Climate Highlights from CESM2 / CVCWG Updates

Adam Phillips and Susan Bates
CGD/NCAR

Thanks to Clara Deser
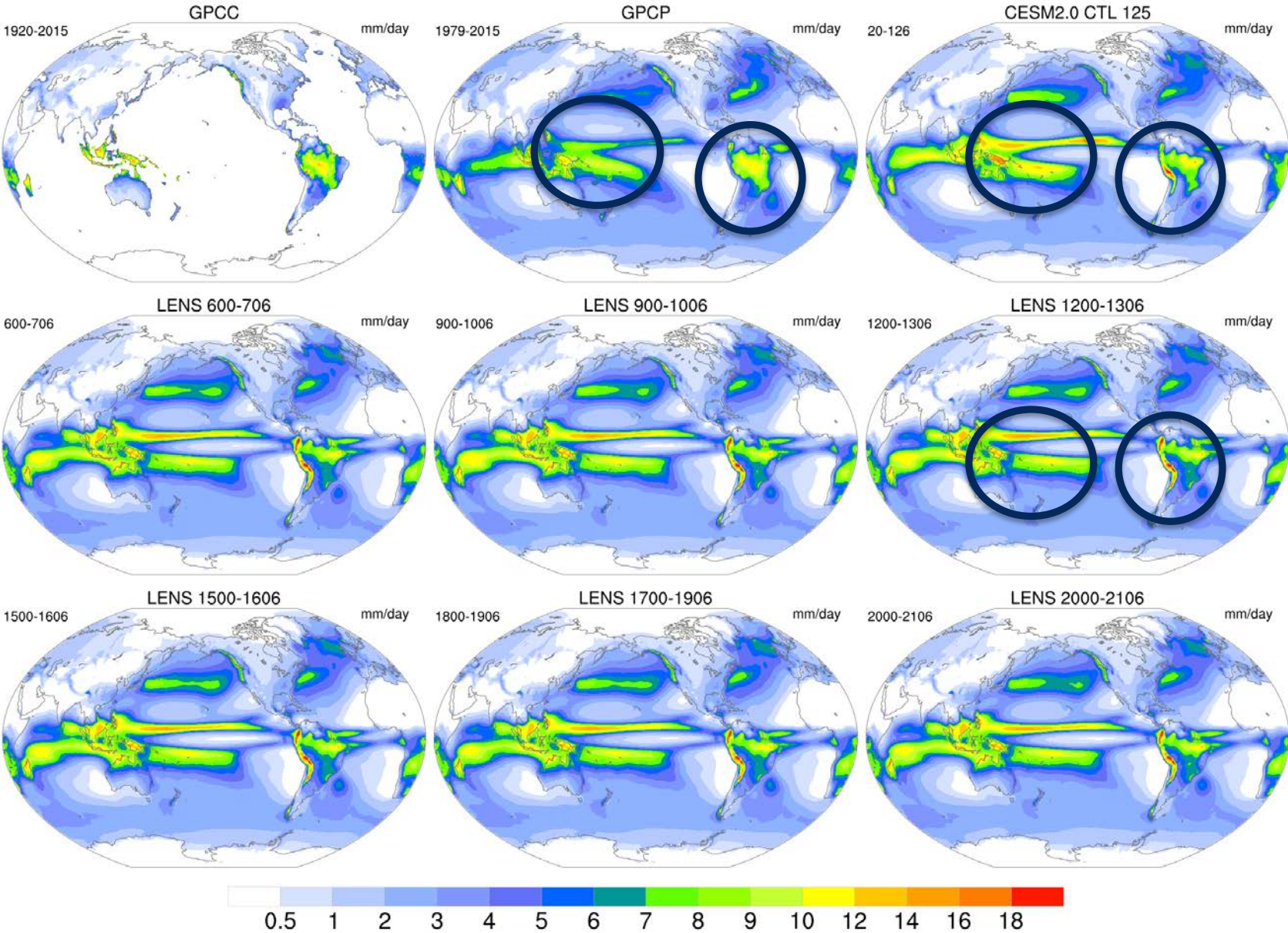
# CESM2 Pre-industrial control run (125)

- Not final configuration, uses older land model parameters, old topography file, dust not tuned, CMIP5 emissions, etc.

- Only 126yrs long, not in equilibrium

- Diagnostic plots are available on the CESM1.5 simulations page here:

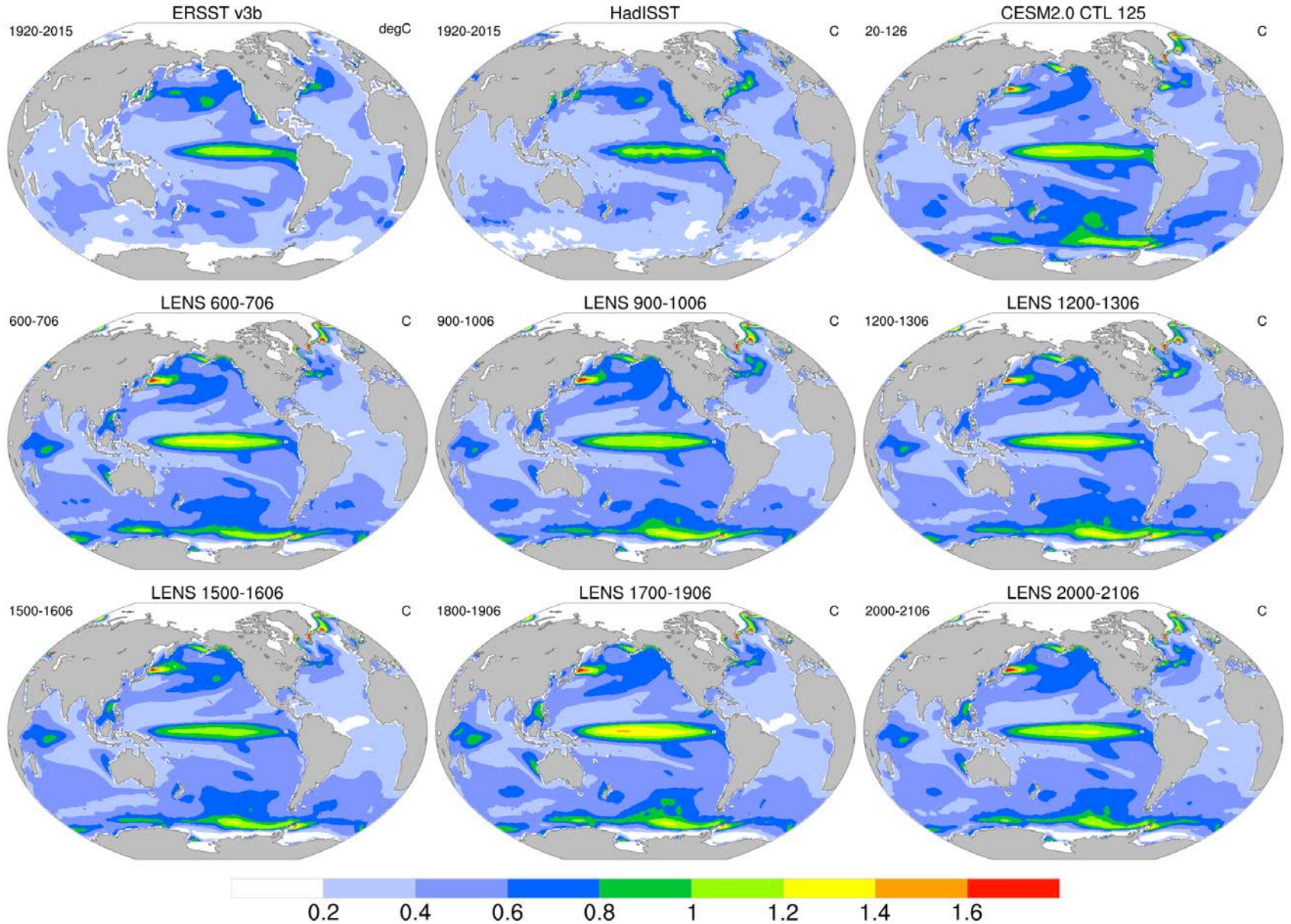http://www.cesm.ucar.edu/working_groups/Atmosphere/development/cesm1_5/
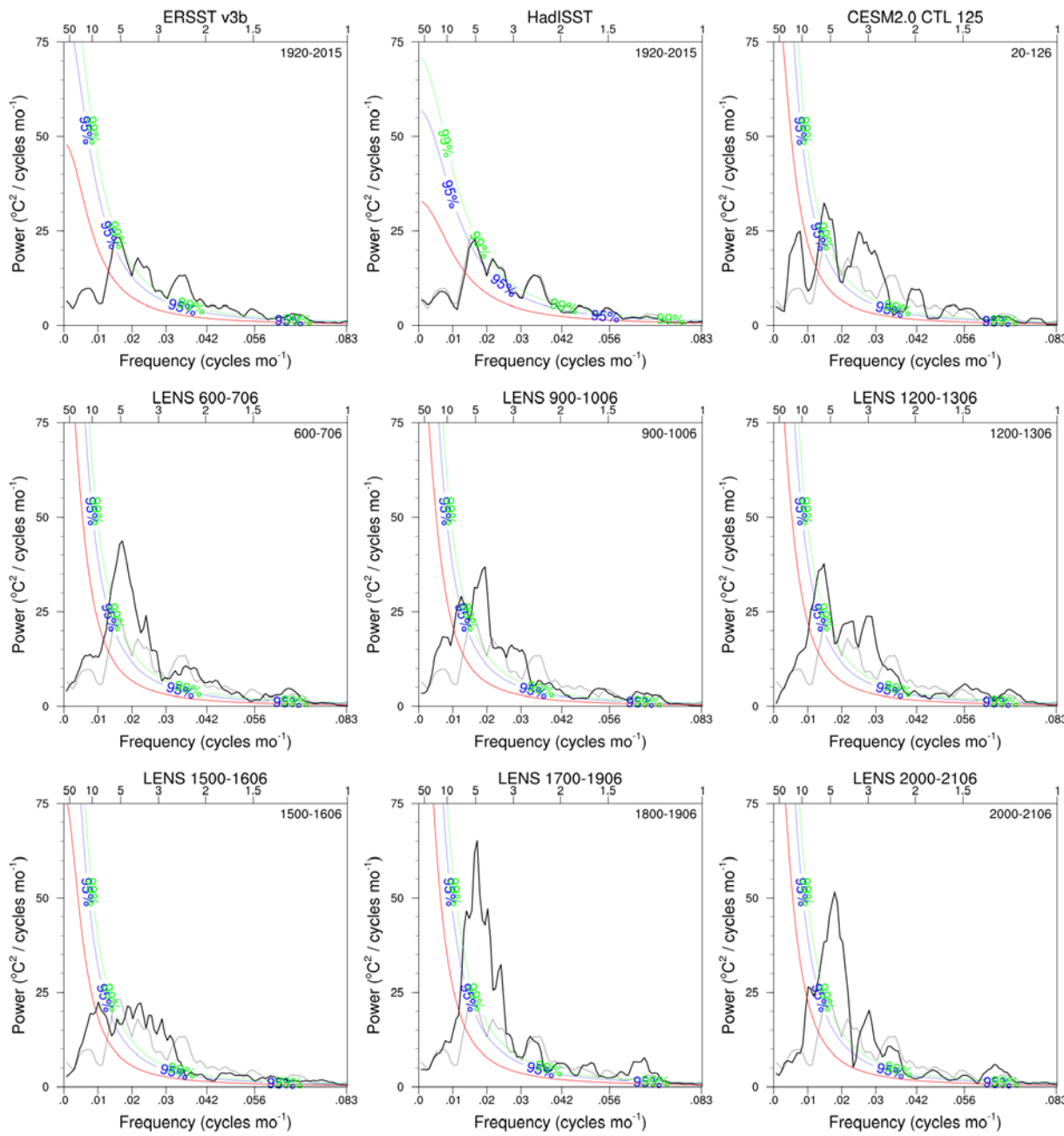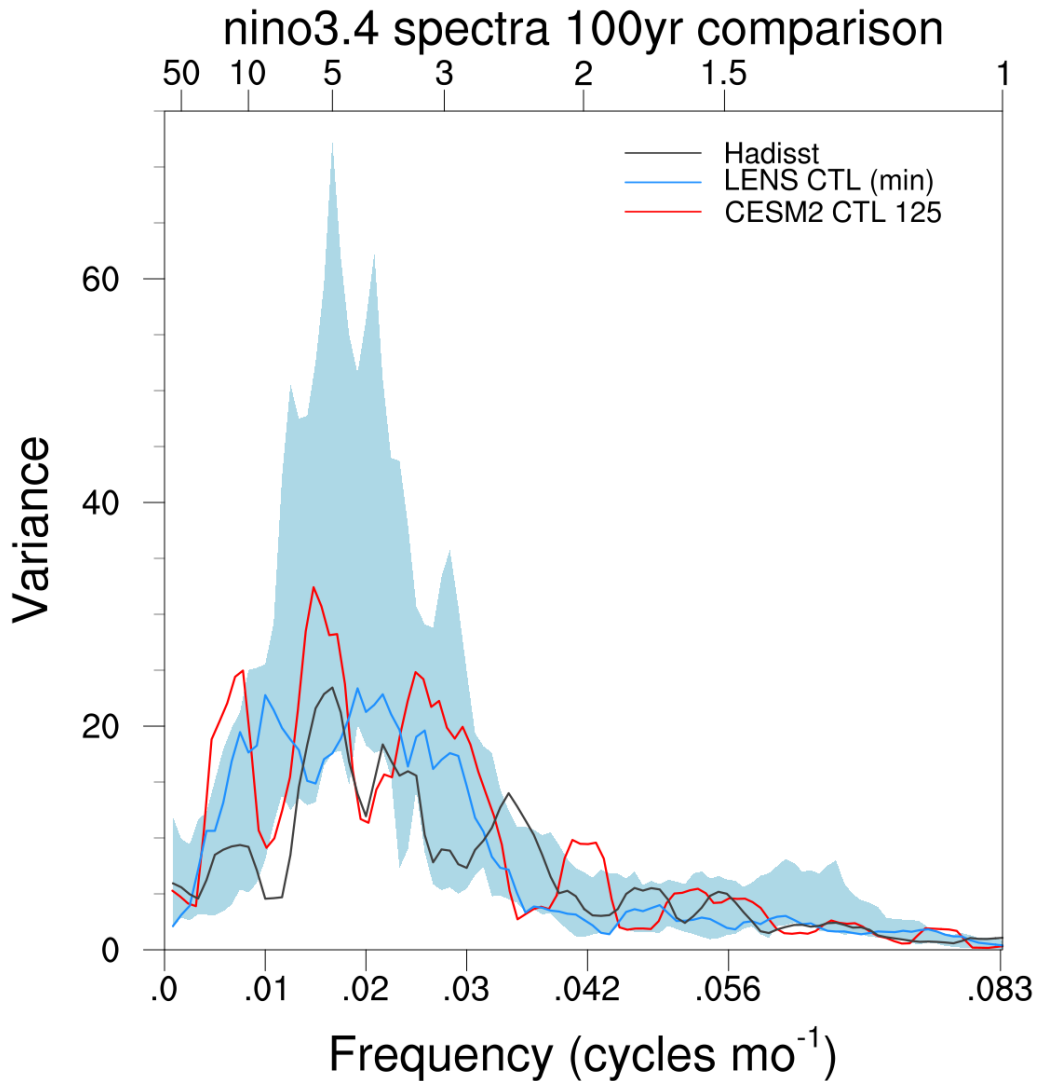
Precipitation Means (DJF)

