

Pacific Arctic Group: Arctic Observing Summit follow-up



Hajo Eicken

International Arctic Research Center

University of Alaska Fairbanks

Fairbanks, AK 99775-7340, USA

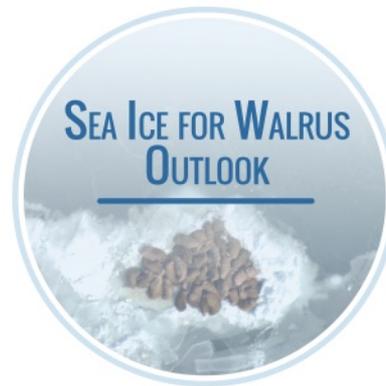
e-mail: heicken@alaska.edu

SIWO Alaska

www.arcus.org/search-program/siwo

The Sea Ice for Walrus Outlook (SIWO) is a resource for Alaska Native subsistence hunters, coastal communities, and others interested in sea ice and walrus. The SIWO provides weekly reports from April through June with information on weather and sea ice conditions relevant to walrus in the northern Bering Sea and southern Chukchi Sea regions of Alaska.

The Outlooks are produced with information on weather and sea ice conditions provided by the National Weather Service - Alaska Region and Alaska Native sea ice experts. SIWO partners include the Eskimo Walrus Commission, the Arctic Research Consortium of the U.S. (ARCUS), and scientists at the National Weather Service and the University of Alaska Fairbanks. Funding for SIWO is provided to ARCUS by the National Science Foundation's Division of Arctic Sciences (PLR-1304316). SIWO is considered a contribution to the Study of Environmental Arctic Change (SEARCH).

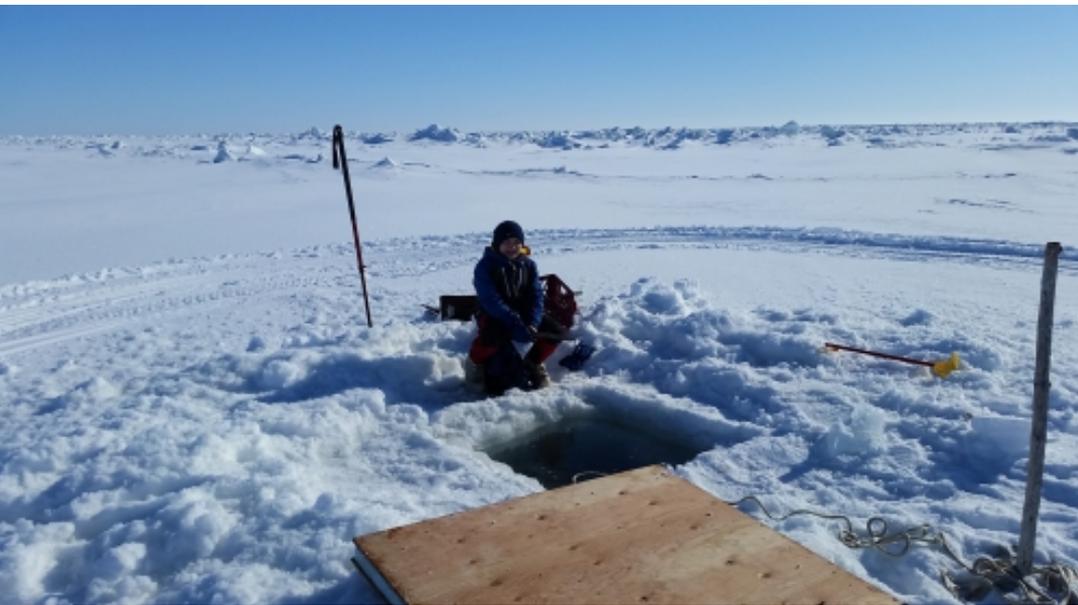


*Northern Bering & southern
Chukchi Sea:*

- *Weather & ice information*
- *Community expert observations*
- *Use of ice & marine environment*



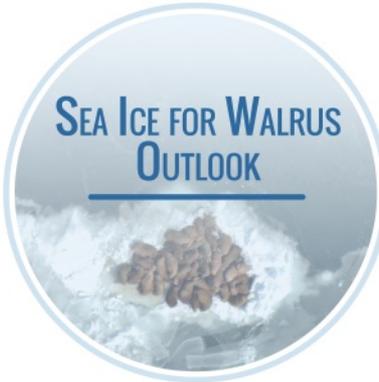
Eskimo Walrus Commission
"To protect the pacific walrus population."



B. Johnson, Nome, AK:
The ice is as deep as a standard gas powered ice auger almost 4' thick. I believe the ice this year will be excellent for the spring hunting. We have had a "normal" winter this year and there hasn't been extensive movement of the ice through the winter like the past couple of winters.

