

# Status of CMIP5 and Release Schedule: CCSM4 and CESM1

James W. Hurrell

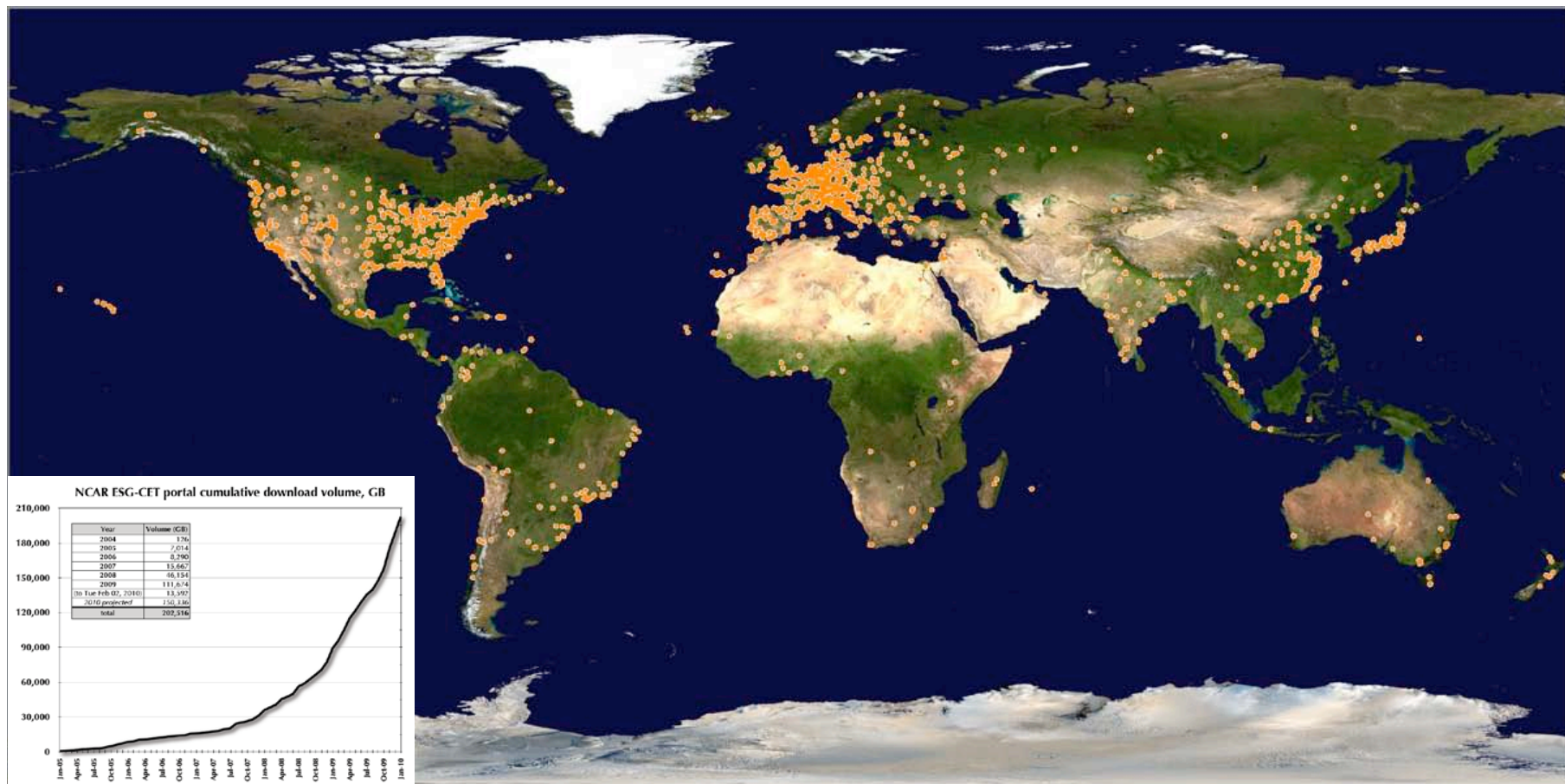
NCAR Earth System Laboratory  
Climate and Global Dynamics Division



