2024 Report of the Section on Carbon and Climate

The Section on Carbon and Climate (S-CC) virtual (online) meeting was held from 17:00-20:00 on Sept 23, 2024 (US/Canada Pacific time). Alex Kozyr and Tsuneo Ono acted as meeting chairs. 11 members were present, representing the US, Canada, Japan, and Korea (*Endnote 1*). Leslie Smith also attended the meeting representing Deep Ocean Observing Strategy (DOOS). The meeting agenda was reviewed and adopted (**Agenda Item 1**; *Endnote 2*).

Progress report of "inventory table" for coastal ocean acidification (OA)/deoxygenation monitoring sites (Agenda Item 2)

Tsuneo Ono reported current status of the inventory table of domestic OA/deoxygenation monitoring sites in each PICES country, a program launched in 2022. Information on coastal monitoring sites including carbon parameters and oxygen in US, Canada, Japan, and Korea has been uploaded to the PICES TCODE catalog homepage, but this home page was lost in 2024 summer. Toru Suzuki provided additional information from TCODE on this issue, indicating little likelihood of recovery. Possible remedies for this accident were discussed. Tsuneo Ono found that 15 out of 18 monitoring programs/sites submitted to the PICES TCODE catalog homepage were also submitted to the GOA-ON data portal. It is recommended that S-CC members submit information on the remaining three programs/sites to the GOA-ON data portal.

Announcement of S-CC session in PICES 2024 (Agenda Item 3)

The S-CC session “Changing Ocean carbon cycle and its consequences for the ocean environment: Detection, prediction and mitigation” will be held during PICES Annual Meeting 2024 on Thursday, October 31. Nine oral presentations and three posters were submitted and will be presented during the session. Among these, three oral and two poster presentations were submitted from the marine carbon dioxide removal (mCDR) community. This is S-CC's first session including the mCDR issue.

Reports from collaborating organizations and agencies (Agenda Item 4)

Alex Kozyr announced the release of new version of GLODAP database, GLODAPv2.2023, in November 2023. GLODAP communities are now creating a new full-version database, GLODAPv3, that is planned to be released in 2025-2026. The GLODAPv3 will include the data synthesis product and the GLODAPv3 gridded climatology.

Shin'ichiro Nakaoka announced the recent publication of a new version of SOCAT (v2024) in June 2024. Although the new version added 3.9 million new fCO_2 data measurement points to the previous version (v2023), the declining trend in new measurements of pCO_2 continued. The number of new pCO_2 measurements in the North Pacific, especially at high latitudes (north of 47° N) is also declining.

Tsuneo Ono reported that a set of new guidelines and advisory specifications on ocean carbon emissions and carbon neutrality is proposed to International Organization for Standardization (ISO/NP 25283-1). The new proposal was submitted to ISO Technical Committee 8. Voting on the proposal is expected until November 2024. As this standard will have great influence on the future development of mCDR technology, S-CC will continue to monitor its progress.

Introduction of recent activities in DOOS (Agenda Item 5)

Leslie Smith introduced recent activities of the Deep Ocean Observing Strategy (DOOS). Since its last S-CC report in 2022, DOOS has continued its activities including the definition of essential ocean variables for deep ocean observations, construction of deep-ocean models, and assessment of observational gaps for understanding climate change in the deep ocean. Their activity further expanded to new fields, such as cultivation of early-career researchers in deep ocean observation (Deep Ocean Early career Researchers: DOREs) and collaboration with social science and technology communities through the Deep-Ocean Stewardship Initiative (DOSI). PICES recently published a series of North Pacific Ecosystem Status Reports (NPESR 2009-2016). Although several chapters in this report show temporal changes of deep ocean ecosystem, and those will be beneficial for DOOS activities, the present report still lacks information on the temporal changes of deep ocean environment. Potential future cooperation of PICES with DOOS in this aspect were discussed. Other possible future collaborations between PICES and DOOS were also discussed.

Discussion for 2024-2025 section business plans (Agenda Item 6)

Throughout this year's activities, S-CC's opportunities for collaboration with mCDR communities have significantly increased. Existing disconnect between mCDR and natural ocean science communities also became visible. The members recognize the need for further commitment of S-CC to mCDR issues, and as part of its activities, the members agreed to hold a one-day workshop to develop a cross-disciplinary discussion

framework between mCDR and natural ocean science communities during the PICES 2025 Annual Meeting. Scientists who are working on existing discussions frameworks such as the GOA-ON CDR working group and DOSI will be invited. Titles and other details will be further discussed by email to define a final proposal.

SCC Endnote 1

SCC participation list

Members

Tsuneo Ono (Co-Chair, Japan)
Alex Kozyr (Co-Chair, USA)
James Christian (Canada)
Wiley Evans (Canada)
Masao Ishii (Japan)
Shin'ichiro Nakaoka (Japan)
Toru Suzuki (Japan)
Masahide Wakita (Japan)
Kitack Lee (Korea)
Geun-Ha Park (Korea)
Jeong Hee Shim (Korea)

Observers

Leslie Smith (DOOS)

SCC Endnote 2

SCC Meeting Agenda (17:00 – 20:00 Sept. 23 US/Canada Pacific time, held Virtually)

17:00 - 17:10	**Opening (Ono, Kozyr)** **Review and adopt agenda**
17:10 - 17:30	**Progress report of "inventory table" for coastal OA/deoxygenation monitoring sites (Ono)**
17:30 - 17:45	**Announce S-CC session at PICES 2024 (Ono/Kozyr)**
17:45 - 18:30	**Information exchange** ***GLODAP (Kozyr)** ***SOCAT (Nakaoka)** ***ISO TC8/WG15 on Negative Carbon Emission (Ono)**
18:30 - 19:00	**Introduction of recent activity on DOOS (Leslie Smith)**
19:00 - 20:00	**Discussion for 2024-2025 section business plans**
20:00	**Adjourn**