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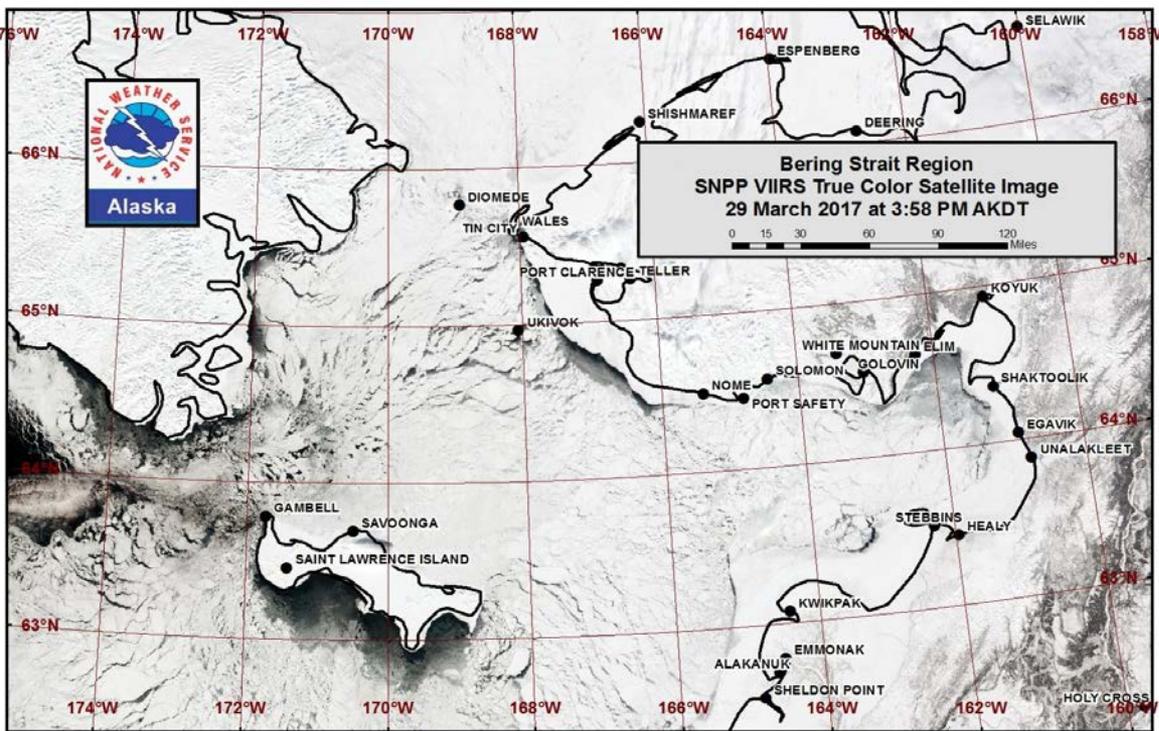


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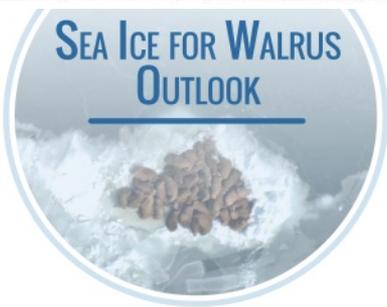
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National Weather Service, Ice Desk Anchorage, AK: Sea ice will continue to be very closely packed through April 4th near Wales to Shishmaref coast, Diomede, and the north side of St. Lawrence Island, while the polynya on the south side of St. Lawrence Island will likely continue to expand through Wednesday, April 4th. The polynya to the west of Nome will likely expand southward, and possibly eastward toward Nome as well.

information on weather and sea ice conditions relevant to walrus in the northern Bering Sea and southern Chukchi Sea regions of Alaska.

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Arctic Observing Summit: Goals



- Provide **community-driven, science-based** guidance for the **design, implementation, coordination** and **sustained** long-term (decades) **operation** of an international network of Arctic observing systems that serves a wide spectrum of needs
- Create a **forum** for coordination and exchange between **academia, government agencies, local communities, industry, non-governmental organizations and other Arctic stakeholders** involved in or in need of long-term observations

PAG & AOS



- How can PAG activities benefit from involvement with AOS and vice versa?
- PAG has made great strides in communicating & planning of research cruises, identifying gaps, establishment of repeat stations (DBO) and serving as a forum for exchange
- Pacific Arctic sector is a region of rapid change & rapidly evolving issues & interests that cut across disciplinary foci

Products & Outcomes



- Arctic Observing **system definition & implementation document**
- **Findings and recommendations** aimed at policy- and decision makers including goals, implementation pathways, points of engagement
- Comprehensive report for community use, incl. 6 thematic **synthesis documents**
- **Peer-reviewed publications** from white papers and summit findings; >80 white papers & special issue of *Arctic* in process
- Response to AOS recommendations - coordination, opportunities, **proposals, policy development**

Navigation

[Home](#)[About](#)[Contact Us](#)[Credits and Links](#)

Home

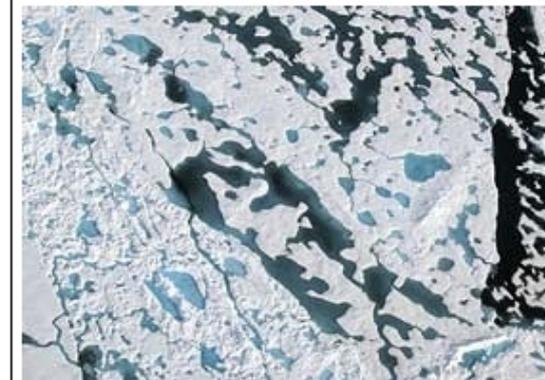
Ice Watch is an international, collaborative program to coordinate Arctic-wide visual sea ice observations collected from ships operating in ice-covered seas of the northern hemisphere, with resources to:

- **record** ship based sea ice observations using the Arctic Shipborne Sea Ice Standardization Tool (ASSIST) software
- **access** data collected on current cruises using ASSIST
- **archive and retrieve** past observations

Download data: You don't need an account to [download data](#). The data archive is hosted by the Geographic Information Network of Alaska (GINA).