Precipitation Means (JJA)
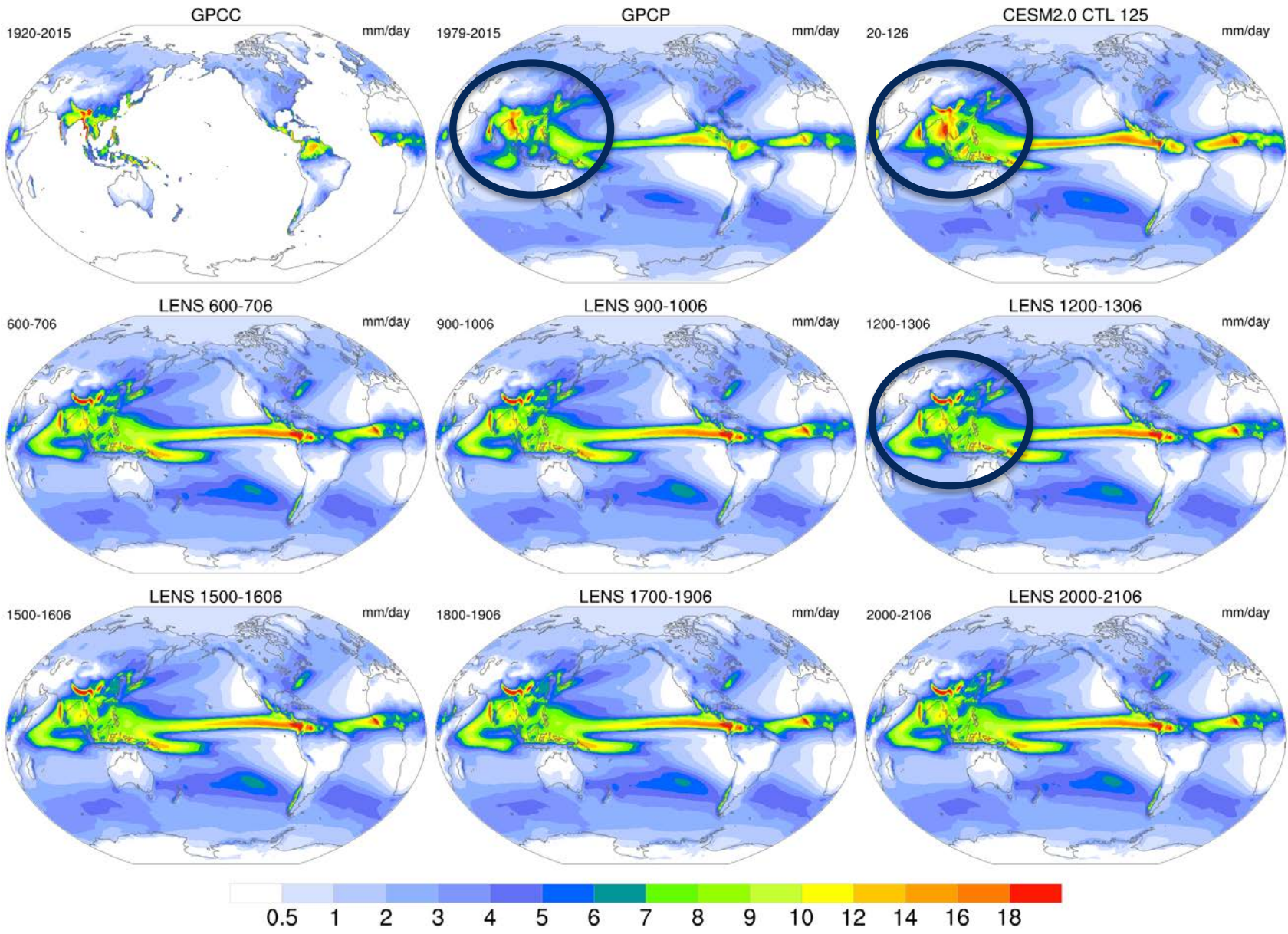
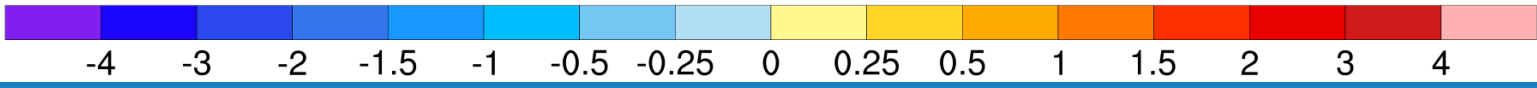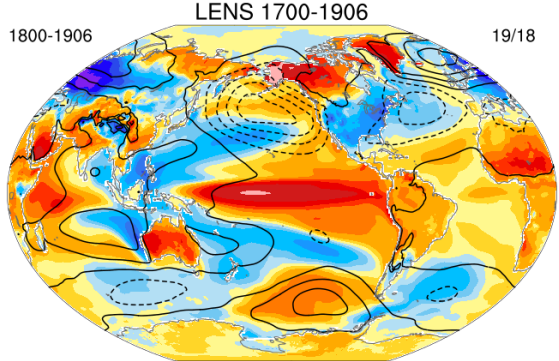# SST Standard Deviations (DJF)

