Pacific Arctic Group (PAG) 2024 Fall Meeting

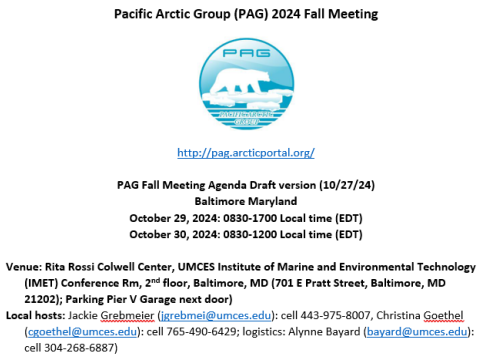
PAG Meeting Agenda
October 29-30, 2024
Baltimore, MD, USA
http://pag.arcticportal.org/

Introduction:

The Pacific Arctic Group (PAG) is a group of institutes and individuals having a Pacific perspective on Arctic science. Originally organized under the International Arctic Science Committee (IASC), the now separate PAG entity 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 the annual "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 following report summarizes presentations and discussions during the 2024 fall PAG meeting held at the Institute of Marine and Environmental Technology (IMET) in Baltimore, Maryland, USA.

Citation: Grebmeier J.M and A. Bayard. 2025. Pacific Arctic Group 2024 Fall Meeting Report, Baltimore, Maryland USA, 15 pp.

DAY 1: TUESDAY OCTOBER 29, 2024 [0830 – 1700 EDT]



Jackie welcomed the group and provided logistic information as well as the meeting agenda.

Russell Hill (Director of IMET) provided an introduction and highlighted examples of IMET's research projects, such as sustainable aquaculture, shellfish genomics, and physiology, and treating PCB-impacted sediments.

Country Reports:

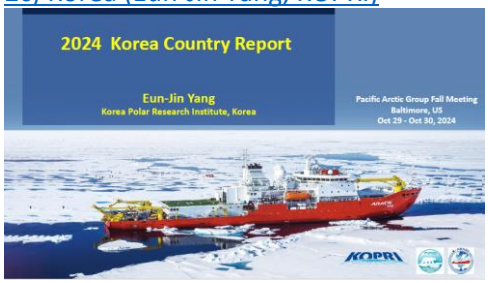
2a) Canada (Bill Williams, Fisheries and Oceans Canada)

Bill provided updates on cruise activities through 2024, including Beaufort Gyre and noted this represents their 22nd year! They have monitored freshwater content in the gyre since 2003 and found that ocean freshwater relative to salinity = 34.8. A deepening of the halocline and increasing Pacific water heat content were found. Trends in bottom temperature, ice concentration, and ice draft were shown for a 30-year moored time series for the Canadian Beaufort Sea, as were maps of planned stations for 2024 that expand ecosystem time-series.

2b) Japan (Shigeto Nishino, JAMSTEC)

Shigeto provided updates on the 2024 R/V Mirai cruise, as well as the cruise plan for R/V 2025 cruise. On the Mirai 2024, they conducted various types of observations including: water sampling, zooplankton/phytoplankton/microplankton sampling, recovery and re-deployment of moorings in the Barrow area, sea ice sampling, ocean-waves-and sea ice interaction in marginal ice areas, trial of an under-the-ice drone developed by JAMSTEC, sediment sampling for paleo-oceanographic study, and changes in clouds and aerosols in ice-free areas.

2c) Korea (Eun-Jin Yang, KOPRI)



Eun-Jin provided updates on the 1st and 2nd legs of the ARAON Summer Arctic Survey from Korea to Korea July-September 2024. Research included ocean-sea / ice-atmosphere integrated observations to understand Arctic warming and to project future changes using numerical models with observational data. The Korea Arctic Ocean-data System (KAOS) can be accessed here: http://kaos.kopri.re.kr/

2e) Jackie Grebmeier, UMCES CBL

Jackie provided updates for the U.S.A., including the 2024 PAG/DBO Cruise Plan Table. A slide from Bob Pickart, "Monitoring the Western Arctic Boundary Current in a warming climate" was included. She also provided an outline of the cruise effort for the DBO-EcoFOCI-AMBON-CEO for August 2024 which occurred on the Sikuliaq (SKQ2024-12S) cruise between August 6-27, 2024 and is confirmed for 2025. She also provided highlights for the research by Ashjian et al. on bio-physical drivers of bowhead whale distribution on the Alaskan Beaufort Shelf during a period of rapid environmental change which ends 2024 as well as Craig Lee's work on the Arctic Mobile Observing System (AMOS, 2019-2025) and the Arctic Argo Pilot study, as well as some summary results from Rebecca Woodgate's Bering Strait Mooring Project.

