

Update on Coupled Runs in CCSM4 with BGC

BGCWG Meeting, Feb 2010

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M. Vertenstein, T. Craig

K. Moore, S. Doney

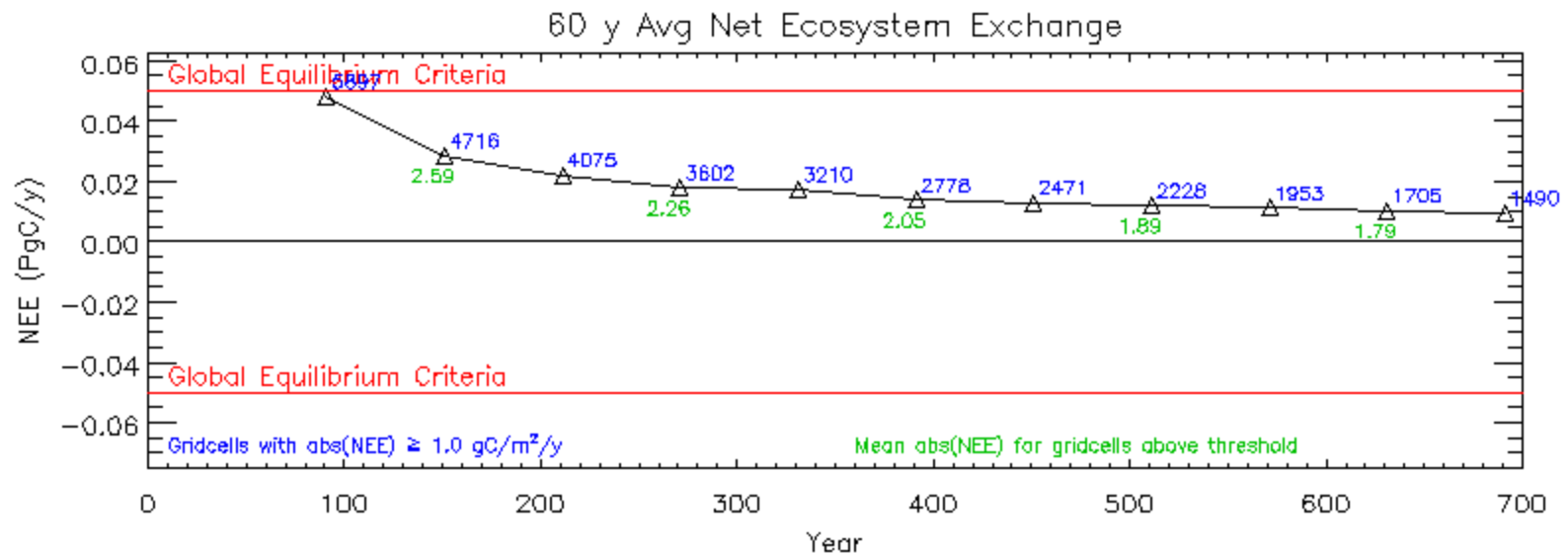
N. Mahowald, J. Randerson

Outline

- Spinup/Initial Condition Generation
- Incremental Coupling
- Preliminary Results from Runs in Progress

CLM-CN Spinup

- 700 year CLM run forced with repeating 30 years of high frequency coupled model output