Nino3.4 Monthly Spectra

Nino3.4 Monthly Spectra
100yr LENS Control Periods Shaded

nino3.4 spectra 100yr comparison

Nino3.4 SST, TAS, PSL Spatial Composite (DJF^{+1})

ERSST v3b / GISTEMP / HadSLP2r
1920-2015   18/15

HadISST / NOAAGlobalTemp / 20thC_ReanV2
1979-2012   7/6

CESM2.0 CTL 125
20-126   16/15

LENS 600-706
600-706   14/15

LENS 900-1006
900-1006   18/16

LENS 1200-1306
1200-1306   14/7

LENS 1500-1606
1500-1606   15/12

LENS 1700-1906
1800-1906   19/18

LENS 2000-2106
2000-2106   17/15

-4 -3 -2 -1.5 -1 -0.5 -0.25 0 0.25 0.5 1 1.5 2 3 4
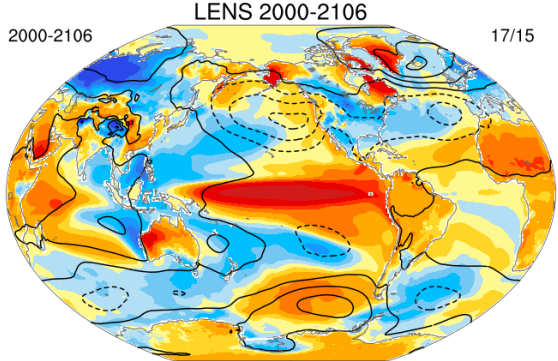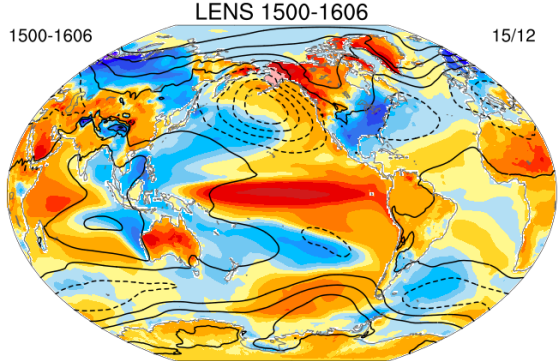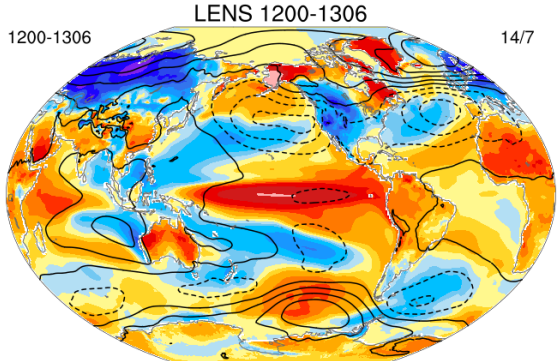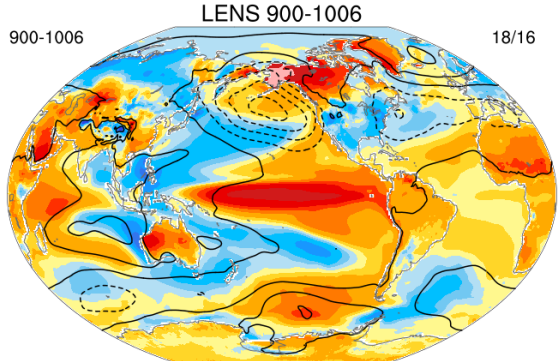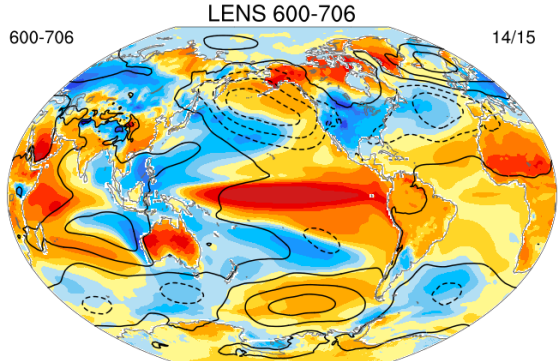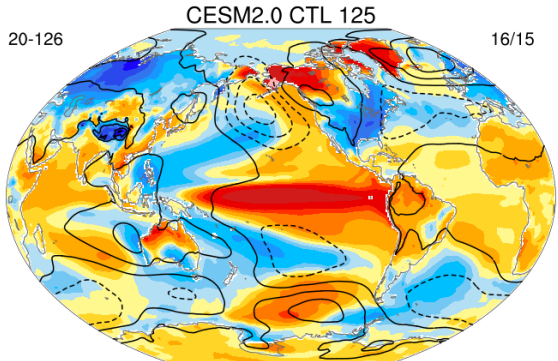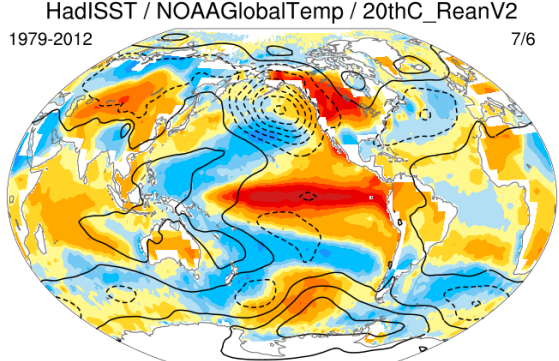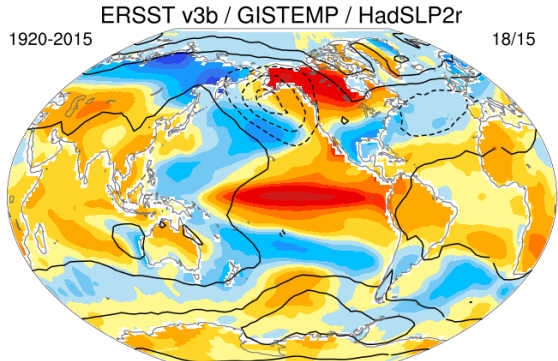
La Niña Hovmöller Composite
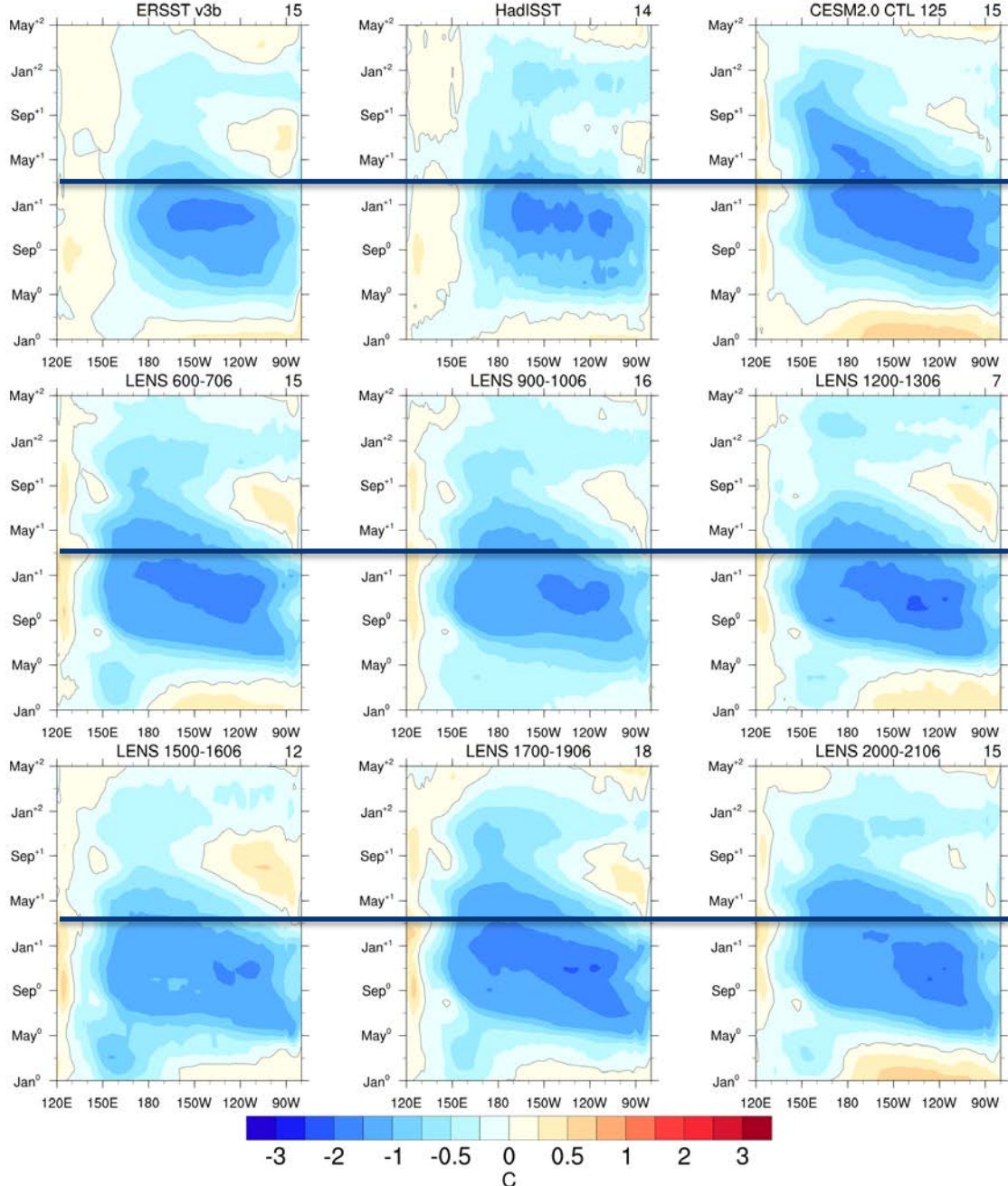
Nino3.4 SST, TAS, PSL Spatial Composite (MAM⁺¹)

