

Update on BGCWG Activities, Jun 2014

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- Community & BGCWG Experiments with CESM1
- Near-term Activities
- Developments targeted for CESM2

NCAR is sponsored by the National Science Foundation

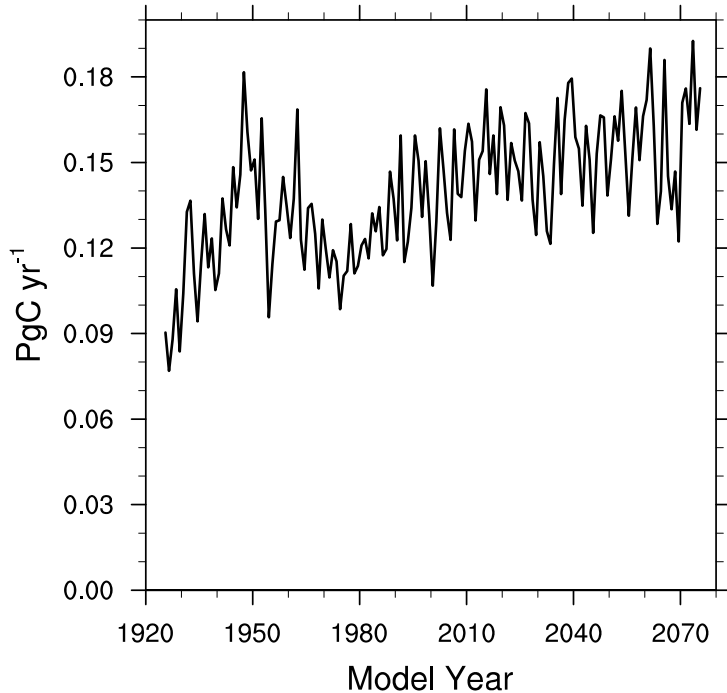


Large Ensemble CESM1.1(CAM5,BGC)

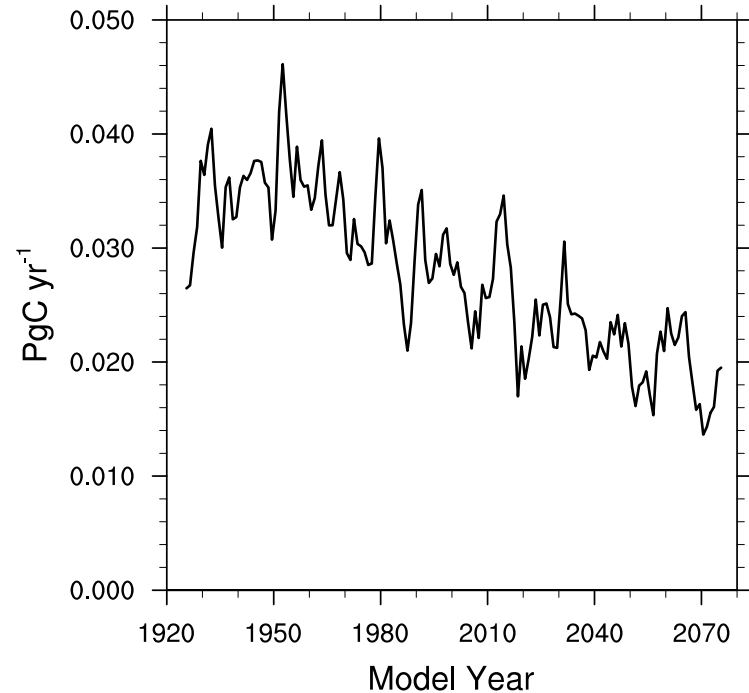
- www.cesm.ucar.edu/experiments/cesm1.1/LE
 - Website has link to page of analysis projects
- BGC essentially unchanged from CESM1
 - Atmospheric CO₂ is prescribed
 - Ocean BGC is purely diagnostic
- 1850 Control, 1500 years long
- 20C,RCP8.5 Transients, 1920-2100
 - 30 ensemble members at NCAR
 - More contributed from external partners

Ensemble Spread in Surface CO₂ Fluxes (after applying 11 year box filter)

