

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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- *** Results from the Tsukuba Workshop on Ocean Surface pCO₂ Data
 - *** SOLAS and IMBER to Work Together on Ocean Carbon Implementation
 - *** BEAGLE 2003 - An Expedition Around the Southern Hemisphere
 - *** POGO - IOC - SCOR Capacity-Building Fellowships Need Hosts
 - *** A Brief History of Ocean Carbon and its Links to the United Nations Global Observing Systems for Climate
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Results from the Tsukuba Workshop on Ocean Surface pCO₂ Data

The National Institute for Environmental Studies, the IOCCP, and PICES co-sponsored a workshop to understand potential sources of error and differences in ocean pCO₂ systems (based on the results of the March 2003 intercomparison experiment for underway pCO₂ systems - see workshop information), to develop guidelines for improving the systems and measurement practices, to reach agreements on data and metadata formats and data exchange practices, and to discuss ways in which we could begin to connect existing activities into a coordinated global network capable of producing high-quality, global data sets of pCO₂ and air-sea flux of CO₂. Support for this workshop was provided by a grant from NIES / MEX and by the US National Science Foundation Award No. OCE-0245278 to SCOR, and there were 44 participants from 12 countries.

While much of the workshop focused on technical issues, it also addressed the need to go beyond simply connecting existing activities through common practices and to develop an international implementation strategy for a global network of observations. The results of the workshop (discussed in detail below) include:

- A technical report of the intercomparison experiment, to be published by CDIAC, entitled "The International Indoor Seawater Pool pCO₂ Intercomparison - Results and recommended practices". A more concise version of the report may be developed for publication in a peer-reviewed journal.
- The development of an IOCCP recommendation for metadata and data formats
- Agreements on data center coordination and data management
- Agreements on public data release and a system of acknowledgement for data use
- Agreements on the coordination of data integration, synthesis, and modeling activities
- Plans for the development of an implementation strategy for a coordinated global network of surface pCO₂ observations.

Further Reading: The full workshop results, including presentations, working group reports, and recommendations are available on line; The IOCCP Recommended Format for pCO₂ Metadata and Data from Underway Systems (pdf 98kb); The IOCCP Recommended Practices for Data Exchange and Integration (80 kb).

SOLAS and IMBER to Work Together on Ocean Carbon Implementation

The latest draft of the IMBER Science Plan and Implementation Strategy (January 15, 2004) outlines the need for close collaboration with SOLAS in the area of oceanic carbon cycle research. IMBER and SOLAS will develop a joint implementation plan, with SOLAS focussing on the flux of CO₂ between the ocean and atmosphere, and the processes in the euphotic zone that control this flux, while IMBER will focus on the carbon cycle in the euphotic zone looking downward (see Table 2, page 76 of the IMBER Science Plan). IMBER and SOLAS are discussing ways to bring the ocean carbon scientists from these two programs together to form a coordinated approach to ocean carbon research.

Further Reading: The IMBER Science Plan and Implementation Strategy; SOLAS Science Plan and Implementation Strategy / Implementation Groups.

BEAGLE 2003 - An Expedition Around the Southern Hemisphere

Blue Earth Global Expedition 2003 (BEAGLE 2003), conducted by Japan Marine Science and Technology Center (JAMSTEC), ended successfully on 19th February, 2004, when the R/V Mirai entered port at Fremantle, Australia. The primary mission of this project was to re-occupy the WHP lines of the Pacific (P6), Atlantic (A10) and Indian (I4 and I3) Oceans (Figure 1). It took 201 days, counted from the start at Brisbane on 3rd August, 2003, to complete the oceanographic works at about 500 stations along the cruise tracks, but experienced no big troubles during the expedition.

I joined the expedition to understand the role of the Antarctic Overturn System, which is the basic thermohaline circulation originating around the Antarctic Continent, in re-distributing anthropogenic CO₂ absorbed in the Southern Ocean. On board the Mirai, we, myself and technicians of Marine Works Japan, measured dissolved inorganic carbon (CT), total alkalinity (AT), pH and underway pCO₂. At about half the number of stations, we collected seawater samples of the CO₂-system parameters in a full water column, and finished all the analyses on board the Mirai. Precision of CT, AT and pH was estimated to be ~ 1.0 umol kg⁻¹, ~ 2.0 umol kg⁻¹ and ~ 7 10⁻⁴ pH unit, respectively. With the precision, I believe that we can have detailed maps of the CO₂-system parameters (Figure 2), accordingly leading to accurate estimations of anthropogenic CO₂ distributions. As the CO₂-related properties such as CFCs, nutrients, dissolved oxygen, etc. were also measured precisely, decadal changes of anthropogenic CO₂ associated with the Antarctic Overturn System would be detected by comparing the distributions with previous WOCE results.

