

## **The Section on *Carbon and Climate***

The meeting of the Section on *Carbon and Climate* (S-CC) was held from 14:00–18:00 on October 13, 2012 at the PICES Annual Meeting in Hiroshima, Japan. Drs. James Christian (Canada) and Toshiro Saino (Japan) acted as meeting Chairs. Eleven members were present, representing all PICES member countries except Russia (*S-CC Endnote 1*). Some minor amendments were made to the meeting agenda (*S-CC Endnote 2*) which was then adopted unanimously.

### AGENDA ITEM 2

#### **Membership**

There was some discussion of membership and how it relates to the goals of S-CC going forward. Some members have not attended a meeting in some time and it was discussed that they may wish to rotate off in favour of new members as the Section's goals evolve and new members are recruited to address new objectives (see below Agenda Item 7). It was agreed that the individual national delegations will discuss this with their members in the coming year, and all members will work to identify potential new members in accordance with the new objectives.

### AGENDA ITEM 3

#### **CC-S achievements in the past 12 months**

##### *PACIFICA data synthesis*

The PACIFICA data files were placed in the public domain in May 2012 and a unified data product based on the final version of the Adjustment Table was developed. It was agreed that the data product will be opened by the end of this calendar year. Two unresolved issues are that the second-level QC of the CFC data was not completed and is ongoing, and that a process for updates and corrections that will inevitably be uncovered by users needs to be established.

### AGENDA ITEM 4

#### **Reports of collaborating organizations and agencies**

Reports were given on several international programs relevant to the mandate of S-CC, including GLODAP (Kozyr), SOCAT (Kozyr), SOLAS (Miller), IOCCP (Kozyr), CLIVAR/GO-SHIP (Murata) and IPCC (Christian).

GLODAP (Global Ocean Data Analysis Project) is planning a GLODAP v.2 dataset which will include PACIFICA, CARINA and other datasets published since the release of v.1. PACIFICA accounts for 280 of 654 cruises anticipated to be included (about as many as GLODAP v.1 and CARINA combined).

SOLAS (Surface Ocean – Lower Atmosphere Study) hosted an Open Science Conference May 7–12 in Cle Elum, WA, USA. There were 190 attendees, with 47% from PICES member countries. Three of 5 student poster award recipients were from PICES countries. SOLAS will host a Summer School from August 23–September 2, 2013 in Xiamen, China. This will be the first SOLAS Summer School held in a PICES member country. SOLAS will be requesting PICES support for travel for three early career scientists from PICES member countries to attend this meeting. S-CC members endorsed this request.

The IOCCP (International Ocean Carbon Coordination Project) Scientific Steering Group met in Sopot, Poland in June. The IOCCP Secretariat has been moved from Paris, France, to Sopot. Dr. Kathy Tedesco has resigned as Project Coordinator and Dr. Maciej Telszewski is now sole Coordinator.

Dr. Murata gave a brief report on CLIVAR (Climate Variability and Predictability of the World Climate Research Programme) and GO-SHIP (Global Ocean Ship-Based Hydrographic Investigations Program) related activities, including WOCE line reoccupations by JAMSTEC and JMA in the northern North

Pacific, western North Pacific, and Southern Ocean. A workshop will be held in the Netherlands in November to advance the development of an “International Nutrients Scale System” to improve the global comparability of nutrient data. Dr. Murata will attend this workshop. Several other S-CC members are on the Working Group charged with developing this product.

The IPCC Fifth Assessment Report (AR5) is currently undergoing Expert Review and revision of the First-Order Drafts. Dr. Christian gave a brief review of timelines for review of the reports of Working Groups I (“Physical Science Basis”) and II (“Impacts, Adaptation and Vulnerability”) and encouraged all members to take part in the process. There are at least one Convening Lead Author, one Lead Author, and two Contributing Authors among the membership, and at least 4 others who have acted as Expert Reviewers.

#### AGENDA ITEM 5

##### **Report on the International Workshop to “Develop an Ocean Acidification Observing Network of Ship Surveys, Moorings, Floats and Gliders”**

A workshop to develop an international Ocean Acidification Observing Network was held in Seattle, USA, in June. Ten S-CC members representing 5 different PICES member countries attended. Dr. Burke Hales gave a brief report about progress towards completion of the workshop final report, which is not yet published. It is expected that the report will recommend a set of core measurements and standards for data quality that will be required for inclusion in the network, as well as protocols for data sharing.