Pacific Decadal Oscillation (monthly)

Northern Annular Mode (DJF)

CESM2 125 Historical Simulation
2m Air T Global Area-Average (monthly)
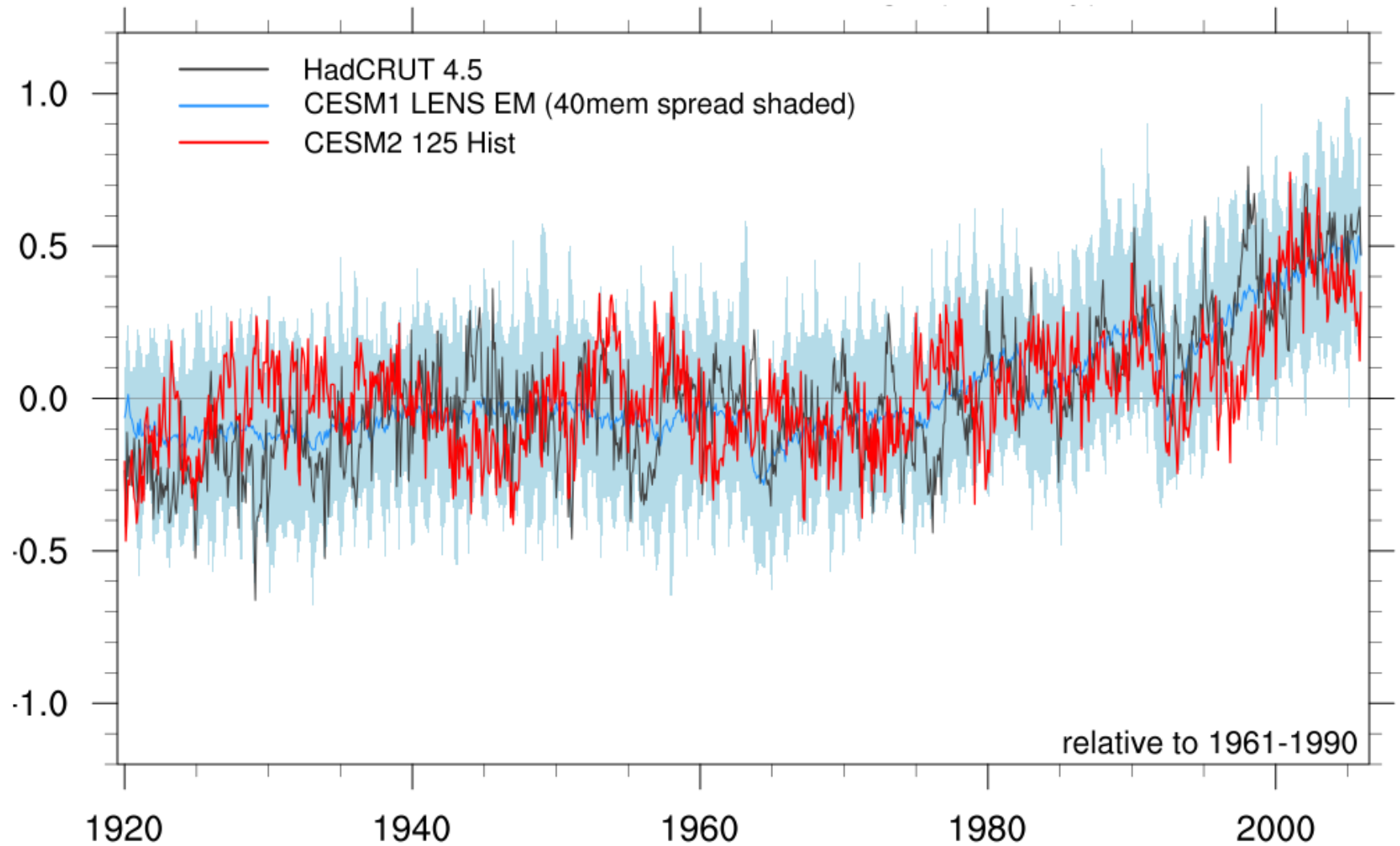
Simulations recently completed(*) or in progress

