

U.S. Arctic Observing Network (U.S. AON)  
Key Findings and Recommendations of the Consultative Phase, January – September 2017

**Executive Summary**

- NOAA and NSF agreed to lead an interagency Arctic Observing Network effort through IARPC more than 10 years ago following a National Academies of Science study on the topic;
- NOAA's commitment at the 2016 White House Arctic Science Ministerial was the impetus for U.S. AON's establishment and progress made over the last year;
- U.S. AON serves as an example to overseas partners to encourage them to establish similar efforts nationally fostering a collective international AON that is robust and effective;
- The IARPC Research Plan (Research Objective 9.1) establishes the U.S. AON, which serves as a means for identifying and fostering new opportunities;
- A multi-agency U.S. AON Board (DHS (USCG), DOD (ONR), DOE, DOI, EPA, HHS, NASA, NOAA, and NSF) spent the last year reviewing options for U.S. AON and developed recommendations on U.S. AON implementation. (The recommendations are provided at the end of this document.)

**U.S. AON Mission Statement**

The U.S. AON develops systematic approaches to maximize the societal benefits of Arctic observing across agencies. The U.S. AON Office, under the guidance of the U.S. AON Board, coordinates funders, subject matter experts, research networks, international partners, and stakeholders through two distinct, but inter-related, approaches: U.S. AON Tasks and an international AON Framework.

Current actions undertaken by the U.S. AON include:

- Advance the first U.S. AON Task focused on mobilizing agency observations in support of Sea Ice Forecasting;
- Scope additional U.S. AON Tasks including mobilizing agency observations in support of wildland fire hazard detection and impacts on health and the environment; and mobilize agency observations in support of Arctic "One Health";
- Coordinate with SAON to advance a vision for an international AON Framework, in which U.S. objectives are well-represented.

**Background on U.S. AON**

In this era of rapid and system-wide Arctic change, sustained and systematic observations of the Arctic are in greater demand than ever. Federal agencies along with the State of Alaska, academia, industrial, and international partners already contribute many important observations that advance our knowledge of the Arctic system and inform critical decision making in support of national security, the protection of life and property, and stewardship of the unique Arctic environment. Despite the many societal benefits that accrue from these observations, the remoteness and harsh climate leave the vast region with sparse observing assets. The recognition of the importance of Arctic observations, the challenge of their sustainment, their interconnectedness, and the necessity of mobilizing greater multinational integration is central to the rationale for an Arctic Observing Network (AON) and to the mission of the international Sustaining Arctic Observing Networks (SAON) process.

In 2006, a National Academies study entitled “Toward an Integrated Arctic Observing Network” recognized the following: (1) the Arctic is region of limited observations compared to low latitudes AND; (2) the interconnectedness of [Arctic Systems] together with the high amplitude of projected changes, make a compelling argument for [an AON] that delivers a coherent set of pan-Arctic, long-term, multidisciplinary observations. It was thus determined that “A key contribution of the AON will be to provide a framework within which existing programs can be linked and supplemented.” (NRC, 2006).

In 2007, under the joint leadership of NSF and NOAA, agencies of the Interagency Arctic Research Policy Committee (IARPC) detailed their contributions towards a notional pan-Arctic, multidisciplinary network in the interagency publication *Arctic Observing Network (AON): Toward a US Contribution to Pan-Arctic Observing*<sup>1</sup>. This publication provided a summary of ongoing and planned Federal Arctic observing activities along with a strategy for enhanced coordination and integration of these activities. That strategy included ten action items for the Federal agencies against which some progress has been made but much work remains, including the articulation of the framework called for by the 2006 study.

In 2016, as a result of the White House Arctic Science Ministerial and in response to a review of the SAON process<sup>2</sup> (both of which called for improved capacities for coordination), NOAA established a U.S. AON Office<sup>3</sup>, and U.S. Agencies established an interagency U.S. AON Board to formalize and advance U.S. efforts towards the international AON. These new organizational capacities and their evolving systematic approaches will hereafter be referred to as “U.S. AON”. U.S. AON is the first national organizing committee to be established following the SAON review, and it is hoped that it will serve as an example to other SAON partners.

From January to September of 2017, NOAA chaired a consultative process to understand how to formally establish U.S. AON as a vehicle that could identify and advance such systematic approaches in support of domestic and international challenges. The results of this consultative process are summarized in this document. They constitute important recommendations through which IARPC agencies can build upon past progress, establish a structured means for leveraging current observing activities (U.S. AON Tasks), and foster a shared vision for the future (AON Framework). A foundational recommendation was the recognition that U.S. AON is and has always been exceptionally well-aligned with the mandate of IARPC and should continue its work directly and explicitly under the IARPC.