ASSIST software has been developed to help you **collect and archive data**. You will need a Google account to [register](#), log in, download ASSIST, and upload your data. Once you're logged in, you can:

1. [Download ASSIST](#)
2. Download [observation sheets and codes](#)
3. [Create and manage cruise datasets](#)
4. Upload and manage observations



Melt ponds pattern a ridged and hummocked multiyear ice floe surrounded by decaying ice. July 2011, 1,000' altitude during helicopter reconnaissance. (Alice Orlich)

About the Arctic Shipborne Sea Ice Standardization Tool (ASSIST)

ASSIST is a multi-media data collection tool that supports standardization of

Products & Outcomes



- Findings and recommendations AOS 2016, Recommendation #4:

Coordinate the implementation of a pan-Arctic observing system with regional and global observing initiatives, and organize efforts in securing resources for its sustained operation through the leadership of the Sustaining Arctic Observing Networks (SAON) initiative.

[SAON as an implementing body]

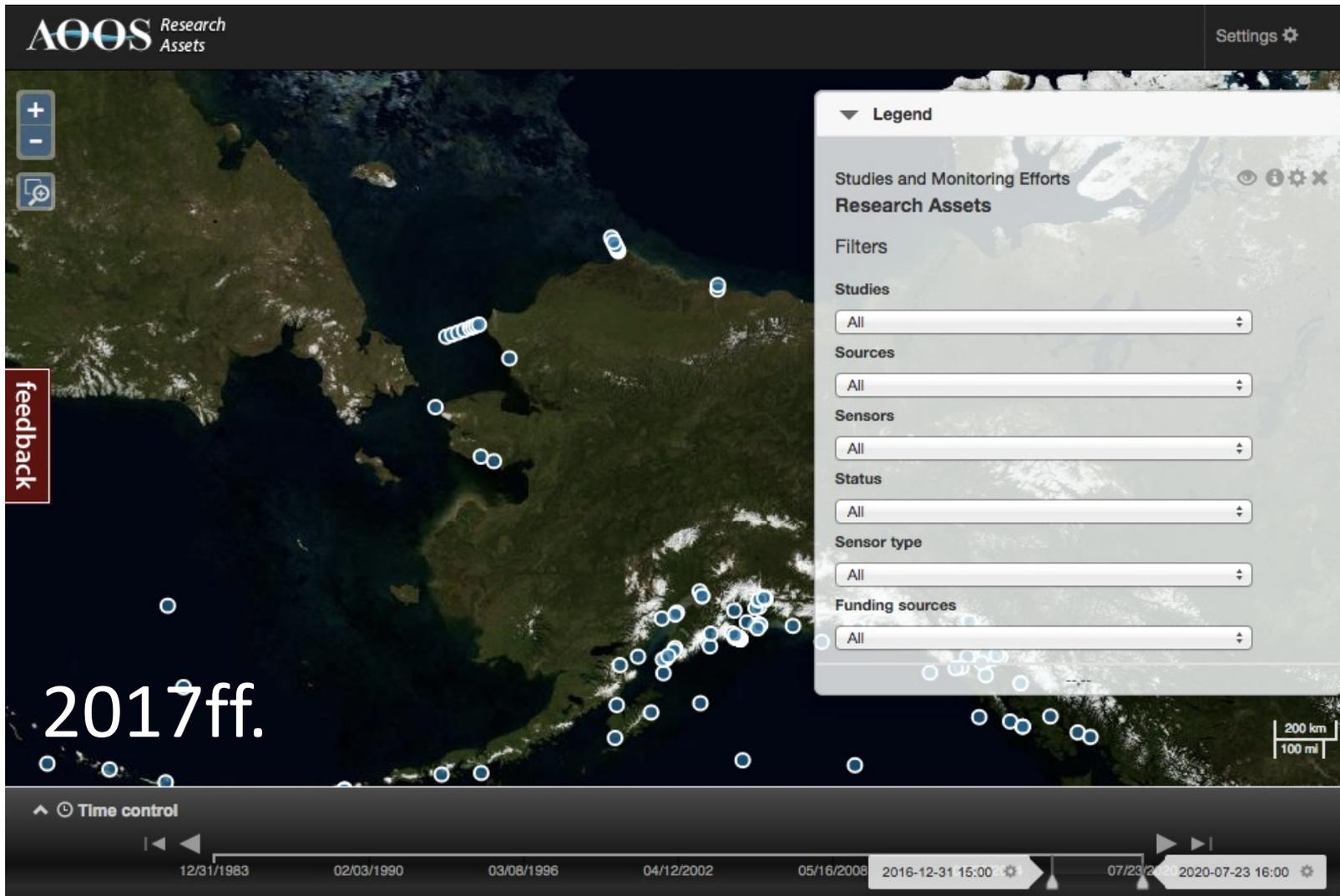
The AOS Process & PAG



- Next AOS in Davos, Switzerland - POLAR 2018
- Opportunity for taking next step in further coordination & advance planning of sustained observations in Pacific Arctic region
- AOS Workshop & session theme on OSSEs, model- and data-based guidance on measurement sites & sampling frequencies?
- *Observing asset coordination, tracking & deployment planning*