- CAM5.2 10-member GOGA ensemble 1880-2015*

- CAM5.2 AMIP w/prescribed sst/ice from LENS PI Control 200yrs*
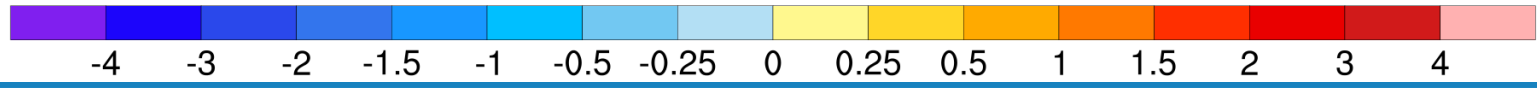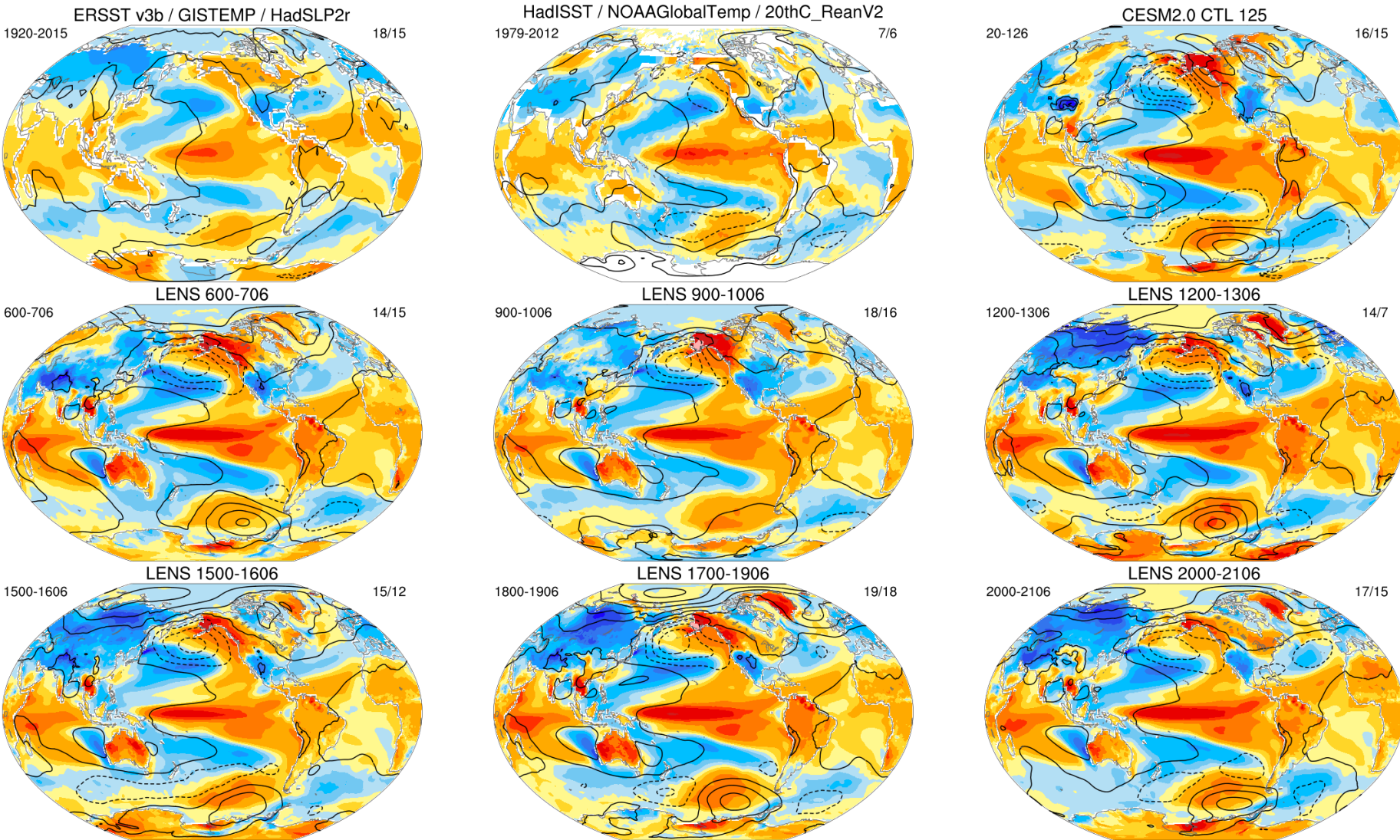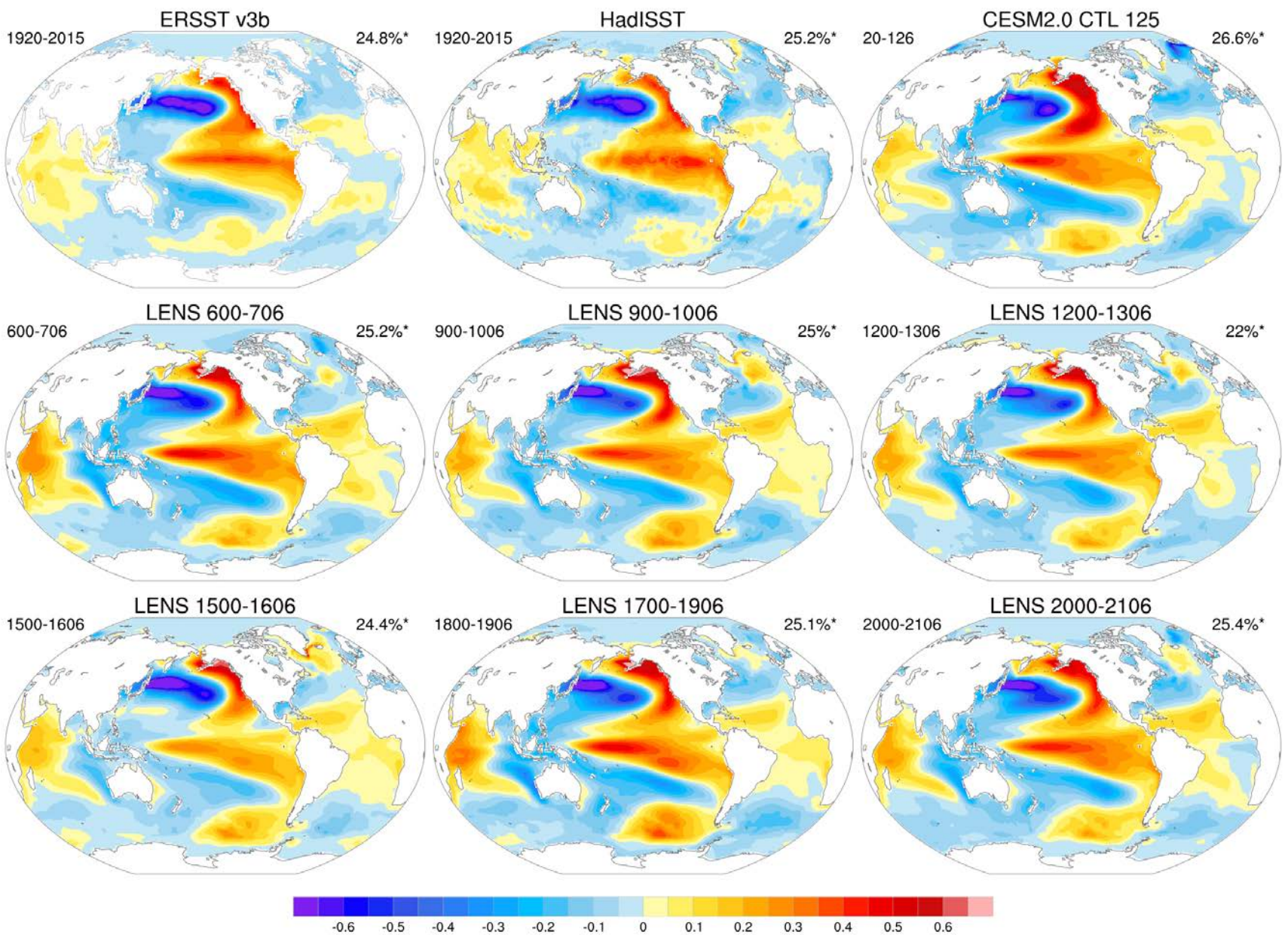