

Welcome

ARCUS Arctic Research Seminar Series

“The US Arctic Observing Network – Mobilizing Interagency Observing Actions in an Era of Rapid Change”



21 July 2017

Presented by Sandra Starkweather
NOAA/U.S. Arctic Observing Network

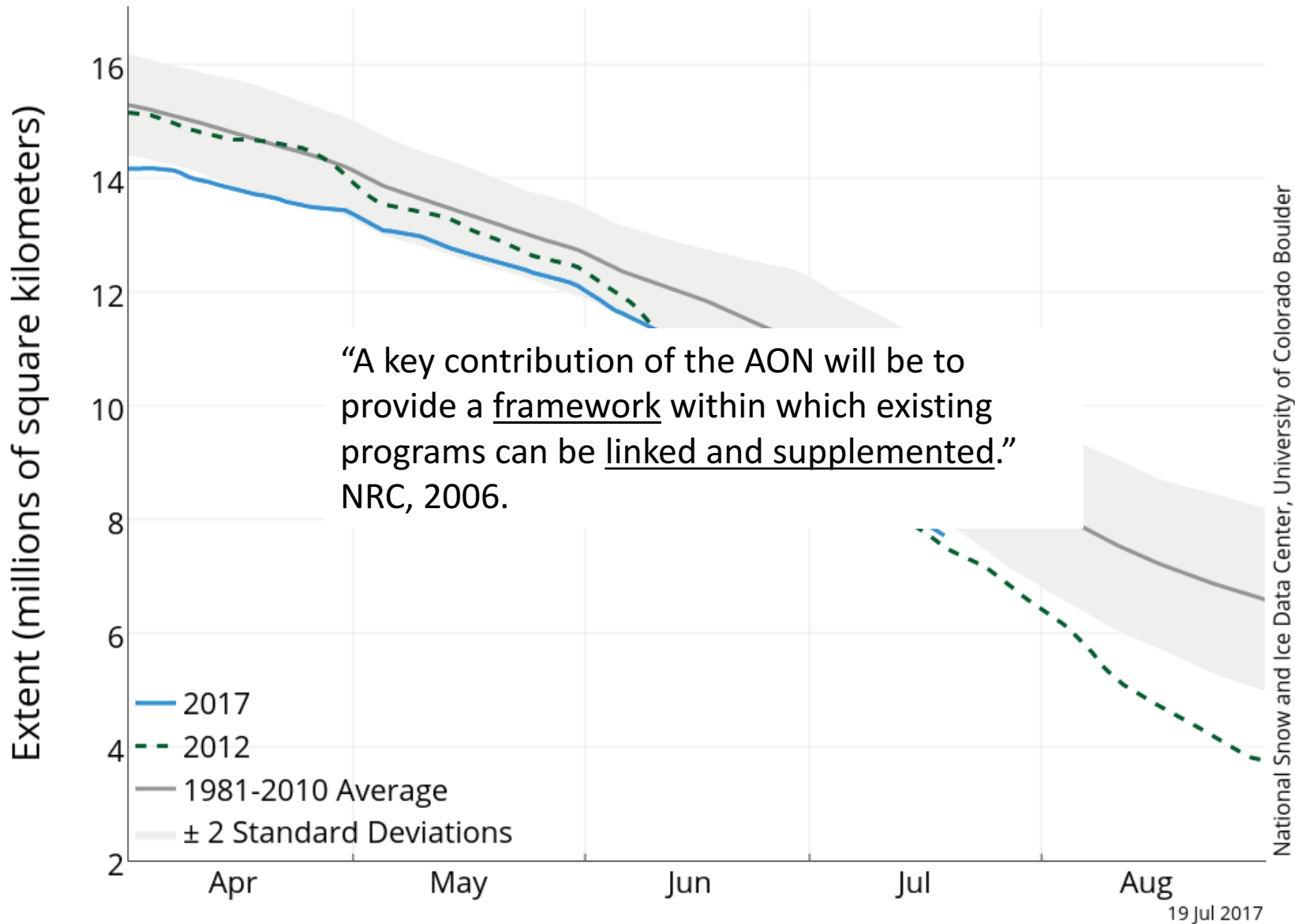
@metaarctic



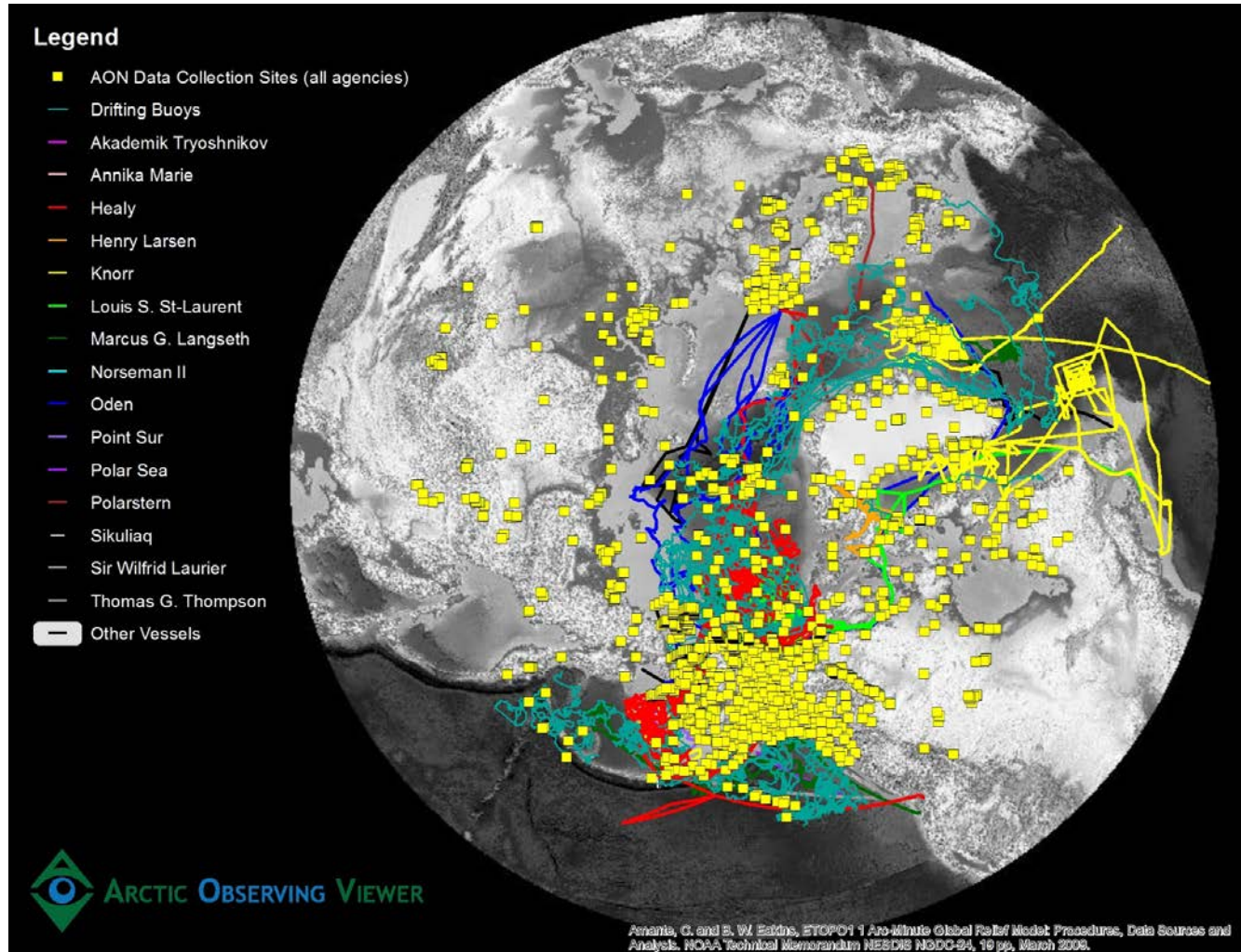
#arcuswebinars

Arctic Sea Ice Extent

