Announcements

PCWG Meeting, Feb 2010

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 12-16th 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.ccsm.ucar.edu

CCSM4 Sea ice results

Marika Holland

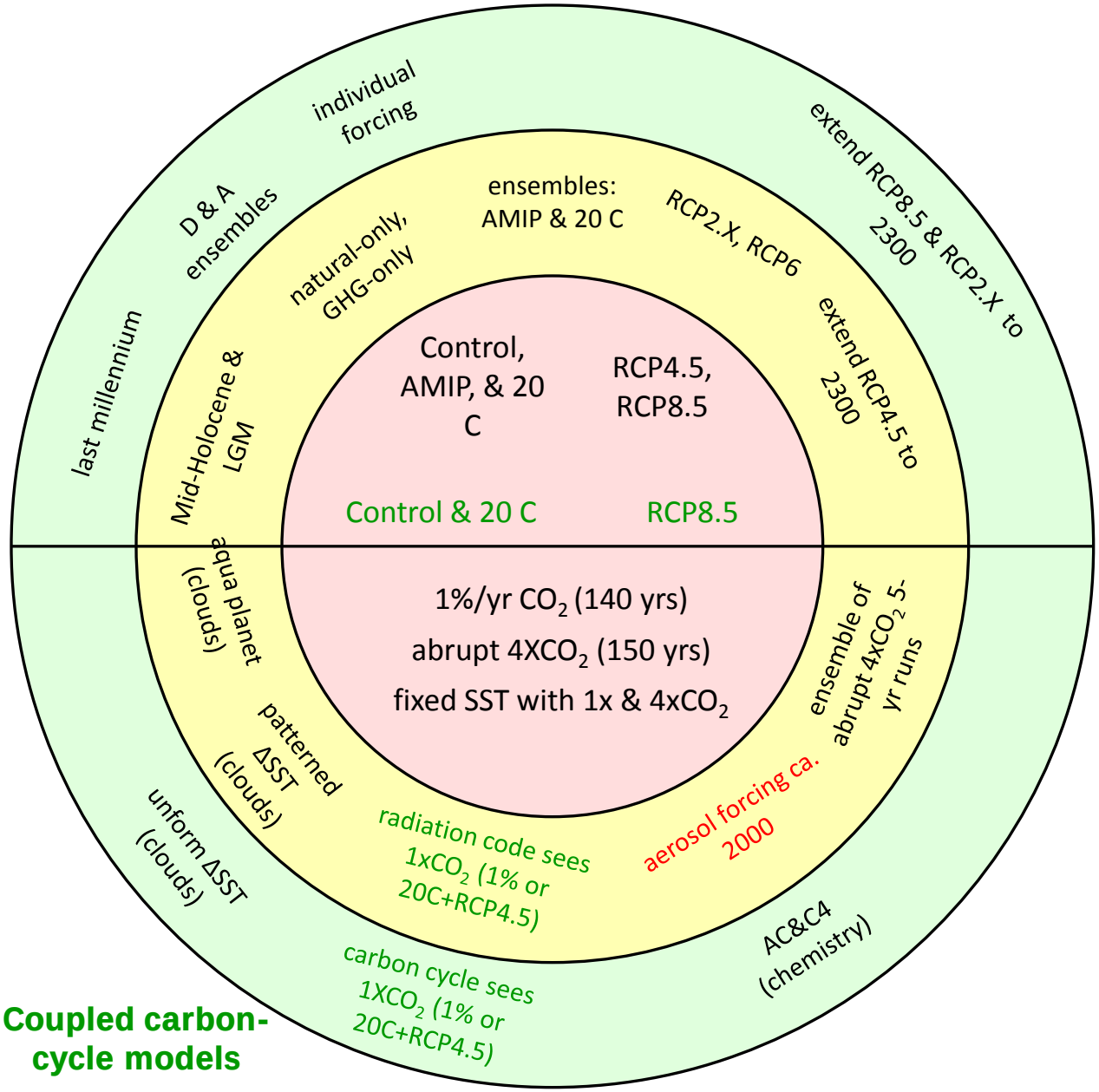
Dave Bailey

Laura Landrum

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

CMIP5 Long-term Experiments



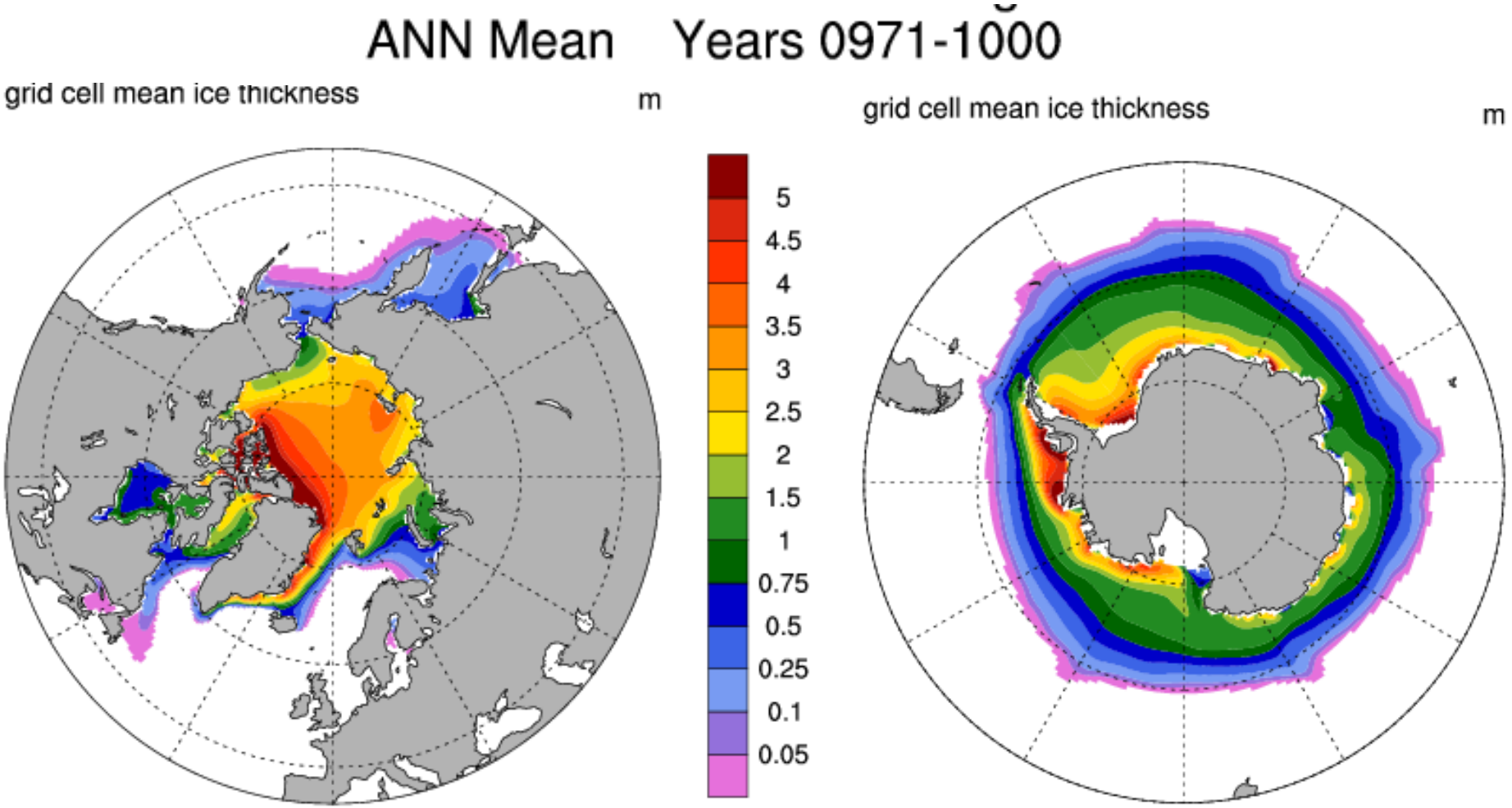
- Core + some Tier to be done at NCAR (11M GAU & 15K yr)
- Others to be done on DOE machines
- Full set of CMIP5 forcings just recently available
- Completed:
  - 1850 1º control
  - 1% yr^{-1} CO_2
  - 20th Century (3)
- Running:
  - 1850 WACCM
  - 1850 CESM cntrl (prognostic + prescribed)
  - 20th Century (3)
- Soon
  - RCP 4.5, 8.5

Pre-Industrial Control Run

- Has been completed
- Standard Model: 1 degree atmosphere, 1 degree (gx1) ocean/ice model
- Year = 1850 forcing
- Integration has run for 1300 years (with a few hiccups along the way)
- 20th Century ensemble member integrations initialized from different years of this run
- Case name b40.1850.track1.1deg.006

Pre-Industrial Control Run

Ice thickness reasonably well simulated
A bit thicker than current Arctic conditions
Antarctic ice a bit thick, especially to west of peninsula