# IPCC Fifth Assessment Report

- NCAR and partners will make a major contribution through simulations performed with the latest versions of the CCSM and WACCM
- CMIP5 Experimental Design (Taylor et al. 2009) will be followed:
  - o A set of coordinated climate model experiments designed to:
    - ✓ address outstanding scientific questions from AR4;
    - ✓ improve understanding of climate variability and change;
    - ✓ provide estimates of future climate change useful to those considering its possible consequences.
- CMIP5 is a 5-year experimental design, but a significant fraction of the experiments will be done in time to be included in AR5
  - o Initialized decadal prediction and climate change (through 2300)
  - o Includes carbon cycle, paleoclimate and whole atmosphere
  - o December 2010: model simulations available to public
  - o August 2012: Papers must be accepted, in press or published
  - o September 2013: IPCC WG I plenary

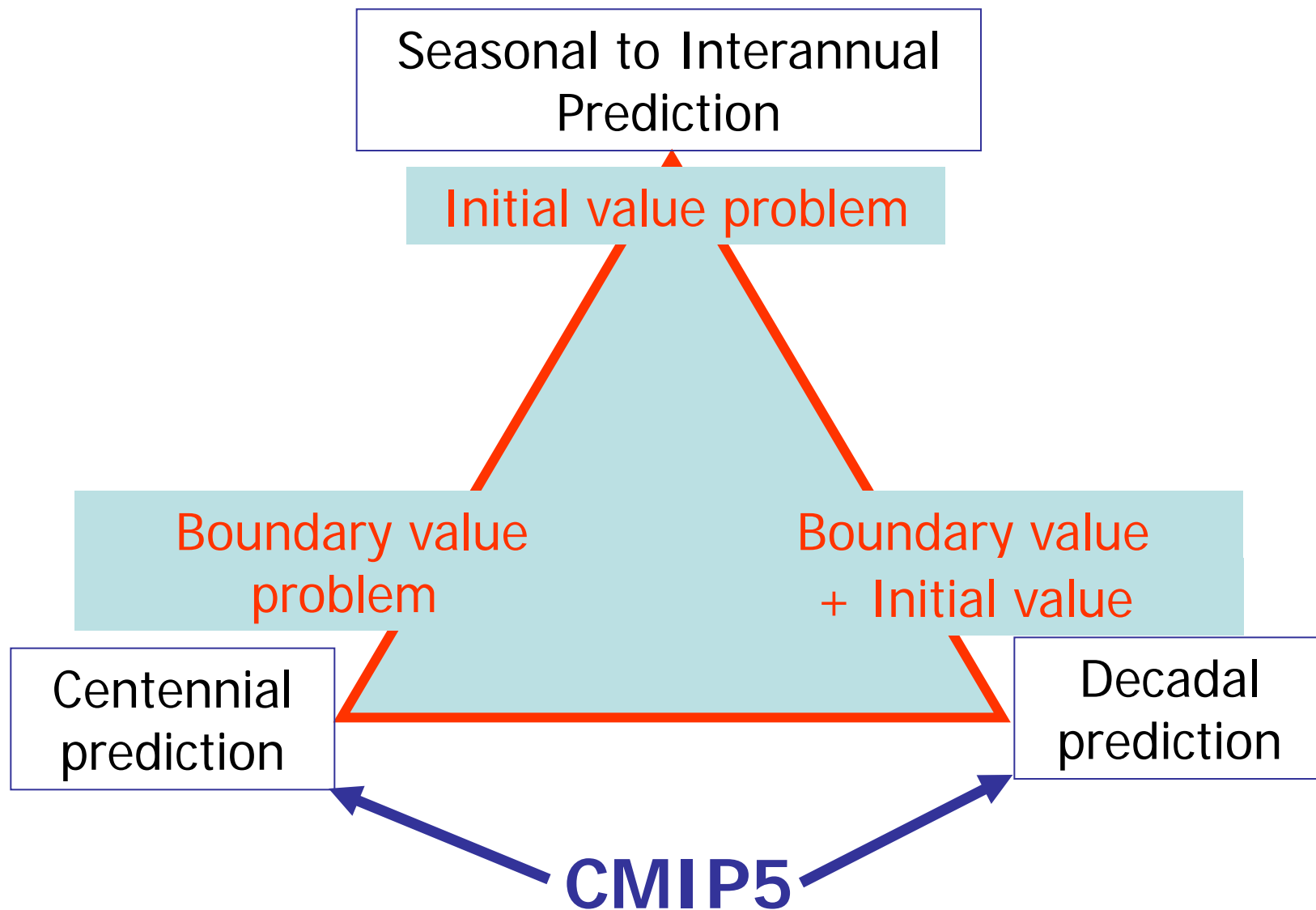
# CCSM Data Downloads (NCAR portal only)



