BGCWG Update, February 2019

Co-Chairs: Gretchen Keppel-Aleks (Univ. Michigan)

Keith Lindsay (NCAR), Abigail Swann (Univ. Washington)

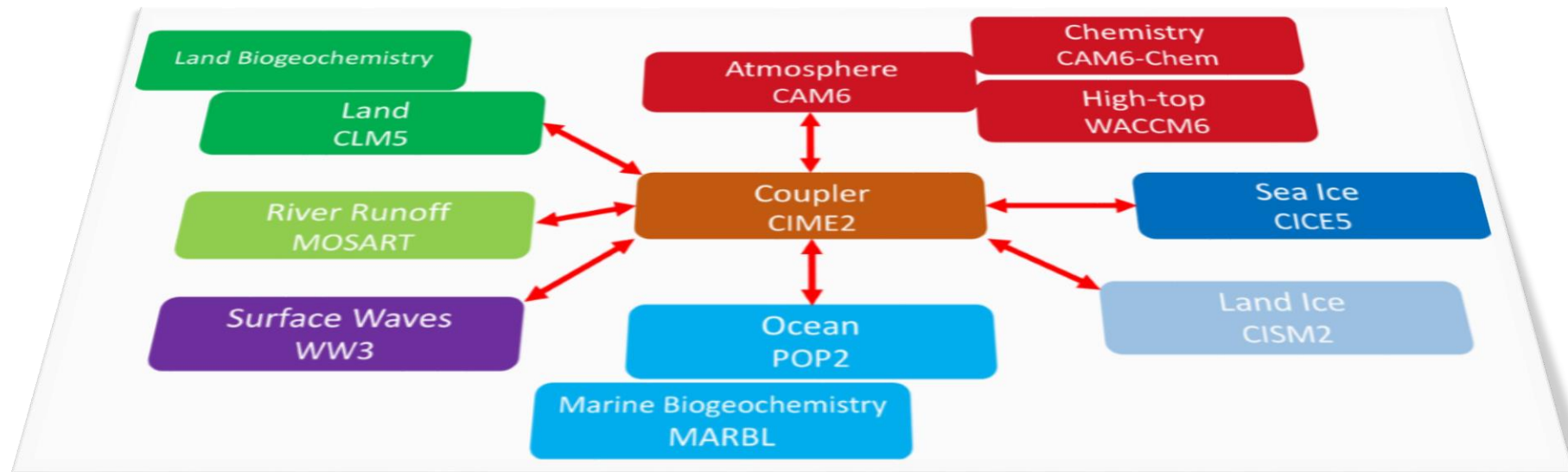Community Liaison: Keith Lindsay (klindsay@ucar.edu)

Last Summer's Near-term Future Activities

- Complete CESM2.1/CMIP6 ocean BGC tuning and spin-up

- CESM 2.1 release

- CESM 2.x Special Collection Papers

- CSL Proposal for Nov 2018–Oct 2020

- CMIP6 MIPS
  - C4MIP: Coupled Climate Carbon Cycle
  - CDRMIP: Carbon Dioxide Removal
  - OMIP-BGC

- Ocean transition to MOM6

CESM 2.1.0 was released to the community on 10 December 2018

This is an incremental CESM2 release containing out-of-the-box configurations for performing DECK PI, 20C, and AMIP simulations for both CAM6 and WACCM6 versions.

