2016 Ocean Carbon and Biogeochemistry (OCB) Workshop

July 25-28, 2016
Woods Hole Oceanographic Institution

OCB Project Office (WHOI)
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OCB Scientific Steering Committee
Chair: Matt Church (Univ. Hawaii)
Vice Chair: Bethany Jenkins (URI)

Thank you to our host and sponsors!
DEMOLITION DERBY
AN OCB TRADITION
OCB is a network of scientists working across disciplines to understand the ocean's role in the global carbon cycle and how marine ecosystems and biogeochemical cycles are responding to environmental change.
OCB SUPPORT ROLES

How can we help YOU?

✧ **Coordinate** workshops, PI meetings, short courses, working groups, and synthesis activities
✧ Contribute to relevant US and international science planning initiatives
✧ Serve as **central information hub** (websites, email list, social media, newsletter) for its network
✧ Develop and disseminate **education and outreach** materials
✧ **Train the next generation of ocean scientists** and engage early career scientists in OCB activities

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OCB LEADERSHIP

✧ OCB Project Office funded by NSF and NASA, based at WHOI
✧ OCB Scientific Steering Committee (SSC)
✧ OCB Subcommittees on Ocean Acidification, Ocean Time-Series, and Ocean Fertilization

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OCB SCIENCE

Changing ocean chemistry

Ocean carbon uptake and storage

Biological pump

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OCB SCIENCE

Ocean observing

Changing marine ecosystems

Hoegh-Guldberg et al. (2007)

Coastal carbon cycle

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OCB DATA

http://www.bco-dmo.org/

CONNECT WITH BCO-DMO THIS WEEK

• Talk to Danie Kinkade
• Sign up for BCO-DMO tutorial via workshop logistics page
• Visit poster garden during poster sessions
OCB DATA

http://cdiac.ornl.gov/

CONNECT WITH CDIAC THIS WEEK
• Talk to Alex Kozyr
OCB OUTREACH MATERIALS

Anthropogenic Carbon Distribution in the Ocean

OCB OUTREACH MATERIALS

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Ocean Acidification

1. Ocean acidification (OA) is a progressive increase in the acidity of the ocean over an extended period, typically decades or longer, which is caused primarily by uptake of carbon dioxide (CO₂) from the atmosphere. It can also be caused or enhanced by other chemical additions or withdrawals from the ocean.

2. OA has been well-documented with global observations conducted over several decades by hundreds of researchers. It has been definitively attributed to human-generated CO₂ in the atmosphere that has been released primarily by fossil fuel combustion and land-use changes.

3. Acidity may be thought of as simply the hydrogen ion concentration ([H⁺]) in a liquid and pH is the logarithmic scale on which this concentration is measured. It is important to note that acidity increases as the pH decreases.

4. Average global surface ocean pH has already fallen from a pre-industrial value of 8.2 to 8.1, corresponding to an increase in acidity of about 30%. Values of 7.8-7.9 are expected by 2100, representing a doubling of acidity.

5. The pH of the open-ocean surface layer is unlikely to ever become acidic (i.e., drop below pH 7.8), because seawater is buffered by dissolved rocks. The term “acidification” refers to a pH shift towards the acidic end of the pH scale, similar to the way we describe an increase in temperature from 20°C to 30°C. It’s still cold, but we say it’s warming.

6. OA is also changing carbonate chemistry. The concentrations of dissolved CO₂, hydrogen ions, and bicarbonate ions are increasing, and the concentration of carbonate ions is decreasing.

7. Changes in pH and carbonate chemistry force marine organisms to spend more energy regulating chemistry in their cells. For some organisms, this may have less energy for other biological processes like growing, reproducing, or responding to other stresses.

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RECENT SCIENCE PLANNING EFFORTS

North American Coastal Carbon Science Plan

International North Atlantic-Arctic Science Plan

Global biogeochemical time-series network

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BIG SCIENCE IN THE 2016 OCB AGENDA

Arctic - COLORS
Coastal Land Ocean Interactions in the Arctic

Biology of BioPump

EXTRACTIONS

SOCOM  

Plankton, Aerosol, Cloud, ocean Ecosystem

IIIOE-2
2nd International Indian Ocean Expedition
GET INVOLVED!

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Participate in OCB activities

Read the newsletter!

Join OCB leadership committee

Submit an activity proposal

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Join OCB email list

Ocean Carbon & Biogeochemistry
Let’s get charged for a great meeting!

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