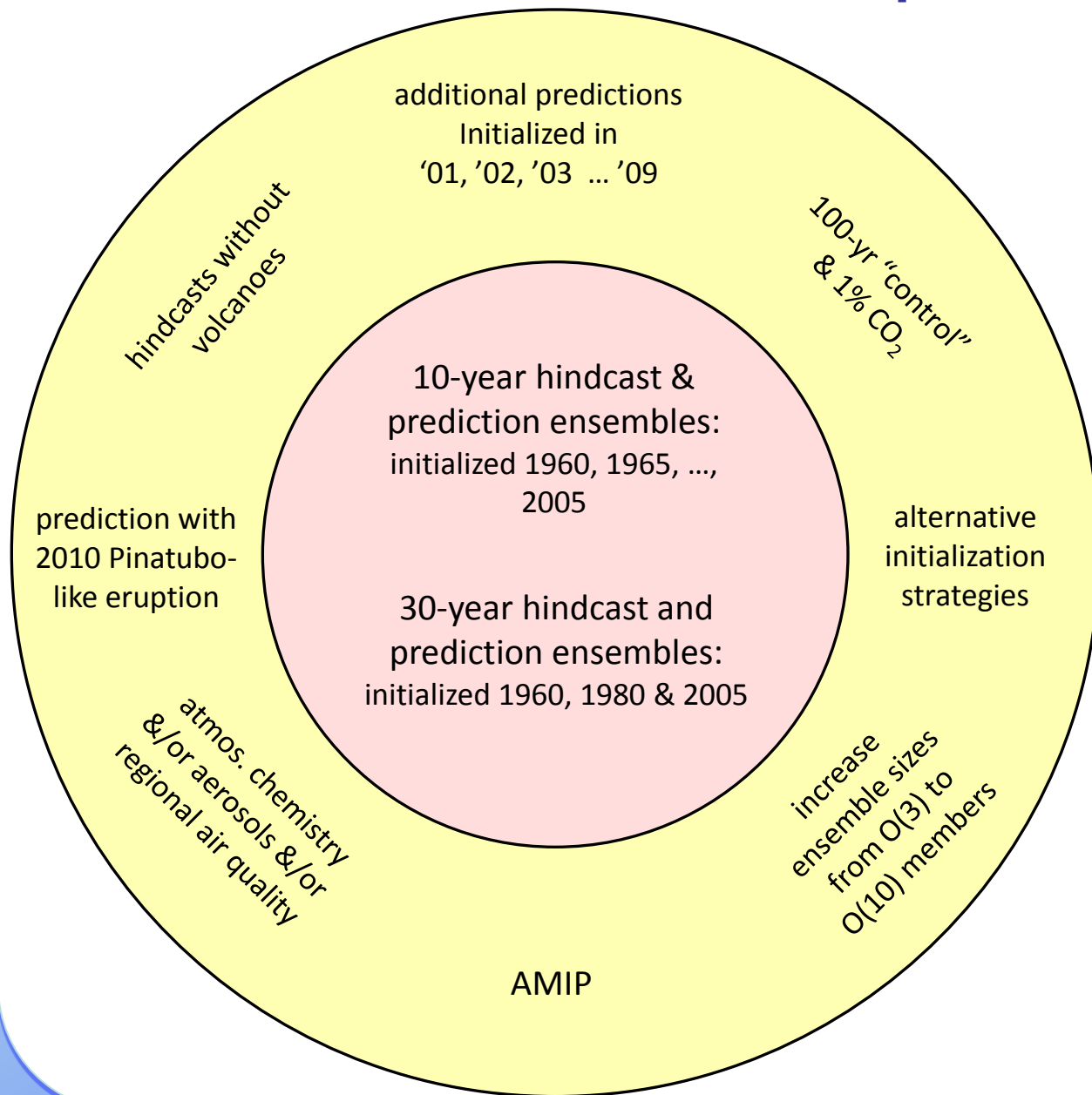
Over 2,700 sites from 120 countries  
>170 Tb since January 2008

