Welcome
10th Annual Ocean Carbon and Biogeochemistry (OCB) Summer Workshop

Craig Carlson (UCSB), Chair, OCB SSC
Heather Benway (WHOI), Exec. Officer, OCB Project Office
Monday:  Plenary Session 1. Atmospheric Nutrient Deposition: Impacts on Marine Ecosystems and Biogeochemical Cycles (Chair: Scott Doney)

Tuesday: Plenary Session 2. Studying Spatial and Temporal Variability in the Ocean with Shipboard and Autonomous Platforms (Chairs: Susanne Neuer, Mike Lomas, Angle White)

Wednesday: Plenary Session 3. Evolving Views on Physical, Ecological, and Biogeochemical Underpinnings of Plankton Blooms (Chairs: Matt Church and Hugh Ducklow)

Thursday: Internal Cycling of Trace Elements: A Budding GEOTRACES/OCB Collaboration (Chair Bob Anderson)

Ocean Biology and Biogeochemistry Pre-Decadal Survey Meeting (Carriage House)

This is an important scientific planning discussion for the Decadal Survey of Earth Science, members of the OCB community are urged to participate!
**OCB Program Review**

**Effectiveness of OCB’s Scientific Coordination Effort**

- **Scientific inspiration**: 1.6
- **Community building**: 1.5

**Community Building** - OCB provides a unifying framework that brings together an otherwise disparate group of individually funded researchers to address important science questions.

**Scientific leadership**: 1.4

**Consensus building**: 1.3

Legend:
- Very Effective
- Somewhat Effective
- Not Effective
OCB Summer Workshops

• Total participation has almost doubled over past 5 years

• Student/postdoc participation has increased - provided travel support, opportunities to give presentations, opportunities to meet with program managers, etc)

• Disciplinary representation has broadened and led to new partnerships:
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2011: Joint science session with US CLIVAR kicked off our ongoing partnership

2012: Satellite data session (links to ocean color/remote sensing community), land-ocean transport (increased links to terrestrial and estuarine/coastal C community)

2013: Evolutionary biology (led to OCB scoping workshop for Lomas workshop), trace metals (links to GEOTRACES and GEOMIC)

2014: North Atlantic-Arctic (physics, ecology, etc.), sea ice and atm-ocean-ice CO2 exchange (SOLAS)

2015: Atmospheric sciences (Atm. nutrient deposition session joint with SOLAS)
OCB PARTNER ACTIVITIES (cont’d)
IOCCP/ OCB International Shipboard Biogeochemical Time-Series Network

Global Intercomparability in a Changing Ocean:
An International Time-Series Methods Workshop

November 28-30, 2012
(Bermuda Institute of Ocean Sciences, St. Georges, Bermuda)
http://www.whoi.edu/website/TS-workshop/


IOCCP and OCB gratefully acknowledge the support of IOC-UNESCO, SCOR, NSF, NASA, NOAA, and BIOS for this workshop.
**OCB PARTNER ACTIVITIES (cont’d)**

**US CLIVAR/OCB Joint Working Groups**

**Oceanic carbon uptake in the CMIP5 models**

**Objective:**
Detailed analysis of CMIP-5 (Coupled Model Intercomparison Project phase 5) simulations to better characterize physical and biogeochemical processes controlling ocean carbon uptake in the North Atlantic, tropical Pacific, and Southern Ocean.

**Heat and carbon uptake by the Southern Ocean**

**Objective:**
To combine data and models (and develop data/model metrics) to explore Southern Ocean response to climate change, with an emphasis on the importance of mesoscale eddies in

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**Driving Forces for CMIP5: All Anthro. Forcings**

**Global CO₂ Concentrations**

- RCP1.9
- RCP2.6
- RCP4.5
- RCP6.0
- RCP8.5

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**U.S. CLIVAR**

Climate Variability & Predictability
OCB PARTNER ACTIVITIES

NACP/OCB Coastal CArbon Synthesis (CCARS)

Outcomes

• Updated regional coastal carbon budgets for North America
• Science plan to inform future coastal carbon research
• Multiple peer-reviewed papers
Coordination and Leadership roles in North Atlantic-Arctic International meeting and Science Plan- help with scientific team building / coordinating

Ocean acidification - PI meetings, short course, outreach products/activities, etc.

OCB provided feedback to important planning initiatives through the SSC and greater OCB community
Increasing visibility of oceans in C cycle science- engaging the CCIWG and CCSSG

Randerson et al. 2015

Global Biogeochemical Cycles

RESEARCH ARTICLE
10.1002/2014GB005079

Key Points:
- We assessed climate-carbon feedbacks with CESM1 to 2300 for RCP/ECMIP5 sensitivity to climate

Multicentury changes in ocean and land contributions to the climate-carbon feedback

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McKinley et al. EOS in press

CARBON CYCLE SCIENCE TO INFORM TARGETED CLIMATE POLICIES

Galen A. McKinley¹, Craig A. Carlson², Arlyn Andrews³, Dan Brown⁴, Paty Romero-Lankao⁵, Gyami Shrestha⁶

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⁴University of Michigan, Ann Arbor, MI
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Training of early career scientists

- pH sensors course (Martz, SIO)
- Internat'l bgc sensors course joint with IOCCP (Sweden)
- Cornell remote sensing course (2013, 2014)
- Second IOCCG Summer Lecture Series (2014)
- IMBER ClimECO4 (2014)
- SOLAS summer school (2013)