

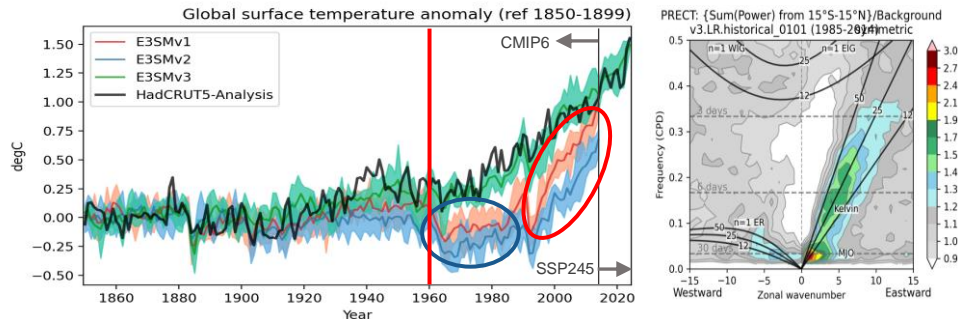
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Objective

- Use large ensemble to robustly characterize simulated
 - major modes of variability,
 - tropical-polar teleconnections,
 - trends in key climate metrics,
 - relative contribution due to internal variability and forced responses during the historical period.

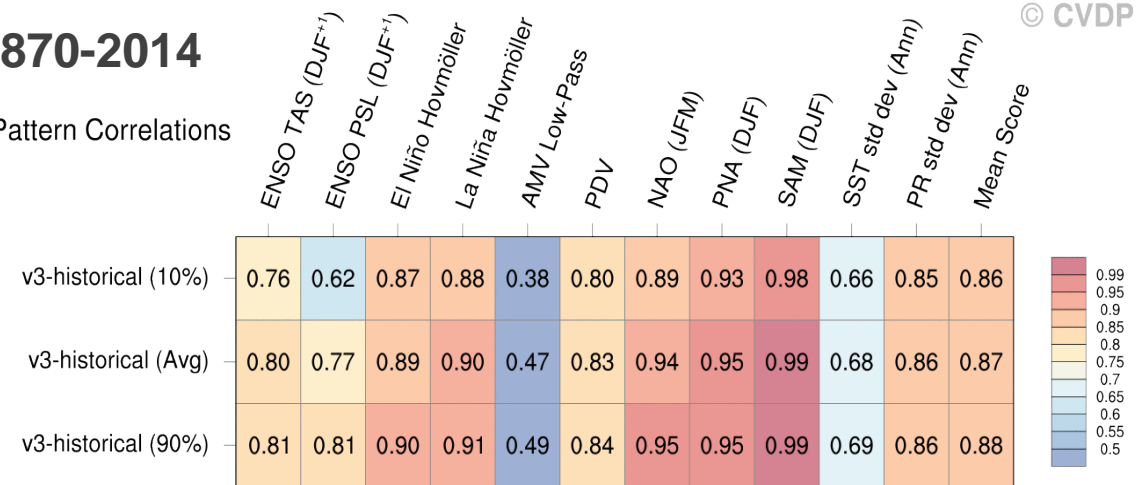
Background

- Built on the much improved E3SMv3 in climate simulation skills.
- Analysis powered by CVDP-LE, PCMDI Metrics, and e3sm diagnostic suites.



1870-2014

Pattern Correlations

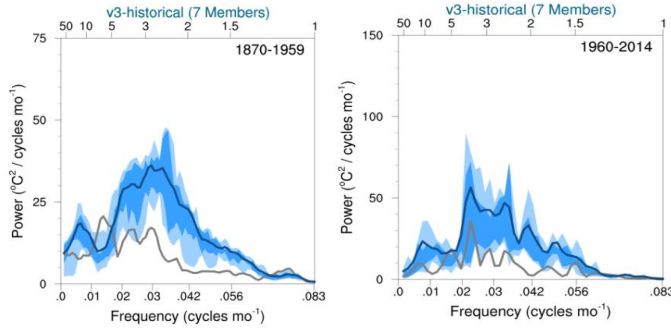


NOAA20C/HadSST. The scores vary with reference data analysis periods.

