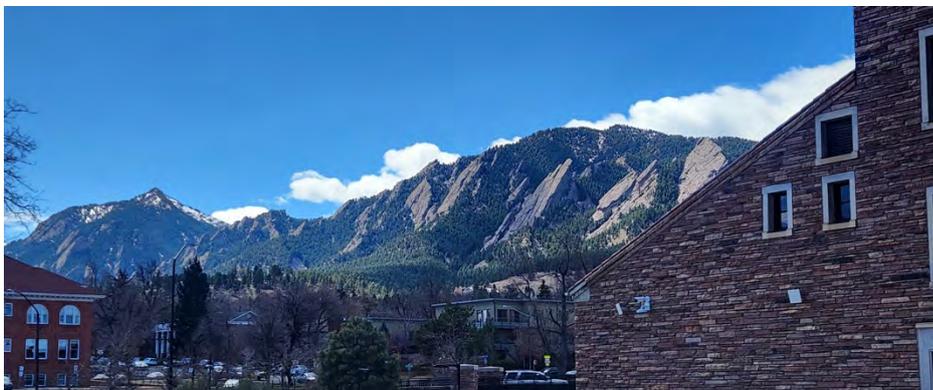


Pacific Arctic Group (PAG) 2025 Spring Meeting Report



Saturday, March 22, 2025
09:00-18:00 (MST)
University of Colorado
Boulder, Colorado, USA
<http://pag.arcticportal.org/>



University Memorial
Center (UMC)

University of Colorado
Boulder, Colorado, USA

The Pacific Arctic Group (PAG) is a group of institutes and individuals having a Pacific perspective on Arctic science. Organized under the International Arctic Science Committee (IASC), the PAG has as its mission to serve as a Pacific Arctic regional partnership to plan, coordinate, and collaborate on science activities of mutual interest. For the purpose, we have Spring and Fall meetings. The Spring PAG meeting is held during Arctic Science Summit Week and is focused on business issues and an update on research plans for the coming field season. The Fall PAG meeting is hosted at various locations in alternating PAG countries after the field season and is focused on review of accomplishments during the previous summer and outlooks for the future. The **PAG 2025 Spring Meeting** was hosted within the Arctic Science Summit Week in Boulder, Colorado, USA, and reported on plans for field activities in 2025 and beyond, highlighted science results from PAG endorsed projects (DBO, PACEO, CAO), joint research activities, interactions with other organizations and projects, PAG organizational issues and other business issues.



1. Welcome and overview



The meeting began with an introduction by new PAG chair Eun Jin Yang (Korea Polar Research Institute, Korea). She acknowledged and thanked Jackie Grebmeier and Christina Goethel in their previous roles as PAG chair and co-chair. An overview of PAG was provided, the plan and agenda for the meeting were reviewed, and participants briefly introduced themselves.

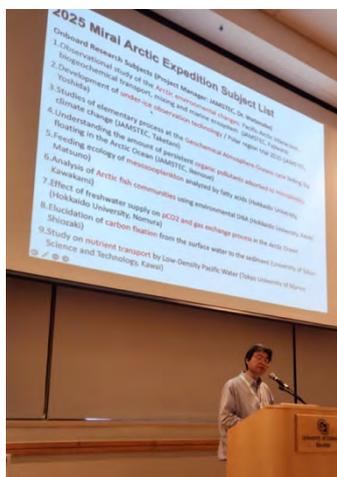
2. Country reports



Canada – Bill Williams (Fisheries and Oceans Canada)

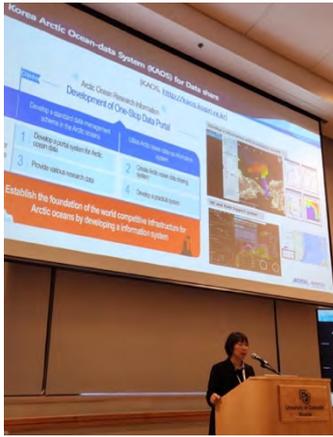
Bill Williams presented the Canada country report, highlighting a range of ongoing and planned Arctic marine research activities. He described work associated with the Arctic Observing Network aboard the *Louis S. St-Laurent*, including long-term monitoring of the Beaufort Gyre that has been conducted since 2003 and recently submitted as a paper to a special issue on the Beaufort Gyre. He also referenced Canada's involvement in the UNCLOS program. Field activities discussed included the DBO program aboard the *Laurier* scheduled for July 17–28, as well as the Kitikmeot Sea Science Study in the Queen Maud Gulf. Ongoing observational efforts on the Beaufort Shelf were noted, including the Beaufort Shelf Marine Observatories and the established Canadian Beaufort Shelf framework. Bill also outlined the Canadian Beaufort Sea Marine Ecosystem Assessment, noting the transition to a new research vessel, *Alliance*, replacing the *Frosty*. Additional monitoring initiatives included the Barrow Strait Monitoring Program. The presentation concluded with a brief overview of plans for the 2025 *Amundsen* expedition.