Courtesy Gary Strand

# Climate Prediction

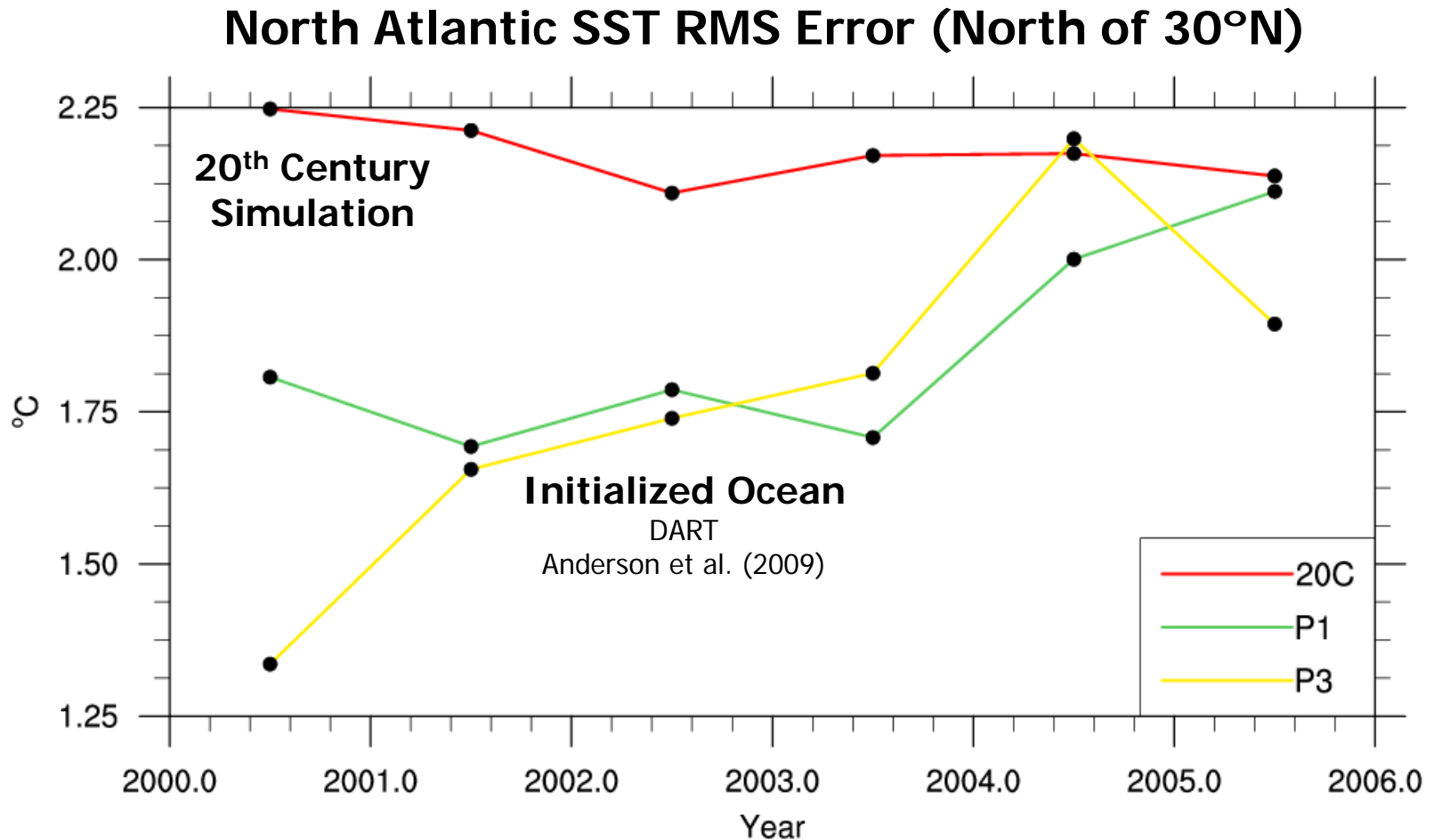


# CMIP5 Decadal Prediction Experiments with CCSM4



- Ensemble initial conditions from ODA (DART facility)
- Ocean analysis for 1998-2007
- Reduced upper-ocean biases (e.g., next slide) relative to hindcasts
- First experiments for yr 2000 start
- Larger ensembles, fewer starts?
- Strategy tbd by SSC (next month)

