

Section on Carbon and Climate

Parent committees:

POC and BIO

Chairs:

James Christian (Canada)

Toshiro Saino (Japan)

Members:

**Canada (3), China (2), Japan (6), Korea (3),
Russia (2), USA (6), IGBP (1)**

Duration:

**Currently 2005-2010 (Sections are indefinite
but require reauthorization every 5 years)**

Section on Carbon and Climate: Terms of Reference

- (1) Coordinate and encourage ongoing and planned national and international syntheses of carbon cycle research studies in the North Pacific and, where necessary and appropriate, for the larger Pacific basin;**
- (2) Ensure effective two-way communication with other international scientific groups that have a responsibility for coordination of ocean carbon studies, such as the International Ocean Carbon Coordination Project (IOCCP), CLIVAR/CO₂ Repeat Hydrography and the SOLAS/IMBER implementation group for carbon research;**
- (3) Review the existing information on carbon cycling in the North Pacific, including anthropogenic carbon, the biological pump, impacts of ocean acidification on marine biota, and possible feedbacks to atmospheric greenhouse gases.**
- (4) Identify gaps in our knowledge, and make prioritized recommendations for future research. Periodically review the status of the methodology of CO₂ measurements including the preparation of standards and reference materials, and advise on intercalibration and quality control procedures;**
- (5) Identify suitable data sets on the oceanic CO₂ system in the Pacific region as they become available, and recommend the mechanisms of data and information exchange;**
- (6) Carry out and publish (in the refereed literature) basin-scale syntheses of carbon cycling in the North Pacific, including new data whenever appropriate, and encourage scientific interpretation of these evolving data sets;**
- (7) Organize symposiums, workshops, or annual meeting sessions on the carbon cycle, ocean acidification, and climate studies in the North Pacific.**

Section on Carbon and Climate

Recent activities: Topic sessions

S2: BIO/POC Topic Session (Oct. 30, 1 day)

Decadal changes in carbon biogeochemistry in the North Pacific

Co-Convenors:

James Christian (Canada) and Toshiro Saino (Japan)

Invited speakers:

Taro Takahashi (Lamont-Doherty Earth Observatory, USA)

Yasuhiro Yamanaka (Hokkaido University, Japan)

Email your questions to [Session 2 Convenors](#)

Email your questions to [Session 2 Invited Speakers](#)

2007 (Victoria)

2009 (Jeju)

S8: POC/BIO Topic Session (Oct. 27, 1 day)

Anthropogenic perturbations of the carbon cycle and their impacts in the North Pacific

Co-Convenors:

James Christian (Canada) and Toshiro Saino (Japan)

Invited speaker:

Richard E. [Zeebe](#) (University of Hawaii, U.S.A)

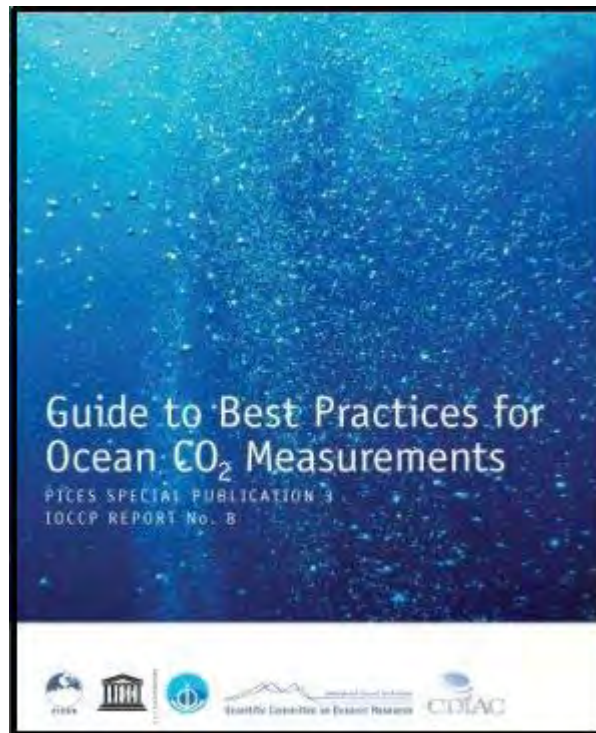
Accumulation of anthropogenic carbon and associated changes in ocean chemistry ("ocean acidification") affect all of the world's oceans. Anthropogenic CO₂ has multiple feedbacks to ocean chemistry and biology, such as reduction of calcification, shifts in phytoplankton species composition, and dissolution of particulate or sedimentary carbonates. The carbon system can also be affected by other anthropogenic factors such as changes in river flow and aeolian dust deposition. Carbon and nutrient biogeochemistry will be affected both directly and indirectly by ocean acidification. This session invites papers that address the biogeochemistry of anthropogenic carbon (processes controlling its distribution, processes by which it alters ocean chemistry), other anthropogenic impacts on carbon and nutrient cycles, acidification impacts on marine biota, and feedbacks among these.