A subset of output files were also made available.
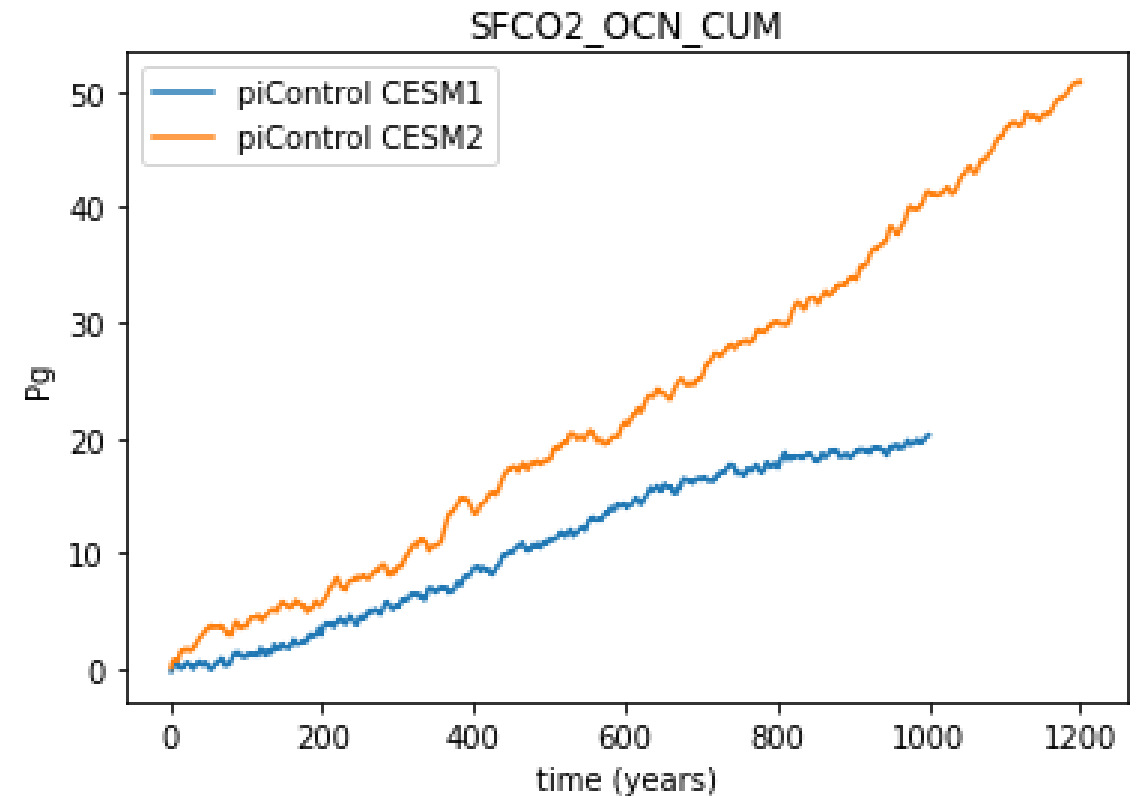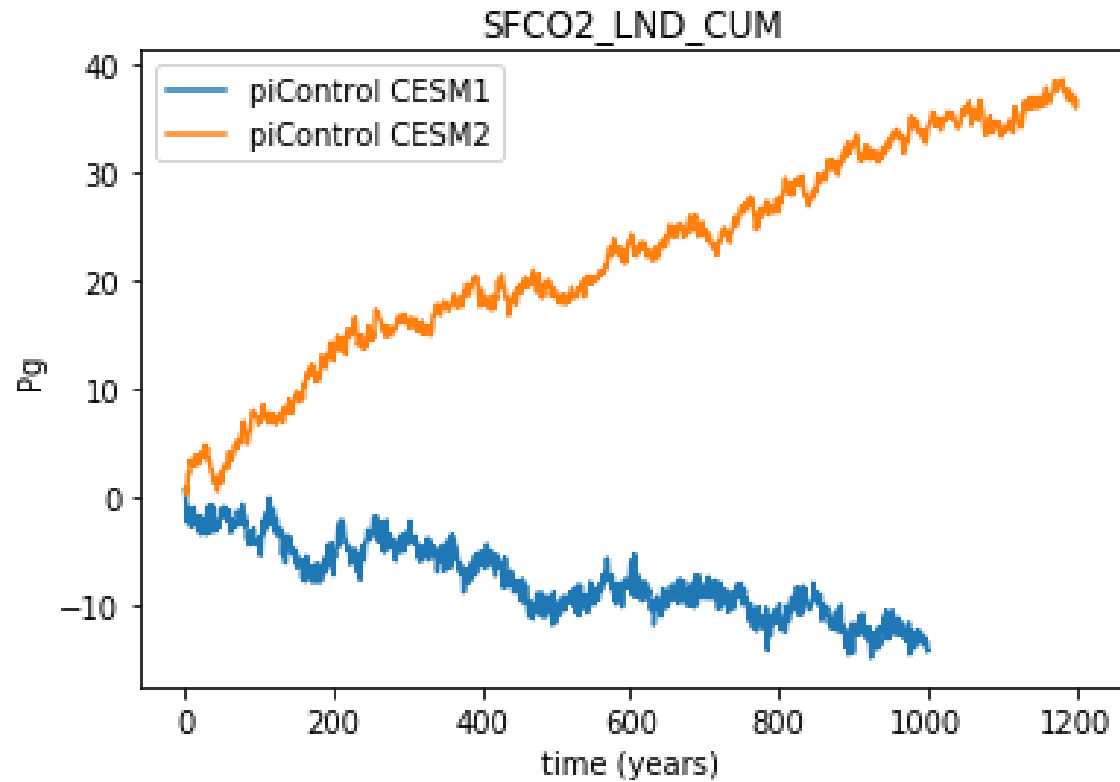
Can I use CESM 2.0 for …?
What is in CESM 2.1 that's not in CESM 2.0?