### **Delivering on the U.S. AON**

The U.S. AON provides a sustained, systematic, and facilitated interface for funders, subject matter experts, research networks, international partners, and stakeholders through which U.S. observing

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<sup>1</sup> *Arctic Research of the United States* was published by the National Science Foundation on behalf of the IARPC.

<sup>2</sup> The leading recommendation of the SAON process review was the establishment of ‘national committees’ to assist with the implementation of a pan-Arctic observing network; full review at [http://www.arcticobserving.org/images/pdf/Review/SAON-External-Review-Final-Report\\_August-29-2016.pdf](http://www.arcticobserving.org/images/pdf/Review/SAON-External-Review-Final-Report_August-29-2016.pdf).

<sup>3</sup>

<https://obamawhitehouse.archives.gov/the-press-office/2016/09/28/fact-sheet-united-states-hosts-first-ever-arctic-science-ministerial>.

systems can be integrated and advanced to maximize societal benefit. The U.S. AON Board recommends coordinating the U.S. community through two distinct, but inter-related, opportunities: U.S. AON Tasks and an international AON Framework.

U.S. AON Tasks are priority areas that can be led by single agencies or multiple partners that catalyze agency efforts around critical tasks, like mobilizing observations towards improved sea ice forecasts. The purpose of Tasks is to maximize the societal benefit of existing observations through the development of enhanced products and services, guided by modeling and user communities. Tasks can be initiated directly by the research community or be driven by the interests of individual agencies; many will draw from and build upon the 16 observing-intensive research objectives already identified in the Plan. The U.S. AON Office, in coordination with the board, fosters Tasks to maximize their impact and link them within the broader AON Framework.

An AON Framework is a multi-national approach to establishing a vision for an international AON, in which U.S. objectives are well-represented. U.S. AON should mobilize U.S. leadership and expertise towards this challenge in coordination with SAON and other national organizing committees. It should seek specific vehicles, like international expert assessment teams, to build upon the results of the 2017 *International Arctic Observations Assessment Framework* (societal benefit framework) in order to deliver an observing system roadmap with maximized benefits.

### **U.S. AON and IARPC Observing**

As with the previous IARPC 5-year plan 2013-2017, the current Arctic Research Plan 2017-2021 (hereafter the Plan) has a research objective to facilitate AON under the Environmental Intelligence goal. It is: *Enhance multi-agency and outside collaborators participation in new and existing activities to improve best practices, coordination, and synthesis of Arctic observations toward a fully integrated interagency U.S. Arctic Observing Network (U.S. AON)*. The agencies responsible for this research objective are DHS (USCG), DOD (ONR), DOE, NASA, NOAA, and NSF. They, plus DOI, HHS, and EPA, comprise the Federal agencies that now participate in U.S. AON Board.

IARPC Collaborations and its teams have been the primary means through which progress is made on the research objectives in the plan. The IARPC Observing Sub-Team (AOSST) works towards achieving Research Objective 9.1 through its monthly meetings, while also including diverse topics related to the advancement of Arctic observing. Membership and meetings of each collaboration team and sub-team are open to U.S. Federal Government employees, and, crucially, researchers, and other groups outside the Federal government. The AOSST provides a broad, revolving, and inclusive platform for community engagement on Arctic Observing. However, sustaining and propelling progress on U.S. AON Tasks and an international AON Framework requires additional organizational capacity. U.S. AON provides this capacity.

## Summary Findings and Recommendations for U.S. AON

The findings of the consultative phase include the following recommendations. U.S. AON should:

- Proceed under the IARPC, which has a clear Congressional mandate to coordinate Arctic research;
- Be led through a rotating chairmanship of NOAA, NASA, and NSF. NOAA will initially move forward as the chair with NASA and NSF serving as vice-chairs;
- Engage the participation of each IARPC agency, where relevant, in its work, including the work of the U.S. AON Board;
- Define a Task-based approach (U.S. AON Tasks) where priority, deliverable-oriented efforts can be identified and led by individual agencies, in strategic partnerships with other agencies;
- Explore a Framework-based approach (AON Framework), in coordination with SAON, building upon the results of the 2017 *International Arctic observations Assessment Framework*<sup>4</sup>.
- Use IARPC Collaborations and its observing team (AOSST) as a key means of mobilizing collaboration around U.S. Tasks and engaging participation in an AON Framework;
- Align U.S. AON Tasks and the AON framework with agency mandates and existing Federal (e.g. U.S. GEO) and international partner activities (e.g. SAON, GCOS, GEO-CRI);
- Revisit the recommendations of the 2006 Academies study and the action items of the 2007 IARPC report to assess where further progress can be made;
- Use both the U.S. AON Board and the AOSST as a mean to mobilize U.S. participation and advance coordination with SAON and other relevant international planning bodies.

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<sup>4</sup> Report available at:

<https://www.arcticobserving.org/images/pdf/misc/STPI-SAON-International-Arctic-Observations-Framework-Report-2017.pdf>