China – Jianfang He (Polar Research Institute of China) = absent



Japan – Shigeto Nishino (JAMSTEC)

Shigeto Nishino delivered the Japan country report, outlining recent activities and future plans for Arctic research. He presented details of the planned 2025 *Mirai* cruise, with a tentative schedule departing on August 31 and concluding on October 5. The expedition plan includes the testing of a COMAI drone designed for under-ice operations. He also noted that this upcoming cruise will mark the final operational year of the *Mirai*, concluding a 27-year service period. In addition to cruise planning, he highlighted several recent and forthcoming scientific publications.



Korea – Eun Jin Yang (KOPRI)

Eun Jin Yang delivered the Korea country report, outlining the planned research activities for the upcoming expedition of the icebreaker R/V *Araon* scheduled from July 20 to August 20. These activities are being conducted under the Korea–Arctic Ocean Warming and Responses of Ecosystem (K-AWARE) project and will include observations of atmospheric, physical, chemical and biological processes. This research will contribute to our understanding of ecosystem responses and will provide support to the Central Arctic Ocean Fisheries Agreement (CAOFA).

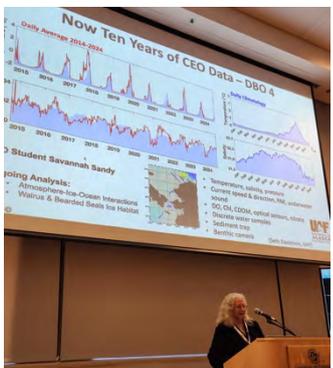


USA - Jackie Grebmeier (UMCES)

Jackie Grebmeier provided the USA country report, summarizing planned DBO-related activities and cruise schedules for 2025. She reviewed the 2025 PAG/DBO Cruise Plan and noted upcoming expeditions on the *Sir Wilfrid Laurier*, *Sikuliaq*, and *Norseman II*. She also presented time-series analyses of sea ice persistence across DBO regions. The update highlighted ongoing research on biophysical drivers of bowhead whale distribution on the Alaskan Beaufort Shelf, as well as sustained observing efforts through the Arctic Mobile Observing System (AMOS) and the Arctic Argo Pilot Study.

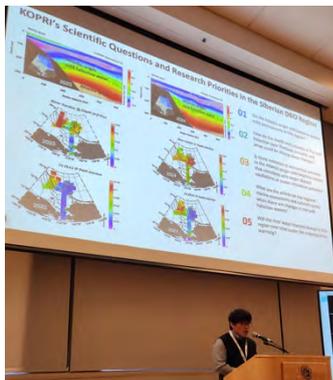
3. PAG-related joint research activities

Distributed Biological Observatory (DBO)



Pacific DBO activities + Oct 2024 7th DBO Data workshop overview – Jackie Grebmeier (UMCES)

Jackie Grebmeier provided updates on recent collaborative Pacific DBO activities (CEO, NOAA moorings, AMBON), highlighting the DBO’s role in linking physical and biological processes and serving as a long-term change-detection array. She noted that standardized ecosystem sampling has been in place since 2010, and discussed ongoing DBO-relevant synthesis and modeling efforts. Jackie further presented an overview of the 7th DBO Data Workshop, held in Baltimore in October 2024.



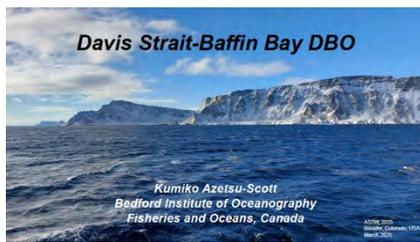
KOPRI’s contribution to DBO: Research Progress and Future Plans - Jinyoung Jung (KOPRI)

Jinyoung Jung outlined five key scientific questions guiding research in the Siberian DBO3 region, focusing on the persistence and variability of Atlantic-origin cold halocline waters and their links to climate forcing, ocean circulation, ecosystems, and nutrient cycling. This research also examines surface-water pathways associated with the Beaufort Gyre using backward trajectory analyses.