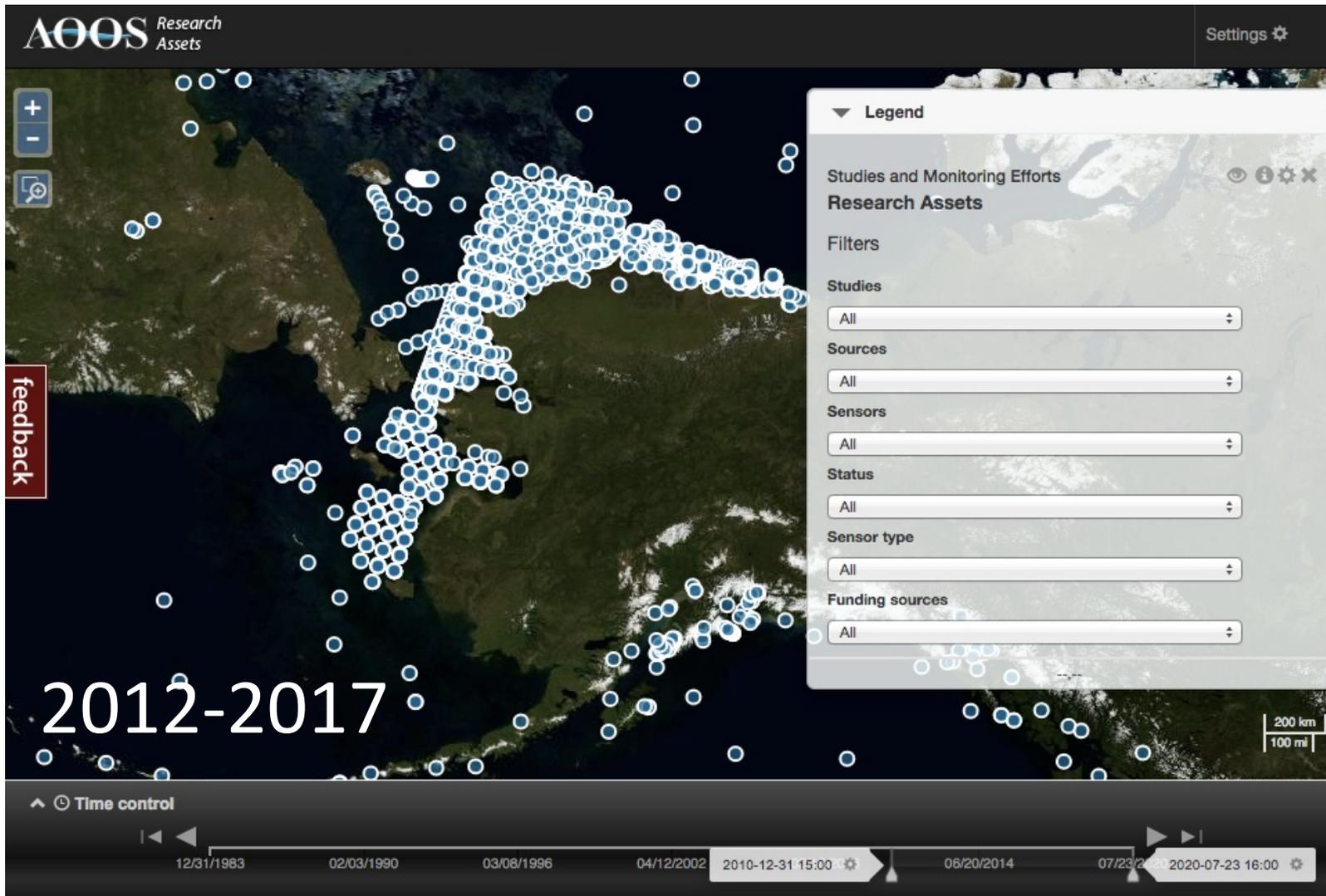
Alaska Ocean Observing System (AOOS) – Arctic Portal – Research Assets

