

Wrap-up

- CESM2.0/CAM6 released
 - B1850, BHIST, FHIST(AMIP) scientifically-supported compsets included. Only with FV 1 degree
 - Simple model compsets
- CESM2.1 to be released later this summer
 - No scientific changes, i.e., no tuning of existing compsets
 - More compsets - including 2 degree configurations, CAM-SE
- Documentation and users guide under construction

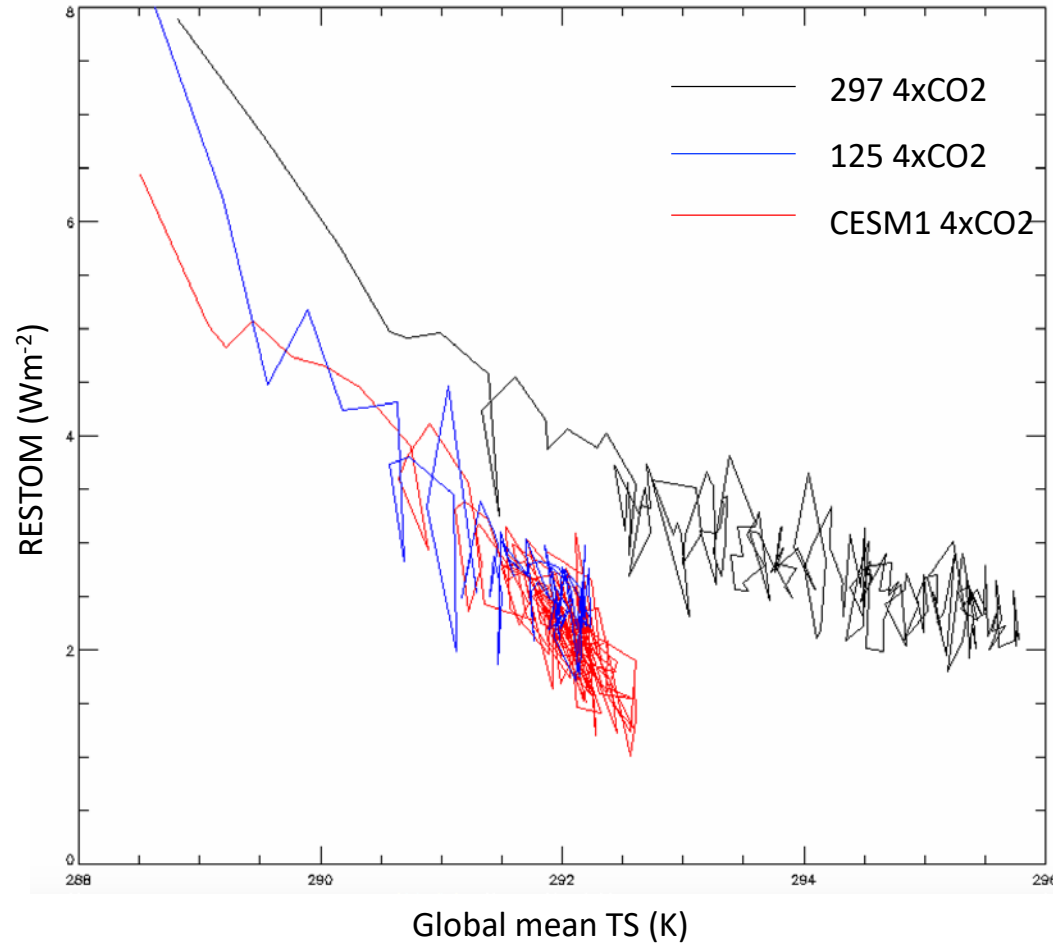
Discussion topics

- Diagnosing CESM2
 - Climate sensitivity, AIE, CMIP5 vs CMIP6
 - F-case runs (AMIP) with various features on/off, e.g.:
 - CLUBB
 - WACCM-SC vs CAM (high-top vs low-top)
 - Other experiments: ***Your input requested***
- Vertical resolution
- Near-Future development
 - Spectral element dycore
 - Regional refinement
 - Initialized configurations (e.g. CAPT), Nudging, Data Assimilation

Discussion topics

- Physics
 - LW scattering
 - Coupling – “physics grid”, sub-stepping, implicit approaches
- Remaining biases
 - Double ITCZ (better but not gone)
 - Orographic biases
 - US Midwest and other MCS dominated regimes
 - Southern ocean biases
- Software engineering/quality control

Gregory plots from abrupt 4xCO2 simulations



Release version of CESM2 (**297**) has higher climate sensitivity than CESM1 and than development version **125**.