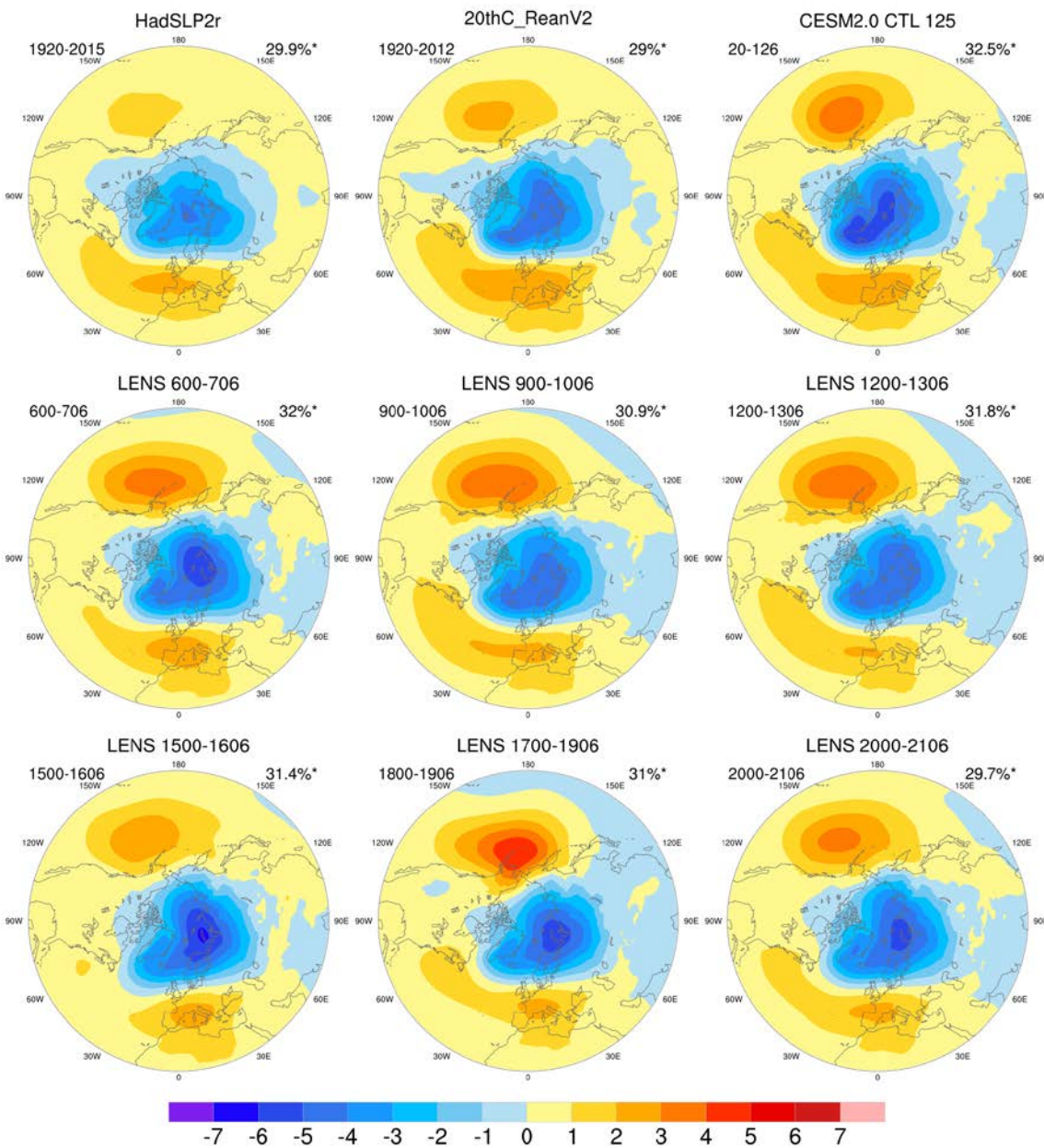
- CESM1.3 0.25° atm/lnd coupled to 1° ocn/ice
  - Includes PI control*, 1% ramp*, abrupt 4xCO_2*, and three each of 20th Century, RCP2.6, and RCP8.5. (Planned completion by end of 2017.)