- Spun up BGC pools in ocean and land
  - Necessary for coupled carbon-climate runs

- Final ocean BGC tunings/configuration

- Final forcings that are used in CESM CMIP6 contributions
  - O_3, Ndep, CO_2 fossil fuel emissions, …

- Support for CMIP6 MIP compsets

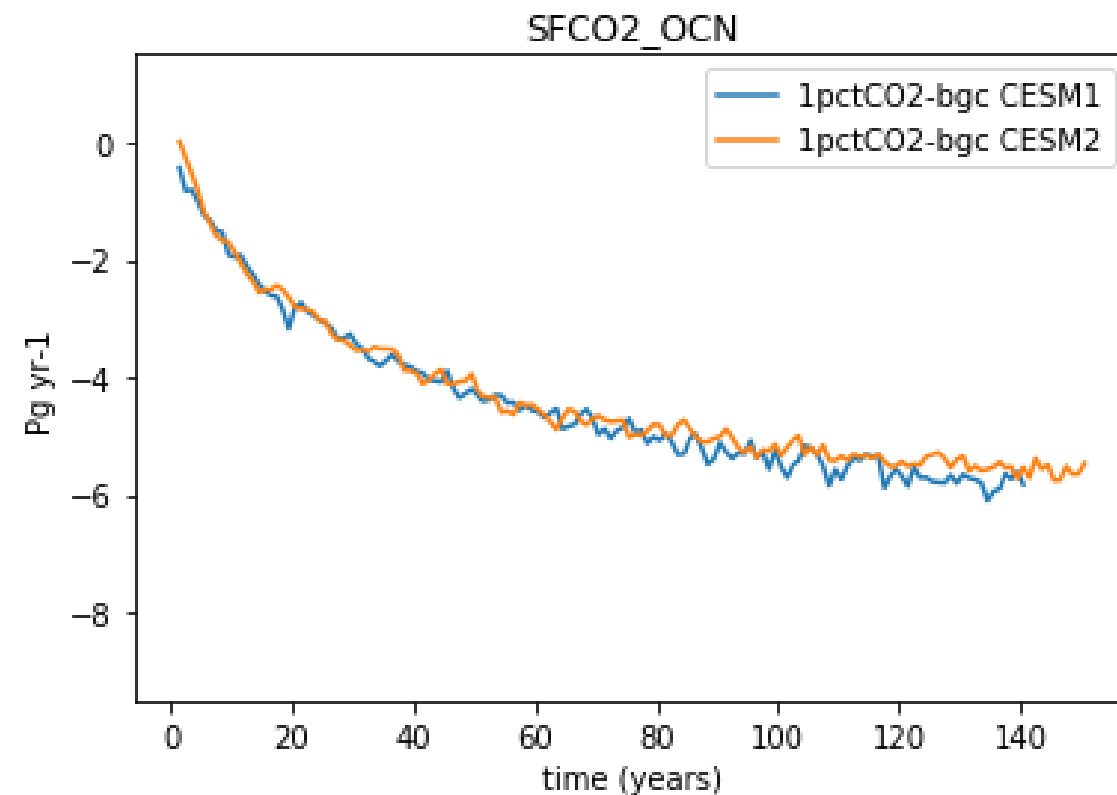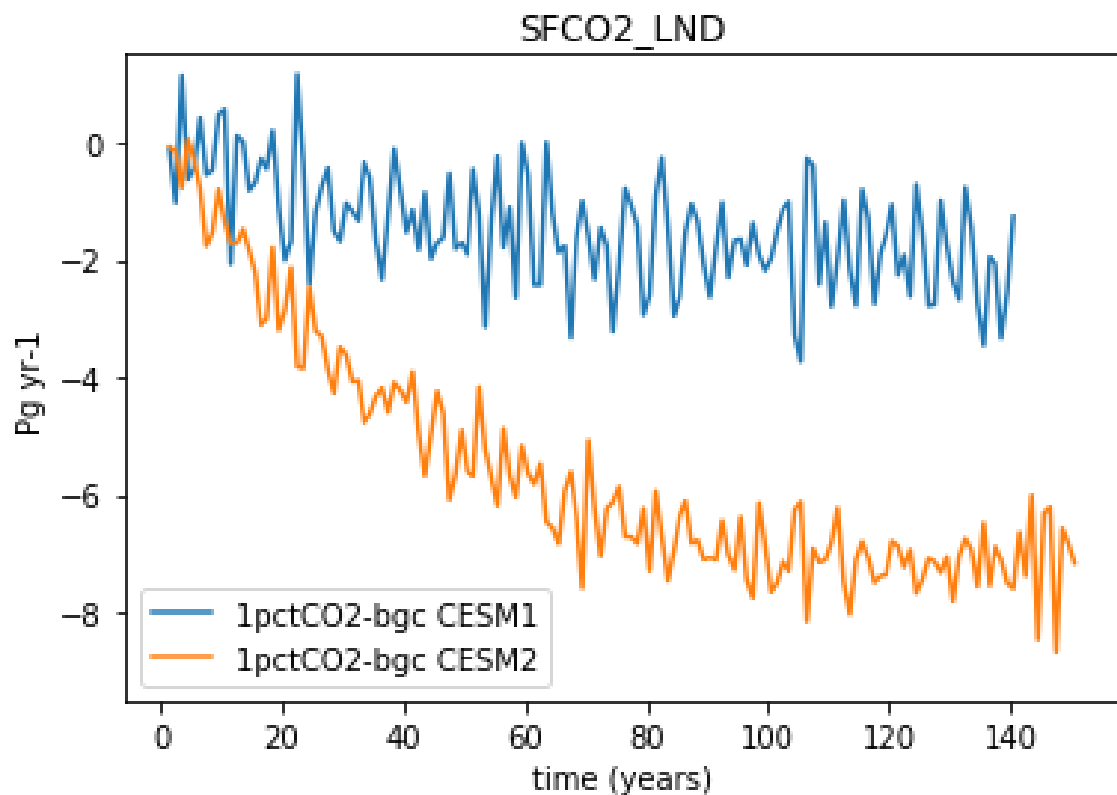- CMIP6 MIP requested diagnostics

