

International Ocean Carbon Coordination Project Workshop Summary

Ocean Carbon Observations from Ships of Opportunity and Repeat Hydrographic Sections workshop, January 13-15, 2003, UNESCO Paris, France

IOCCP Report No. 1

Objectives for the International Ocean Carbon Coordination Project (A Joint Pilot Project of the SCOR-IOC Advisory Panel on Ocean CO₂ and the Global Carbon Project)

1. Develop a compilation and synthesis of large-scale ocean carbon observation activities and plans.
2. Promote the full integration of large-scale carbon studies into the planning activities of international research programs (e.g., CLIVAR, OCEANS, SOLAS)
3. Identify and coordinate regional-scale science groups (e.g., PICES WG17, CARINA) to critically examine the scientific balance, quality and completeness of these programs with reference to global-scale research needs. Promote the establishment of other regional groups as needed.
4. Organize international groups to promote acceptance of:
 - Standardized Measurement techniques (e.g. through the publication of a best practices handbook).
 - Improved accessibility to international carbon data sets (e.g. Promote more uniform data handling/reporting, encourage submission of data to one of three regional data centers within 2 years or less of data collection, investigate data citation issues)
 - Internationally recognized QA/QC procedures (e.g. promoting the use of CRMs, helping to organize training workshops and inter-laboratory comparison exercises)

Specific Action Items from this Workshop:

The IOCCP should develop a web site to disseminate information on national plans for large-scale carbon observations and progress on objectives listed above. **Action 1:** Hood, Sabine, Wallace, Canadell, Foster, and Hill to develop site through IOC and GCP in collaboration with CLIVAR.

The IOCCP should serve as a focal point for communication between the carbon community and CLIVAR to identify key areas of common interest and promote a stronger collaboration in developing a measurement strategy for carbon and tracers on repeat hydrographic sections. **Action 2:** Hood, Tilbrook, Sabine, and Feely to develop a statement to the CLIVAR community about the need for tracer measurements on specific repeat sections, promote the appointment of carbon representatives to the CLIVAR regional panels, and establish a closer dialogue with CLIVAR planning of repeat section work in each basin.

The IOCCP should establish formal links with PICES WG17 and CARINA to encourage these regional programs to evaluate the scientific balance, quality and completeness of the large-scale carbon programs with reference to global-scale research needs and facilitate the organization of training workshops and inter-laboratory comparisons to improve data quality. **Action 3:** Hood, Sabine, Dickson, Mintrop to establish mechanism for IOCCP to provide global coordination to regional groups.

The IOCCP should facilitate closer links (possibly through interdisciplinary workshops) between the ocean and atmospheric carbon observation communities and the modelling community. **Action 4:** Hood, Canadell, Feely, Gnanadesikan, and Heinze to document on-going ocean

carbon modelling projects and groups, and begin a dialogue with appropriate key scientists to outline the needs for a workshop.

The IOCCP should promote the public release of large-scale carbon data sets within 2 years of cruise completion and encourage submission of international repeat hydrographic section data with carbon measurements to CDIAC and to GHDO. **Action 5:** Kozyr, Swift, and Hill to provide a plan for coordinated data submission of carbon and tracer data on CLIVAR repeat hydrographic sections.

The IOCCP should facilitate the revision and expansion of the DOE CO₂ Methods Handbook (lead by A. Dickson) and promote it as a manual of best practices to be followed by those participating in the large-scale carbon observation network. **Action 6:** Hood and Dickson to develop a plan to finalize the revision, possible translation into other languages, and to promote and distribute the handbook.

The IOCCP should work with appropriate organizations and scientific groups to develop a policy for the proper citation of large-scale data sets. **Action 7:** Hood, Sabine, Feely, and Wallace to encourage data centers to clearly indicate appropriate reference/acknowledgement for data being downloaded and to contact the American Geophysical Union, the European Geophysical Union, and other appropriate groups to initiate discussions on policies for acknowledging the use of large-scale data sets in peer-reviewed articles.

The IOCCP should coordinate and promote the compilation and public release of historical pCO₂ data sets. **Action 8:** Dickson, Kozyr, and Heinze to develop a brief position paper outlining this high priority for the community and a plan for coordination between on-going efforts at CDIAC, WDC-MARE / ORFOIS, and other programs.

The IOCCP should address the problem of excessive delays in obtaining permission from governments to make pCO₂ measurements on ships of opportunity in territorial waters. **Action 9:** Hood, Manabe, Tilbrook, Zika, Feely, and Nojiri to document particular problems faced with the current system and work with the IOC-WMO JCOMM Ship Observations Team to find the best way forward.

The IOCCP should support and promote certified reference material programs, including the development of appropriate standard gases for ocean carbon work. **Action 10:** Hood, Dickson, and Nojiri to work with the atmospheric community (Roger Francey) to develop a round-robin intercomparison test for ocean carbon gases.

Priorities for Future Workshops:

1. pCO₂ inter-laboratory comparison study - March 10-14, 2003, Japan (Nojiri through PICES WG17)
2. Data exchange and formats - workshop should be held in close collaboration with data centers and analysis projects; suggested end 2003 / early 2004 (Nojiri).
3. Ocean carbon modelling and new observation system planning (Gnanadesikan).
4. Ensure increased representation of the ocean community in the International CO₂ Conference, and encourage the ocean community to participate in this integrated workshop. (Wallace to contact Tans).
5. Publish the Methods Handbook and then hold a training workshop with the manual to train new / young scientists.

Web-site Features:

The central means of communication between the IOCCP between sessions / workshops will be the IOCCP Web site. The participants suggested that the site include:

1. Information about current and on-going repeat sections, underway measurement programs, and time series stations, including interactive maps and tables of information.
2. Information/recommendations for coordination of activities, upcoming workshops or meetings, position statements on best practices for large-scale ocean carbon observations
3. Information about current ocean carbon modelling and relevant atmospheric projects and groups
4. Contact lists / email lists for international colleagues
5. A news bulletin, with notices and abstracts of news items sent to the community via email with links back to full articles on the web site.

Resources and Project Feasibility Issues:

The Participants noted that, given the number of different organizations to be contacted, coordinated with, and linked to, an international coordination project must have one central focal point. It was remarked that the roles for this coordination project outlined here are not new – they have been discussed for 20 years or more. The Participants stressed that the reason these coordination activities have never been accomplished is because there has never been a central focal point or sufficient secretariat support to adequately establish such a program. The Participants also stressed that because there is interest and pressure to develop an ocean carbon observing capability and research strategy for ocean carbon assessment and projection, the ocean carbon community must have its own international coordination program rather than trying to coordinate its activities via individual scientists participating in interdisciplinary programs.

The Participants strongly urged the IOC, SCOR, and the GCP to undertake seriously this initiative to develop an international ocean carbon coordination project, taking into account previous failures at similar attempts, and further urged that these sponsor organizations recognize and support the critical need for adequate secretariat support for such an endeavour. The Participants noted with appreciation the value of the close association with the IOC, particularly in matters of developing and gaining international acceptance of standards, the development of international data exchange agreements, and issues of conducting marine scientific research in territorial waters.