Atlantic DBO activities and Pan-Arctic DBO – Anna Nikolopoulos (Norwegian Polar Institute)

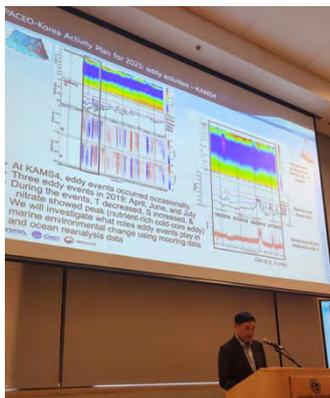
Anna Nikolopoulos highlighted A-DBO’s role as a collaborative platform that supports scientific exchange, data sharing, and synthesis, while also helping to identify knowledge gaps and bottlenecks. She emphasized on the importance of integrating biogeochemical and physical measurements across regions to identify common drivers, signals, and responses within Arctic shelf systems. Key objectives as part of A-DBO include prioritizing a set of core variables and tracking the propagation of signals such as heat, salt, nutrients, and species distributions across the Arctic Ocean.



Baffin Bay/Davis Strait DBO – Kumiko Azetsu-Scott (Fisheries and Oceans Canada)

Kumiko Azetsu-Scott provided an update on progress within the Davis Strait–Baffin Bay DBO since ASSW 2024. Recent activities included three cruises, meetings, and efforts to broaden participation to community-based coastal observing programs and social scientists through NordForsk. She also provided updates on governance and strategic planning and addressed the development of coastal DBOs and future coordination of the Davis Strait–Baffin Bay DBO within the broader DBO network.

Pacific Arctic Climate Ecosystem Observatory (PACEO)



Update from KOPRI physical oceanography activities – Kyoung-Ho Cho (KOPRI)

Kyoung-Ho Cho presented an overview of PACEO activities, highlighting Korea’s long-term observational efforts in the Arctic. PACEO was proposed in 2015 to monitor marine environmental changes associated with Arctic warming along the Beaufort Gyre extension. Observations focus on physical, chemical, and biological oceanographic parameters, with Korea conducting annual summer expeditions and mooring deployments using the icebreaking R/V *Araon* to support this effort. The contribution of Korea to PACEO and international programs was also emphasized, underscoring the importance of coordinated, multinational observations for understanding Arctic system change.



Update from KOPRI biological oceanography activities – Jee-Hoon Kim (KOPRI)

Jee-Hoon Kim provided an update on the comprehensive field activities conducted from July 31 to August 23, 2024 during the R/V *Araon* expedition. Key research areas included phytoplankton community composition and physiological responses, microzooplankton community dynamics and grazing impacts, mesozooplankton community structure and grazing, as well as fish and ichthyoplankton distribution. In addition, acoustic surveys were carried out to assess trophic interactions and biomass distribution.



Algal flux in the Pacific Arctic region – Catherine Lalande (KOPRI)

Catherine Lalande provided an overview of algal flux measurements derived from moored sequential sediment trap deployments in the Pacific Arctic region. Algal flux measurements obtained from a network of moored sediment traps maintained by China, Korea, Japan and the USA revealed significant spatial and temporal variability in the magnitude, timing, duration, and composition of algal blooms, and

highlighted the potential for PAG collaborative projects to better understand biogeochemical and ecological responses to ongoing Arctic environmental change.

Central Arctic Ocean (CAO)



CAOFA Joint Program of Scientific Research and Monitoring (JPSRM) + ICES-PICES-PAME Working Group on the Integrated Assessment of the Central Arctic Ocean Ecosystem (WGICA): Results and way forward – Shigeto Nishino (JAMSTEC)

Shigeto Nishino presented on the agreement to prevent unregulated fisheries in the Central Arctic Ocean (CAOFA) and its aim to improve understanding of Central Arctic Ocean ecosystems by promoting scientific research including Indigenous Knowledge. The agreement prohibits commercial fishing until sufficient scientific information is available to support effective and sustainable management measures. Shigeto also provided an overview on behalf of the WGICA, summarizing progress

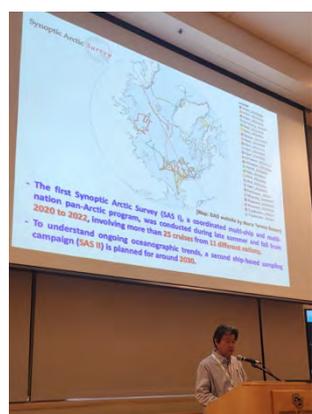
through a three-step assessment framework including a compilation of background information, multidisciplinary scoring by relevant participants and stakeholders, and data analyses.