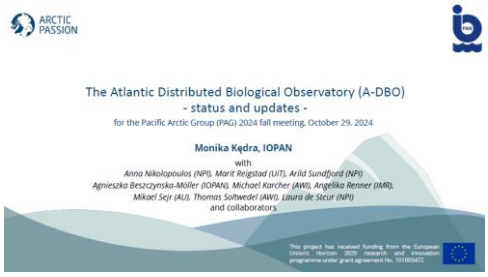
PAG-related joint research activities – summaries, results, plans for 2024 & onwards:

A) Distributed Biological Observatory (DBO):

3a) Jackie Grebmeier, UMCES CBL

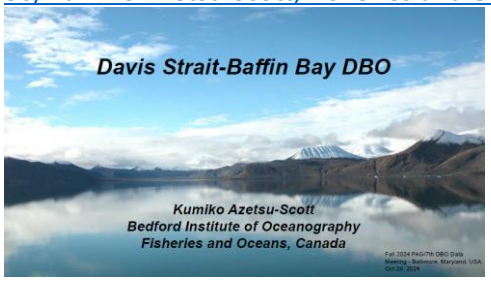
Jackie provided updates of recent collaborative Pacific DBO activities, including a summary of the DBO – Linking physics to biology and serving as a change detection array, where standard sampling in the ecosystem was established in 2010. Maps of integrated water column and surface sediment chl a were shown for SKQ24-12S ODV as were ODV graphics such as temperature, salinity, and chl a for DBO1 to DBO5. Stewart et al. 2023, show a decline in gray whales with increasing open water and decline in benthic crustacean prey quality in DBO1-3 regions. She also mentioned ongoing DBO-relevant synthesis and modeling projects as well as the Pan Arctic DBO-UNDOS Endorsement as of July 2024.

3b) Monika Kędra, IOPAN



Monika provided the status and updates for The Atlantic Distributed Observatory (A-DBO), including a map of the research project areas and transects. They are building on a selection of standard positions for long-term national monitoring programs with a data time series ranging from 10-30+ years. Parameters collected are mainly physical and chemical, but coverage of ecosystems parameters are improving. Monika also provide the time table for the "proof of concept" and noted that the main progress in 2024 was metadata harmonization and collaborations. She also provided the dates of several cruises in 2024.

3c) Kumiko Azetsu-Scott, Fisheries and Oceans, Canada

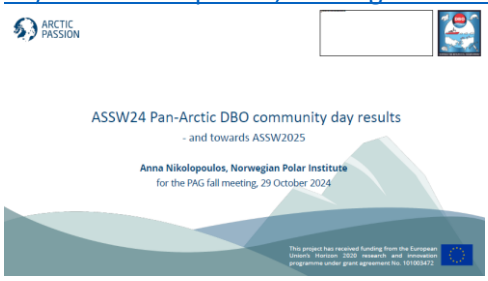


Jackie presented updates for Kumiko on development of Davis Strait-Baffin Bay DBO which started in 2018. A map was shown of original stations/lines showing areas of biological and oceanographic importance. Of particular interested was how ocean acidification has increased impacting the entire water column along the Greenland Shelf. New sections of coastal DBO stations are being developed.

3d) Jinyoung Jung, KOPRI

Jinyoung provided recent updates from DBO3 and Siberian DBO. Since 2014, KOPRI has conducted comprehensive annual surveys at DBO3 using the R/V ARAON and in 2023 initiated regular observations at the S-DBO. Eastern and western hydrographic characteristics of DBO3 and S-DBO in 2023 and 2024 were compared using ODV graphics showing strong influence of Anadyr/Bering shelf waters in the west and influence of Alaska Coastal Water in the east. Observations included: lower salinity in 2024 and despite high NO_3 concentrations, chl a remained moderate.