Ens Std Dev (29 members), Land to Air CO₂ Flux, Global, 11 yr box filter

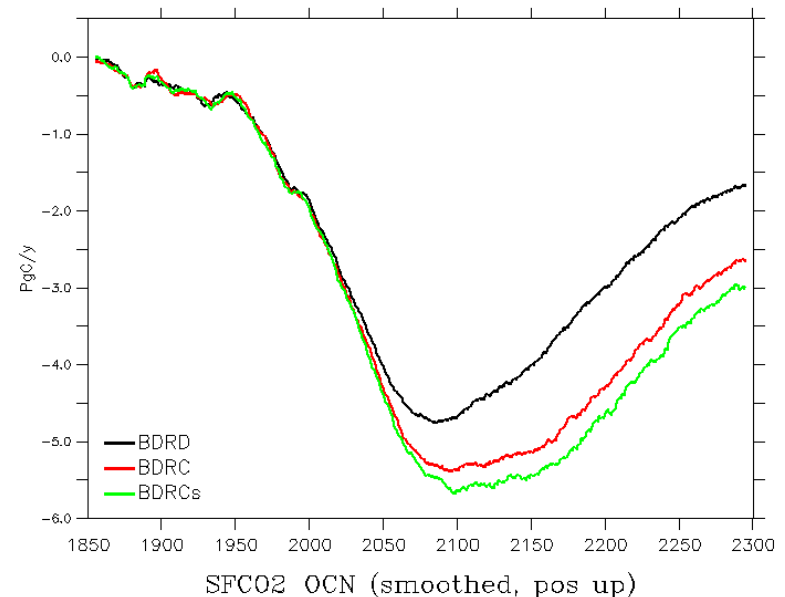
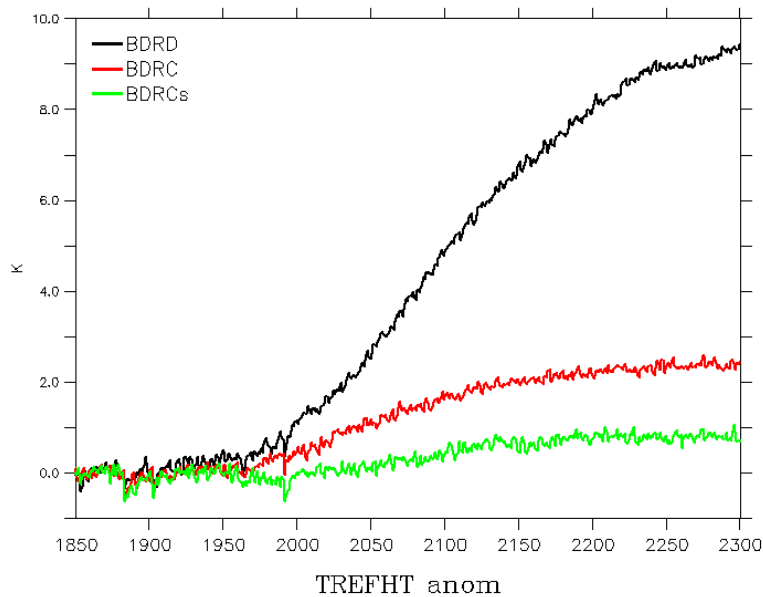


Ens Std Dev (23 members), Sea to Air CO₂ Flux, Global, 11 yr box filter



Coupled Experiments with CESM1(BGC)

- Extensions of RCP8.5 experiments to 2300
 - How do biogeochemical cycles respond to accumulated climate change?
 - How do carbon-climate feedbacks evolve on longer timescales?



Working Group Wide Activities

- Additional Science with CESM1(BGC)
 - PI driven
- Move towards coupled integrations with new BGC parameterizations in CESM1.2
- Improved Metrics and Diagnostics
 - ILAMB
- Development work for CESM2
 - Address documented biases
 - Additional functionality
 - Enhanced coupling with chemistry

Ocean BGC Specific Activities

- Ongoing interactions with OMWG
 - Address biases in physical model directly impacting BGC
- Ecosystem dynamics with resolved eddies
- Newton-Krylov based fast spinup
- Offline tracer tools

Ocean BGC Developments targeted for CESM2

- Modularized BGC core
- Treatment of light under sea ice
- Ocean Acidification feedbacks
- Fe in Sea-Ice
- Spatially varying iron ligand
- Optional Phaeocystis functional group
- Carbon Isotopes
- Methane module
- Couple to sea ice BGC
- DMS emissions
- Support for offline tracer tools
- N isotopes
- Coupled riverine inputs
- NH_4 emissions, N_2O tracer
- Explicit calcifier functional group

CESM NCAR Computer Allocation

- Accommodate development work and production experiments
- New proposal to be prepared by Sep 1
- 2 year duration, with review after 1st year
- Prioritized list of experiments for 1st and 2nd years due by August
 - proposed experiments are invited