

THE INTERNATIONAL OCEAN CARBON COORDINATION PROJECT (IOCCP)

A joint project of SCOR and IOC and an affiliate program of the Global Carbon Project.

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www.ioccp.org

GO-SHIP News

The Global Ocean Ship-based Hydrographic Investigations Panel was established in 2007 by the IOCCP and CLIVAR to develop a strategy for a sustained global repeat hydrography program as a contribution to the OceanObs09 Conference (September 2009) and to revise the 1994 WOCE hydrographic program manual. Based on community discussions at the OceanObs09 Conference, the Panel recommended the development of a sustained repeat hydrography program to:

- develop formal international agreements for a sustained international repeat ship-based hydrography program, including an internationally-agreed strategy and implementation plan building on the guidelines in the Community White Paper,
- advocate for national contributions to this strategy and participation in the global program,
- provide a central forum for communication and coordination, and
- develop syntheses of hydrographic data, in partnership with national, regional, and global research programs.

The IOCCP and CLIVAR International Project Offices have agreed to provide project office support to this program as it develops. In November, the 3rd session of the IOC-WMO Joint Technical Commission on Oceanography and Marine Meteorology (JCOMM) supported the initiative of IOCCP and CLIVAR to develop a sustained program for ship-based repeat hydrography.

Under the guidance of an expanded GO-SHIP committee, program development is moving forward and will begin its 2010 activities with an open 1-day international planning meeting in conjunction with the 2010 Ocean Sciences meeting on Sunday, 21 February, at the Crowne Plaza Hotel in Portland, Oregon. The meeting will (i) inform the wider community about the initiative to develop a sustained coordination activity for hydrography, (ii) review existing national plans and proposals for repeat

hydrography, (iii) identify potential areas of duplication or sections that do not include the full suite of core variables, (iv) review ongoing and planned ocean interior synthesis activities, and (v) discuss data assembly / management of recent and near future cruises. The agenda currently includes speakers from 11 countries who will present their repeat hydrography plans. The meeting is open to all but space is limited.

More information about GO-SHIP and the international planning meeting is available on the new GO-SHIP Web site at www.go-ship.org. The site includes an updated inventory of on-going and planned repeat hydrography programs, a community bulletin board, and links to resources for the hydrographic community. Draft chapters for the revised hydrographic program manual are also available on the site. The final versions will be made available in January 2010.

Surface Ocean CO₂ Atlas (SOCAT) Project Homepage Launched

A dedicated SOCAT homepage is now available under [http:// www.socat.info/](http://www.socat.info/). The Surface Ocean CO₂ Atlas project was initiated at the "Surface Ocean CO₂ Variability and Vulnerability" (SOCOVV) workshop in 2007 where participants agreed to establish a global surface CO₂ dataset that brings together, in a common format all publicly available fCO₂ data for the surface oceans. After several meetings and workshop it is the aim to release the first SOCAT dataset by summer 2010.

For more information: Visit www.socat.info

Release of the Global Surface CO₂ (LDEO) Database v2008

The Global Surface pCO₂ (LDEO) Database V2008 is now available online through CDIAAC web page:

http://cdiac.ornl.gov/oceans/LDEO_Underway_Database/LDEO_home.html

Approximately 4.5 million measurements of surface water partial pressure of CO₂ obtained over the global oceans during 1968-2008 are listed in the Lamont-Doherty Earth Observatory (LDEO) database, which includes open ocean and coastal water measurements. The data assembled include only those measured by equilibrator-CO₂ analyzer systems and have been quality-controlled based on the stability of the system performance, the reliability of calibrations for CO₂ analysis, and the internal consistency of data. To allow re-examination of the data in the future, a number of measured parameters relevant to pCO₂ measurements are listed. The overall uncertainty for the pCO₂ values listed is estimated to be +/- 2.5 µatm on the average.

This version is referred to as Version 2008, and includes the data collected through 31 December 2008. In this update, twenty six new cruise/ship files are added to the previous version 2007. Dr. Nicolas Metzl of Universite Pierre et Marie Curie, Paris, kindly called our attention to discrepancies between his original and our data file listed in Version 2007. The discrepancies were caused by applying temperature correction to

his data which were already corrected to SST. Affected are a total of 13,981 records for the southern Indian Ocean in the file names OISO for years 1998 and 2000 (File Name OISO). The errors range from $-29.6 \mu\text{atm}$ to $+1.3 \mu\text{atm}$ with an average of $-9.27 \pm 3.43 \mu\text{atm}$. In Version 2008, these errors are corrected, and a total of 67,403 new OISO data spanning years 2000-2008 are added.