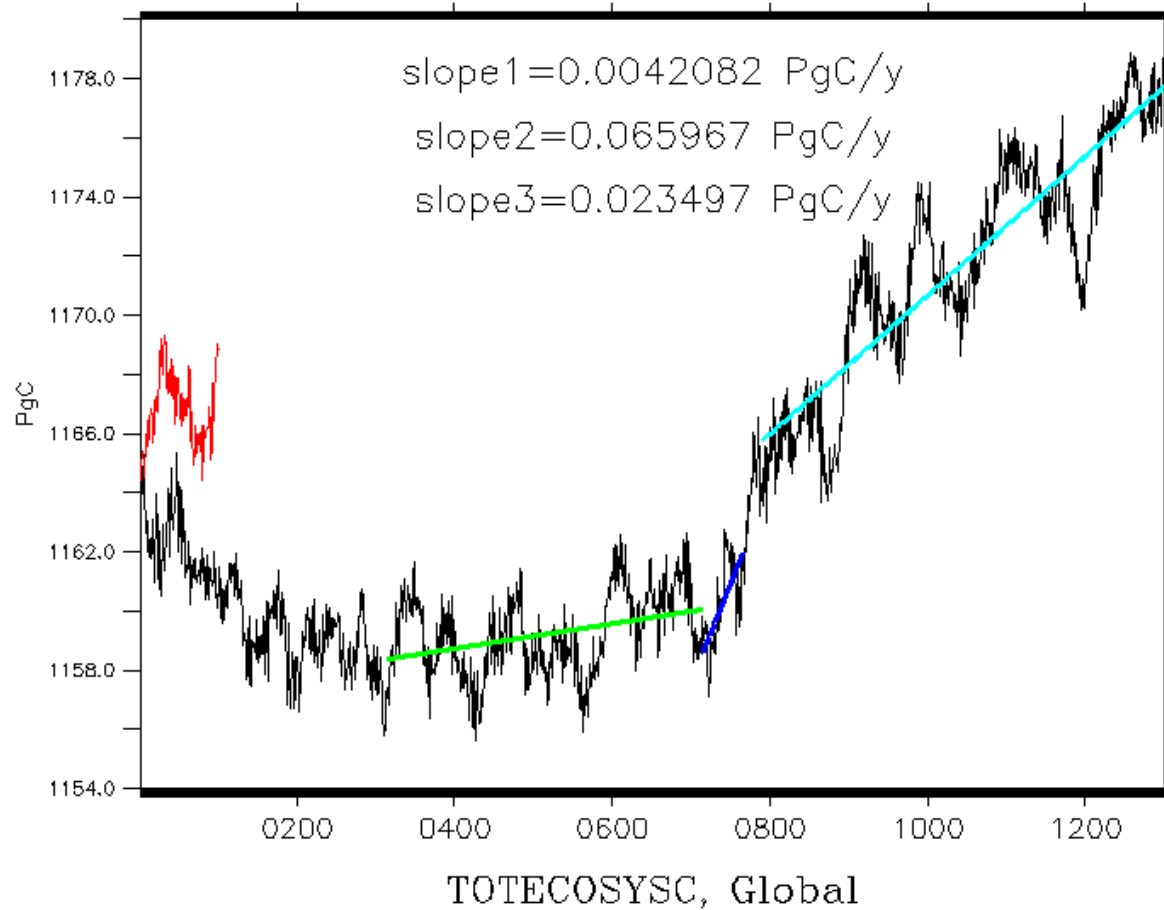


i40.1850BCN_bgcspinup2

Insertion in Coupled Model

LONGITUDE : 0.6W(-0.6) to 0.6W
LATITUDE : 90.5S to 90.5N
CALENDAR: NOLEAP

FERRET Ver. 8.1
NOAA/PMEL TRAP
Jan 4 2010 10:28:25



POP-BEC spinup

- Newton-Krylov not successful at x1 yet
- Backup plan: ~1000 year POP-CICE run forced with repeating 5 years of high frequency coupled model output