- CESM1.1 Idealized IPO pacemaker simulations
  - Relax SST to IPO+/-/neutral states

- CAM5 decadal prediction hindcasts (lead: Steve Yeager yeager@ucar.edu)
  - 61 start dates (1954-2014) 10 years in length
  - ASD project to add 30 members for each start date
  - ~30 members completed. Data already available upon request.

CVCWG Planned Simulations (Jun-Dec 2017)

- CMIP6 simulations with CESM2
    - Flux Anomaly MIP (FAFMIP)
    - Detection/Attribution MIP (DAMIP)
    - Decadal Climate Prediction Project (DCPP)
- Other CESM2 simulations
    - F-case Control (2000+ years)
    - FAMIP-TOGA ensemble (10 members, 1880-2016)
    - Pacemaker Tropical Pacific ensemble (10 members, 1880-2016)

All simulations will be run with the 1 degree FV atmosphere/land model.

2017 CESM Tutorial

August 14th-18th, 2017, Boulder, CO

- Lectures focused on simulating the climate system
- Practical sessions focused on running CESM2, modifying components and analyzing data
- 2nd and 3rd year graduate students targeted
- Application deadline: Friday March 2nd

Useful Websites

- CVCWG Website http://www2.cesm.ucar.edu/working-groups/cvcwg

- CVCWG published simulations https://www2.cesm.ucar.edu/working-groups/cvcwg/cvcwg-simulations-finished-and-published

- Climate Variability Diagnostics Package (CVDP) http://www2.cesm.ucar.edu/working-groups/cvcwg/cvdp

- Large Ensemble http://www.cesm.ucar.edu/experiments/cesm1.1/LE/

- Last Millennium Ensemblehttps://www2.cesm.ucar.edu/models/experiments/LME