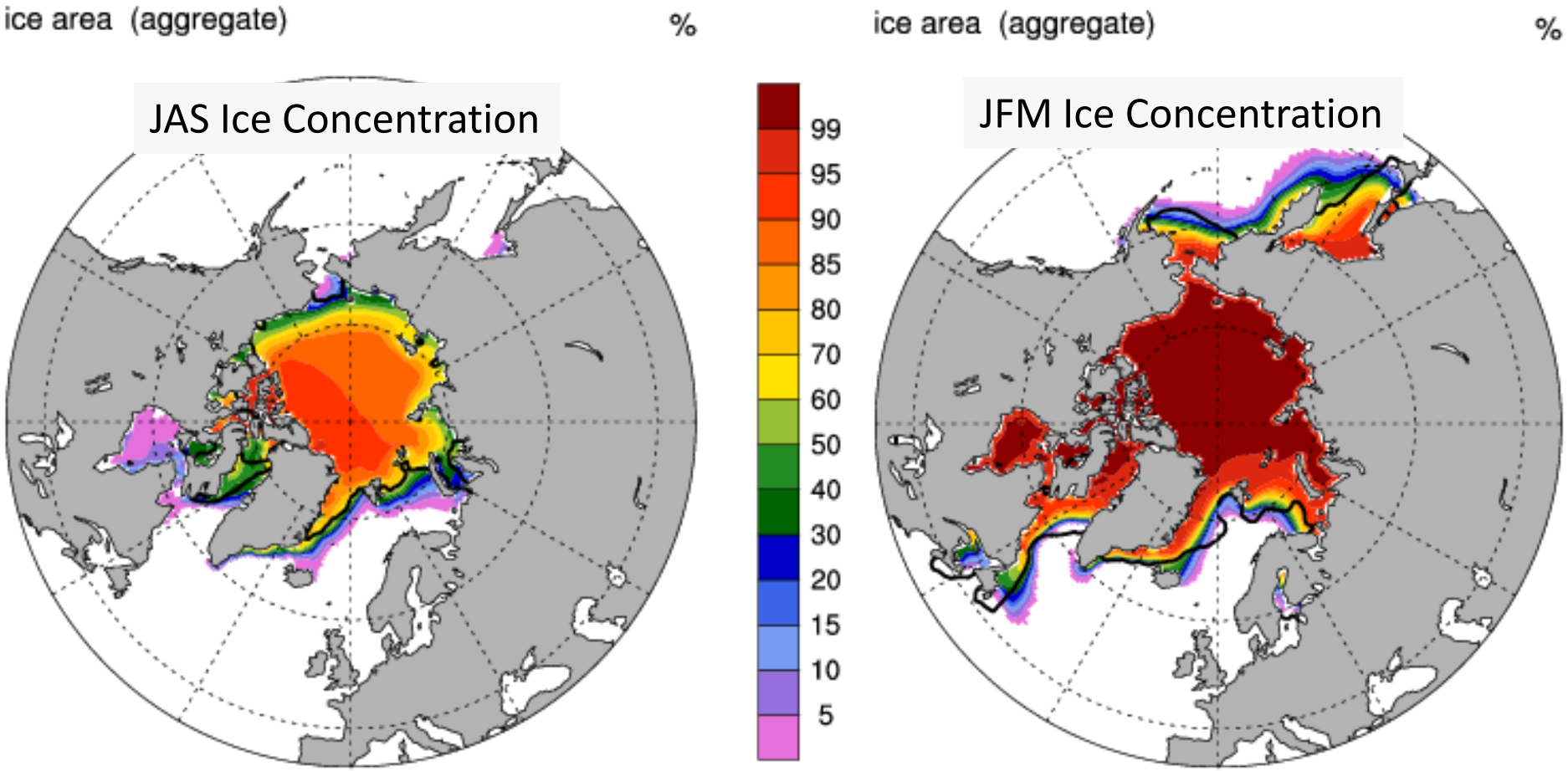
Pre-Industrial Control Run

Ice concentration:

Compared to present day observations:

Ice edge compares well to observations

Summer ice concentrations a bit low?