(Area of ocean with at least 15% sea ice)

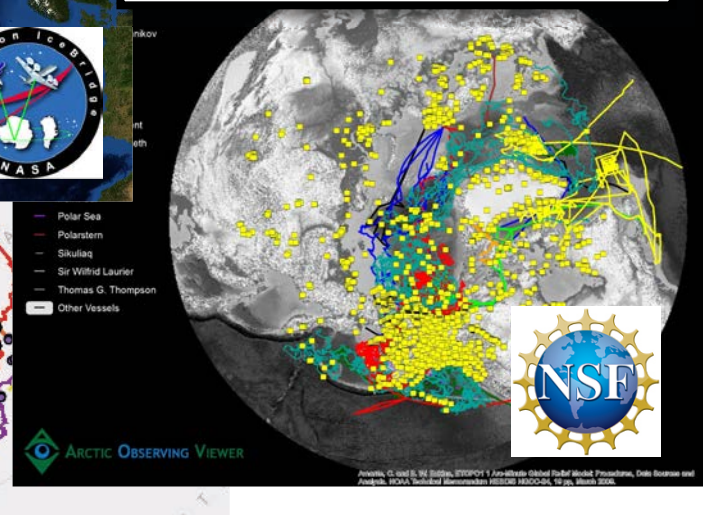
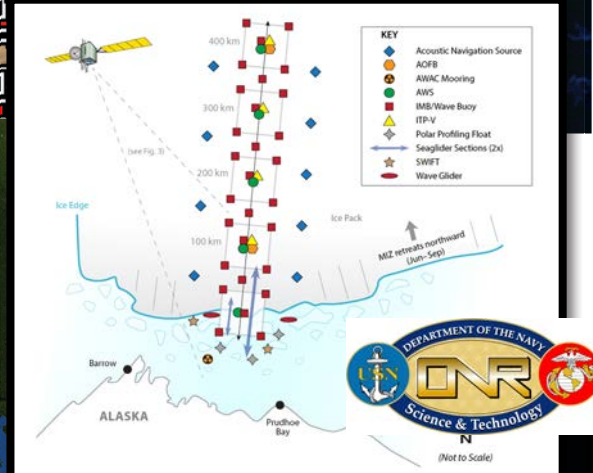
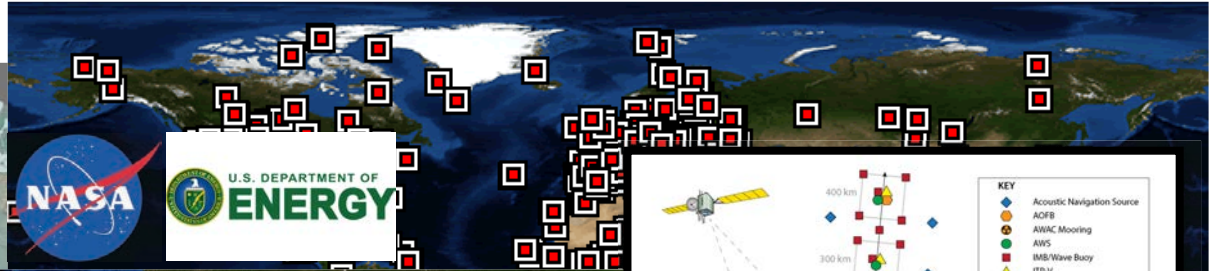
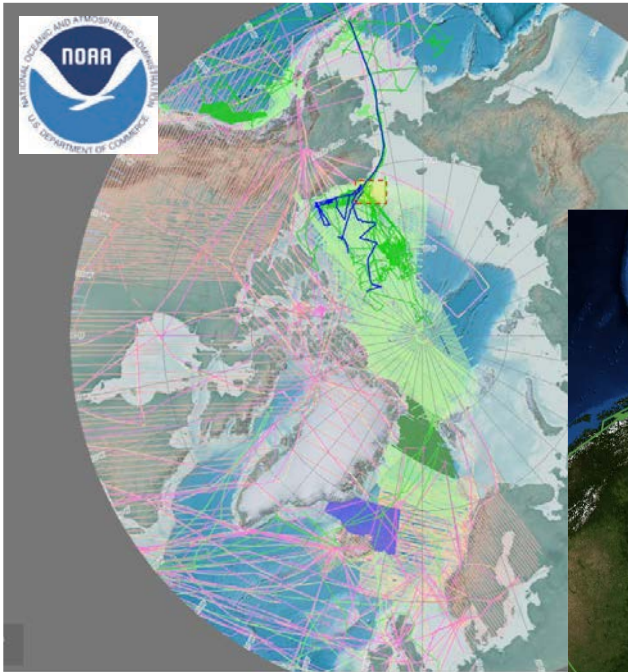


US Arctic Observing



<http://www.arcticobservingviewer.org/>

US Arctic Observing Network



What would an **interagency** US AON make possible?