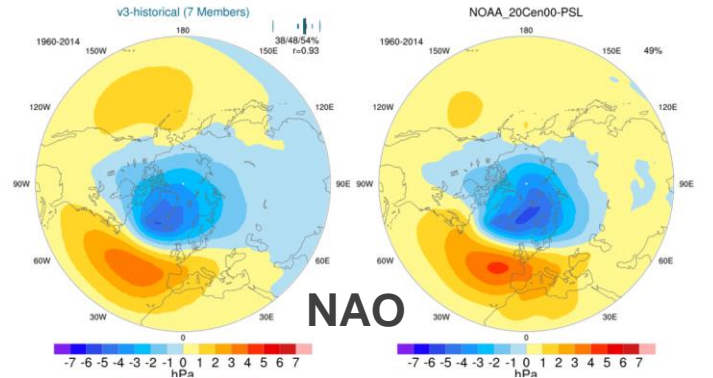
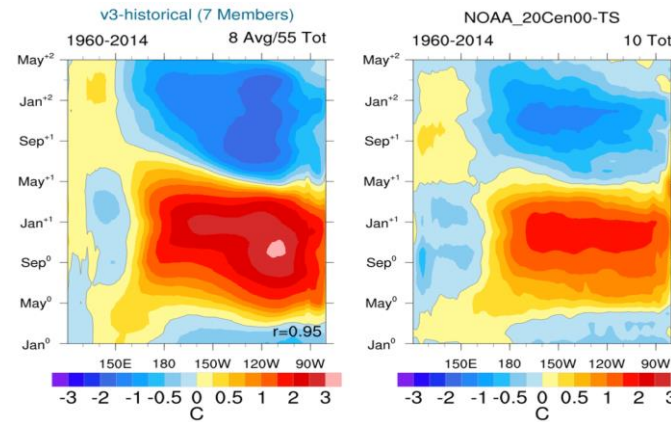
Simulations

- CMIP6 historical + SSP245 extension through 2024
- 30 ensemble members
 - macro initialization off the 500-year piControl simulation (every 10 years from 0051- 0351)
 - completed 7 simulations.

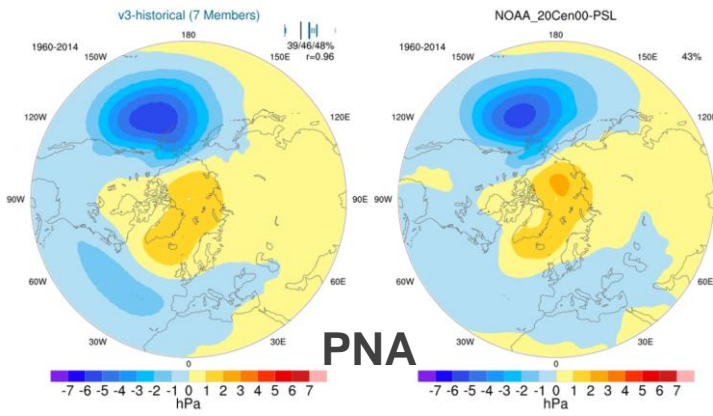
Ensemble Summary



El Niño

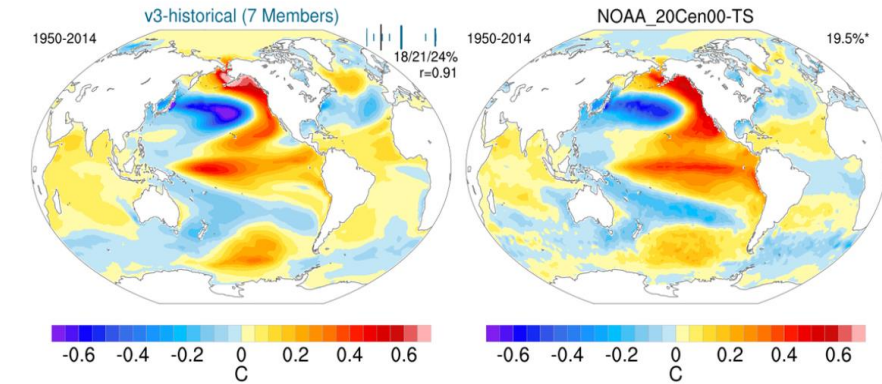
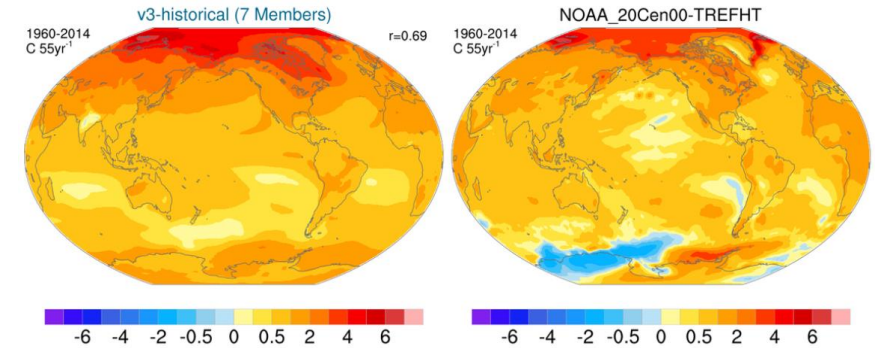