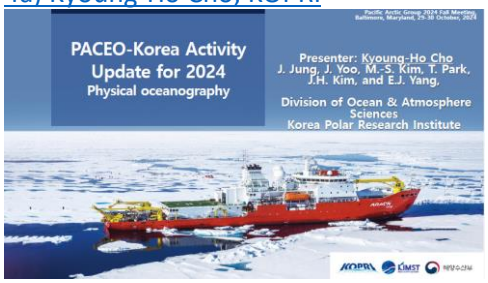
3e) Anna Nikolopoulos, Norwegian Polar Institute



Anna provided updates on the ASSW24 Pan-Arctic DBO and towards ASSW2025. A map was shown of the status of the 2024 constellation of the pan-Arctic DBO network as well as summaries of anticipated new DBO sections and coastal stations and future coordination with the Baffin Bay/Davis Strait DBO and Siberian DBO research networks. Aims until ASSW2025 include finding the best ways to bridge the systems including regional vs pan-Arctic connectivity.

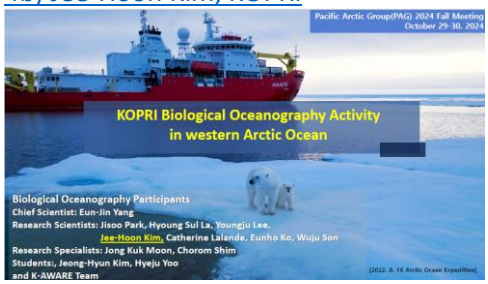
B) Pacific Arctic Climate Ecosystem Observatory (PACEO):

4a) Kyoung-Ho Cho, KOPRI



Kyoung-Ho provided physical oceanographic activity for the PACEO research which was proposed in 2015 to monitor marine environmental change induced by Arctic warming along the Beaufort Gyre extension. He provided a summary of results from the 1st leg of the 2024 ARAON Arctic cruise, including spatial patterns of water masses and circulation, changes in heat and freshwater contents, long-term variations of T, S, and current, and interannual variability and trend of water profiles. Results from the Korea Arctic Mooring System (KAMS) were also provided.

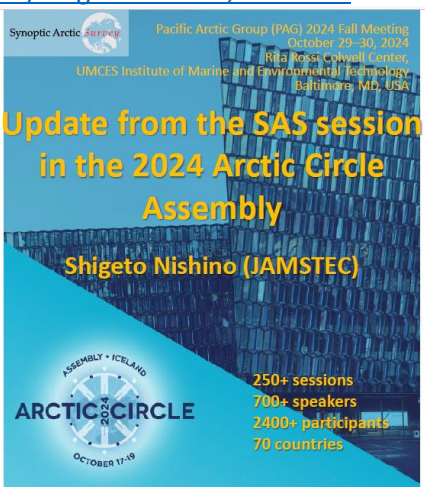
4b) Jee-Hoon Kim, KOPRI



Jee-Hoon provided biological oceanographic activity in the western Arctic Ocean. This included data collection on: phytoplankton, microzooplankton, mesozooplankton, zooplankton/micronekton, fish distribution, and marine mammals. Jee-Hoon noted papers that were published in 2024 as well as provided the field plan for the ARAON in 2025.

C) Central Arctic Ocean (CAO):

5a) Shigeto Nishino, JAMSTEC

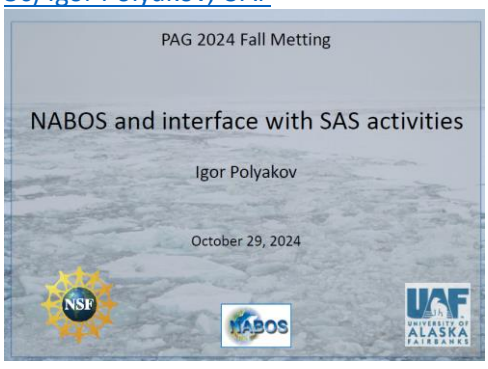


Shige provided a summary of synthesis research conducted on the Synoptic Arctic Survey currently and prospects for the next decade. The synthesis research included work on understanding connectivity between shelf to Central Arctic Ocean ecosystems, contributions to the CAO fisheries agreement, ArCSII ocean modeling activities, and prioritizing research regions and parameters for future SAS expeditions. The science and implementation plan summary to develop SASII (2030) was also provided.

5b) Carin Ashjian, WHOI

Carin provided some new results and activities related to the U.S. 2022 Synoptic Arctic Survey cruise noting that the North Pole transects filled critical gaps in SAS Arctic Basin coverage. Many variables were measured including chemistry, phytoplankton/zooplankton, infauna, sediment characterization, etc… observing that the ice was not very thick so there were many leads. She noted that the Canadian (eastern) and Makarov (western) basins differed hydrographically as did the Chukchi Shelf. There were also more nutrients in the Canada Basin than in the Makarov basin and DOC from rivers was observed in the Makarov Basin. Summaries of meiofaunal characteristics, seabird observations over shallow shelf water, and marine mammal sightings were also provided.