CESM2 CMIP6 Experiments (CAM based)

- Prescribed CO_2 Concentrations
  - piControl, 1850 conditions, 1200 years complete
  - historical, 1850-2014, 9 ensemble members complete, 10th underway
  - abrupt4xCO2, 150 years complete
  - 1pctCO2, 1pctCO2-bgc complete
  - SSP5-8.5 21st century scenario run should start soon
  - Other 21st century scenario runs waiting on WACCM generated forcing
- CO_2 Emissions Based
  - esmControl, 50 year test run
  - esmHistorical, few years of testing
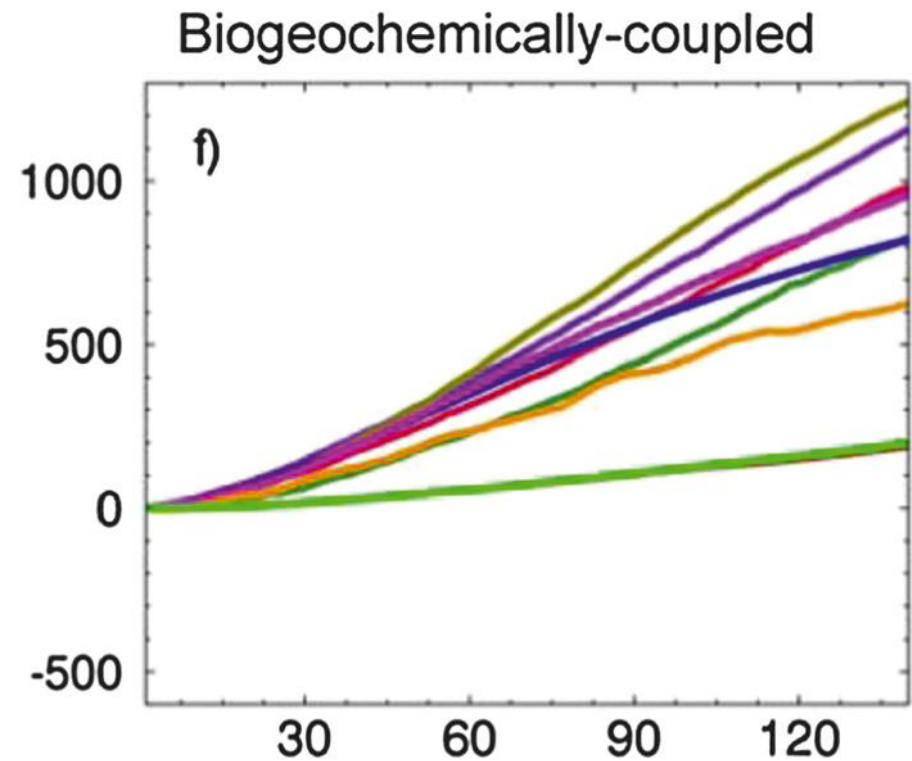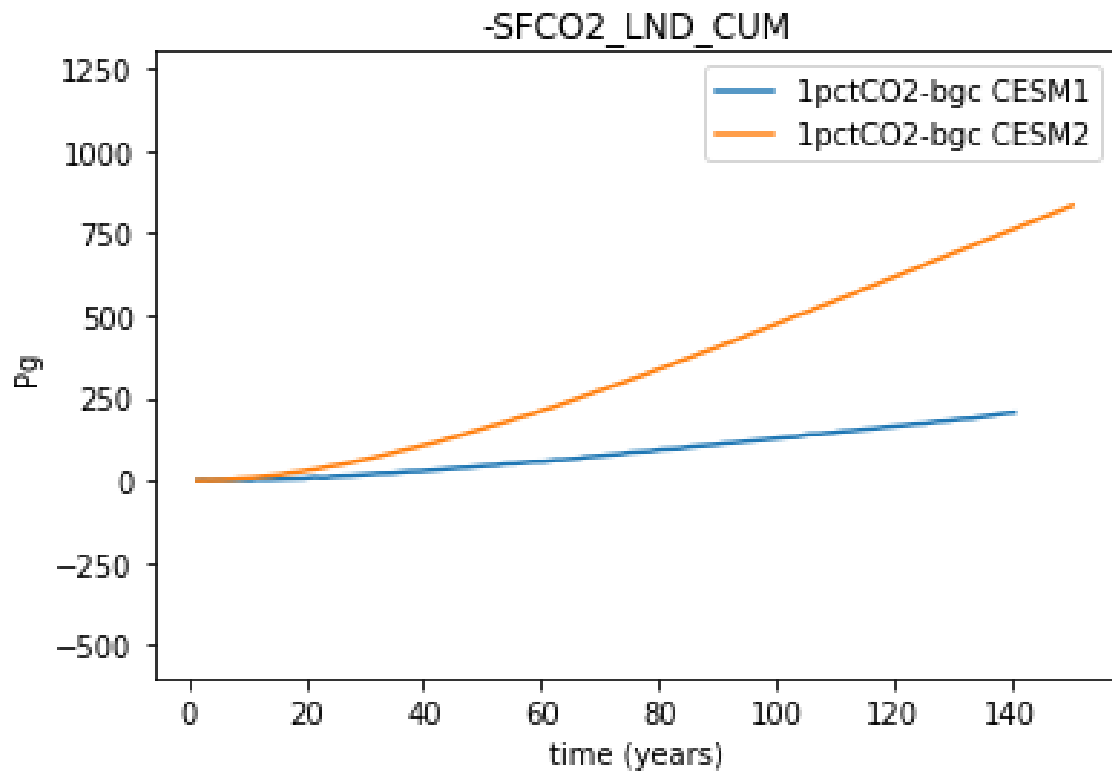 - awaiting evaluation of recently discovered CAM/WACCM bugs before proceeding