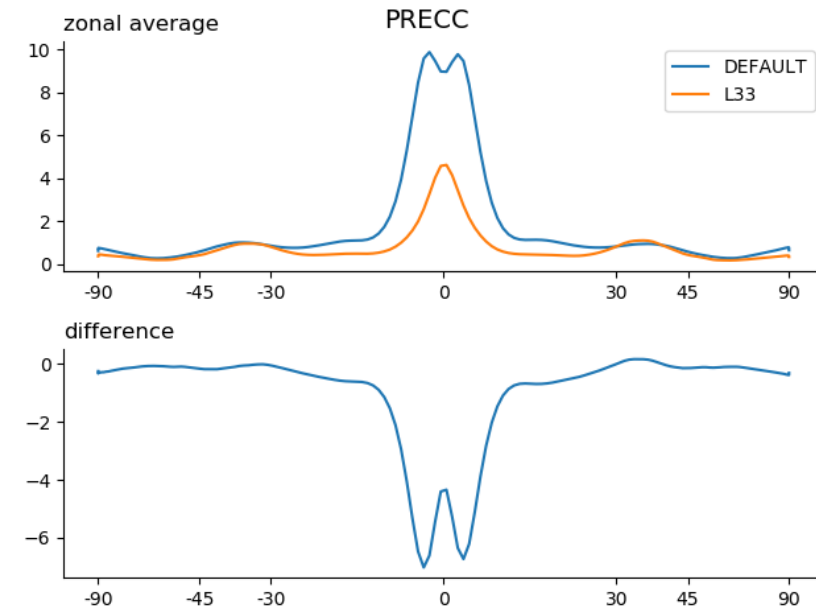
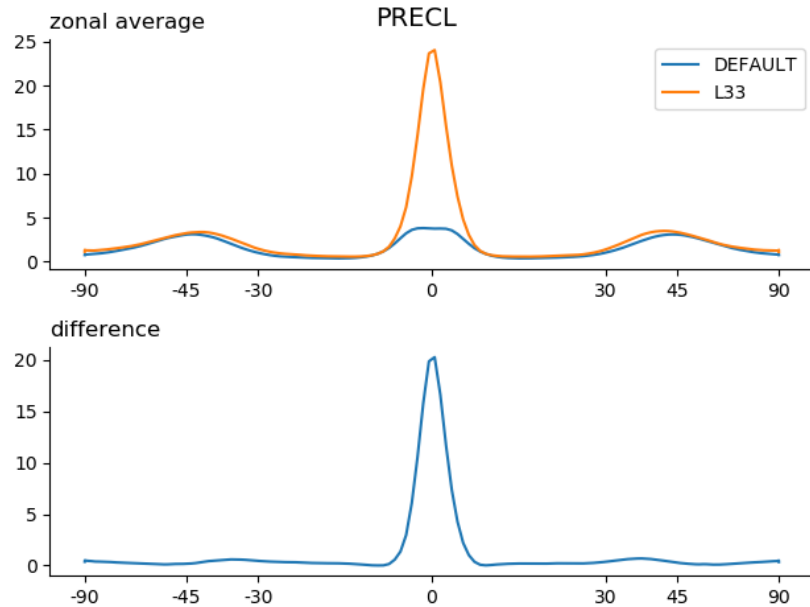
Note: 125 has CLUBB and MG2. Origin of higher sensitivity is not clear, nor is possible connection to 20th C warming

Vertical Resolution Summary

- Vertical resolution & model top are critical issues to address in development of CESM3
- **Pressing Questions:** what resolution/model top is needed for the science we want to do? How many configurations are needed and can be sustained?
 - Scientifically supported compsets vs. more tools for users
- Send input to Yaga Richter (jrichter@ucar.edu) & Brian Medeiros (brianpm@ucar.edu)