Sustaining the Implementation Progress: Three Years of the CAOFA through Conference of the Parties (2022-2024) – Hyoung Chul Shin (KOPRI)

Hyoung Chul Shin presented on sustaining implementation progress of (CAOFA) through the Conference of the Parties. He reviewed the history of the agreement, its timeline and legal requirements, and emphasized CAOFA's foundation in a cautionary approach and ecosystem-based management, including the prohibition of exploratory fishing. He emphasized the central role of science as a mandatory component in the decision-making of international law under CAOFA, ensuring that management actions are informed by robust scientific evidence.

Synoptic Arctic Survey (SAS)



Brief updates of recent activities and SAS results – Shigeto Nishino (JAMSTEC)

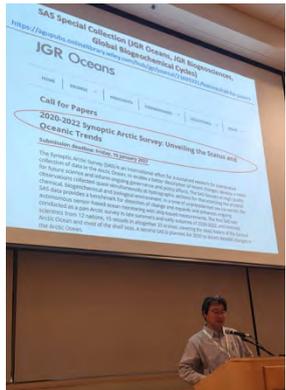
Shigeto Nishino reviewed key SAS tasks, emphasizing on the development of a comprehensive science and implementation plan through the organization of international meetings. He highlighted the importance of communication and synthesis through publications and continuous updates to the SAS website, as well as further development of the interactive SAS cruise map, including improved visualization, metadata, and sea ice information. He also addressed SAS representation in international groups, support for SAS working groups, and assistance with funding applications to advance coordination and long-term sustainability of SAS II.



US SAS activities and plans – Carin Ashjian (WHOI) and Jackie Grebmeier (UMCES)

Carin Ashjian introduced initial findings from a recent USCGC *Healy* cruise conducted as part of the international Synoptic Arctic Survey, highlighting the collaborative nature of the expedition. She provided an overview of the cruise and preliminary observations, noting that data processing and sample analyses are still ongoing following the completion of the cruise in early November 2024.

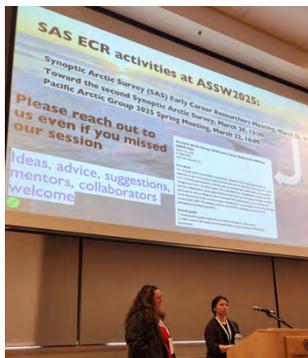
NABOS and interface with SAS activities – Igor Polyakov (University of Alaska Fairbanks) = absent



SAS special collection-JGR Oceans – Shigeto Nishino (JAMSTEC)

Shigeto Nishino announced a SAS special collection in JGR Oceans. This issue invites studies that use SAS data from multiple and single cruises to provide new insight on hydrographic, biogeochemical and ecosystem state processes and trends in the Arctic Ocean. Submissions from complementary cruises that were not originally included in the SAS program are strongly encouraged. This special collection brings together assessments of the interconnected system and climate change in the Arctic Ocean and their far-reaching impacts. Submission deadline: Friday, 15 January 2027

4. Updates on proposed international research activities



Cross cutting proposal for SAS ECR activities – Clare Gaffey (Oregon State University) and Christina Goethel (UMCES)

Clare Gaffey and Christina Goethel presented a pan-Arctic research program involving early career researchers seeking to coordinate an interdisciplinary research cruise as a pilot program to SAS II. The ECR group will host a 2-day workshop during ASSW2026 to identify joint research interests for SAS II, develop a group structure, formulate goals and ideas into a white paper to share with the broader SAS community, draft a proposal outline and establish detailed objectives for an ECR-led research cruise targeted for 2028-2030.

Pan-Arctic DBO NordForsk proposal – Lee Cooper (UMCES) = no slide



Potential Japanese activities of IPY2032-33 – Shigeto Nishino (JAMSTEC)

Shigeto Nishino introduced Japan’s first icebreaker dedicated to Arctic science, scheduled to be delivered in 2026, highlighting its role in expanding year-round Arctic observations. The vessel will conduct unique observations during the polar evening (October–December) and polar morning (April–June) as part of IPY 2032–33, addressing critical seasonal data gaps, and will be complemented by ice-edge tracking observations during summer to provide a comprehensive view of Arctic environmental variability.