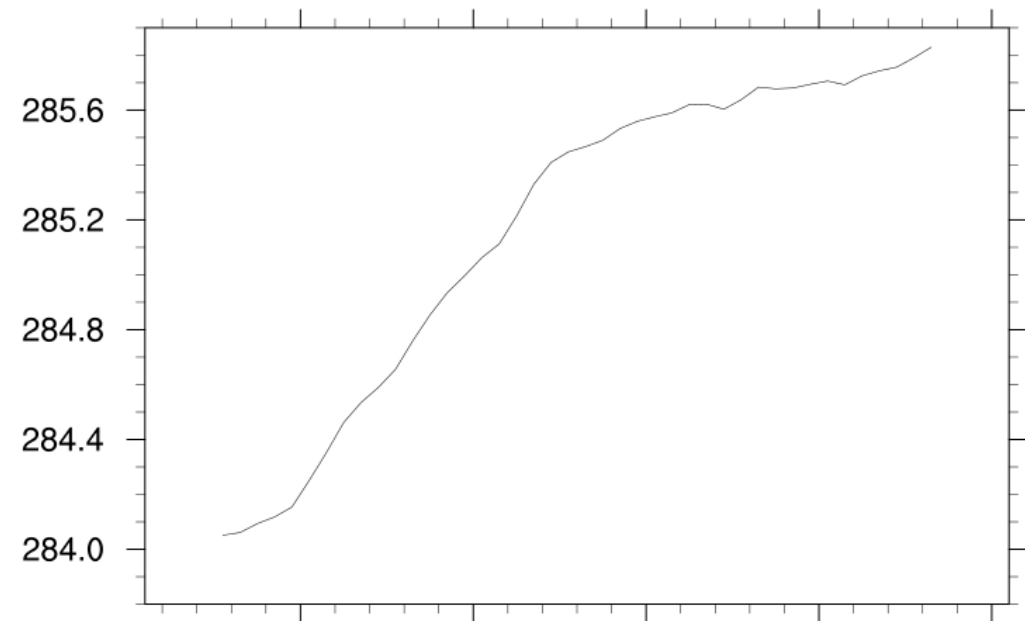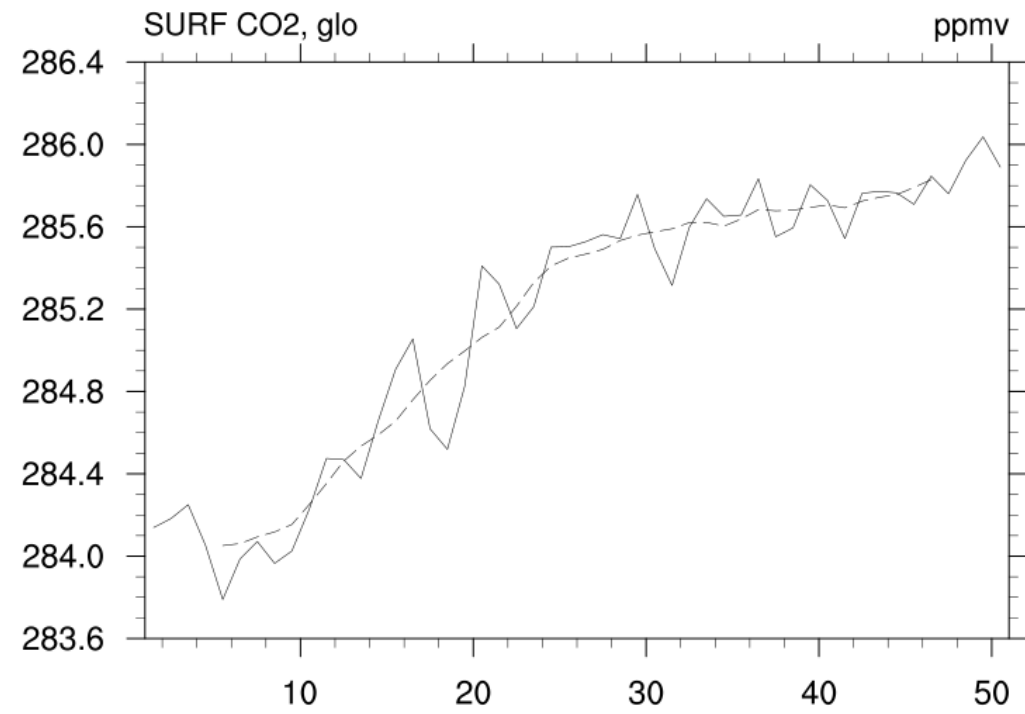# Component Carbon Inventories Drift piControl (prescribed CO_2)

Land->Atm and Ocean->Atm CO$_2$ flux 1pctCO2-bgc

Cumulative Land CO$_2$ uptake, 1pctCO2-bgc CESM and CMIP5 models (Arora et al. 2013)

b.e21.B1850_BPRP.f09_g17.CMIP6-piControl.tst.002

SURF CO2, glo   ppmv

Near-term Future Activities

- Go into production mode with emissions based CMIP experiments
- CMIP6 MIPS
  - C4MIP: Coupled Climate Carbon Cycle
  - CDRMIP: Carbon Dioxide Removal
  - OMIP-BGC
- CESM 2.x Special Collection Papers
- Ocean transition to MOM6