

International Coordination to Improve Studies of Changes in Arctic Sea Ice Cover

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The Arctic sea ice cover is undergoing tremendous changes. The end-of-summer ice extent is decreasing, the ice is thinning, and there is a fundamental shift from perennial to seasonal ice. These changes have important implications for both the Arctic and the global climate system. This importance creates a need to observe and understand the ongoing changes and to predict future changes in the Arctic sea ice cover.

The Arctic Sea Ice Working Group of the Climate and Cryosphere Project of the World Climate Research Programme held a workshop at the National Snow and Ice Data Center to discuss ways to improve our ability to observe, understand, and predict changes in Arctic sea ice through internationally coordinated activities. More than 40 researchers from 10 countries attended the workshop. The group included field experimentalists, remote sensing specialists, and sea ice and climate modelers. The workshop featured presentations on sea ice observations and models plus ample time for group discussions. A common theme was the need for

collaboration and coordination and an ongoing dialogue among experimentalists, remote sensing scientists, and modelers. Specific recommendations and proposed actions are described below.

Participants recommended developing and implementing a standardized, computerized ship-based ice observation protocol and creating an online center for summarizing ongoing field activities and collecting, disseminating, and archiving ice observations. This should be coordinated with the International Ice Charting Working Group and other relevant bodies.

The group also agreed that a long-duration field campaign studying first-year ice is needed. The campaign should integrate observations of the atmosphere, ice, and ocean, examining physical and biogeochemical properties and processes. The experimental design should be developed jointly by observationists and modelers. The Arctic Sea Ice Working Group should coordinate with other working groups involved in similar planning.

In addition, participants pointed to a need to integrate surface-based and airborne observations with modeling activities and remote sensing. Team members with modeling

backgrounds will help identify priorities and types of observations of greatest utility in understanding and predicting changes in the Arctic sea ice cover. Guidance from models will help inform strategies for observing campaigns and the design of observing networks. The overall goal is to improve sea ice predictions on seasonal to interannual time scales.

Finally, the working group agreed to build on the Arctic Sea Ice Outlook (<http://www.arcus.org/search/seaiceoutlook/>) to integrate all of the above activities. The Sea Ice Outlook will be used as a central clearinghouse for highlights from surface-based and remotely sensed observations. These observations can be assimilated into models. Predictions from different models will be intercompared and assessed.

Small teams have been assembled to undertake each of these tasks. The goal is to make significant progress within 1–3 years. Results from these efforts will be published in reports and journal articles. Those interested in participating in any of these activities should contact any of the authors of this meeting report.

Ralf Doescher, Sebastian Gerland, Alexander Makhstas, Jinping Zhao, and the meeting attendees contributed to this report.

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