5. Updates on interaction with other organizations



Update on CoObs RNA and SAON – Hajo Eicken (University of Alaska Fairbanks)

Hajo Eicken described the role of Sustaining Arctic Observing Networks (SAON), a joint initiative of the Arctic Council and the International Arctic Science Committee (IASC), supported by the Committee on Observations and Networks and the Arctic Data Committee. Within an observing context focused on marine ecosystems and food security, he introduced the SAON Roadmap for Arctic Observing and Data Systems (ROADS) as a new effort to build partnerships and develop well-defined plans to improve Arctic observing and data systems, linking ocean change to food security, regional policy, and local response, and highlighting practical examples such as RNA CoObs, the Salmon Knowledge Portal, and emerging challenges including system complexity and harmful algal blooms (HABs).

Announcements

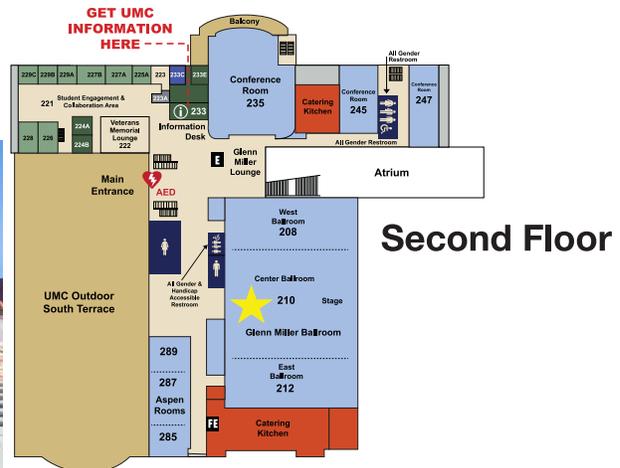
- 2nd Japan New Icebreaker Workshop (27 October 2025)
- 8th International Symposium on Arctic Research (ISAR-8; 28-31 October 2025)
- 2026 Fall PAG meeting = Victoria, Canada
- 2025 Fall PAG meeting in Incheon, Republic of Korea = November, 3-5, 2025

Pacific Arctic Group (PAG) 2025 Spring Meeting



| | |
|--------------------------------|--|
| Date: | Saturday 22 March 2025 09:00 - 18:00 (MST) |
| Venue: | Glen Miller Ballroom - 212 University Memorial Center (UMC) University of Colorado Boulder, Boulder, Colorado, USA |
| Local hosts: | Eun Jin Yang (ejyang@kopri.kr.re) Catherine Lalande (catherine.lalande@kopri.re.kr) |
| Breaks: | Coffee breaks = 10:00-10:30 and 15:30-16:00 Lunch break = 12:00-13:30 |
| Virtual meeting link: | Hybrid session: link to be provided by ASSW |
| Additional information: | http://pag.arcticportal.org/ https://assw.info/program/assw-2025-program#modal-iframe |

The **PAG Spring Meeting** is hosted within the Arctic Science Summit Week. We report on and discuss plans for field activities in 2025 and beyond, highlights of science results from PAG endorsed projects (DBO, PACEO, CAO), joint research activities, interactions with other organizations/projects, PAG organizational issues and other business issues.



Agenda

Saturday 22 March, 2025

[9:00 - 9:15] **1. Welcome and overview** – Eun Jin Yang
Agenda review and Introduction of participants

[9:15 - 10:00] **2. Country reports (max 15 min each): Field season plans for 2025**

-  Bill Williams
-  Jianfeng He
-  Shigeto Nishino

[10:00 - 10:30] **Group photo and coffee break**

[10:30 - 11:00] **Country reports (continued)**

-  Eun Jin Yang
-  Jackie Grebmeier

[11:00 - 12:00] **3. PAG-related joint research activities: reports, summaries, results, plans for 2025 and beyond (max 15 min each)**

- *Distributed Biological Observatory (DBO)*
 - Pacific DBO activities – Jackie Grebmeier
 - KOPRI's contribution to DBO: Research Progress and Future Plans – Jinyoung Jung
 - Atlantic DBO activities and Pan-Arctic DBO – Anna Nikolopoulos
 - Baffin Bay/Davis Strait DBO – Kumiko Azetsu-Scott
 - Oct 2024 7th DBO Data workshop overview – Jackie Grebmeier

[12:00 - 13:30] **Lunch**

[13:30 - 15:30] **PAG-related joint research activities (continued):**

- *Pacific Arctic Climate Ecosystem Observatory (PACEO)*
 - Update from KOPRI physical oceanography activities – Kyoung-Ho Cho
 - Update from KOPRI biological oceanography activities – Jee-Hoon Kim (virtual)
 - Algal flux in the Pacific Arctic region – Catherine Lalande

