Creation of an SST metric for E3SM

Metrics are commonly used in climate science to determine relationships between parameters. Examining sea surface temperature (SST) variability is compelling for such purposes, due to the long time series of SST available over the global ocean and due to the importance of ocean temperature on global climate. In particular, we seek to relate ocean temperatures with precipitation extremes across the United States using E3SM. We examined the relationship between SST trends and seasonal SST with extreme precipitation, quantified via the Standardized Precipitation Index (SPI), a widely used index to characterize meteorological drought on a range of timescales. We found a strong dependence of precipitation on decadal oscillations, particularly ENSO, with warmer temperatures along the equator (e.g. an El Nino event) tending to produce significant increases in precipitation in many watersheds. Similar patterns are observed for PDO and ENSO. Future work could expand on this in an effort to relate SST to chlorophyll or crop yields across the US.