5c) Igor Polyakov, UAF



Igor provided an update on NABO and the interface with SAS activities. He provided a map of 2021, 2023 stations as well as those proposed for 2025. It was noted that Atlantification is already in the Amerasian Basin with the center of the action being in the Siberian Arctic Ocean and that oceanic heat fluxes explain up to 1m (!) of sea ice loss in the Eurasian Basin and tens of cm in the Marakov Basin in 2021-2023. He provided maps comparing delay of sea ice formation between 2002 and 2018 which highlighted this Atlantification phenomenon.

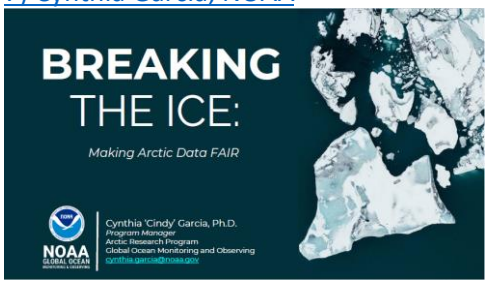
5d) John Bengston (no ppt provided)

John provided information on opportunities for collaborative research through the Central Arctic Ocean Fisheries Agreement (CAOFA). Jackie suggested a cross-talk about ideas, interest, and coordination at an in-person meeting.

6) Libby Logerwell, NOAA *(link is to screenshot of first slide only)*

Jackie presented on Libby's behalf about the Arctic Ecosystem 20-year synthesis. Twenty years of trends in pelagic and benthic taxa in the Northern Bering and Chukchi seas have been collected and although it seems the research did not support weakening pelagic-benthic coupling, it did support borealization. The trends for various variables were summarized as increasing, decreasing, or staying the same.

7) Cynthia Garcia, NOAA



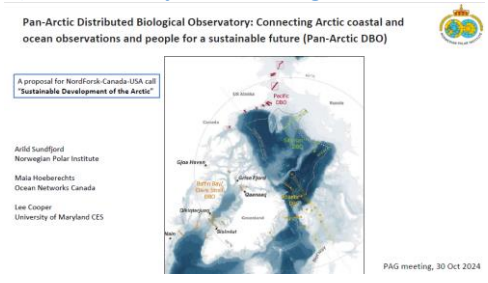
Cindy presented on Making Arctic Data FAIR (Findable, Accessible, Interoperable, Reusable). She provided information on NOAA GOMO's Arctic Research Program (ARP), ARP's project landing pages, IRA-funded projects, and International collaborations such as the NOAA-Korea Joint Panel Agreement (JPA). She also discussed future plans to expand data discovery and access, build community partnerships, and improve user support.

DAY 2: WEDNESDAY, OCTOBER 30, 2024 [0830 – 1200 EDT]

8) Lis Lindal Jørgensen, Institute of Marine Research, Norway

Lis provided updates on the ICES-PICES-PAME working group on the Central Arctic Ocean integrated ecosystem risk assessment (WGICA). This work involves identifying and describing the ecosystem, identifying and describing the human sectors and its pressures, investigating the sensitivity/vulnerability of the ecosystem components, using this information to "score" the risk for each ecosystem component with expert knowledge, and writing a paper (in prep) to convey the message. Next steps include, determining how to map risk and communicate the messages by making them clear and understandable.

9) Arild Sundfjord, Norwegian Polar Institute



Arild presented on the Pan-Arctic DBO and noted a proposal for "sustainable development of the Arctic," and articulated three main objectives. These include: to develop and consolidate a joint framework across the DBOs, to significantly strengthen the observational capacity of the DBOs, and to build a durable pan-Arctic science collaboration. The building blocks for four pilot themes were suggested related to marine mammals, phytoplankton biomass, connectivity time scale, and regional ocean indicators.

10) Shigeto Nishino, JAMSTEC

Shige provided an update on the International SAS program for 2025-2026, and beyond. The results of SAS synthesis are being discussed in order the build the necessary next steps for the success of SASII. He provided the schedule of meetings for the development of the SASII science and implementation plan.