- *Central Arctic Ocean (CAO)*
 - CAOFA Joint Program of Scientific Research and Monitoring (JPSRM) – Shigeto Nishino
 - ICES-PICES-PAME Working Group on the Integrated Assessment of the Central Arctic Ocean Ecosystem (WGICA): Results and way forward (Lis Lindal Jørgensen, Sei-Ichi Saitoh, Martine van den Heuvel-Greve) – Shigeto Nishino
 - Sustaining the Implementation Progress: Three Years of the CAOFA through Conference of the Parties (2022-2024) – Hyoung Chul Shin
- *Synoptic Arctic Survey (SAS)*
 - Brief updates of recent activities and SAS results – Shigeto Nishino
 - US SAS activities and plans – Carin Ashjian and Jackie Grebmeier
 - NABOS and interface with SAS activities – Igor Polyakov (virtual)
 - SAS special collection-JGR Oceans – Shigeto Nishino

[15:30 - 16:00] **Coffee break**

[16:00 - 17:00] **4. Updates on proposed international research activities**

- Cross cutting proposal for SAS ECR activities – Clare Gaffey and Christina Goethel
- Pan-Arctic DBO NordForsk proposal – Lee Cooper
- Potential Japanese activities of IPY2032-33 – Shigeto Nishino

5. Updates on interaction with other organizations

- Update on CoObs RNA and SAON – Hajo Eicken
- 2nd Japan New Icebreaker Workshop (27 October 2025)
- 8th International Symposium on Arctic Research (ISAR-8; 28-31 October 2025)

[17:00 - 17:30] **6. Updates on PAG Structure, Chair Rotation, and PAG Meetings**

a. Chair and Secretariat rotates every 2 years at the end of the Fall Meeting:

- 2012-2014 – USA (Jackie Grebmeier, UMCES)
- 2014-2016 – Korea (Sung-Ho Kang, KOPRI)
- 2016-2018 – Japan (Takashi Kikuchi, JAMSTEC)
- 2018-2020 – China (Jianfeng He, PRIC)
- 2020-2022 – Canada (Bill Williams, DFO)
- 2022-2024 – USA
 - 2022-2023 (Jessica Cross, NOAA)
 - 2023-2024 (Jackie Grebmeier and Christina Goethel, UMCES)
- 2024-2026 – Korea (Eun Jin Yang, KOPRI)
- 2026-2028 – ?

b. Executive committee composed of:

PAG Chair: Eun Jin Yang (Korea)

Vice-Chairs (one representative from each PAG member nation):

Bill Williams (Canada)

Jianfeng He (China)

Shigeto Nishino (Japan)

Jackie Grebmeier (USA)

c. Past and Future PAG meetings

Fall meetings:

2010: Tokyo, Japan

2011: Victoria, Canada

2012: Suzhou, China

2013: Incheon, Korea

2014: Seattle, USA,

2015: Korea, Incheon

2016: Qingdao, China

2017: USA, Seattle, USA

2018: Japan, Hakodate, Japan

2019: Hangzhou, China

2020: Online

2021: Online

2022: Victoria, Canada (hybrid)

2023: Tokyo, Japan (hybrid)

2024: Baltimore, USA (hybrid)

2025: Incheon, Korea (hybrid)

2026: ?

Spring meetings at ASSW:

2012: Montreal, Canada (IPY)

2013: Krakow, Poland

2014: Helsinki, Finland

2015: Toyama, Japan

2016: Fairbanks, Alaska

2017: Prague, Czech Republic

2018: Davos, Switzerland

2019: Arkhangelsk, Russia

2020: Akureyri, Iceland (online)

2021: Lisbon, Portugal (online)

2022: Tromsø, Norway (hybrid)

2023: Vienna, Austria (hybrid)

2024: Edinburgh, UK (hybrid)

2025: Boulder, USA (hybrid)

2026: Aarhus, Denmark

2027: Hakodate, Japan

[17:30] End of PAG meeting

| PAG 2025 Spring meeting attendees | | | |
|-----------------------------------|--------------|---|--|
| Kyoung-Ho | Cho | Korea Polar Research Institute | kcho@kopri.re.kr |
| Ben | Alsip | US Coast Guard | benjamin.m.alsip@uscg.mil |
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| Yeong Jun | Choi | Korea Polar Research Institute | yeongjun@kopri.re.kr |
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