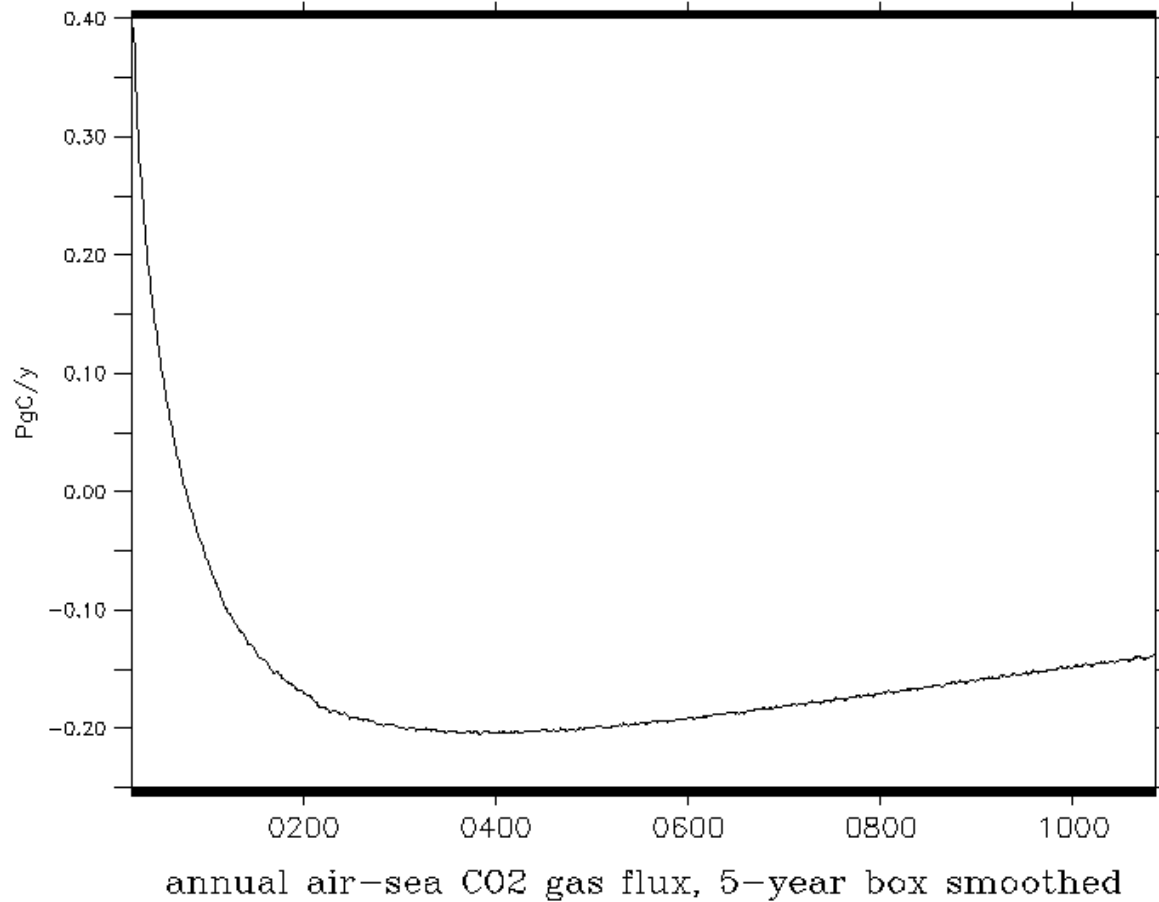
Balance through 1000 Years

X : 0.5 to 320.5
Y : 0.5 to 384.5
CALENDAR: NOLEAP

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Det 7 2008 14:36:47

DATA SET: FG_CO2

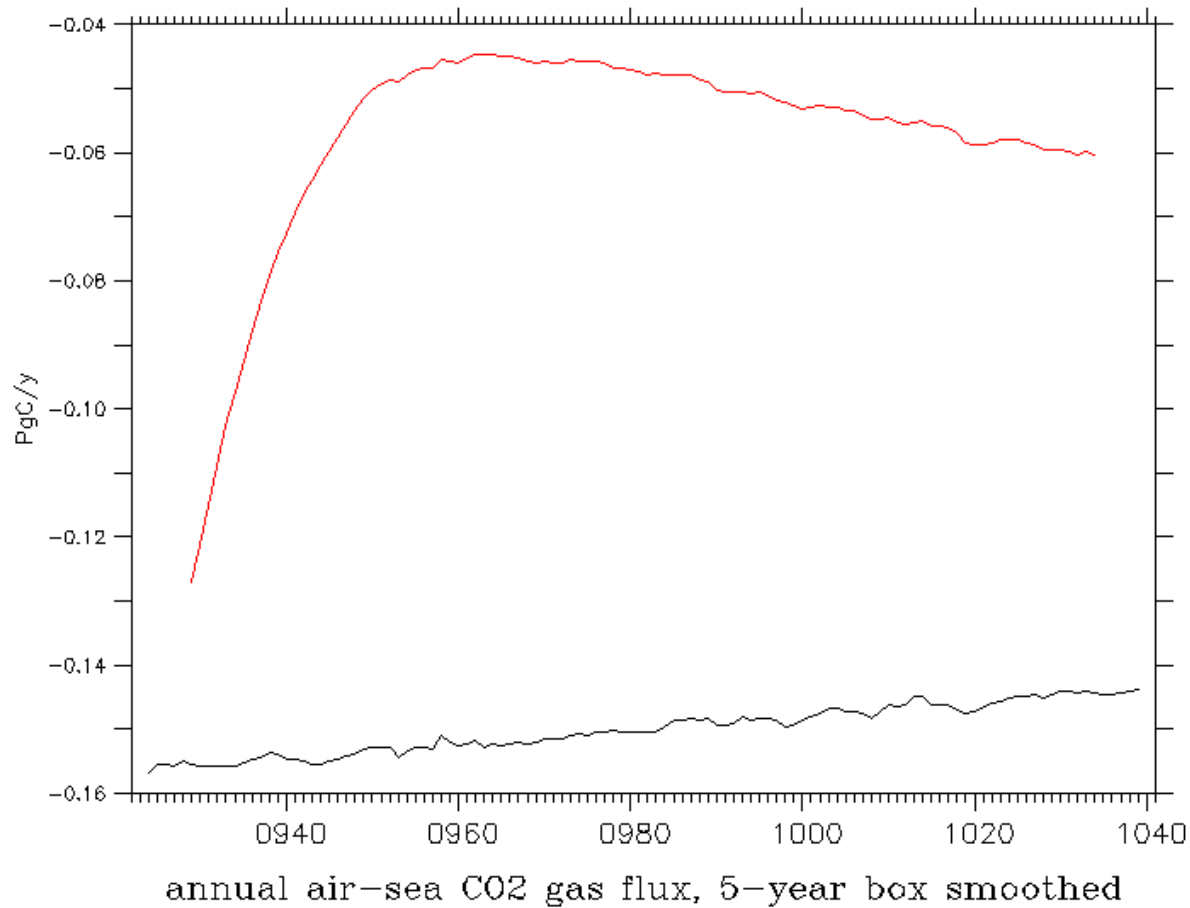
G.brute.cesm4.04