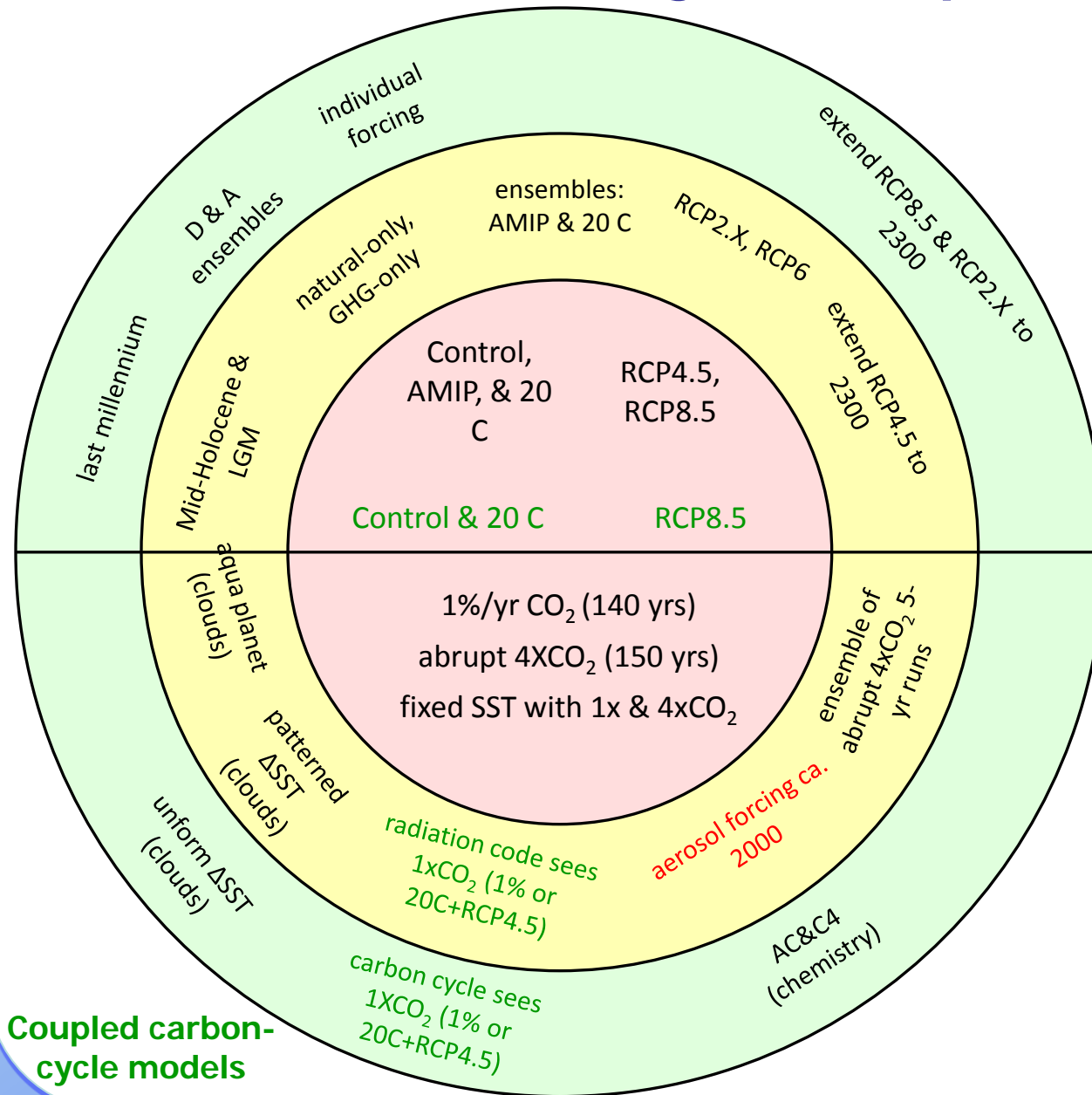
# CCSM4.0: Initialized (Decadal) Predictions