<http://portal.aos.org/research-assets.php>



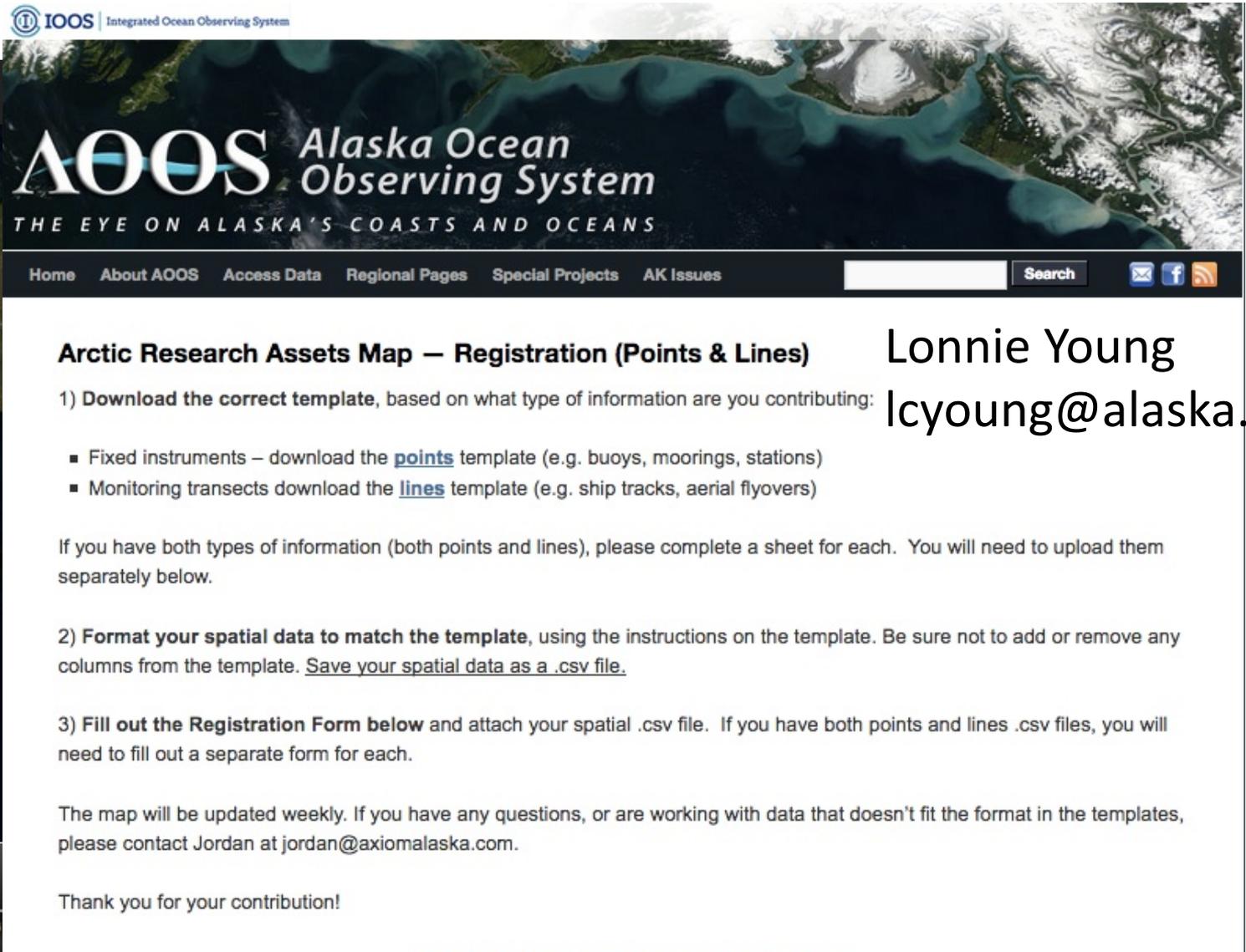
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AOOS – Arctic Portal – Research Assets Data Entry Form

<http://www.aos.org/arctic-assets-points-lines-instructions/>



The screenshot shows the AOOS website interface. At the top left is the AOOS logo with the text "Research Assets". The main header features the AOOS logo and the text "Alaska Ocean Observing System" and "THE EYE ON ALASKA'S COASTS AND OCEANS". Below the header is a navigation menu with links: Home, About AOOS, Access Data, Regional Pages, Special Projects, and AK Issues. A search bar and social media icons (email, Facebook, RSS) are also present. The main content area is titled "Arctic Research Assets Map – Registration (Points & Lines)". It contains three numbered steps: 1) Download the correct template, based on what type of information are you contributing: Fixed instruments – download the points template (e.g. buoys, moorings, stations) and Monitoring transects download the lines template (e.g. ship tracks, aerial flyovers). 2) Format your spatial data to match the template, using the instructions on the template. Be sure not to add or remove any columns from the template. Save your spatial data as a .csv file. 3) Fill out the Registration Form below and attach your spatial .csv file. If you have both points and lines .csv files, you will need to fill out a separate form for each. Below the steps, there is a note: "The map will be updated weekly. If you have any questions, or are working with data that doesn't fit the format in the templates, please contact Jordan at jordan@axiomalaska.com." At the bottom of the main content area, it says "Thank you for your contribution!".