- Create **interoperability** across independent efforts through harmonizing, blending and integration;
- Address **complexity** across systems that don't care about agency mandates;
- Engage a **diversity** of stakeholders and **use** case scenarios to maximize the **value** of each observation;
- Establish vision for future observing and improve **international coordination**.

US AON

Backward Problem: Forward Problem

US
AON
Tasks



AON
Frame
work

Work across
existing
networks
and
programs

Design the
network of
the future

How is US AON organized?

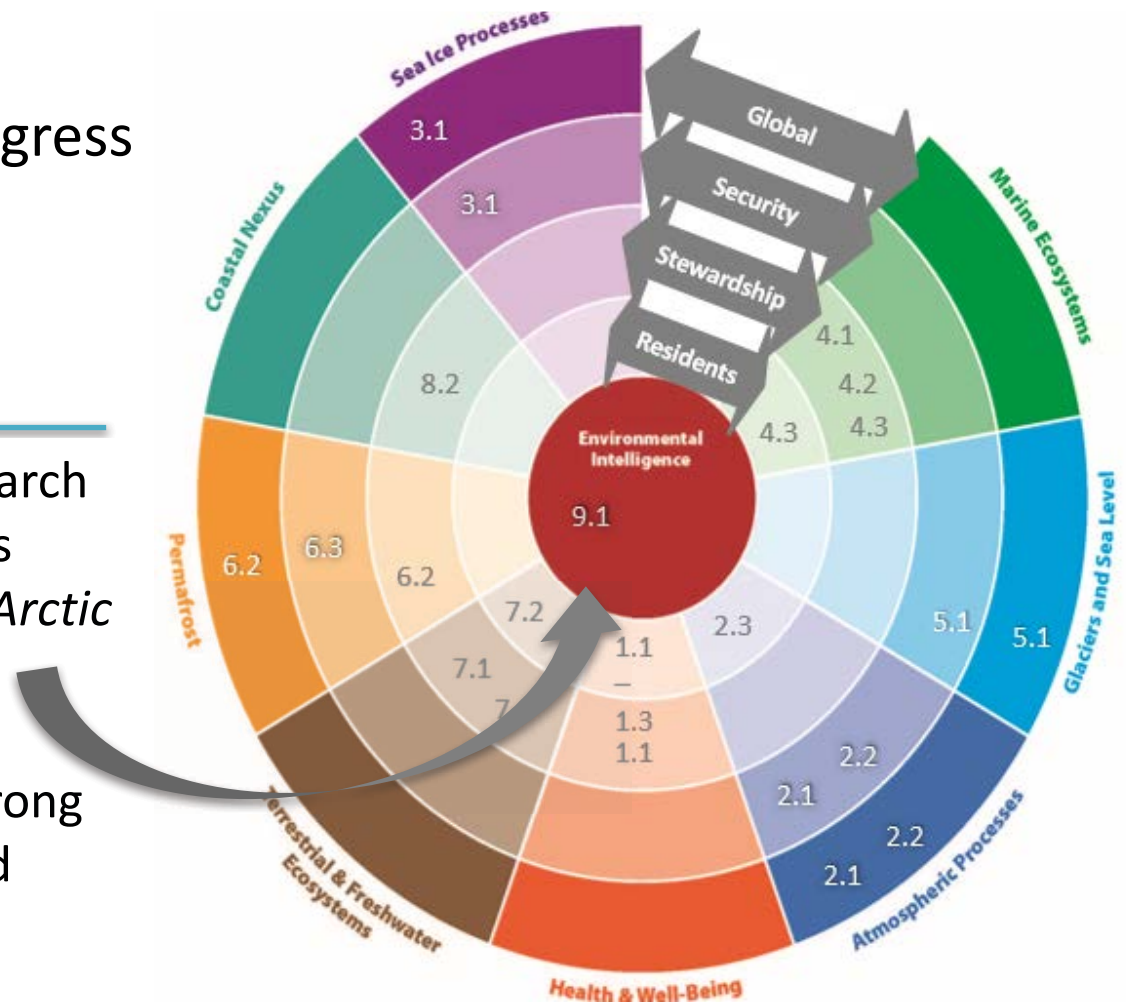
US AON and IARPC

Interagency Arctic Research Policy Committee | Executive Director, Martin Jeffries
NSF (Chair), USDA, DOC, DOD, DOE, HHS, DHS, DOI, DOS, DOT, EPA, MMC, NASA, OMB, OSTP, SI

IARPC was created by Congress with the mandate to coordinate Federal Arctic Research.

IARPC Produces the Arctic Research Plan to guide these efforts. This diagram depicts the 9 Goals of *Arctic Research Plan 2017-2021*