11) Savannah Sandy (UAF); Christina Goethel (UMCES/CBL)

Savannah and Christina provided information about Early Career Scientists related to the SAS program. The goals are to create a space for early career researchers (including the international community) who were involved in SAS2022 and want to be involved with SAS going forward. You can join the SAS ECS on Discord here: https://discord.gg/PRQZAHXK

12) Sue Moore, UW

Sue presented updates on marine mammal watches in the Pacific DBO. She emphasized the importance of including Upper Trophic Level (UTL) species in ocean observatories to see how they respond to changes in ecosystem variability and that humans rely on UTL species for food and cultural practices. Species distributions for Gray and Humpback whales were shown, noting the shift in range and diet of Gray whales and an influx of Humpback whales over the years. She also provided some results related to Passive Acoustic Monitoring (PAM) in offshore Alaska.

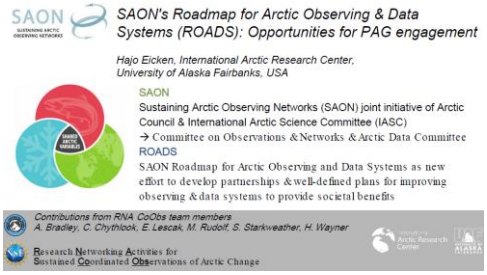
13) Shigeto Nishino, JAMSTEC

Shige (on behalf of Takashi Kikuchi) presented updates on the Arctic Research Vessel, Mirai II, including the schedule from 2020 to planning for the first Arctic cruise in the summer of 2027. He highlighted the 2023 International workshop on Arctic Ocean observation and future collaboration by research vessels and icebreakers. He also provided the schedule for meetings related to SASII and ISAR-8.

14) Lee Cooper, UMCES/CBL

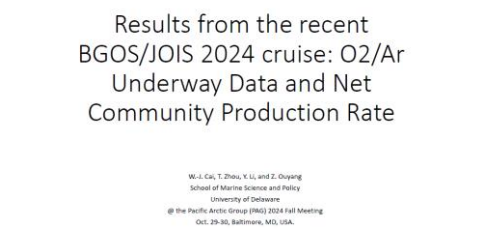
Lee provided a summary of presentations from the American Geophysical Union annual meeting in Washington DC, USA in December 2024. Posters and oral presentations were given under the topic: Drivers of marine ecosystem change under climate warming evaluated from regional to Pan-Arctic marine observatories.

15) Hajo Eicken, UAF



Hajo provided updates on SAON's roadmap for Arctic Observing and Data Systems (ROADS) and highlighted opportunities for PAG engagement. Some observing context includes marine ecosystems and food security and as there are ocean changes regional policy and local responses need to be implemented. An example project is tracking salmon returns in the Bering Sea. He also provided the project timeline and noted that there is a Salmon Information Portal Design proposed for access to data and integration opportunities through the Arctic Data Center.

16) Wei-Jun Cai, University of Delaware



Wei-Jun provided a few updates on SST, salinity, chl a, and O2/Ar underway data and net community production rate. He noted that the data show high net biological community production (NCP) near the ice edge, in addition to the shelf regions. He also noted that they collected water samples from surface to 500m depth to measure δ13C-DIC.

AGENDA

DAY 1: TUESDAY OCTOBER 29, 2024 [0830 – 1700 EDT]

[0830] 1. Welcome and Introduction *(Jackie Grebmeier and Christina Goethel)*

- Welcome
- Introduction by IMET Director (*Russell Hill)*
- Internet connection: Wireless meeting instructions
- Overview of PAG and Agenda Review
- Introduction of participants

[0900] 2. Country reports: Activities during the field season (and prior results) and plans for 2025 (max 15 mins each)

- Canada: *Bill Williams*
- China: *Jianfeng He?*
- Japan: *Shige Nishino*
- Korea: *Eun Jin Yang*
- United States: *Jackie Grebmeier*

[1000 - 1030] Coffee break

[1030] Continuation of Country Reports

[1045} 3. PAG-related joint research activities: reports, summaries, results, plans (max 15 minutes):

- **Distributed Biological Observatory (DBO***)*
  - Update of Pacific DBO activities, including UNDOS endorsement (highlight from *Jackie Grebmeier*, with individual presentations at subsequent DBO workshop)
  - Atlantic Distributed Biological Observatory (A-DBO) - status and updates *(Monika Kedra)*
  - Baffin Bay/Davis Strait DBO *(Kumiko Azetsu-Scott?, virtual)*
  - KOPRI's contribution to DBO: Recent updates from DBO3 and Siberian DBO *(Jinyoung Jung)*
  - ASSW24 Pan-Arctic DBO community day results and ASSW25 (*Anna Nikolopoulos, virtual)*