#### AGENDA ITEM 6

##### **Report on the FUTURE workshop**

A 2½-day workshop on a FUTURE Roadmap was held in Busan, Korea from May 24–26, 2012, with representation from various PICES expert groups. Drs. Christian and Toru Suzuki attended, representing S-CC. Dr. Christian gave a brief report on this meeting and discussed ways of aligning future S-CC activities with the FUTURE Science Plan (see below Agenda Item 7).

#### AGENDA ITEM 7

##### **Future goals and objectives**

###### *Completion and publication of PACIFICA*

With the technical phase of PACIFICA complete, there is still substantial work to do in terms of documentation of the process and analysis of the resulting data product. It was decided that all participants would be contacted with respect to previous and/or on-going commitments to analysis and synthesis activities, and additional such analyses solicited. It is expected that such analyses will generate about 6–7 papers which will be published in a journal yet to be determined. Dr. Lisa Miller volunteered to act as a Guest Editor if a special issue can be arranged. Several possible choices for the target journal were discussed.

###### *Topic Session for PICES-2013*

A topic session has been proposed for the PICES 2013 Annual Meeting by Drs. Minhan Dai, Sophia Johannessen, and Dong-Jin Kang, entitled “*The changing carbon cycle of North Pacific continental shelves and marginal seas*” (see S-CC Endnote 3).

###### *Integration with FUTURE*

Plans for the coming years and integration of S-CC into FUTURE were discussed at length. An intensified focus on coastal oceans and marginal seas has been a theme in such discussions for some years, but no one has been yet identified who will actually undertake the relevant activities. Membership renewal was discussed with respect to future activities, and it was agreed that new members should be solicited who will bring resources to address these issues. The Topic Session proposed for 2013 represents a first step,

but it is unclear whether the three members who have proposed this session have adequate resources to undertake the envisioned activities.

Analysis of the PACIFICA data product also falls under FUTURE-related activities and will be a focus of activity over the next year or two. These analyses are expected to address a number of issues central to FUTURE, including evolution of ocean acidification and deoxygenation and their effects on ecosystems.

### ***S-CC Endnote 1***

#### **S-CC participation list**

##### Members

Liqi Chen (China)  
 James Christian (Canada, Co-Chairman)  
 Burke Hales (USA)  
 Masao Ishii (Japan)  
 Alex Kozyr (USA)  
 Kitack Lee (Korea)  
 Lisa Miller (Canada)  
 Akihiko Murata (Japan)  
 Tsuneo Ono (Japan)  
 Toshiro Saino (Japan, Co-Chairman)  
 Toru Suzuki (Japan)

##### Observers

Alexander Bychkov (PICES)  
 Taka Ito (USA)  
 Keith Rodgers (USA)  
 Atsushi Tsuda (Japan)

### ***S-CC Endnote 2***

#### **S-CC meeting agenda**

1. Opening (Christian, Saino)
  - Review and adopt agenda
2. Membership
3. S-CC achievements in the past 12 months
  - PACIFICA Data Synthesis (Ishii, Suzuki)
4. Information Exchange
  - GLODAP (Kozyr)
  - SOLAS-IMBER (Miller)
  - IOCCP (Kozyr)
  - SOCAT (Kozyr)
  - CLIVAR/GO-SHIP (Murata)
  - IPCC (Christian)
5. Report on International Workshop to “*Develop an Ocean Acidification Observing Network of Ship Surveys, Moorings, Floats and Gliders*” (Hales, K. Lee, Murata)
6. Report on Busan FUTURE workshop (Christian, Suzuki)
7. Future goals and objectives
  - Completion and Publication of PACIFICA
  - Topic Session for PICES-2013
  - Integration with FUTURE

*S-CC Endnote 3*

**Proposal for a 1-day Topic Session on “*The changing carbon cycle of North Pacific continental shelves and marginal seas*” at PICES-2013**

Coastal waters link the atmosphere, the land and the open ocean, both dynamically and biogeochemically. Consequently, the carbon cycle of the continental shelves and marginal seas that ring the North Pacific is particularly complex and prone to rapid changes induced by global climatic and regional anthropogenic forcings. Among others, these drivers include increasing temperature, ocean acidification, eutrophication, and deoxygenation of seawater. Such changes represent a great potential for harm to the ecosystems and fisheries that rely on these highly productive waters. We invite presentations on ocean acidification, hypoxia, eutrophication and other topics related to the biogeochemistry of organic and inorganic carbon in Pacific continental shelves and marginal seas.

Sponsoring Committee: POC

Co-sponsor: SOLAS

Proposed convenors: Minhan Dai (China), Sophia Johannessen (Canada), and Dong-Jin Kang (Korea)