16 Research Objectives have strong ties to sustained and networked Arctic observations.



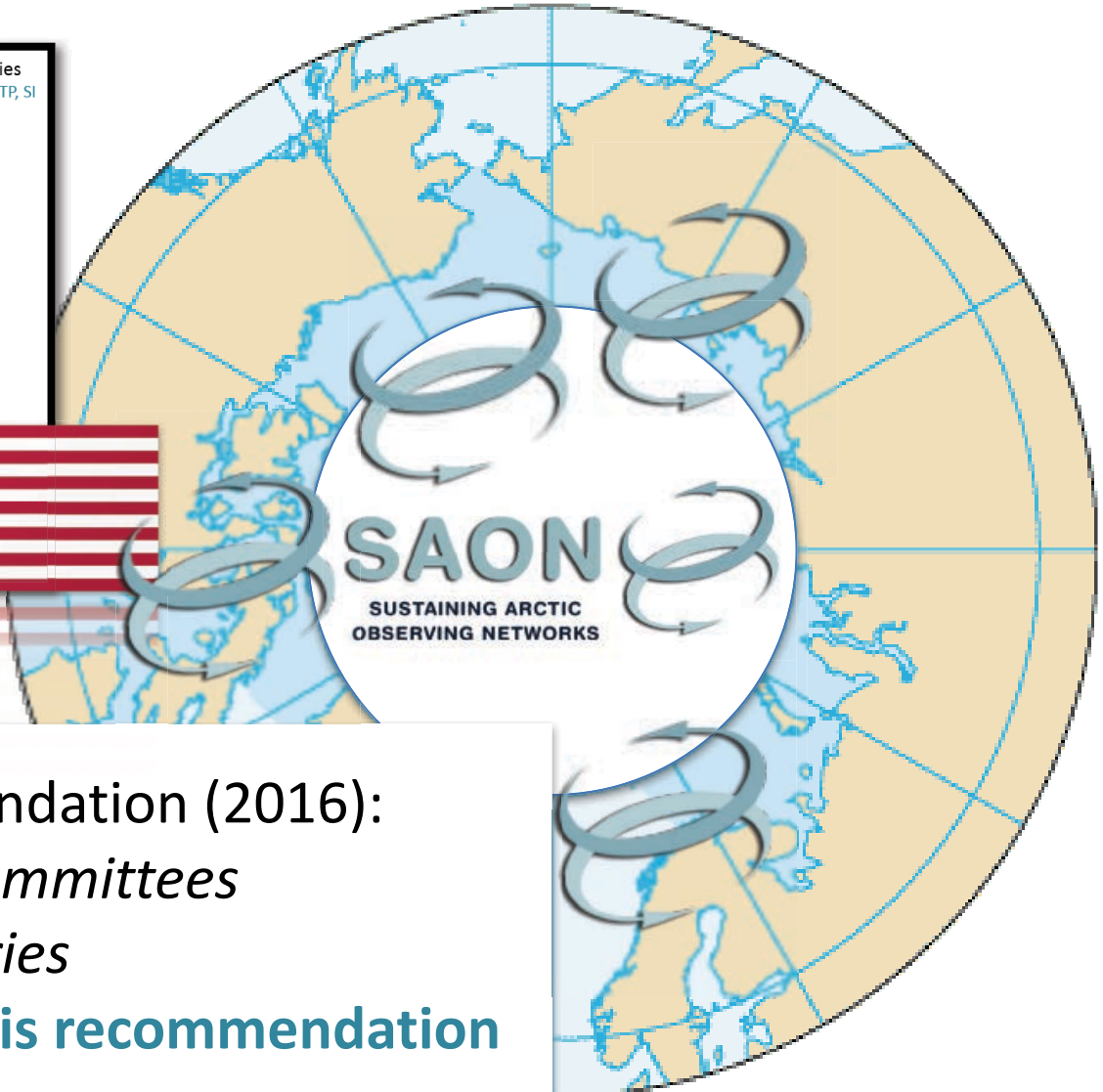
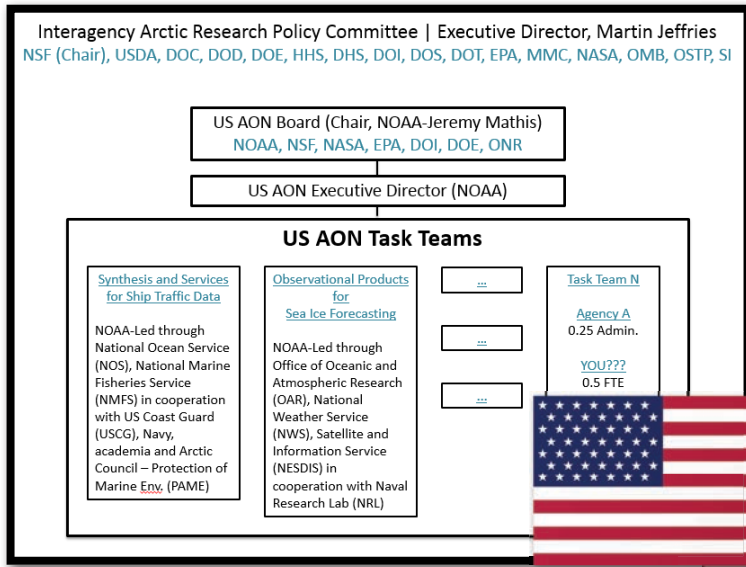
US AON *is*



Sustained Observing

- US AON Board [NOAA, NSF, NASA, EPA, DOI, DOE, ONR] is convening to provide guidance on US AON Tasks and to advance a strategic AON Framework;
- US AON Exec. Dir. is directly tasked with fostering US AON Tasks and advancing AON Framework in coordination with Agency Researchers and Outside Partners;
- US AON works through IARPC Observing Team (AOSST) to identify opportunities and to communicate progress.

SAON: US AON Relationship



#1 SAON Review Recommendation (2016):
*Establish National SAON Committees
in all SAON Member Countries*

US AON is a response to this recommendation

US AON

Backward Problem



Work across
existing
networks
and
programs

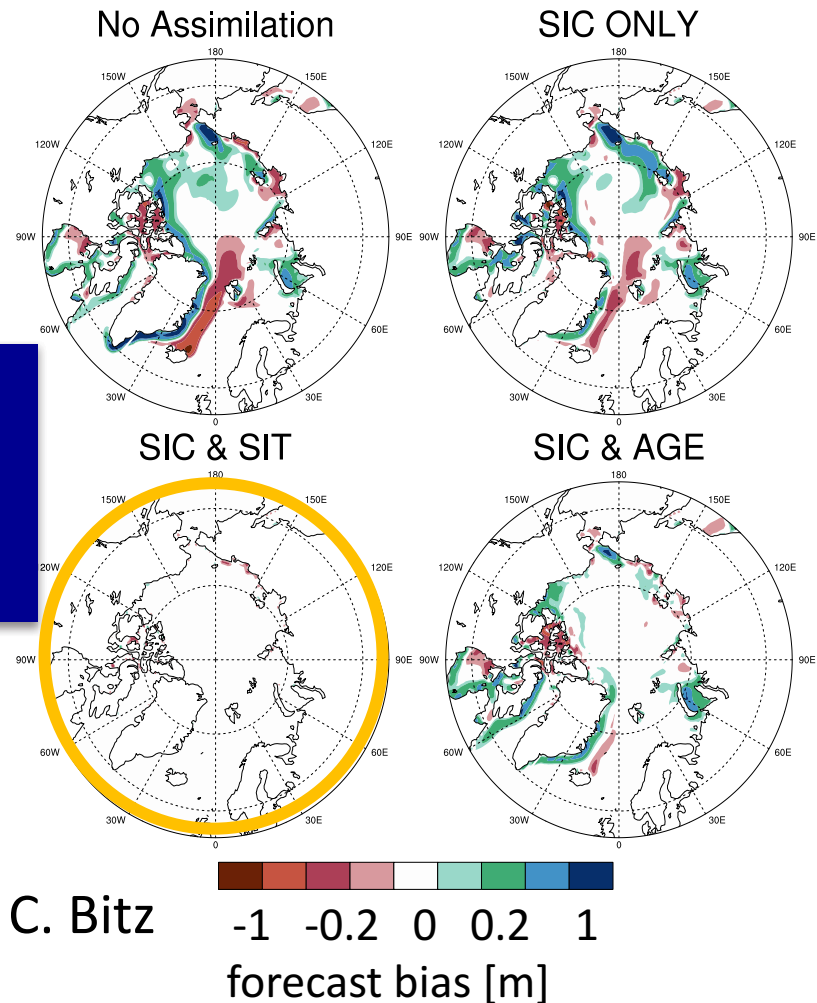


- Add resources and direction to recommended efforts poised to deliver valuable products & services;
- Advance utilization of design-oriented analysis and coordinate guidance from modeling groups;
- Support data & information discovery and interoperability *across agencies*.