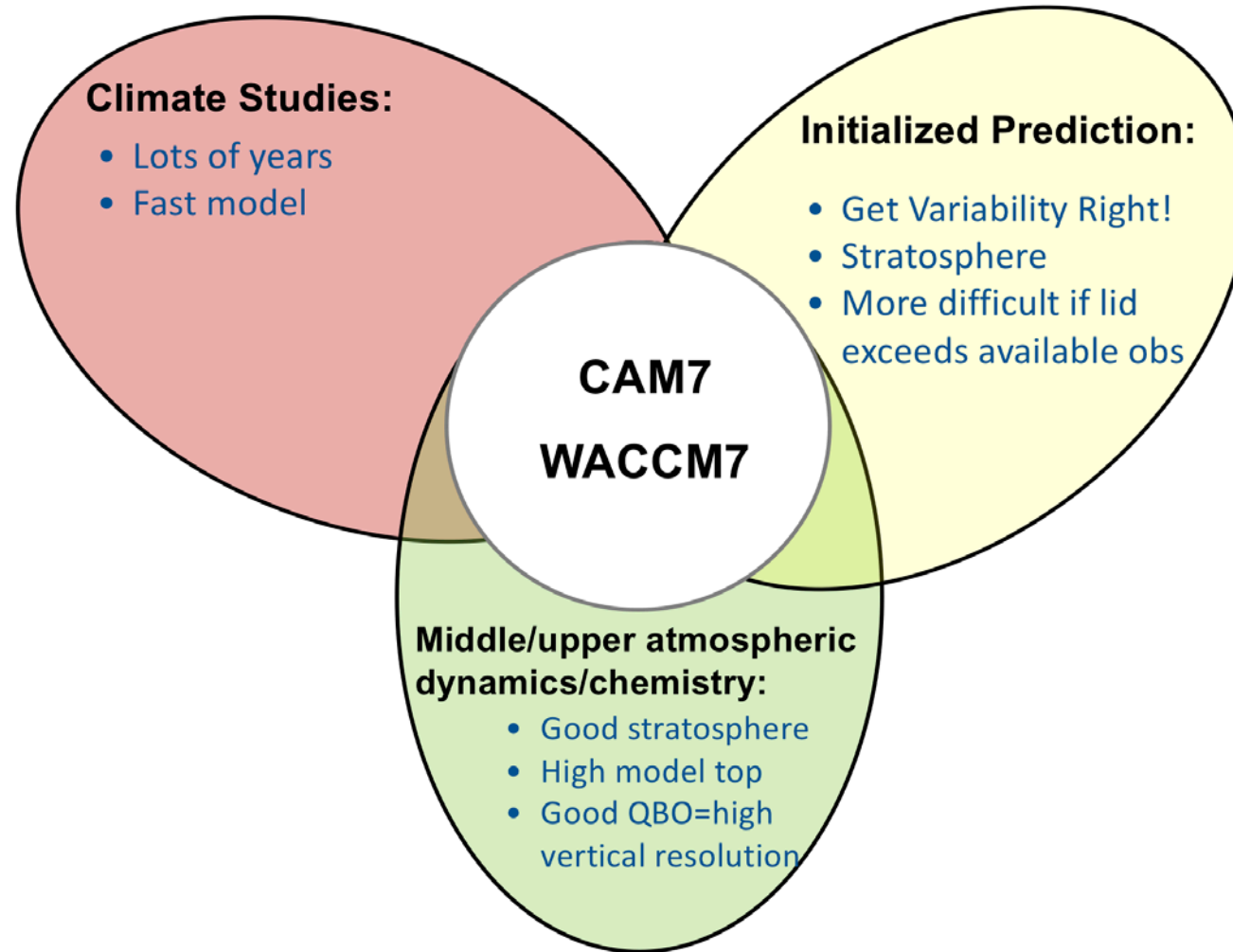
Boundary Layer (very bottom):