[1200 - 1330] Lunch provided

[1330] Pacific Arctic Climate Ecosystem Observatory (PACEO)

- Update from KOPRI physical oceanography activity (*Kyoung-Ho Cho*)
- Update from KOPRI biological oceanography activity (*JeeHoon Kim*)

[1400] Central Arctic Ocean (CAO)

- Update from the SAS session in the 2024 Arctic Circle Assembly (*Shige Nishino*)
- US SAS activities and plans (*Carin Ashjian*)
- NABOS and interface with SAS activities (*Igor Polyakov, virtual*)
- Potential Collaboration with Joint Program of Scientific Research and Monitoring (JPSRM) *(John Bengtson, virtual)*

[1500] Coffee break and Group Photo

[1545] 6. Synthesis and Modeling Activities

- Update of synthesis activities with NPRB project (*Libby Logerwell-NOAA/USA, presented by Jackie Grebmeier)*
- Others?

[1600] 4. Data access and archiving topic

- Breaking the Ice: Making Arctic Data FAIR (*Cynthia Garcia*)
- Group discussion of protocols, data sharing, archiving, product topics

[1700] End Day 1

DAY 2: WEDNESDAY, OCTOBER 30, 2024 [0830 – 1200 EDT]

[0830] Welcome and overview agenda

[0840] Status report WGICA activities (*Lis Lindal Jørgensen, virtual*)

[0900] 5. Proposed international research activities

- Pan-Arctic DBO NordForsk proposal (*Arild Sundfjord, virtual*)
- International SAS Program, 2025-2026 and beyond (*Shige Nishino*)
- IASC FOX (Fellows' Ongoing X-change) and SAS Early Career Researcher activities *(Christina Goethel and Savannah Sandy)*

[1000-1030] Coffee break

[1030] 5. Proposed international research activities (cont).

- What we've learned from Marine Mammal Watches on P-DBO surveys *(Sue Moore, virtual*)

[1045] 8. Interaction with other Organizations, Updates

- Japan's new research ice-breaker for the Arctic Ocean (*Shige Nishino on behalf of Takashi Kikuchi*)
- December AGU Arctic observing session (*Lee Cooper*)
- Update on CoObs RNA and SAON (*Hajo Eicken, virtual*)

[1130] 10. PAG Structure, Chair Rotation, and PAG Meetings

- Chair and Secretariat rotates every 2 years at the end of the Fall Meeting: 2024-2026 Korea **(*Eun Jin Yang*, KOPRI-CONFIRMED)**; short introduction, see supplementary information at end of this agenda)
- Open discussion
    - Results from the recent BGOS/JOIS 2024 cruise: O2/Ar Underway Data and Net Community Production Rate (*Wei-Jun Cai)*

[1200] End of PAG meeting, lunch provided

NOTE: Following Lunch:

[1330-1700] start Day 1 of 7th DBO data workshop (see separate agenda)

[1830] Note: Jackie and Christina are organizing a **self-pay group dinner** for both PAG and DBO meeting participants (Wed night, Oct 30); sign-up google sheet to be provided soon

ADDITIONAL INFORMATION

- 2022-2024: USA*;* 2022-2023 *(Jessica Cross, NOAA, then rotated off)*
    - 2023-*2024 (Jackie Grebmeier and Christina Goethel)*
- **2024-2026: Korea (*Eun Jin Yang*, KOPRI)-CONFIRMED**
- 2026-2028:?

a. Executive committee composed of:

- **PAG Chair(s):** *Jackie Grebmeier and Christina Goethel*
- **Vice-Chairs** (one representative from each PAG member nation):
    - *Bill Williams (Canada)*, *Shigeto Nishino* (Japan), *Eun-Jin Yang* (Korea), *Jianfeng He* (China)
    - Leads from each of PAG activities: DBO: *Jackie Grebmeier*, PACEO: *Kyoung-Ho Cho,* CAO: *Shigeto Nishino*

b. Future PAG meetings:

- **Spring meeting ASSW *2025*** *March 25: 9 am-6 pm MT*, Boulder, Colorado, USA
- **Fall meeting 2025-**Incheon, Republic of Korea
- **Spring ASSW 2026-**Aarhus, Denmark

Meeting Participants:

First Name	Last Name	Affiliation	Email Address	Attendance (IP: In person; V: Virtual)
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