US AON Task: Towards an Operational, Multi-Sensor Sea Ice Thickness (SIT) Product

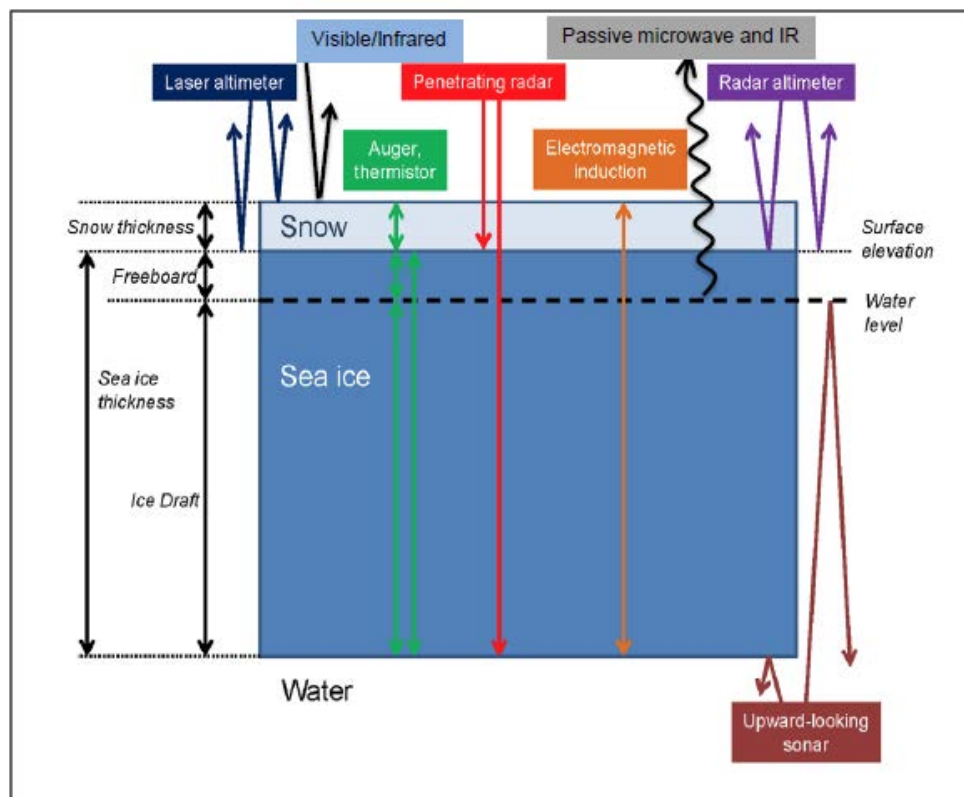
- Need: An operational sea ice thickness product for forecast models has been identified as a *critical advancement for sea ice forecasting*.

Assimilating SIT
virtually
eliminates the
forecast bias



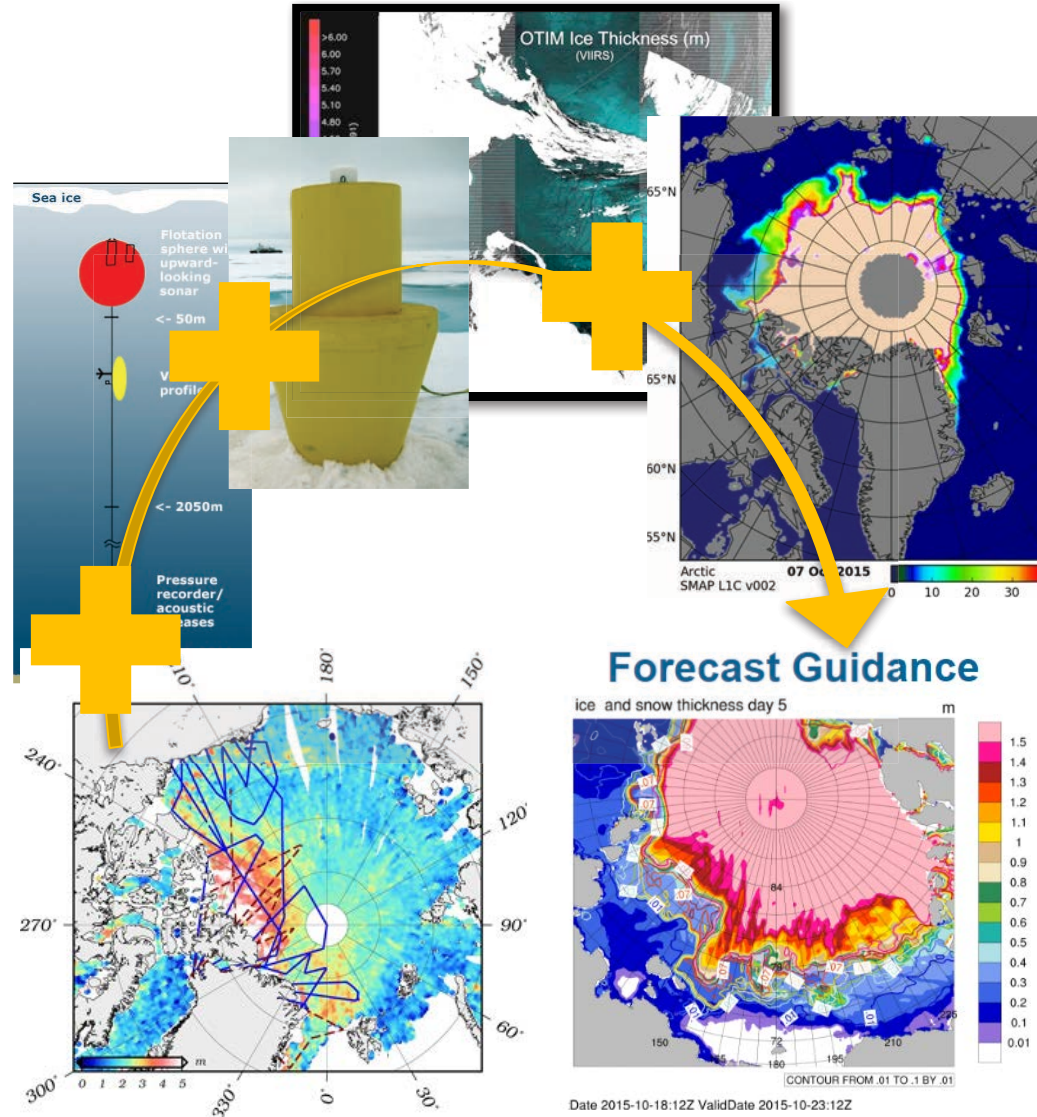
US AON Task: Towards an Operational, Multi-Sensor Sea Ice Thickness (SIT) Product