Balance after Parameter Adjustment

X : 0.5 to 320.5
Y : 0.5 to 384.5
CALENDAR: NOLEAP

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Oct 8 2009 13:20:14

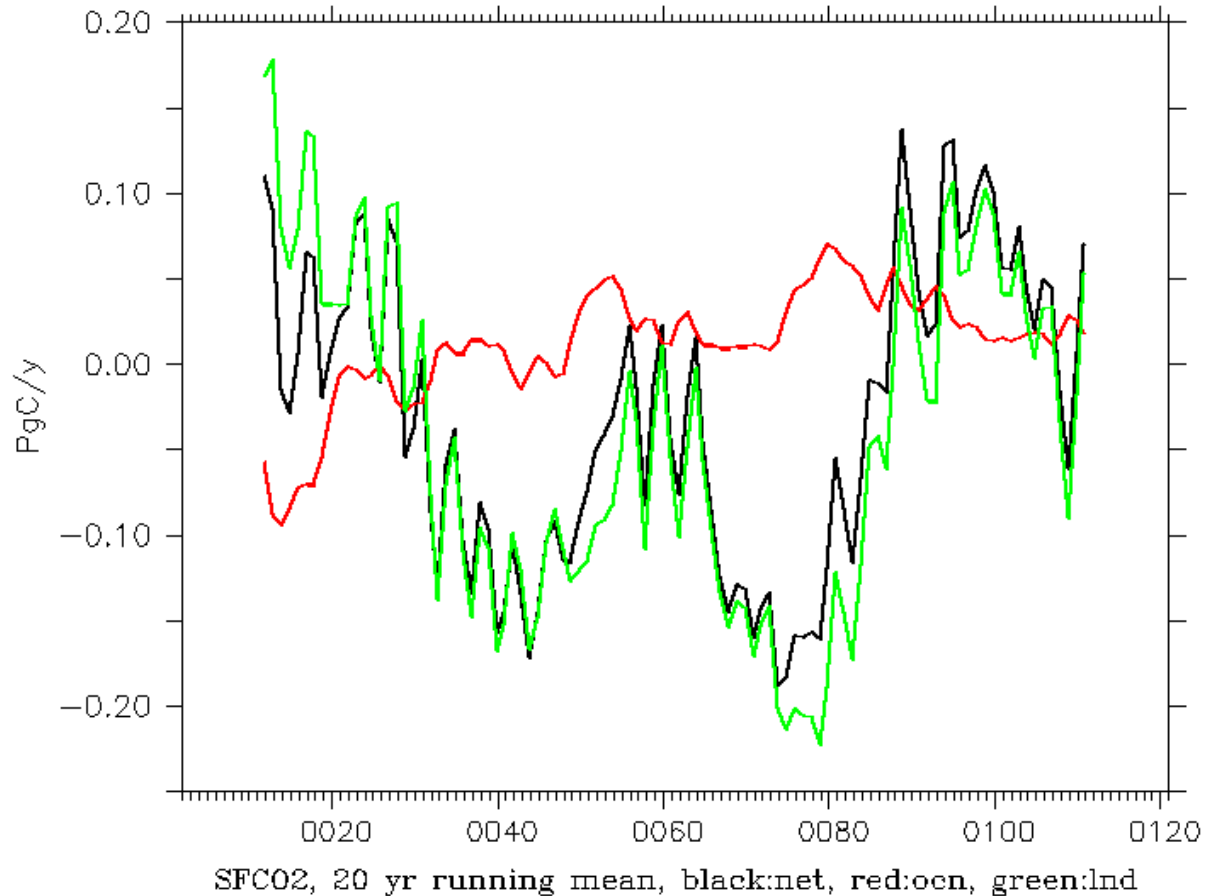


Results when coupled together

LONGITUDE : 0.6W(-0.6) to 0.6W
