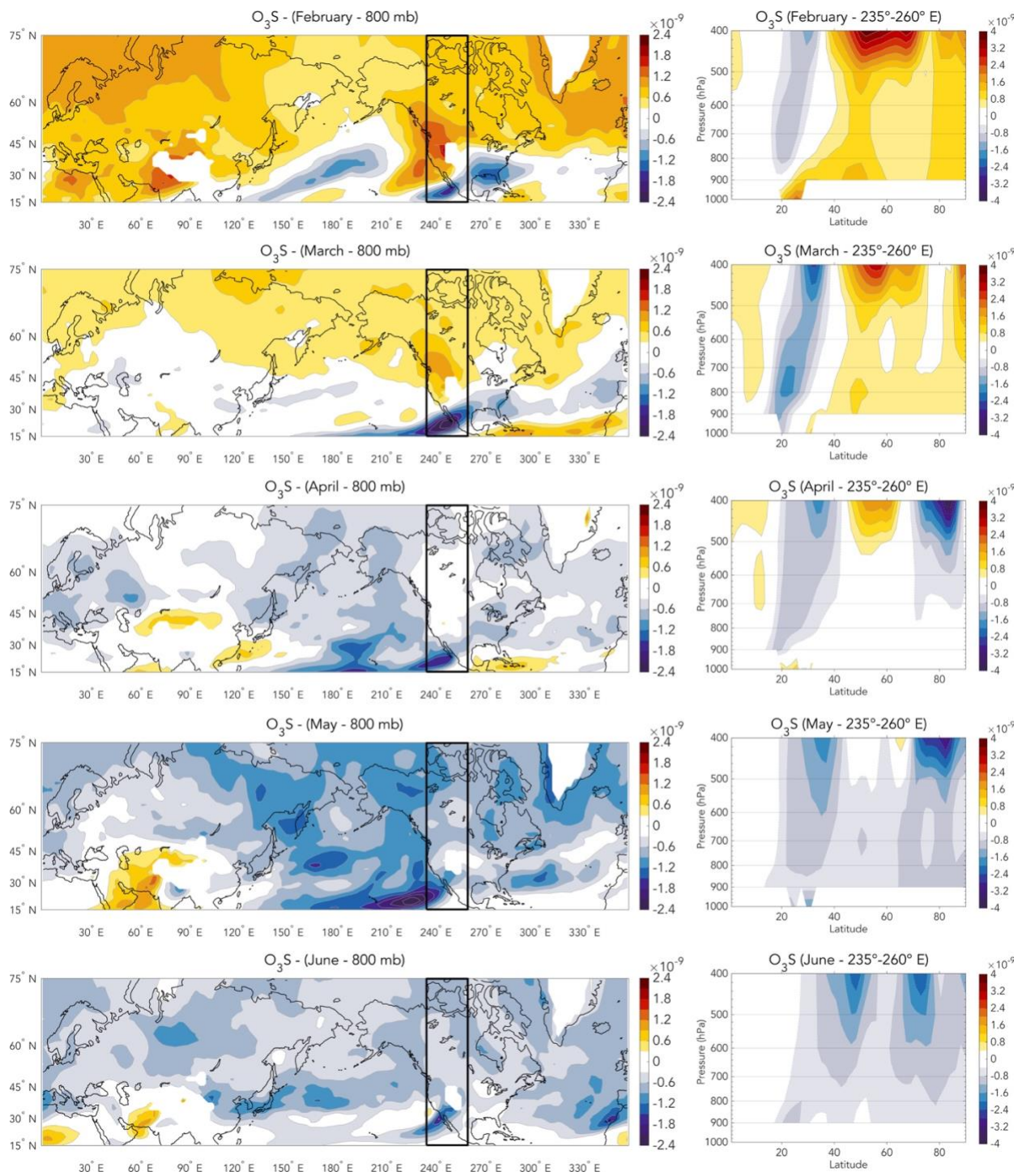


**Figure S1:** Two-year cycle of El Niño SST anomalies used in WACCM time slice simulations. Units are in degrees Celsius.



**Figure S2:** January-May O<sub>3</sub>S climatology at 800 hPa. Units are mass mixing ratio. White areas reflect missing data associated with topography.



**Figure S3:** February-June La Niña composites of: (left column) 800 hPa O<sub>3</sub>S anomalies, and (right column) zonal mean anomaly cross-sections of O<sub>3</sub>S where the longitudinal boundaries (235°-260° E) of the zonal mean correspond to the box overlaying the left column composites. All units are mass mixing ratio.