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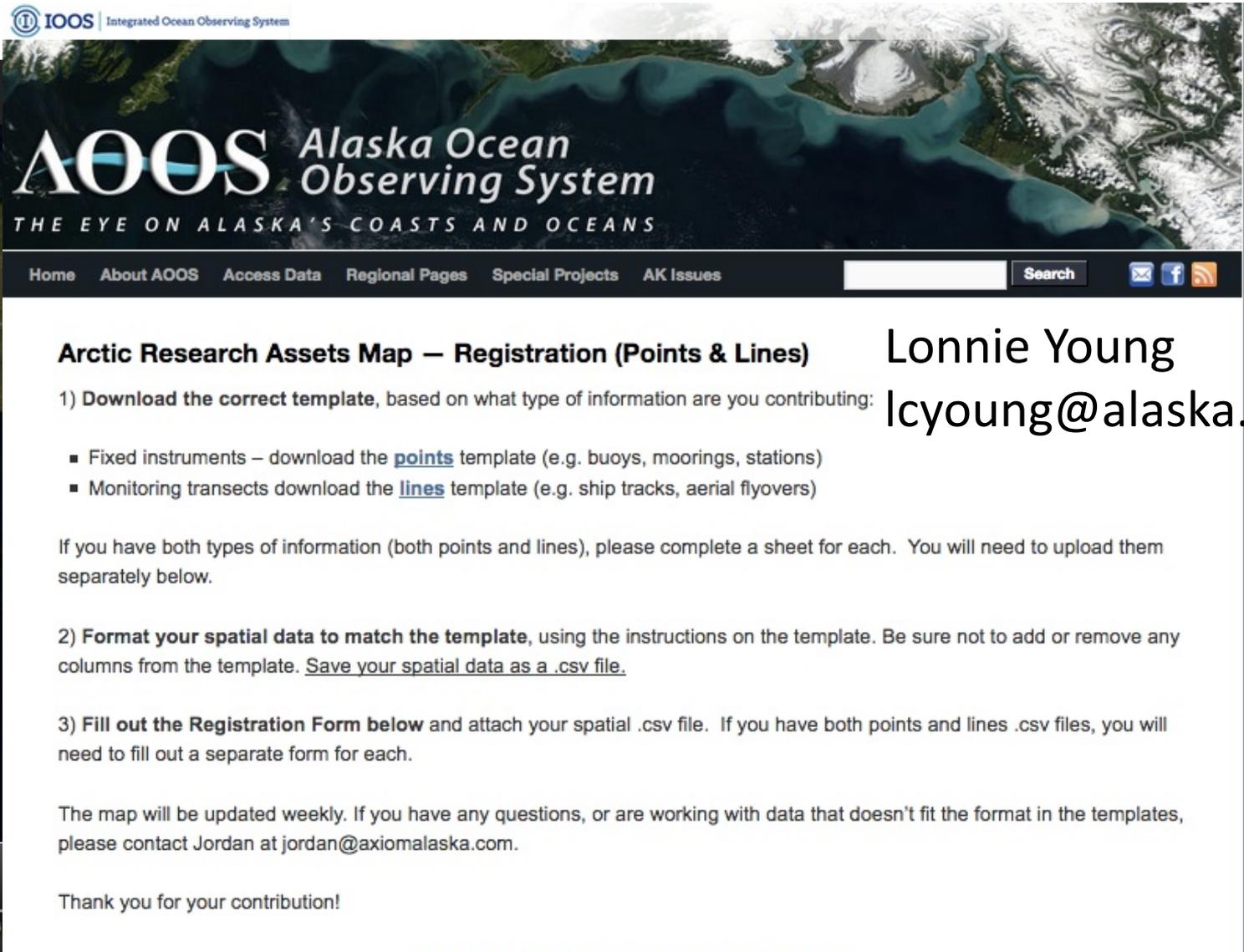
Thank you for your contribution!

Lonnie Young
lcyoung@alaska.edu

[Proceed to Points & Lines Registration Form](#)

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Thank you for your contribution!

Lonnie Young
lcyoung@alaska.edu

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TABLE I. OBSERVING PROGRAMS IN U.S. MARITIME ARCTIC BY ORGANIZATION

Fraction of organizations [%]^a		
<i>Category</i>	<i>2010/11</i>	<i>2014/15</i>
U.S. Federal	16	23
State of Alaska (ex. academic)	6	3
Local Government/Organization	3	3
U.S. Academic	31	37
Industry	16	7
Foreign Nations	28	27

^a Data from Alaska Ocean Observing System and National Oceanographic Data Center; total number of organizations – 2010/11: 31; 2014/15: 30

TABLE II. NUMBER OF RESEARCH PROGRAMS AND ASSETS ACQUIRING OBSERVATIONAL DATA IN U.S. MARITIME ARCTIC

<i>Year</i>	<i>Number of programs^b</i>		<i>Number of assets^b</i>
	<i>Multi-year programs</i>	<i>Total programs</i>	
2010	32	37	307
2011	35	44	898
2012	40	51	1816
2013	36	41	1444
2014	29	35	824
2015	22	32	442

^b Data from Alaska Ocean Observing System

Sustained observations in U.S. maritime Arctic (PAG region)

- Diversity of observation programs & entities:
 - 1/3 academia; >1/4 foreign countries; 1/4 federal agencies; <1/10 industry; <1/10 local agencies

• Broad base enhances robustness, relevance & potential for multiple benefits & actionable science