- Need: An operational sea ice thickness product for forecast models has been identified as a **critical advancement for sea ice forecasting**.
- Challenge: There is currently **no single observing technology** that provides comprehensive, real-time sea ice thickness;



US AON Task: Towards an Operational, Multi-Sensor Sea Ice Thickness (SIT) Product

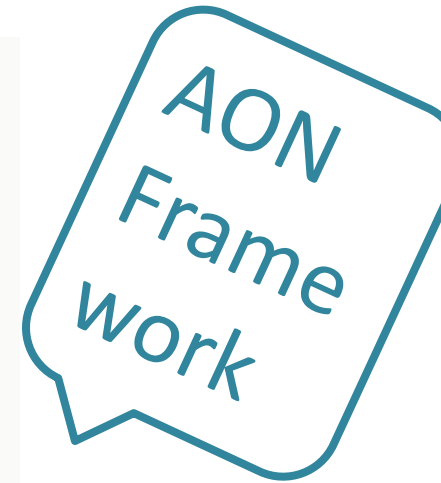
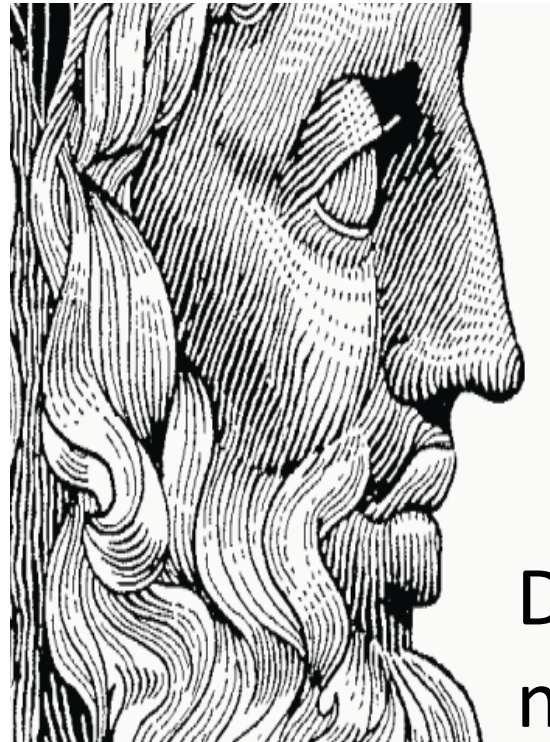
- Need: An operational sea ice thickness product for forecast models has been identified as a *critical advancement for sea ice forecasting*.
- Challenge: There is currently **no single observing technology** that provides comprehensive, real-time sea ice thickness;
- US AON Task Approach: Assemble an **interdisciplinary task team** comprised of experts from each technology, model developers and operational ice centers to develop **fit-for purpose, multi-sensor product(s)**.



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Forward Problem

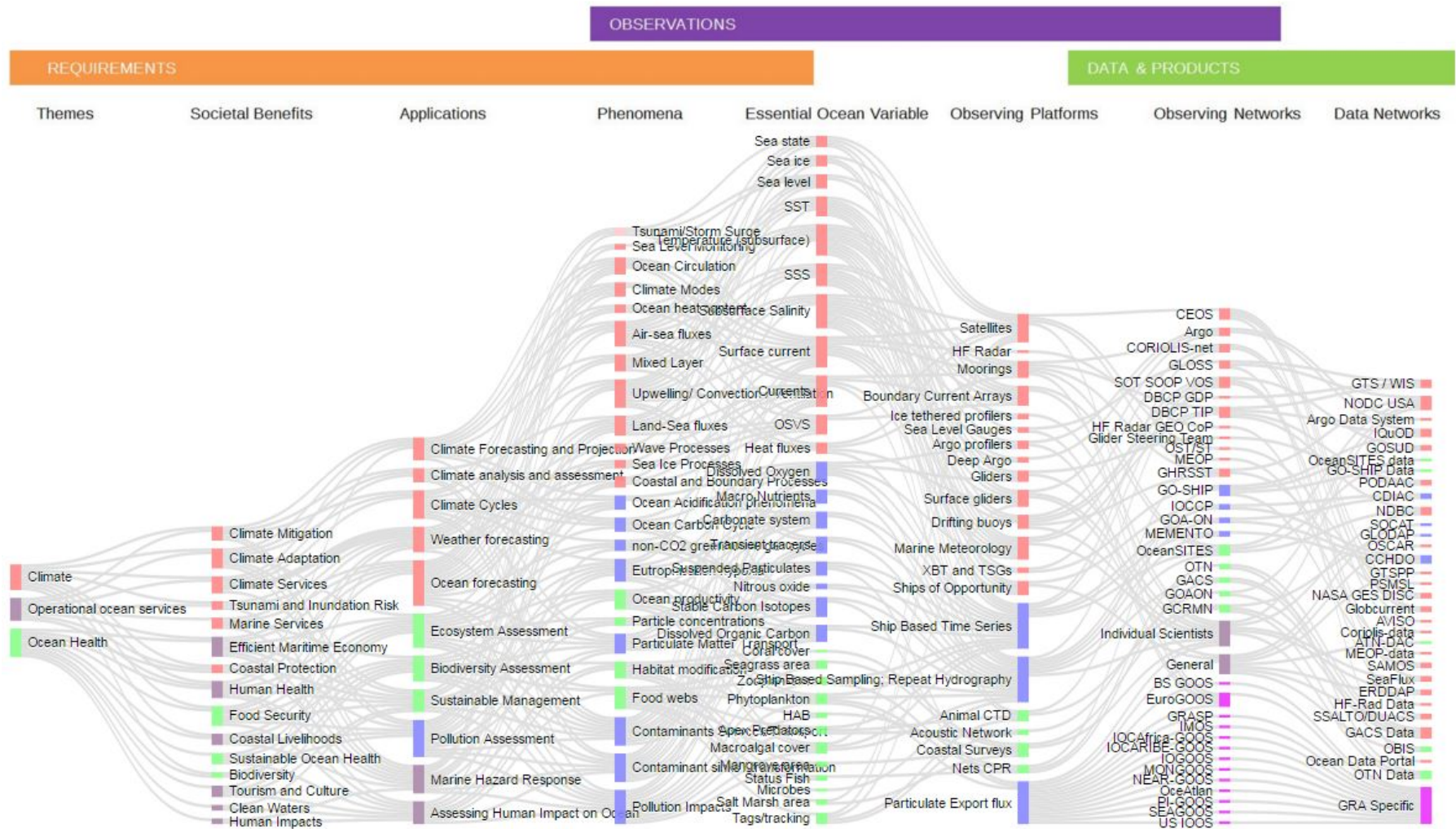
- Define Arctic-Specific Societal Benefits to Weigh Impacts;
- Convene Authoritative Expert Bodies to Assess the Technology (Feasibility) of Observing Systems;
- Identify Essential Variables.