NAO



PNA

Annual TAS Trend

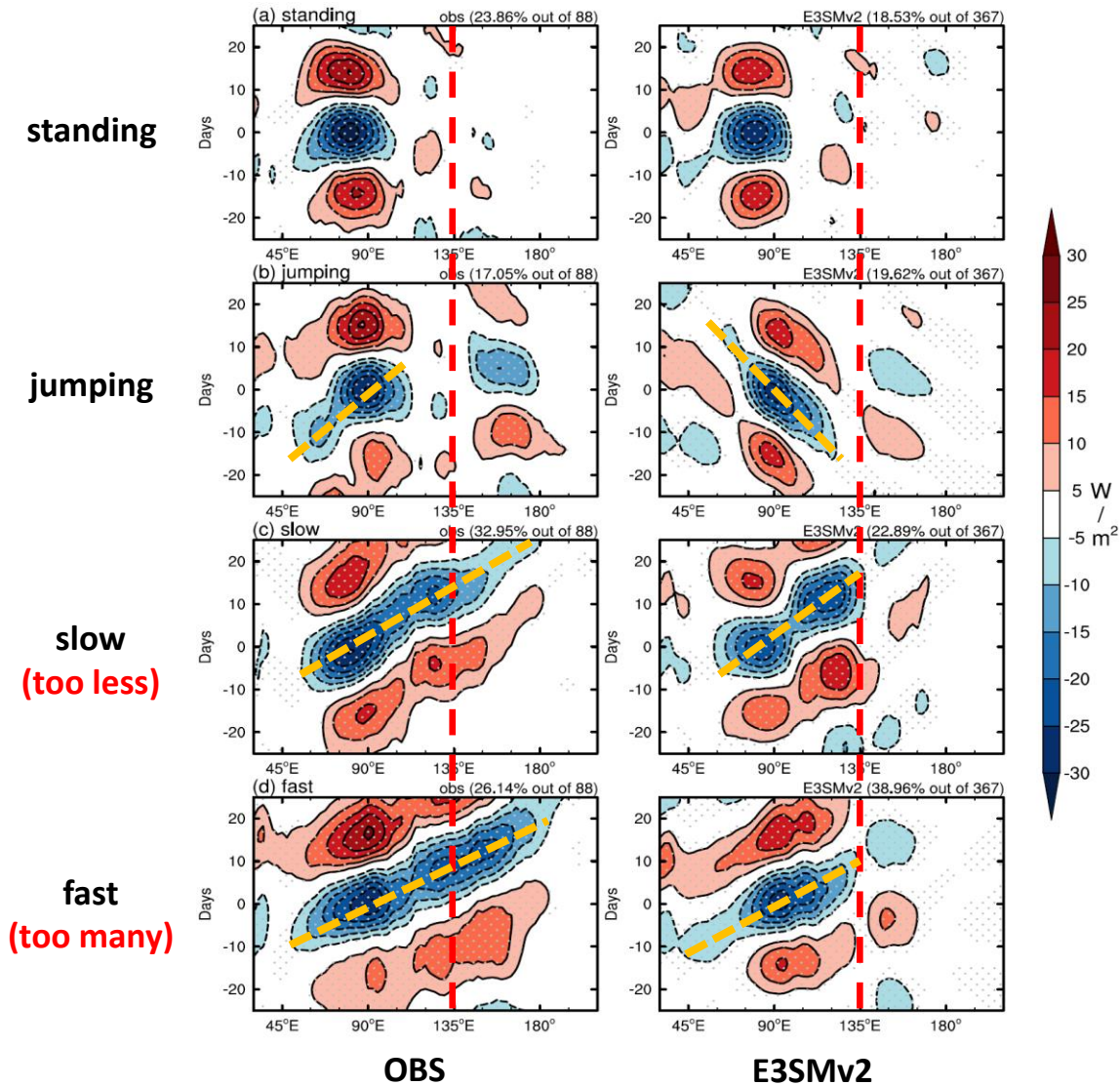


PDV Monthly

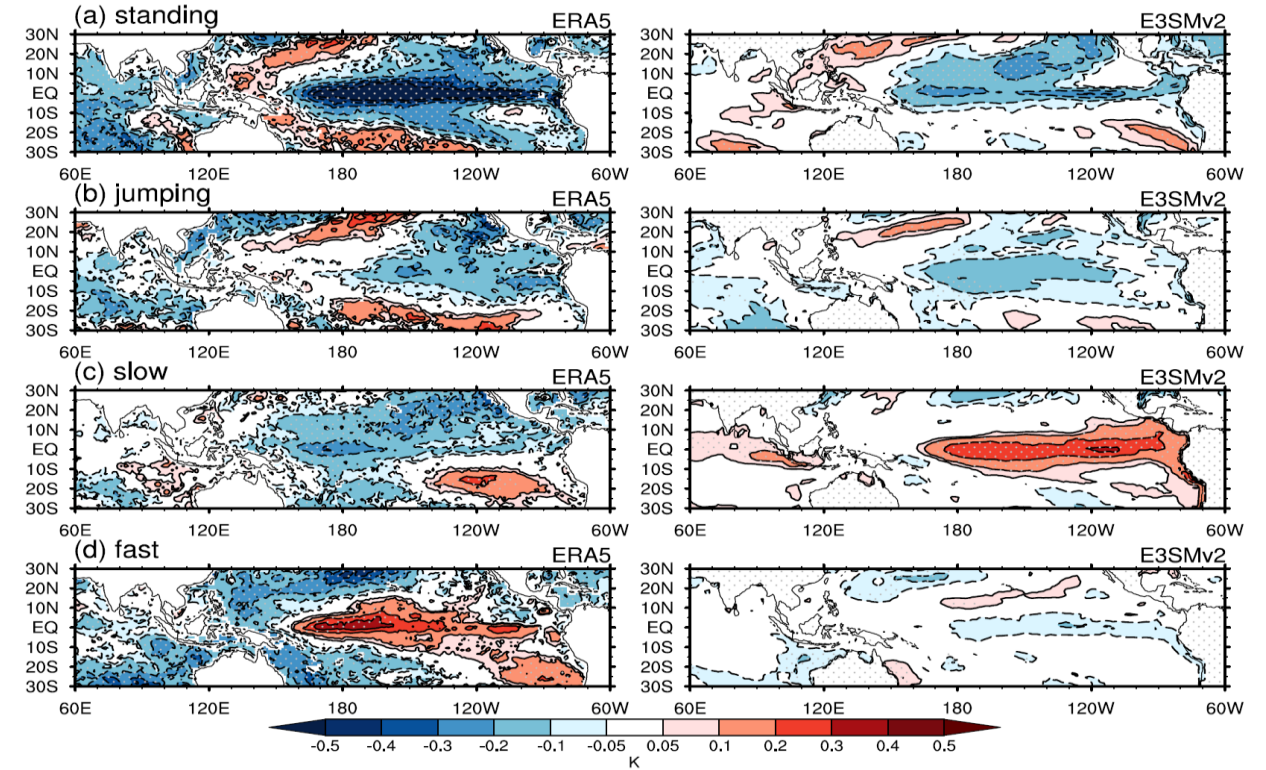
Next steps

- Complete remaining simulation members
- Incorporate other observational data (best estimate products for each quantity analyzed)
- Expand the analysis, including ocean and sea ice metrics
- Welcome collaborations on topical applications using the E3SMv3-LE data

Composited OLR Hovmöller diagrams (10S-10N)



90-day-mean SST Anomalies



- **E3SMv2 captures four types of MJO but with biases in**
- **propagating direction/ranges**
- **portions of the four MJO types**
- **ENSO phase locking**
- **vertical structure (not shown here)**