Persistence of large-scale SST bias reduction

Yeager et al. (2010)

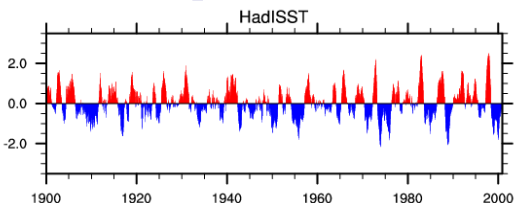
# CMIP5 Long-term Experiments



- Core + some Tier to be done at NCAR (11M GAU & 15K yr)
- Others to be done on DOE machines
- Full set of CMIP5 forcings just recently available
- Completed:
  - 1850 1° control
  - 1% yr<sup>-1</sup> CO<sub>2</sub>
  - 20<sup>th</sup> Century (3)
- Running:
  - 1850 WACCM
  - 1850 CESM cntrl (prognostic + prescribed)
  - 20<sup>th</sup> Century (3)
- Soon
  - RCP 4.5, 8.5

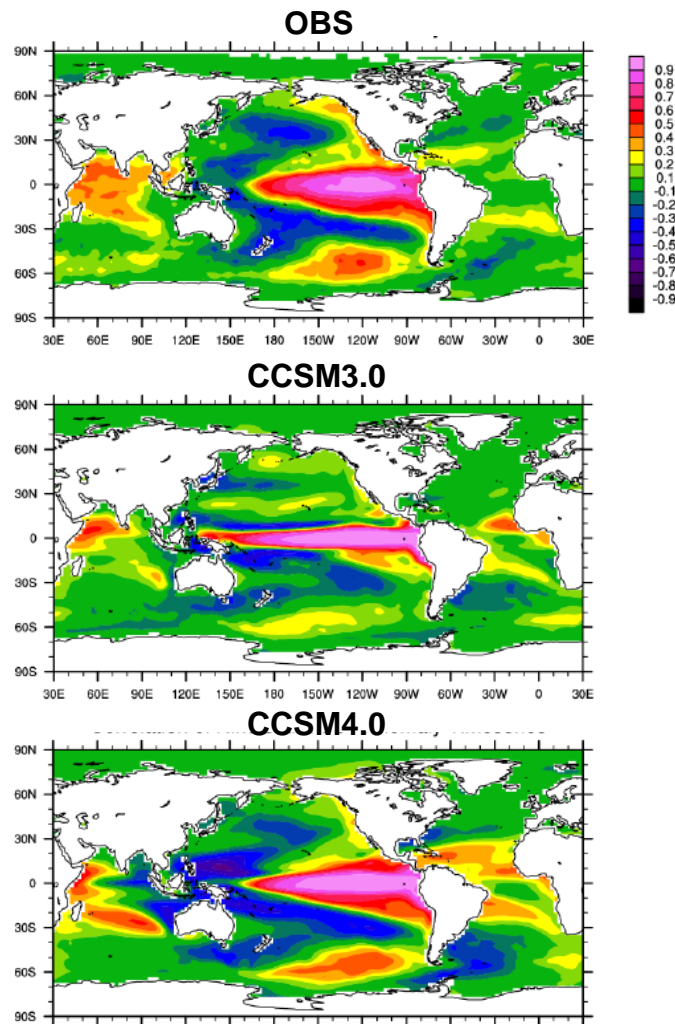
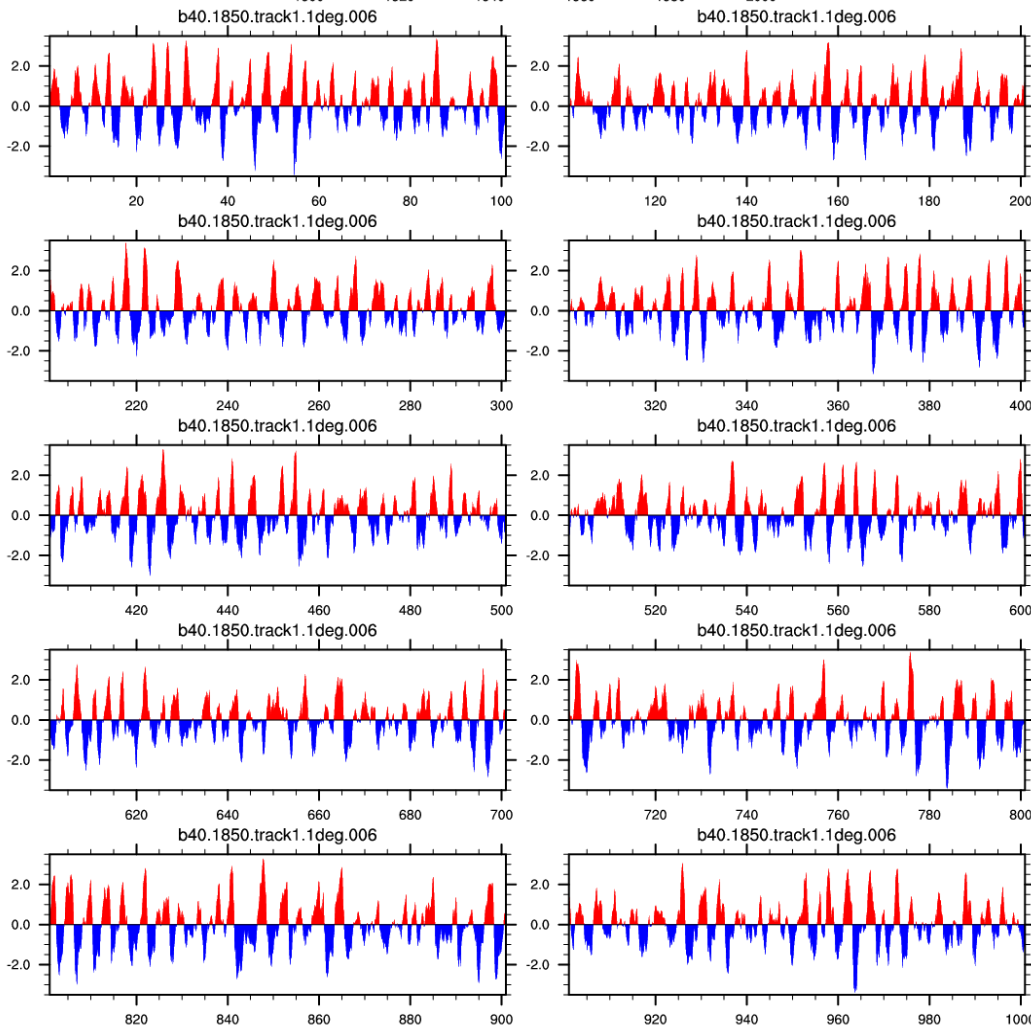
# CCSM4.0: Improved Simulations of Variability