Design the
network of
the future

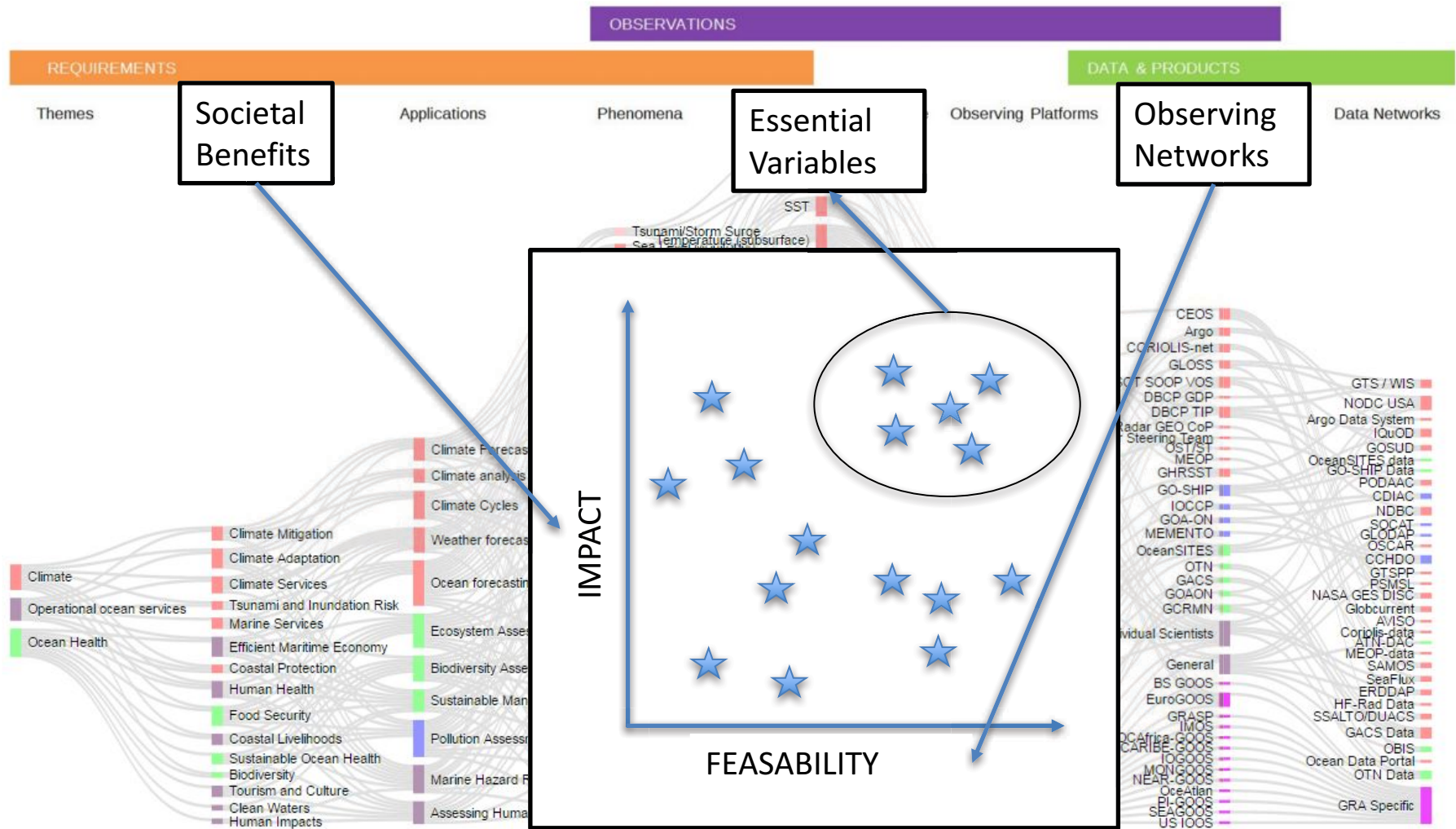
Framework for Ocean Observing (GOOS)