Email your questions to [Session 8 Convenors](#)

Email your questions to [Session 8 Invited Speaker](#)

Section on Carbon and Climate

Recent activities: Publications



Best practices guide (2007)

PICES North Pacific Carbon Synthesis

Guest Editor-in-Chief
Toshiro Saino JAMSTEC, Japan

Guest Editors
James R. Christian *IOS and U. of Victoria, Canada*
Kitack Lee *Pohang U. of Science and Technology, Korea*
Christopher L. Sabine *NOAA/PMEL, U.S.A.*

Foreword

The North Pacific Marine Science Organization (PICES) launched the Section on Carbon and Climate in 2005. The Carbon and Climate Section (CC-S) was evolved from the former PICES Working Groups: *US CO₂ in the North Pacific* and *17 (Biogeochemical data integration and synthesis)*. The Section in PICES represents a sub-committee under a Scientific Committee that has a longer lifespan than a Working Group, and the CC-S has POC (Physical Oceanography and Climate Committee) and BIO (Biological Oceanography Committee) as supervising committees. The CC-S is aiming to coordinate and encourage ongoing and planned national and international synthesis of carbon cycle research studies in the North Pacific and, where necessary and appropriate, for the larger Pacific Basin. Amongst the focus listed in the terms of reference, to organize scientific meetings on a regular basis at PICES annual meetings is one of the most important tasks of the CC-S.

The POC/BIO Topic Session on "Decadal changes in carbon biogeochemistry in the North Pacific" was held as a part of the PICES Systemic Annual Meeting in Victoria, Canada, in October 2007. This session was the first effort by the CC-S to synthesize the current understanding on inter-relationship between the carbon cycle and climate in the Pacific. Emphasis was placed on decadal change in carbon cycling, e.g., anthropogenic carbon, air-sea exchange of CO₂, the biological pump, impacts of increasing levels of carbon dioxide on carbonate chemistry and marine biota, and possible feedbacks to atmospheric greenhouse gases. We expected that the session will enable us to update our understanding of the relationships between the carbon cycle, marine biota, and climate in the Pacific, and to identify gaps in our knowledge for future research in areas of importance for the CC-S.

For the one-day session, there were 18 oral presentations, including an invited talk given by Taro Takahashi (U.S.A.), and 9 poster presentations. The session focused on decadal variability of biogeochemical cycles in the North Pacific. Topics ranged widely covering pCO₂, DIC (dissolved inorganic carbon), nutrients, phytoplankton, models and observations, and coastal and open ocean areas. Majority of the presentations have already been published elsewhere and here we have 3 papers for this special section.

James R. Christian and Toshiro Saino
Co-Chairs, PICES Section on Carbon and Climate



Journal of Oceanography (2009)

Section on Carbon and Climate

Recent activities: Data synthesis

The PACIFICA data synthesis project is the most ambitious and significant work of CC-S.

By comparison to previous efforts such as GLODAP and CARINA, PACIFICA contains an unprecedented amount of temporal information, which will help us to understand the role of carbon biogeochemistry in a changing ocean.

Its legacy will include data products accessible to the broader community as well as publications.

The project has progressed very rapidly over the past year and is expected to be completed in 2011.

A workshop (W5) will be held in Portland at which we will attempt to finalize all corrections to individual data sets.