



## CliC ASIWG Workshop Report, 4 June 2023



### Summary:

The Climate and Cryosphere (CliC) Arctic Sea Ice Working Group (ASIWG) held their first open workshop since 2019, held in Bremerhaven, Germany on 4 June 2023. There were over 40 attendees, including Sebastian Gerland, Walt Meier, and Melinda Webster of the ASIWG. Over 30% of the attendees were Early Career Researchers (ECR), and more than 25% of the presentations were given by ECRs. The morning session was dedicated to ASIWG activities, while the afternoon session was jointly coordinated with the [SCAR/CliC Antarctic Sea Ice Processes & Climate \(ASPeCt\) working group](#). The CliC ASIWG meeting was structured around bringing the Arctic observational and modelling sea ice communities together. The goals of this [CliC ASIWG](#) workshop were to facilitate discussions on the following themes of ASIWG activities:



1. Develop, standardise, and implement observations and measurement protocols for Arctic sea ice in coastal, seasonal, and perennial ice zones;
2. Integrate surface-based observations with remote sensing and modelling efforts and;
3. Establish and foster connections between international groups involved in sea ice observations, modelling, remote sensing, and data assimilation.

To achieve this, we sub-divided the morning into three sessions that were composed of a series of lightning presentations (3-5 minutes each) and 30-minute discussion periods (see agenda in appendix). The first session provided overviews of several relevant activities and initiatives to the Arctic sea-ice community, including: the International Arctic Science Committee (IASC), the Sustaining Arctic Observing Networks (SAON), the Association of Polar Early Career Scientists (APECS), the Arctic Monitoring and Assessment Programme (AMAP), the NOAA Arctic Report Card, the Biogeochemical Exchanges at the Sea Ice Interfaces (BEPSII) working group, the MOSAiC expedition, the Nansen Legacy project, the Arctic Passion project, and the Arctic Regional Ocean Observing System.



**Figure 1 | Left:** A status update on the MOSAiC expedition from Marcel Nicolaus (AWI), as part of Session 1. **Right:** Despite the sunny weather in Bremerhaven, participants were engaged throughout the ASIWG meeting.

In the second session, the topic targeted past and ongoing activities that bring observations and modeling together. The first presentation was on the Sea-Ice Model Intercomparison (SIMIP) project, including updates on CMIP6. The second presentation provided an overview on the ongoing revision of an observational needs document, guided by the modeling community, to help guide future field and remote sensing activities for model assessment and development. The second presentation also gave an overview of the ongoing development of a MOSAiC forcing package, designed for single-column model, for parameterization assessment and development. Challenges were presented and included: creating a data set useful to models outside of the



Community Earth System Model group, issues of relating point measurements to model grid cells, and implementing the Model-Data Fusion framework.

In the third session, remotely-sensed observations and mission updates were given. Product highlights include: the Sea Ice Essential Climate Variables (sea ice thickness, snow thickness, surface temperature, surface albedo, ice age, ice drift, and ice concentration), ensuring algorithm code legacy of long-standing passive microwave climate products (i.e., NASA Team and Bootstrap algorithms), sustained monitoring of the Distributed Biological Observatory sites, development of new products such as melt and freeze onset dates, length of the Arctic sea-ice season, daily surface melt, 20+ of sea ice thickness data from altimetry, and thematic sea ice products (to be released 2023). Mission updates include the upcoming satellite launches of GOSAT-GW in 2024-2025, CRISTAL in 2027, and CIMR in 2029. The session wrapped up with open science initiatives including the project Transform to Open Science (TOPS).

During the discussion periods, two specific issues arose that can help guide future ASIWG activities:

- (1) There are numerous working groups and initiatives that have similar goals, which causes confusion and, in some instances, fatigue within the Arctic sea-ice community. There is a need for coordination across initiatives to carve out complementary activities, to identify specific individual goals, and to reduce redundancy. Lessons learned from past successes (i.e., SIMIP) can help provide a framework for future ASIWG activities.
- (2) There is an ongoing need for inter-comparison studies to elucidate uncertainties, biases, and appropriateness of different observational products' fit for use for different applications. In this, there is a need to reconcile differences in nomenclature across communities (i.e., operational, climate, observational, remote sensing, modeling, Indigenous Knowledge, etc.), as well as updating the usage of sea ice characteristics (e.g., ice age) as a reliable metric of sea-ice conditions given the state change of the Arctic sea-ice regime with climate change.

In the afternoon joint session with ASpeCt, the joint audiences received updates on ongoing activities from the Global Cryosphere Watch and CryoNet. This included the process for best practices of observational requirements and nomenclature changes, an overview of partnerships between operational and scientific communities, and upcoming initiatives including the planned COP28, ICARP IV in 2025, the joint SCAR-IASC Polar Conference in 2030, and the 5<sup>th</sup> International Polar Year (2032-2033). There was also a presentation highlight on how to adapt ice core processing protocols to address the needs for ice physical and biological properties. The joint session wrapped up with an overview of the International Programme for Antarctic Buoys (IPAB) and desires to expand observations.



### **ASIWG Action Items:**

Several recommendations were collected during the meeting discussions that will guide the activities of the CliC ASIWG in 2023-2025. In response to the recommendations, the workshop organizers will:

- Write a joint press release with the SCAR/CliC ASPeCt working group on Arctic and Antarctic sea-ice critical updates and observational needs.
- Update the ASIWG website, including (with permission) making available the presentations from ASIWG meeting presenters.
- Send a survey for anonymous feedback on the issues discussed during the meeting, as well as solicit suggestions for future ASIWG activities.
- Coordinate with Alice Bradley to facilitate a workshop that brings chairs of various groups and initiatives together to promote coordination and reduce redundancy across Arctic sea ice activities.
- Coordinate with Jari Haapala to explore Arctic-ROOS initiative to dovetail its aims into existing activities and groups.
- Bring on board new ASIWG committee members in 2023-2024 as replacement for Jenny Hutchings (stepping down 2023), Sebastian Gerland (stepping down 2024), and Walt Meier (stepping down 2025). Several prospective members have already been identified and are engaged in ongoing discussions.