**L33: Standard L32 grid with one extra level at ~8m.
2-year aquaplanet test with CAM6 by Brain M**

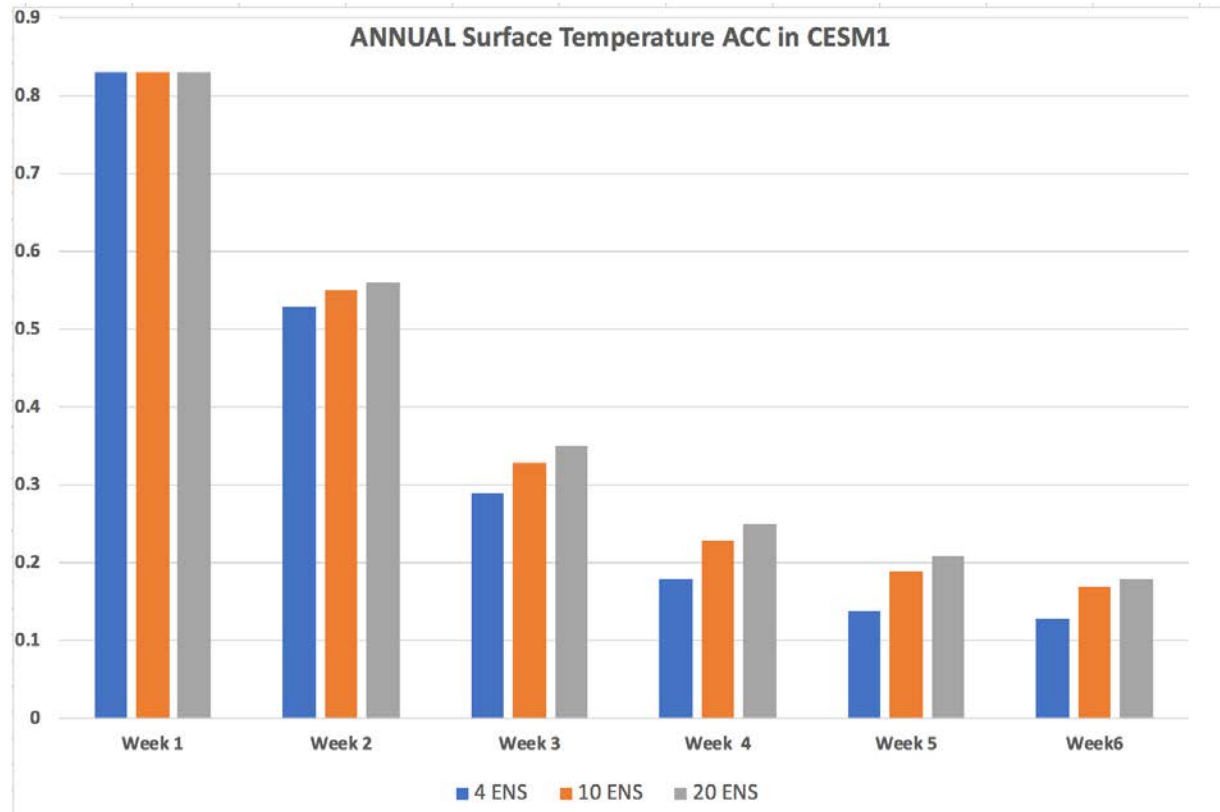


**Split-ITCZ merges to single ITCZ.
Rain changes from dominated by convection to dominated by large-scale.
(Likely due to triggering of deep convection scheme)**

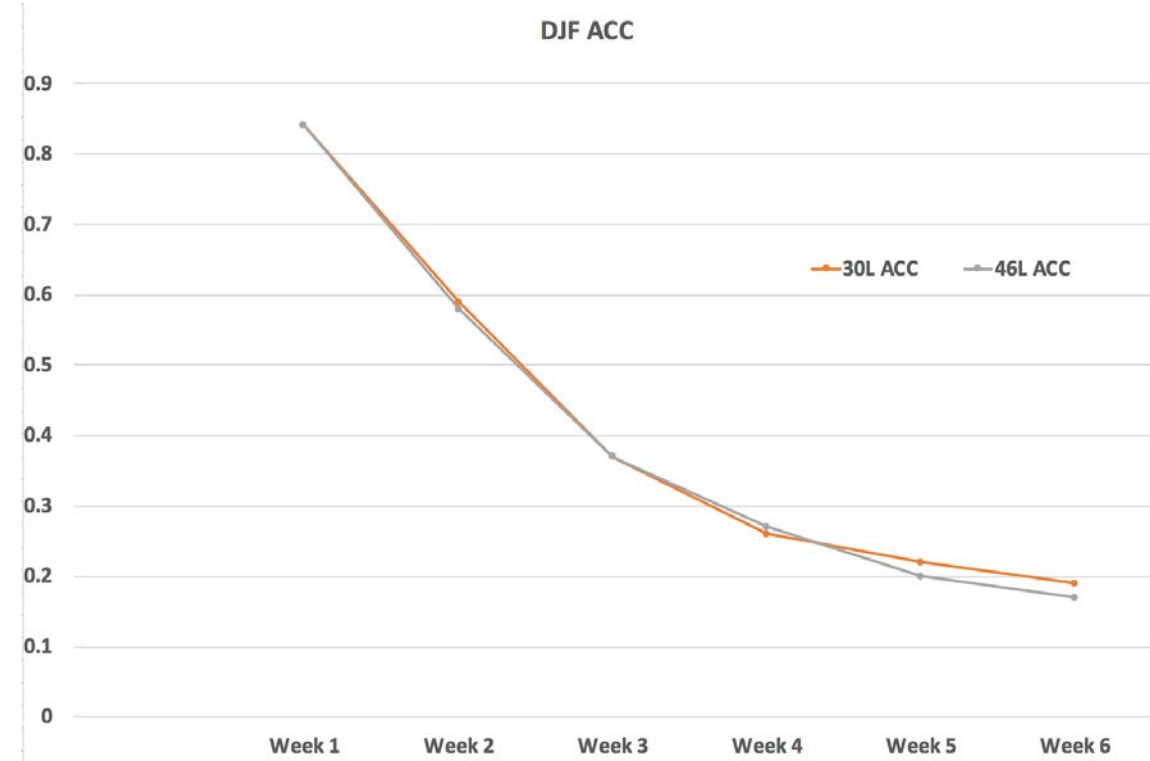
CESM3



Seasonal Prediction:



More ensembles = more skill



Higher top – so far, similar skill