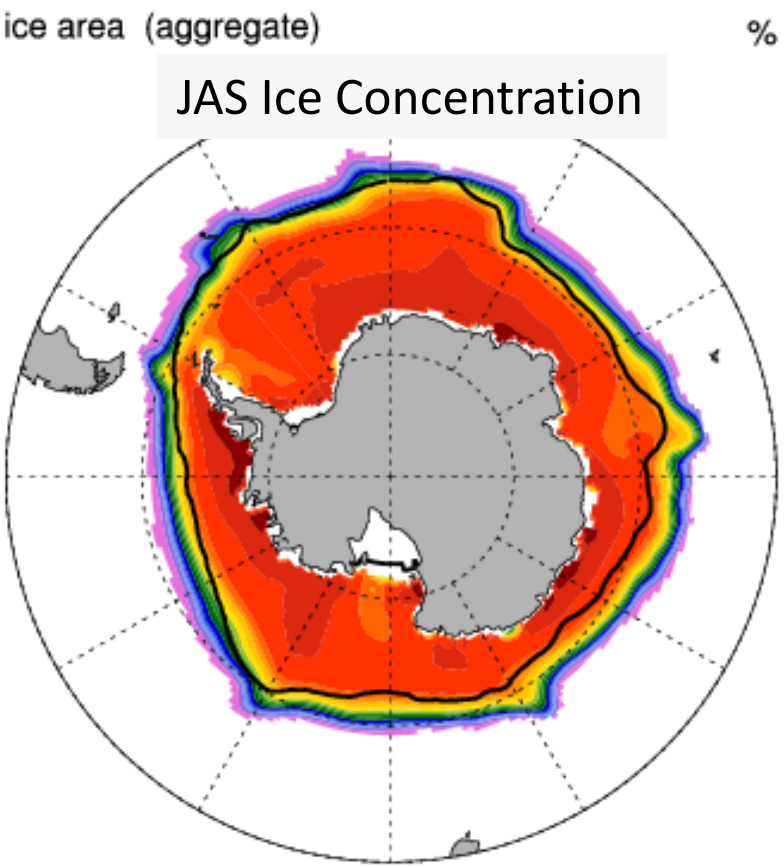
Pre-Industrial Control Run

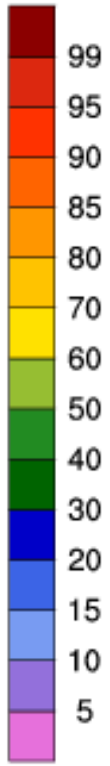
Ice Concentration

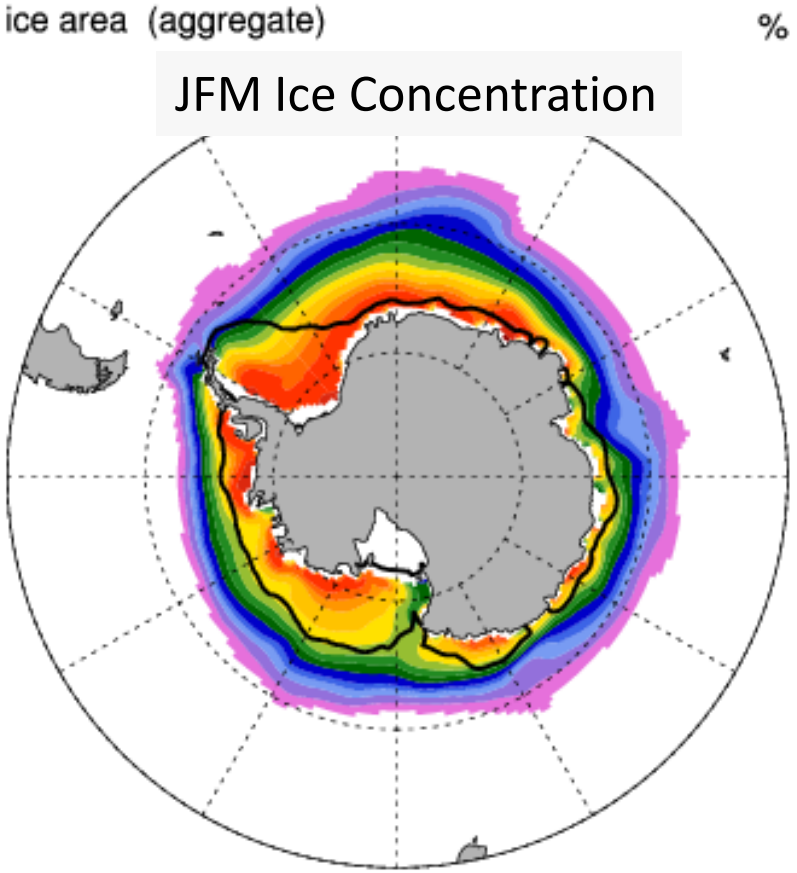
Compared to present day observations:

Winter ice-edge a bit extensive

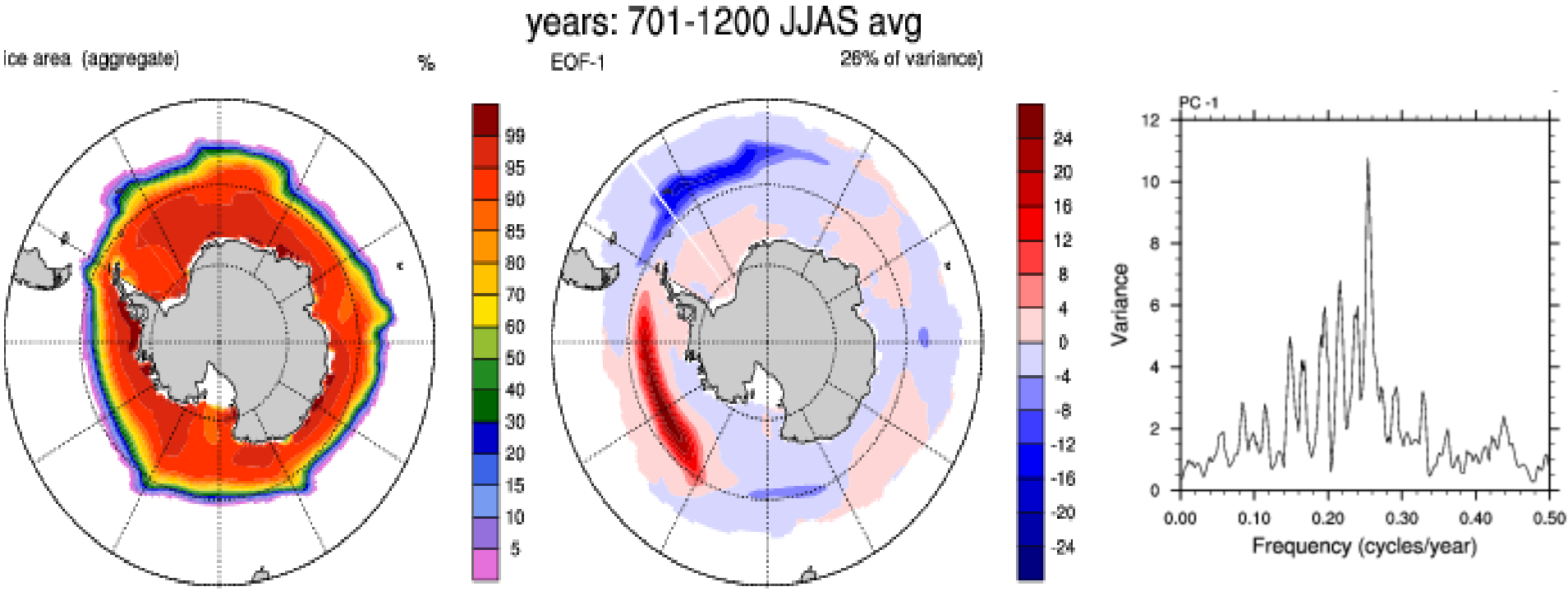
Not enough ice retreat during summer







Antarctic Sea ice variability from PI control



First EOF of winter sea ice cover exhibits dipole pattern, much like observations