LATITUDE : 90.5S to 90.5N
CALENDAR: NOLEAP

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Feb 12 2010 22:33:12

DATA SET: SFCO2

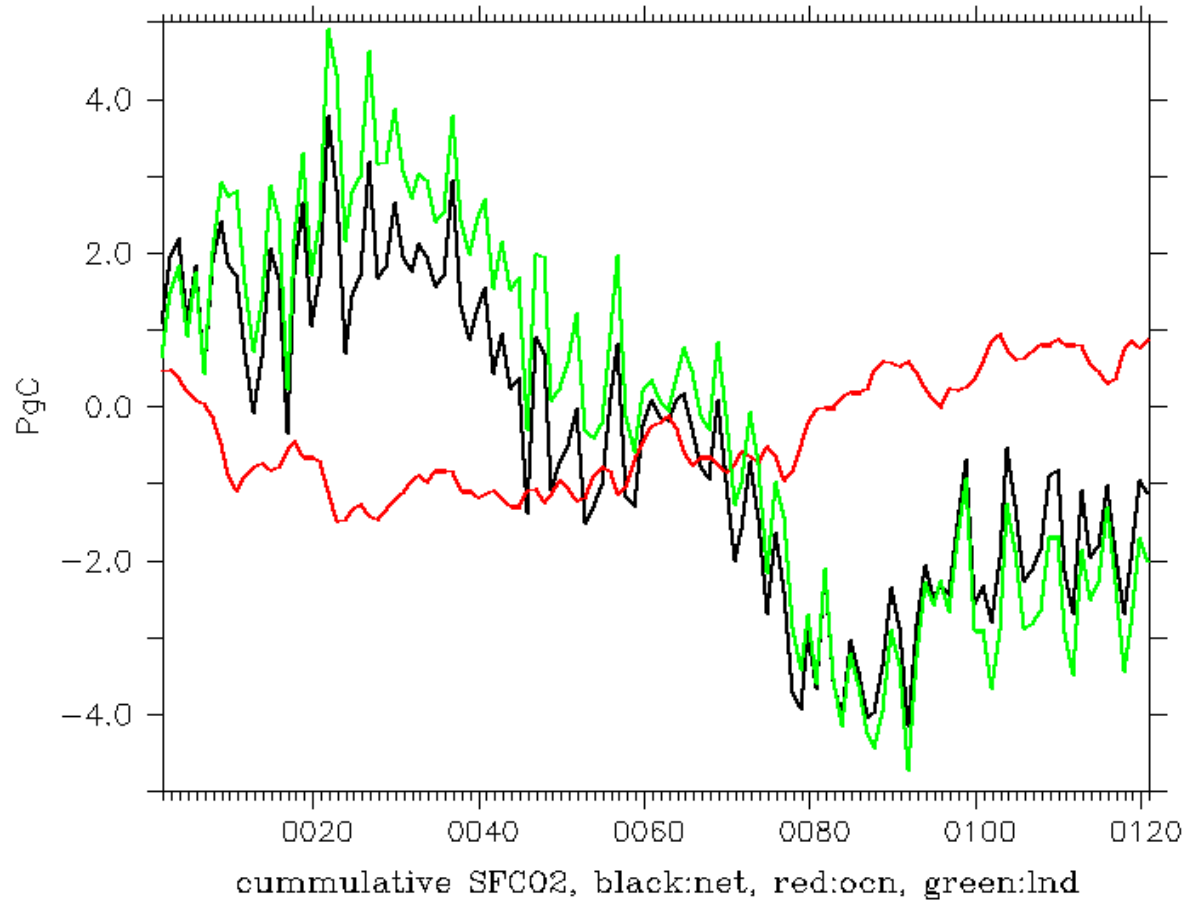


Cumulative CO₂ Fluxes

LONGITUDE : 0.6W(-0.6) to 0.6W
LATITUDE : 90.5S to 90.5N
CALENDAR: NOLEAP

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Feb 11 2010 22:33:10

DATA SET: SFCO2



Status of Runs in Progress

2010-02-09

- Initialize w/ 0051-01-01 from prev slide
- 1850 Control Prognostic CO₂ : 192 years
- 1850 Control Prescribed CO₂ : 74 years