The documentation for the database can be found in NDP-088r, which was updated to the latest version.

For more information please contact:

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Ocean CO₂ WWW Page: <http://cdiac.ornl.gov/oceans/home.html>

Special Issue on the Future of Ocean Biogeochemistry in a High-CO₂ World Published

The December special issue of Oceanography magazine:

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Special Issue on the Future of Ocean Biogeochemistry in a High-CO₂ World

is now posted online at:

<http://tos.org/oceanography/issues/current.html>

The articles are all open-access. The hard copies will be available in early January.

Special Issue Features

- Ocean Acidification: A Critical Emerging Problem for the Ocean Sciences By S.C. Doney, W.M. Balch, V.J. Fabry, and R.A. Feely
- An Accounting of the Observed Increase in Oceanic and Atmospheric CO₂ and an Outlook for the Future By P. Tans
- Ocean Acidification: Present Conditions and Future Changes in a High-CO₂ World By R.A. Feely, S.C. Doney, and S.R. Cooley
- Observing Ocean Acidification from Space By D.K. Gledhill, R. Wanninkhof, and C.M. Eakin
- Ocean Acidification in the California Current System By C. Hauri, N. Gruber, G.-K. Plattner, S. Alin, R.A. Feely, B. Hales, and P.A. Wheeler
- Effect of Ocean Acidification on the Speciation of Metals in Seawater By F.J. Millero, R. Woosley, B. DiTrollo, and J. Waters
- Ocean Acidification and the Increasing Transparency of the Ocean to Low-Frequency Sound By P.G. Brewer and K. Hester
- Ocean Acidification in Deep Time By L.R. Kump, T.J. Bralower, and A. Ridgwell
- Coral Reefs and Ocean Acidification By J.A. Kleypas and K.K. Yates

- Why Corals Care About Ocean Acidification: Uncovering the Mechanism By A.L. Cohen and M. Holcomb
- Nutrient Cycles and Marine Microbes in a CO₂-Enriched Ocean By D.A. Hutchins, M.R. Mulholland, and F. Fu
- Potential Interactions Among Ocean Acidification, Coccolithophores, and the Optical Properties of Seawater By W.M. Balch and P.E. Utgoff
- Ocean Acidification at High Latitudes: The Bellweather By V.J. Fabry, J.B. McClintock, J.T. Mathis, and J.M. Grebmeier
- Ocean Acidification's Potential to Alter Global Marine Ecosystem Services By S.R. Cooley, H.L. Kite-Powell, and S.C. Doney
- Research Priorities for Understanding Ocean Acidification: Summary From the Second Symposium on the Ocean in a High-CO₂ World By J.C. Orr, K. Caldeira, V. Fabry, J.-P. Gattuso, P. Haugan, P. Lehodey, S. Pantoja, H.-O. Pörtner, U. Riebesell, T. Trull, E. Urban, M. Hood, and W. Broadgate
- European Project on Ocean Acidification (EPOCA): Objectives, Products, and Scientific Highlights By J.-P. Gattuso, L. Hansson, and the EPOCA Consortium

New CO₂ Outreach Tool Developed

Despite the direct and unambiguous connections, links between the carbon cycle and climate change in the 21st century are often misunderstood by the public. Moreover, the importance of natural sinks in modulating the atmospheric CO₂ growth rate is often overlooked. With support from NASA's New Investigator Program, Galen McKinley of University of Wisconsin - Madison has developed a website (<http://carboncycle.aos.wisc.edu/>) with the centerpiece being a java-based applet (<http://carboncycle.aos.wisc.edu/index.php?page=carbon-budget-tool>) to address this community outreach need.

The applet allows users to define trajectories through 2100 of carbon sources (fossil fuel and land use) and sinks (land and ocean), and then to click a "run" button to see how this modifies the atmospheric CO₂ concentration. A rough scaling to the global mean temperature impact (in C and F) based on mean IPCC AR4 results is also provided. The website offers basic information about the carbon cycle with a focus on explaining the processes represented in the applet. This project aims to provide a tool widely applicable to the outreach and education needs of the carbon cycle community.

Please send any comment to Galen McKinley at gamckinley@wisc.edu.