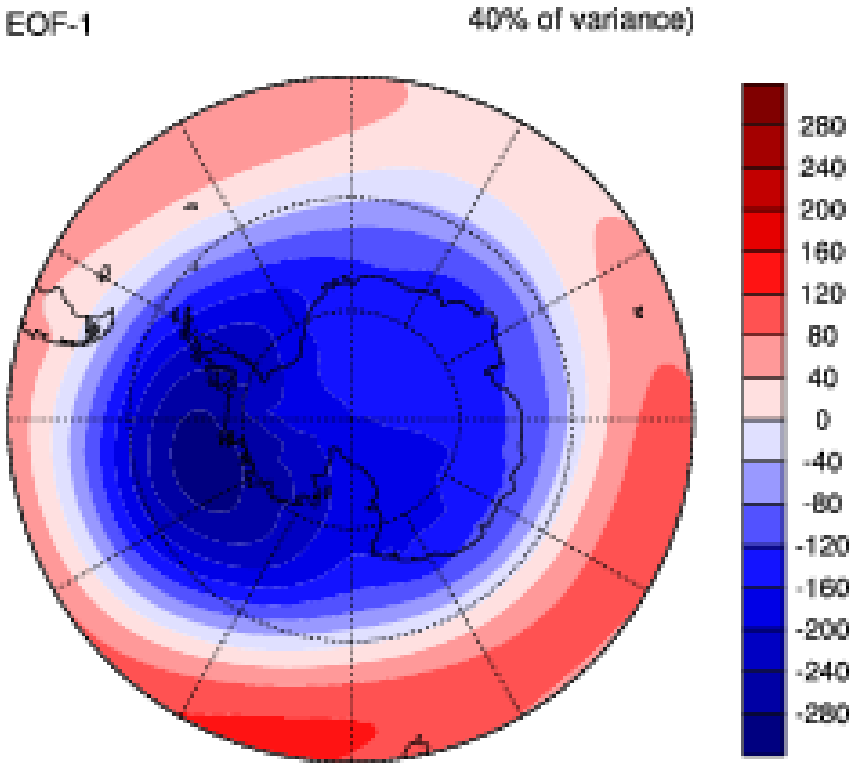
Has dominant 4-year timescale

ENSO Relationships? SAM Relationships?

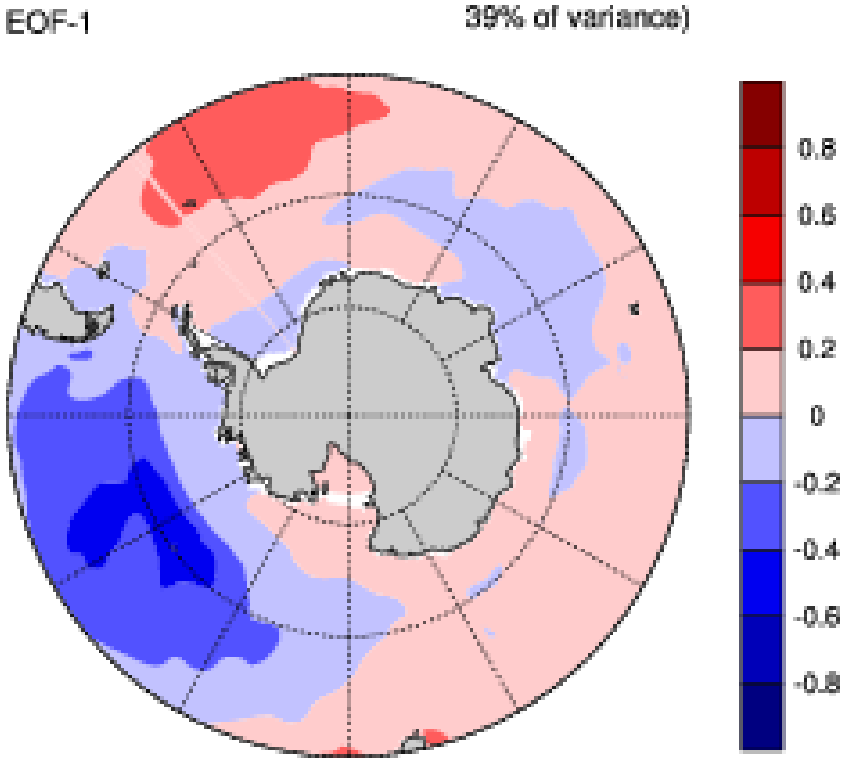
(courtesy of Laura Landrum)