### **Acknowledgements:**

The workshop organizers thank Marcel Nicolaus and Lena Buth, for the meeting room and facilities to have the workshop at the Alfred Wegener Institute in Bremerhaven.

We also highly appreciate the financial support by CliC/WCRP for travel of some of the ECRs making it possible for them to attend the workshop. We finally also want to thank Steffi Arndt, Petra Heil, and Marilyn Raphael of the ASPeCt workshop for the good collaboration in having a shared session and so merging parts of the two parallel workshops.

### **Appendix:**

- **Press release:** issued on 16 June 2023 by WMO and WCRP (links: <https://public.wmo.int/en/media/news/polar-scientists-call-urgent-action-view-of-rapid-arctic-and-antarctic-change>; <https://www.wcrp-climate.org/news/wcrp-news/2031-polar-scientists-call-for-urgent-action-in-view-of-rapid-arctic-and-antarctic-change>)
- **ASIWG workshop attendees:** Melinda Webster (UW)\*\*, Walt Meier (NSIDC)\*\*, Sebastian Gerland (NPI)\*\*, Stefan Kern (U. Hamburg), Stefan Paul (AWI), Angela Bliss (NASA GSFC), Gunnar Spreen (U. Bremen), Sinead Farrell (UMD), Jack Landy (UiT), Dirk Notz (U. Hamburg), Alex Jahn (CU), David Clemens-Sewall (NCAR)\*, Lorenzo Zampieri (NCAR)\*, Marc Oggier (UAF)\*, Michael Karcher (AWI), Jacqueline Stefels (U. Groningen), Meghan Helmberger (CU)\*, Molly Wieringa (UW)\*, Jakob Dörr (U.



Bergen)\*, Niels Fuchs (U. Hamburg)\*, Ian Raphael (Dartmouth)\*, Evgenii Salganik (NTNU)\*, Jari Haapala (FMI), Petra Heil (U. Tasmania), Christian Haas (AWI), Hannah Chapman-Dutton (UAF)\*, MacKenzie Jewell (OSU)\*, Alice Bradley (Williams College), Marcel Nicolaus (AWI), Letizia Tedesco (SYKE), Johanna Langer (U. Victoria)\*, Axel Schweiger (UW), Sascha Willmes (Trier Uni.), Kitrea Takata-Glushkoff (UAF)\*, David Babb (U. Manitoba)\*, Freya Chen (U. Chicago)\*.

\* Early Career Researchers

\*\* Members of workshop organizing committee, along with Jenny Hutchings and Don Perovich

- **Meeting agenda:** (below)



## CliC Arctic Sea Ice Working Group (ASIWG) 2023 Workshop

**Objectives:** The Climate and Cryosphere (CliC) Arctic Sea Ice Working Group (ASIWG) workshop is structured around bringing the Arctic observational & modelling sea ice communities together. The [CliC ASIWG](#) goals are to:

1. Develop, standardise, and implement observations and measurement protocols for Arctic sea ice in coastal, seasonal, and perennial ice zones;
2. Integrate surface-based observations with remote sensing and modelling efforts and;
3. Establish and foster connections between international groups involved in sea ice observations, modelling, remote sensing, and data assimilation.

### ***Welcome/Overview/Introductions (09:00-09:15)***

#### ***Looking back & looking forward (09:15-10:30)***

Gunnar Spreen:	International Arctic Science Committee
Alice Bradley:	Sustaining Arctic Observing Networks
Meghan Helmberger:	Association of Polar Early Career Scientists
Sebastian Gerland:	Arctic Monitoring and Assessment Programme
Walt Meier:	Arctic Report Card
Jacqueline Stefels:	Biogeochemical exchanges at Sea Ice Interfaces
Marcel Nicolaus:	MOSAiC
Sebastian Gerland:	Nansen Legacy/Arctic Passion
Jari Haapala:	Arctic Regional Ocean Observing System

*Discussion*

### **BREAK (10:30-10:40)**

#### ***Modeling activities & bringing observations together (10:40-11:20)***

Alex Jahn:	Sea-Ice Model Intercomparison Project
Dirk Notz:	Sea-Ice Model Intercomparison Project/Grand Challenge
David Clemens-Sewall:	Model/Observation Synthesis
Lorenzo Zampieri:	Model/Observation Synthesis

*Discussion*

### **BREAK (11:20-11:30)**

#### ***Remotely-sensed observations (11:30-12:30)***

Stefan Kern:	Sea Ice Essential Variables
Stefan Paul:	Sea Ice Essential Variables
Angela Bliss:	Passive Microwave Products/Mission updates
Gunnar Spreen:	Passive Microwave Products/Mission updates
Sinead Farrell:	Altimetry Products/Mission updates
Jack Landy:	Altimetry Products/Mission updates
Walt Meier:	Year of Open Science/Sea Ice Outlook

*Discussion*

### ***Future ASIWG activities & wrap-up (12:30-13:00)***

### **LUNCH (13:00-14:00)**

#### ***Joint session with ASPeCt (14:00-16:00)***

Marc Oggier:	Standardization of observations
Petra Heil & others:	Global Cryosphere Watch; CryoNet
Christian Haas:	IPAB & IABP
Discussion:	Polar Year 2032