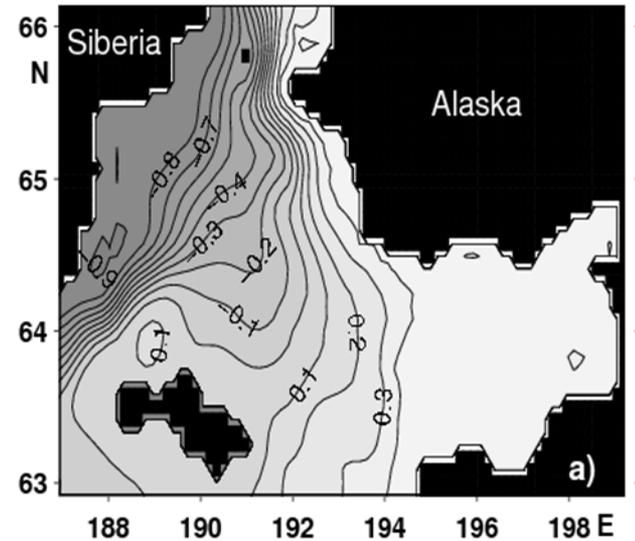
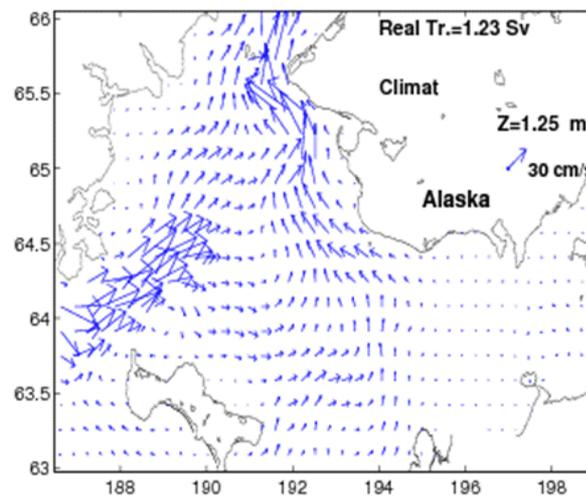
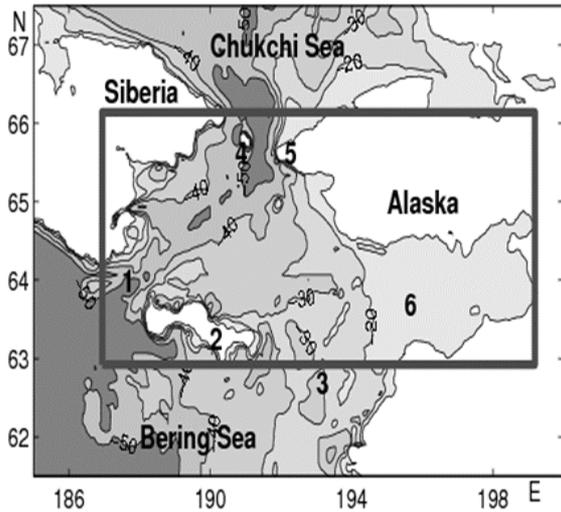
- Different goals & MOs pose challenges for integration

The AOS Process & PAG



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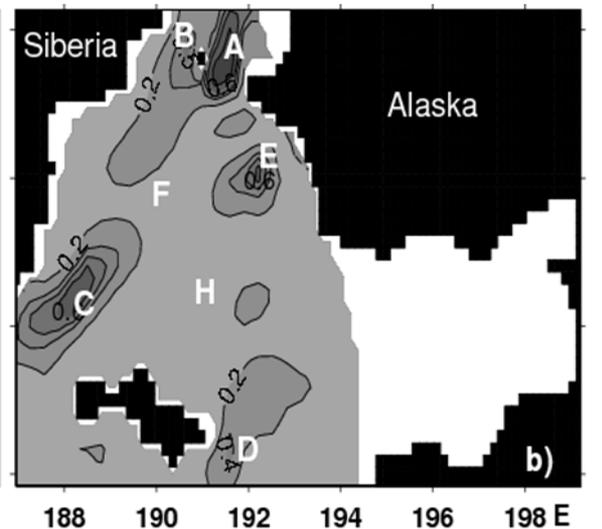
Optimization of the mooring observations in the Bering Strait: Adjoint Sensitivity analysis (Panteleev, Nechaev et al.)