Antarctic variability from PI control

SLP EOF 1



SST EOF 1



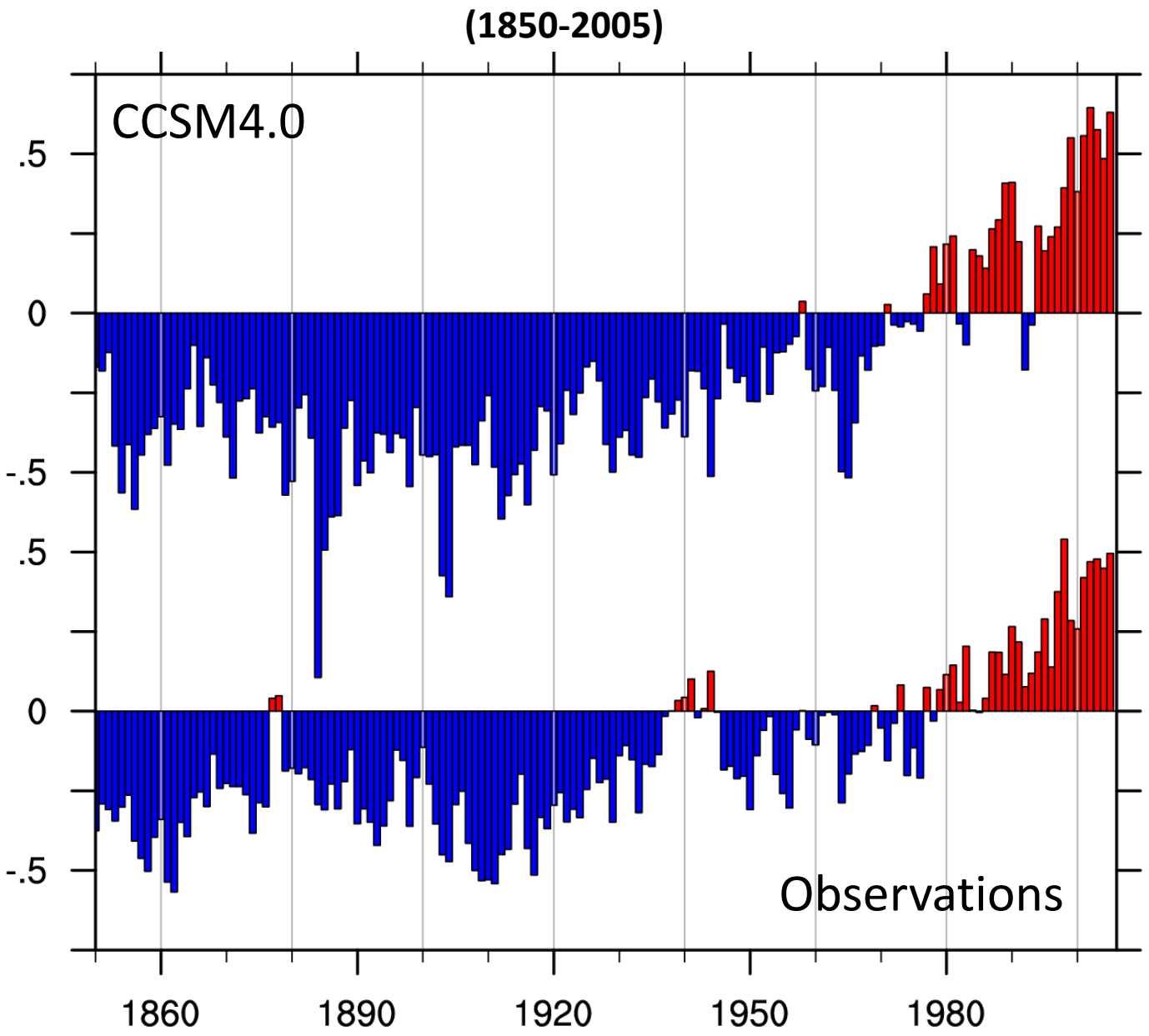
Starting to assess relationships to SLP (SAM) and SST variability

(courtesy of Laura Landrum)

20th Century Runs

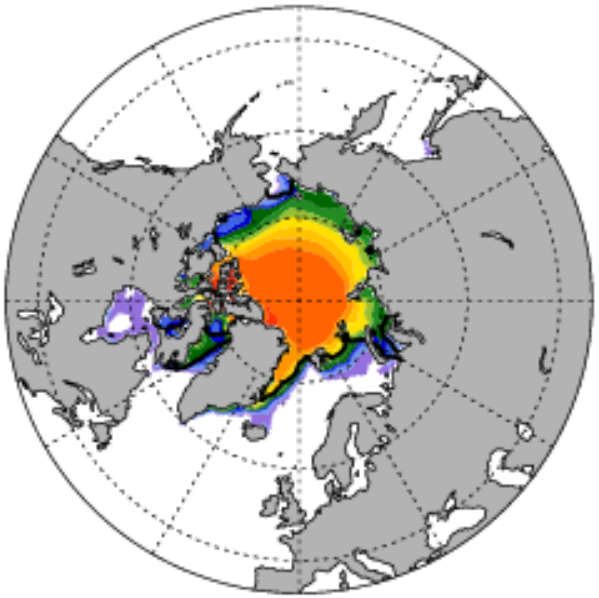
- 3 Runs Completed
- Runs from year = 1850-2005
- Branched off different years of the 1850 Preindustrial Run

Global Temperature

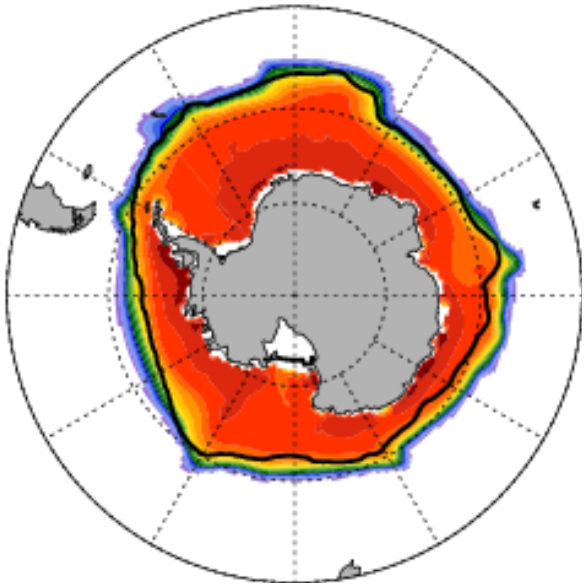


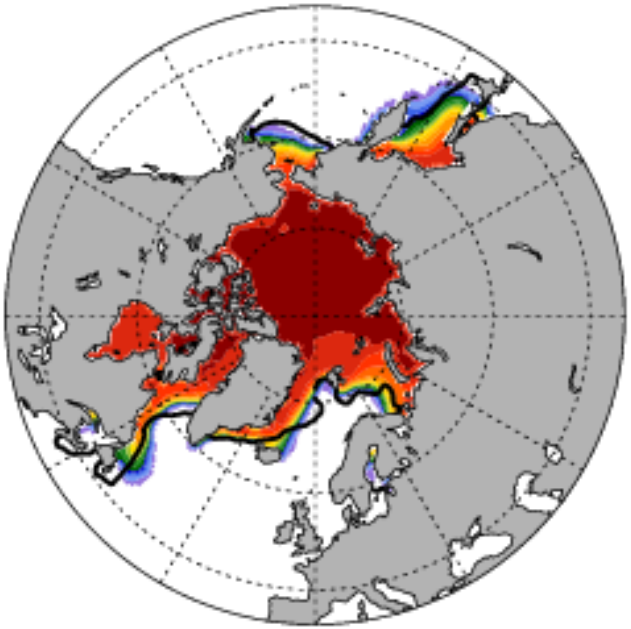
(Courtesy of Jim Hurrell)