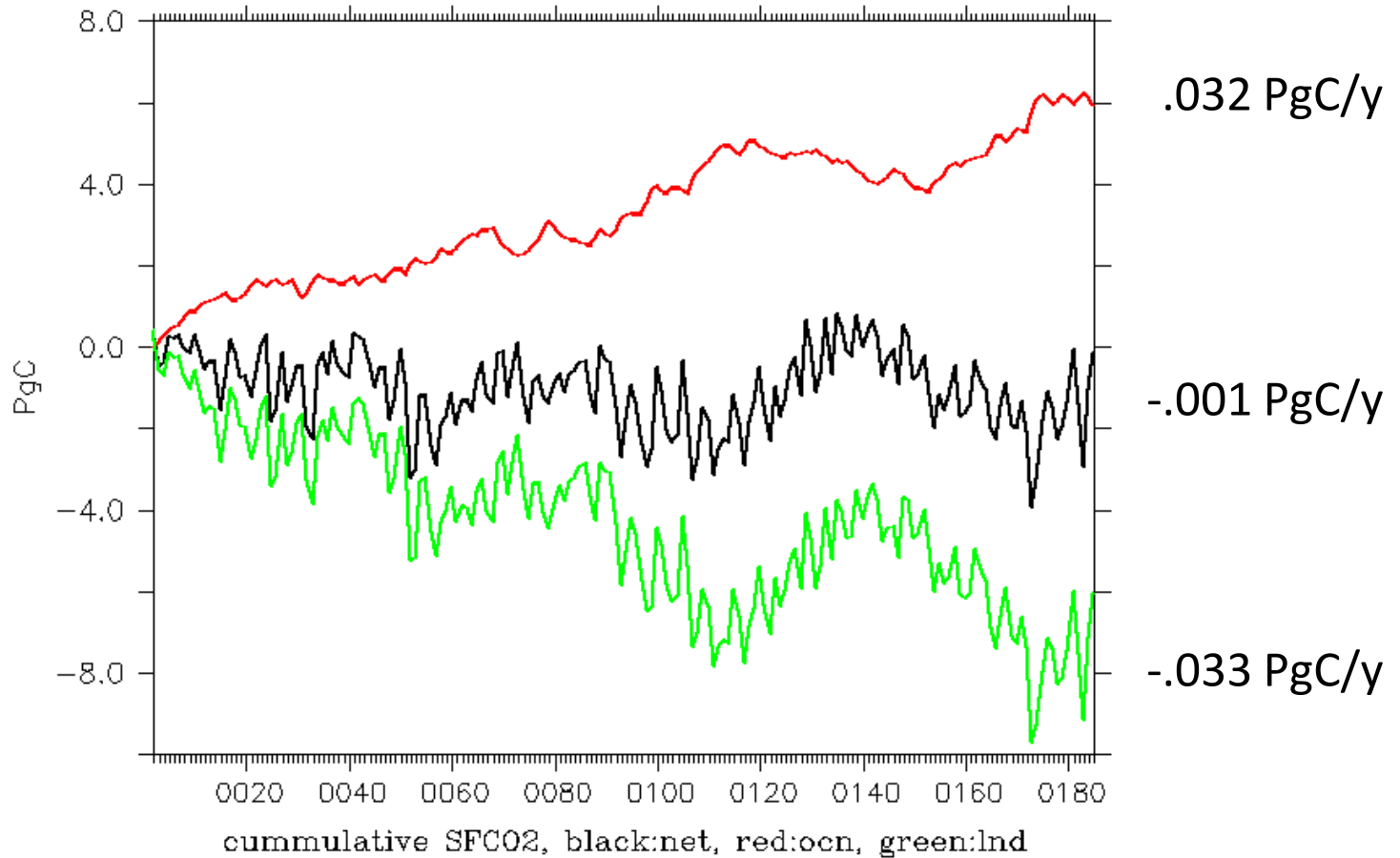
- 'non-BGC' runs have CN within CLM
 - 1850 Control : 1300 years (complete)
 - Multiple 1850-2005 transients complete