Figure 2. Total Carbon from BEAGLE 2003. (Schlitzer, R., Ocean Data View, <http://www.awi-bremerhaven.de/GEO/ODV>, 2003). For a larger image, click here (Gif 100kb).

Data obtained in the expedition will be open to public in a few years, after quality control is made. For more information of BEAGLE 2003, please visit our site:
<http://www.jamstec.go.jp/beagle2003/en/preface.html>

POGO - IOC - SCOR Capacity-Building Fellowships Need Hosts

The Partnership for Observation of the Global Oceans (POGO), the Intergovernmental Oceanographic Commission (IOC) and the Scientific Committee on Oceanic Research (SCOR), announce the Fellowship Programme for 2004. This programme is designed to promote training and capacity building leading towards a global observation scheme for the oceans.

This fellowship programme is open to scientists, technicians, graduate students (PhD) and Post Doctoral Fellows involved in oceanographic work at centres in developing countries and countries with economies in transition. In 2004, priority will be given to applicants from the Indian Ocean region, involved in, or planning to be involved in, the Indian Ocean GOOS initiatives. Priority topics include:

- Argo Floats
- Fixed-Point Time-Series Observations
- Large-scale, Operational Biological Observations including Biodiversity
- Emerging Technologies for Ocean Observations
- Data management

This fellowship can be an excellent way to establish new collaborations with scientists working in poorly-studied regions and on topics of interest to the ocean carbon community, especially time series observations and emerging technologies.

For details about this fellowship program, please visit: <http://ocean-partners.org/fellowshipb.html>

For any scientists who would be willing to act as host supervisors for this program, please contact Tony Payzant at the POGO project office.

A Brief History of Ocean Carbon and its Links to the United Nations Global Observing Systems for Climate

The Global Climate Observing System (GCOS), headquartered at the World Meteorological Organization in Geneva, is the program charged with developing and implementing a global observing system for climate in support of the United Nations Framework Convention on Climate Change (UNFCCC). For the ocean climate domain, GCOS relies on the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC) for scientific and technical guidance. The OOPC, in turn, relies on the SCOR - IOC CO₂ Panel and its IOCCP for advice on ocean carbon observations relevant to global climate observations.

In 1997, the Conference of the Parties (COP) to the UNFCCC requested that a report be prepared to assess the adequacy of the global observing systems for climate to meet the observational needs of the Convention, and GCOS, in collaboration with GOOS and the terrestrial observing system, GTOS, prepared the First "Report on the Adequacy of the Global Climate Observing Systems" in October 1998.

In 2001, the Subsidiary Body on Scientific and Technological Advice (SBSTA) of the UNFCCC endorsed the preparation of a Second Adequacy Report to be completed for consideration by the COP in November 2003. The OOPC and the CO₂ Panel / IOCCP were involved in the development of this report, with ocean carbon information on existing networks and plans being provided by the IOCCP. The results of the 2nd Adequacy Report for the ocean domain are:

There has been significant improvements due to new satellite data, Argo and new international co-ordination. It has now been demonstrated that we can observe climate changes in the ocean at global scales.

Despite this significant progress, ocean networks are not yet adequate to meet the needs of the Parties for most variables and in most regions of the planet.

An agreed design of an initial global ocean observing system for climate has been achieved, since the First Adequacy Report. First priority is to implement this initial system together with the associated data, analysis and product capabilities, including R&D to improve monitoring capabilities for key climate variables and improved understanding of the oceanic ecosystem and processes that limit forecast skill.

At its most recent meeting in December 2003, the COP requested the GCOS secretariat to coordinate the development of a phased 5- to 10 year implementation plan for the integrated global observing systems for climate, using a mix of high-quality satellite and in situ measurements, dedicated infrastructure and targeted capacity-building, and including implementation priorities, resource requirements and funding options, and metrics for measuring implementation progress. COP also requested GCOS and GOOS to prepare a special report on progress made towards implementing the initial ocean climate observing system, to be provided to COP in June 2005.

This implementation plan is being developed in coordination with the ad hoc Group on Earth Observations, which is a ministerial-level governmental group working to develop a coordinated and sustained Earth observing system (the "Earth Observation Summit").

The CO2 Panel has been called on to provide input into the GCOS implementation plan. The plan will have two parts, one addressing global climate issues, and the second focusing on specifics in each domain (land, ocean, atmosphere). The CO2 Panel will need to provide input on existing and planned networks, but also identify priorities, costs, and metrics of implementation progress. The CO2 Panel technical officer and IOCCP project coordinator Maria Hood will be coordinating the carbon inputs to the document and working with the writing team to finalize the plan. This is a process that requires community input and consensus on priorities and approaches, and Maria will be using the IOCCP network to solicit input and reviews of the document throughout the process.

Further Reading: The Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC; Decisions from UNFCCC COP 9, December 2003; Decision on Global Observing Systems for Climate; The Group on Earth Observations.