20th Century Runs – Ice Concentration

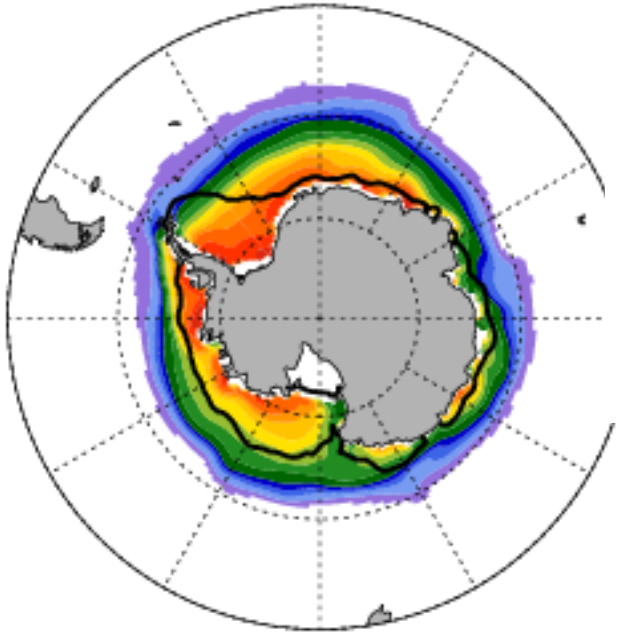


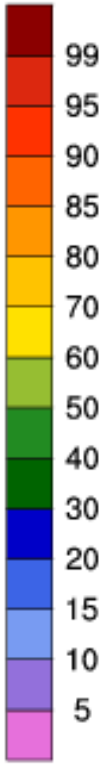
1996-2005
JAS Mean

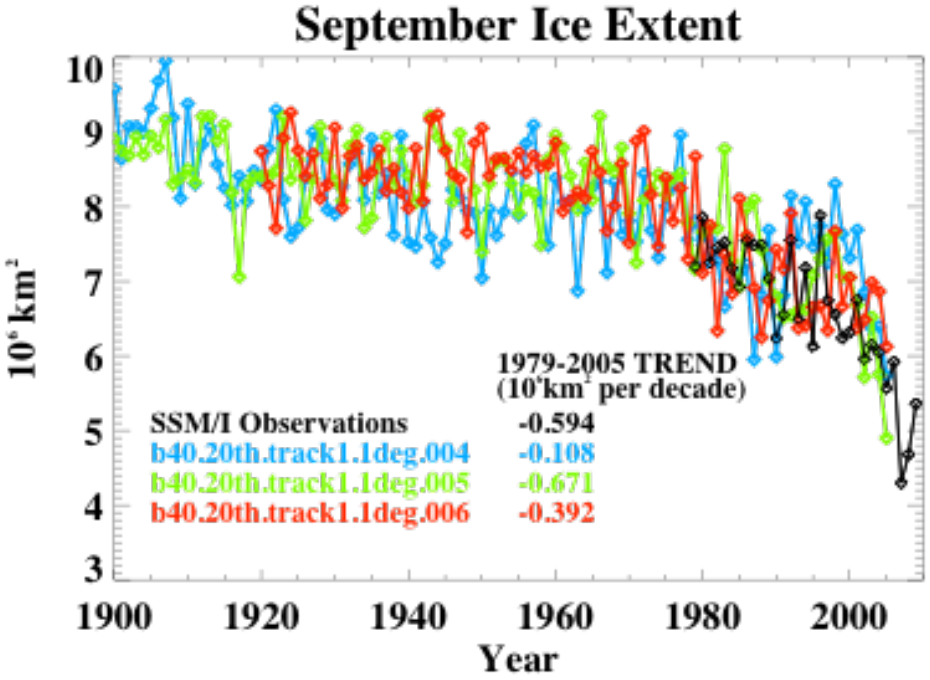


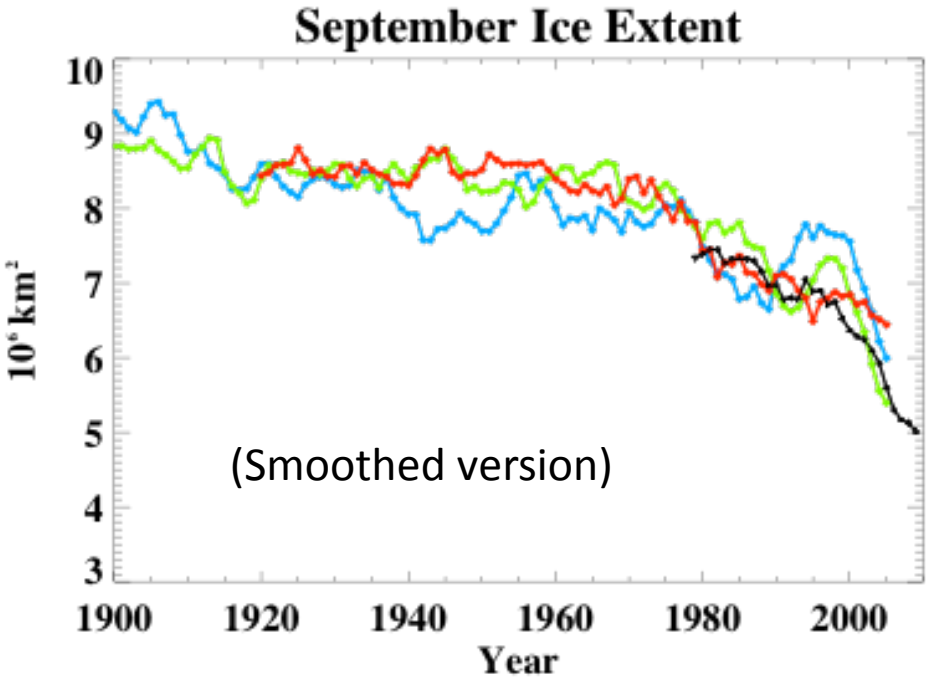


1996-2005
JFM Mean





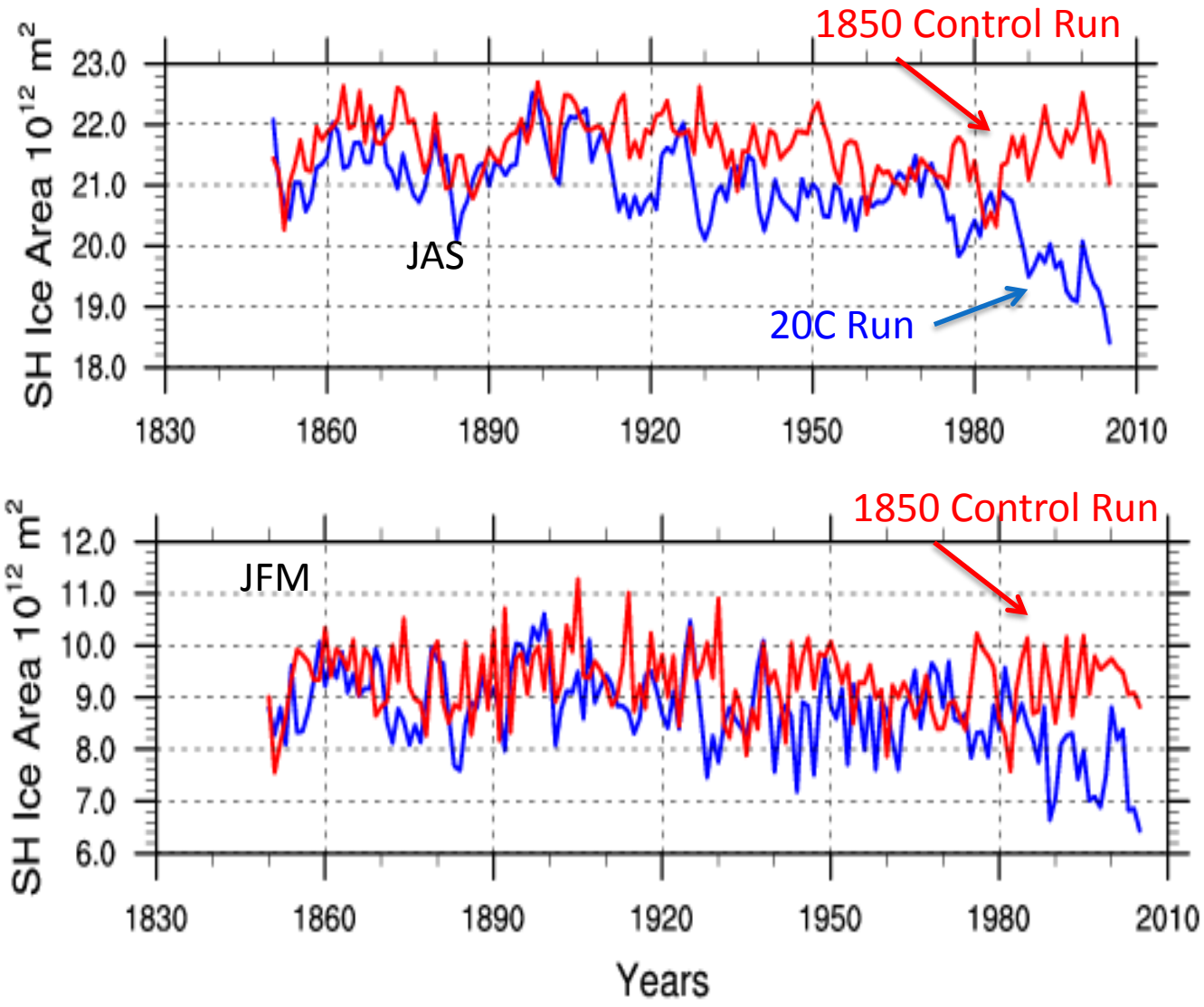




20th Century Sept Ice Extent

Trends in late 20th century Sept ice extent loss from the ensemble members bracket the observed trend

20th Century Antarctic Ice Loss



Model simulates a significant downward trend at the end of the 20th century.

This is in contrast to observations, which show no significant trend.

Conclusions

- CCSM4 integrations are well underway
- In many respects sea ice conditions are well simulated
  - Arctic ice extent very good
  - Antarctic ice cover too extensive
  - Interesting variability to assess
  - Late 20th Century Arctic ice decline compares well to observations