Niño 3.4



$\sigma = 0.75^{\circ}\text{C}$

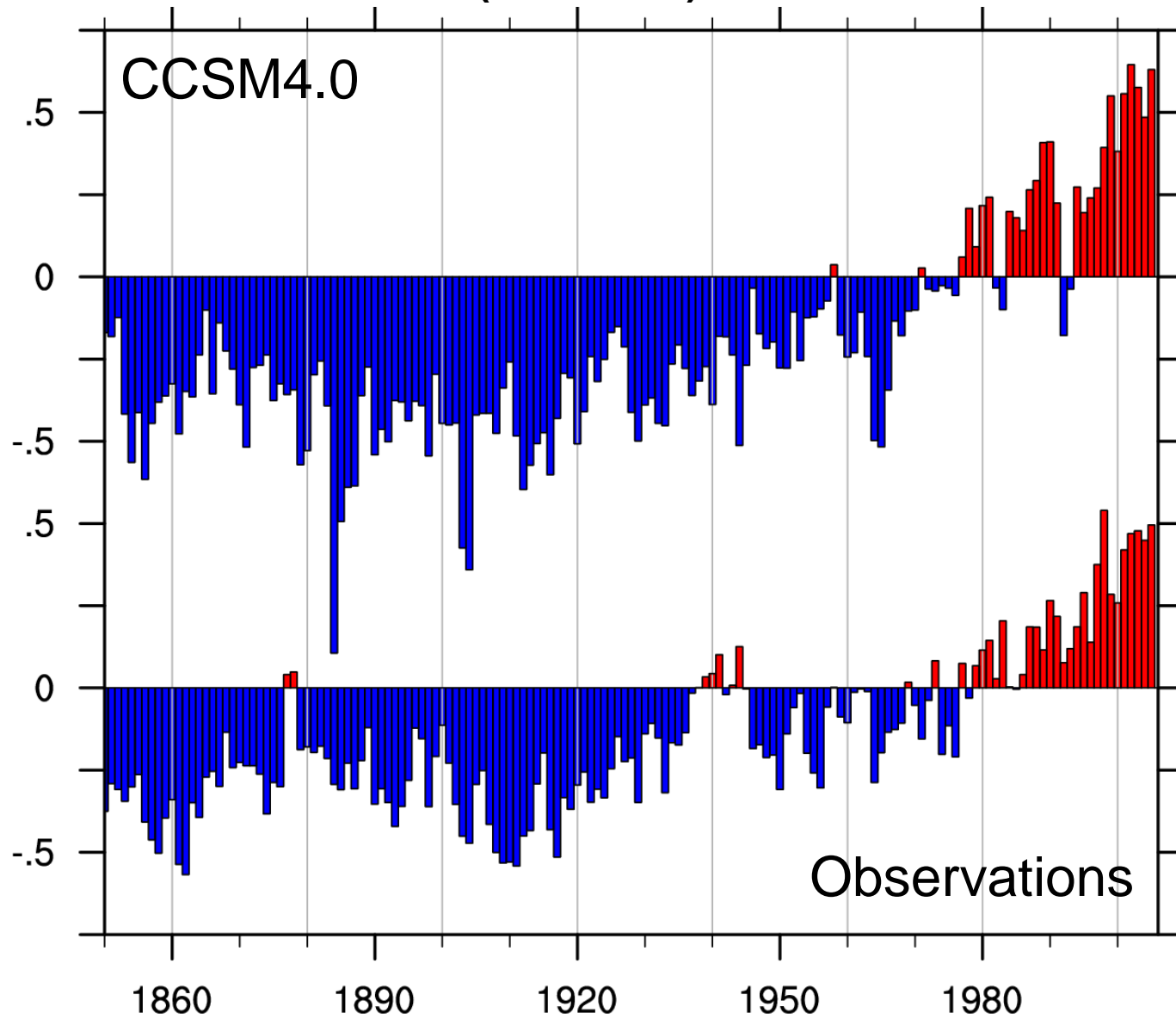
## Niño 3.4 and SST





# Global Temperature

(1850-2005)



# Release Schedule

- January 15, 2010: CCSM4.0 alpha release
  - ✓ to subset of users and vendors with minimal documentation (except for general script's User's Guide)
- April 1, 2010: CCSM4.0 release
  - ✓ full documentation, including User's Guide, Model Reference Documents, and experimental data
- June 1, 2010: CESM1.0 release
  - ✓ ocean ecosystem, CAM-AP, interactive chemistry, WACCM
- New CCSM web design underway (including comprehensive diagnostics)

# Special Journal Issues

- *J. Climate*
  - ✓ Tony Broccoli (Chief Editor) to oversee
  - ✓ List of expected submissions by 1 April, 2010 from each CCSM WG
  - ✓ All papers submitted by 1 January, 2011
- Interest is high for special issue to document SE advances
  - ✓ John Drake, Phil Jones and Mariana Vertenstein to develop

# First Annual CESM Tutorial

**July 12-16<sup>th</sup> 2010**  
**NCAR, Boulder, CO**

- Lectures on simulating the climate system
- Practical sessions on running coupled model & modifying components
- Targeted at Grad Students, Post-docs (max 40 people)
- Limited funding available

## How to Apply:

- Website available in early March 2010
- application deadline: April 15, 2010
- Announcements through CCSM Working groups and <http://www.cesm.ucar.edu>

# Thank You