Cumulative CO₂ Fluxes w/ Prognostic CO₂

LONGITUDE : 0.6W(-0.6) to 0.6W
LATITUDE : 90.5S to 90.5N
CALENDAR: NOLEAP

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Feb 11 2010 16:23:51

DATA SET: SFCO2

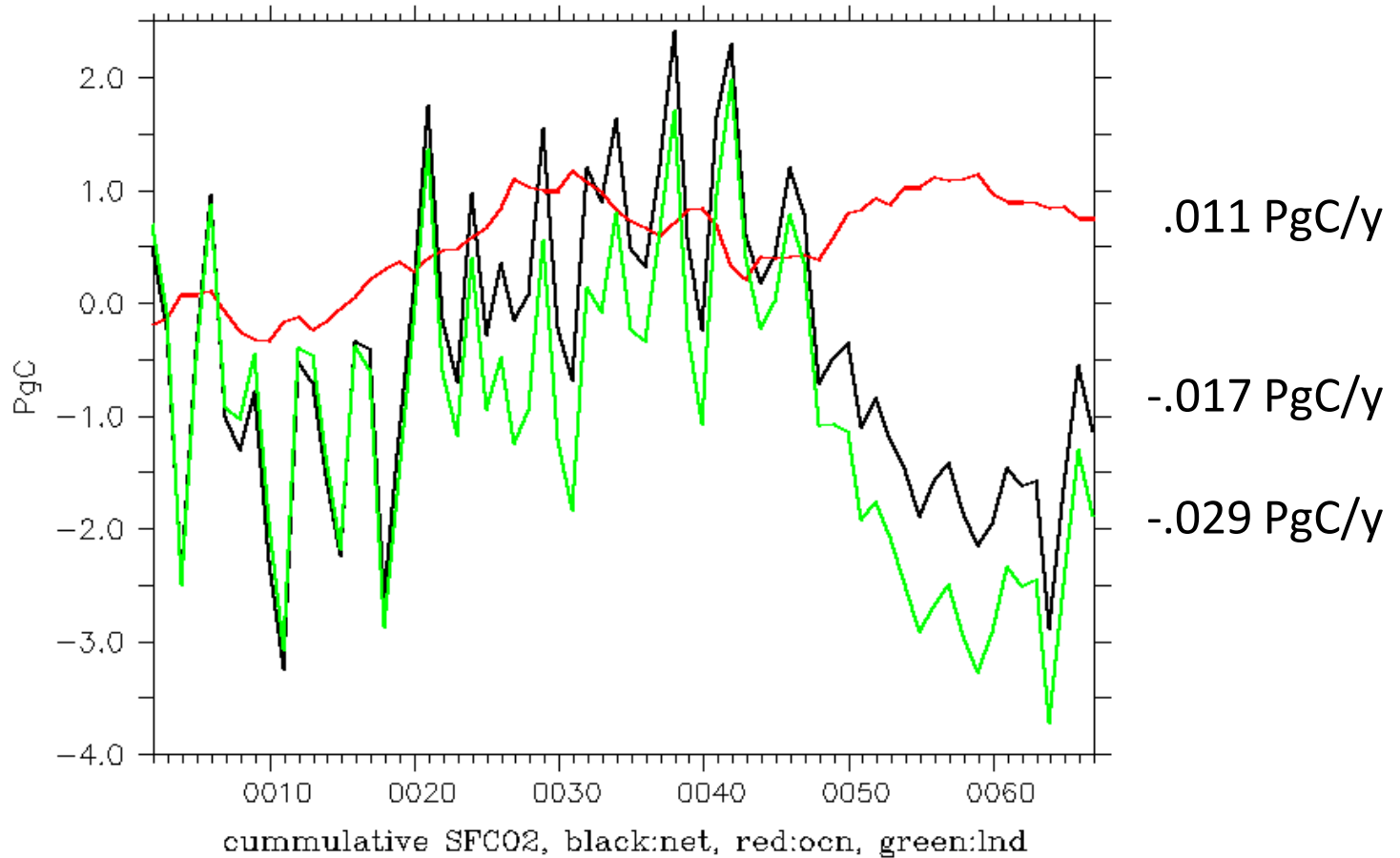


Cumulative CO₂ Fluxes w/ Prescribed CO₂

LONGITUDE : 0.6W(-0.6) to 0.6W
LATITUDE : 90.5S to 90.5N
CALENDAR: NOLEAP

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NOAA/PMEL THMP
Feb 12 2010 20:24:42

DATA SET: SFCO2



What's Next

- Implement some omitted IPCC diagnostics
- Analysis, analysis, analysis
- Transient Runs
 - 20th Century
 - 21st Century RPCs
 - Various Sensitivity Studies