Optimized surface velocity and stream function

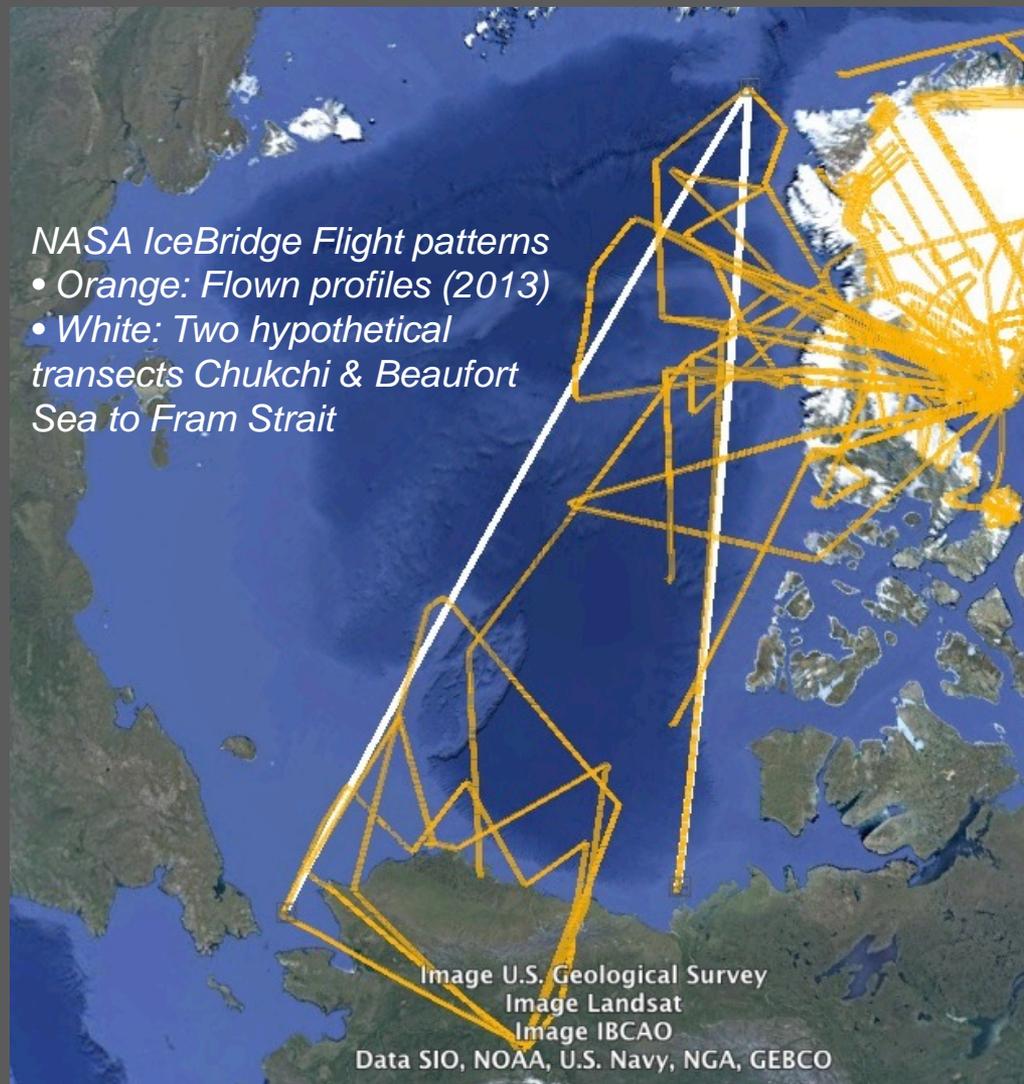


The adjoint sensitivity map of the Bering Strait transport to velocity observations reveals regions of high correlation between the velocity data and total transport through the Bering Strait. (slide courtesy of Dmitri Nechaev)

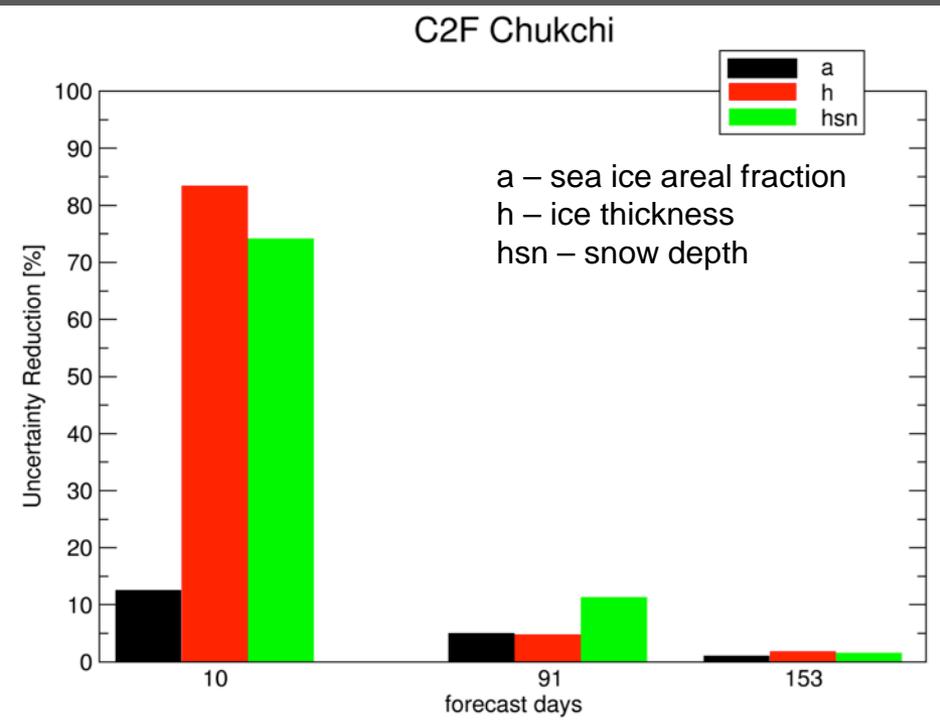


Observations for seasonal predictions: SIPN – EU ACCESS project collaboration

- Guidance on airborne thickness surveys to reduce uncertainty in prediction of ice area and volume weeks to months out
- Based on coupled ice-ocean model run within variational data assimilation system; measurement errors & uncertainties specified



Reduction in uncertainty of predicted target variables on synoptic to seasonal scale



- Uncertainty in forcing data, model initial state & physical process parameterization → uncertainty & errors of predicted target variables
- Reduction of uncertainty in target variables in Chukchi Sea through assimilation of ice thickness transect from Chukchi Sea to Fram Strait
- Even transects outside of target region can significantly reduce target variable uncertainty

Kaminski et al., TCD (2015), doi:10.5194/tcd-9-1735-2015

The AOS Process & PAG



- AOS Workshop & session theme on OSSEs, model- and data-based guidance on measurement sites & sampling frequencies?
- Jointly explore target quantities, uncertainty tolerances, and synthesis of different assessment approaches in workshop setting
- Embed conversations in ongoing DBO, PACEO and PAG observations and coordination