Essential Ocean Variables



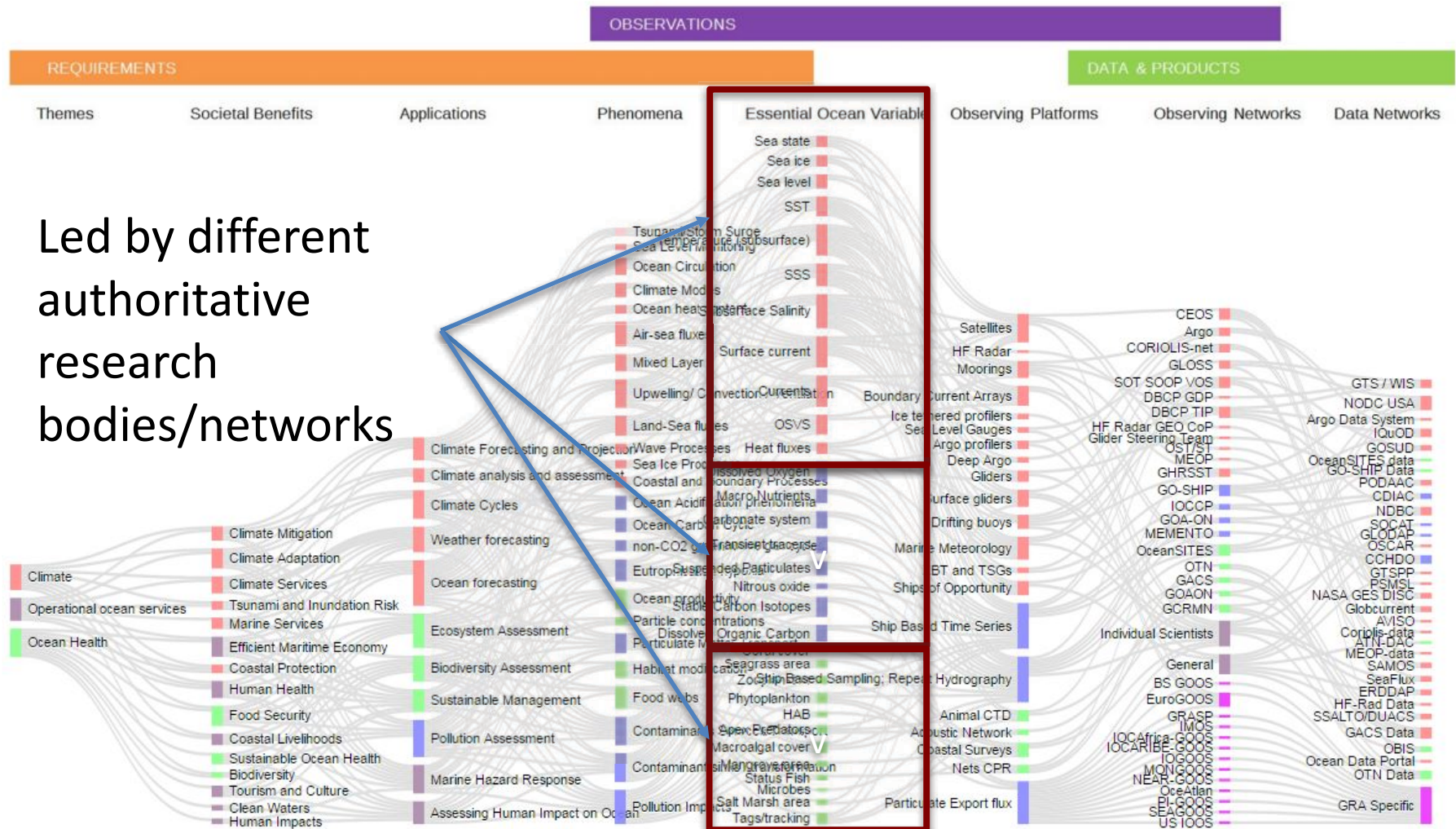
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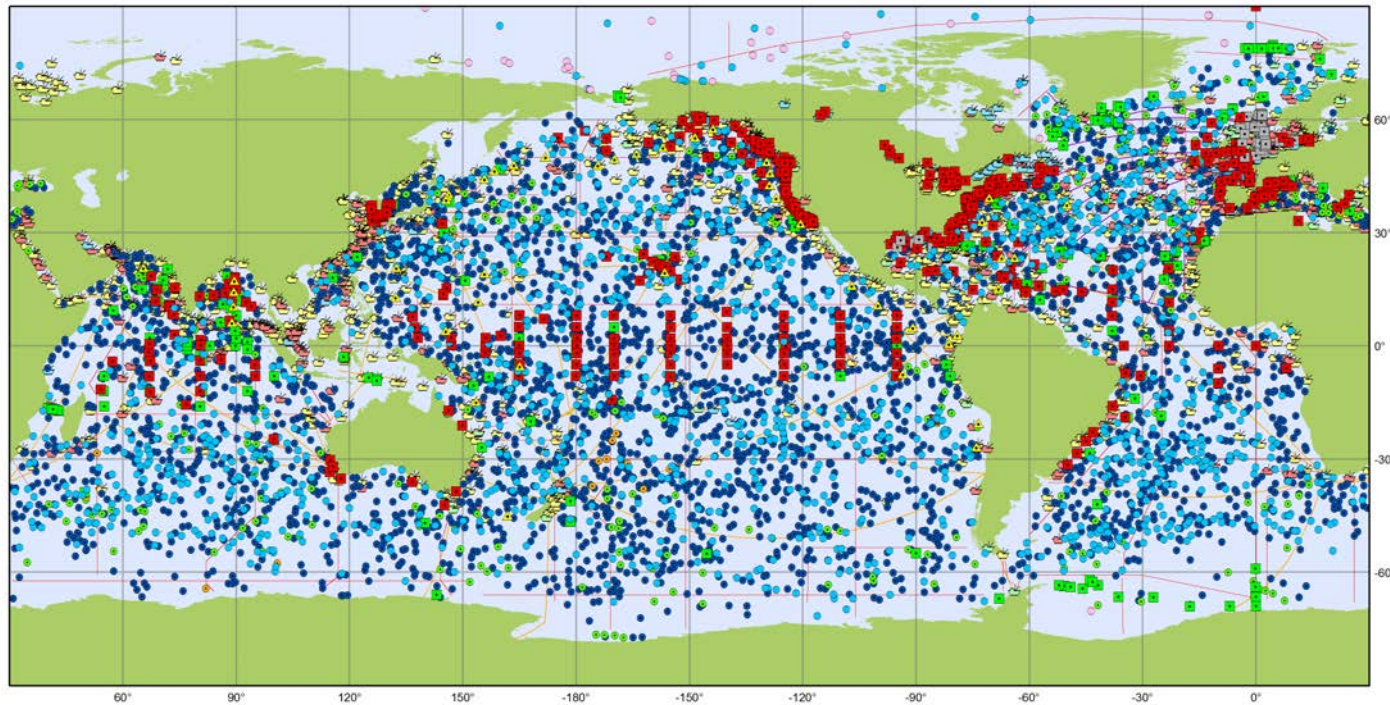
Framework for Ocean Observing (GOOS)

Essential Ocean Variables



Led by different authoritative research bodies/networks

Success story for collaborative observing; diverse & utilized



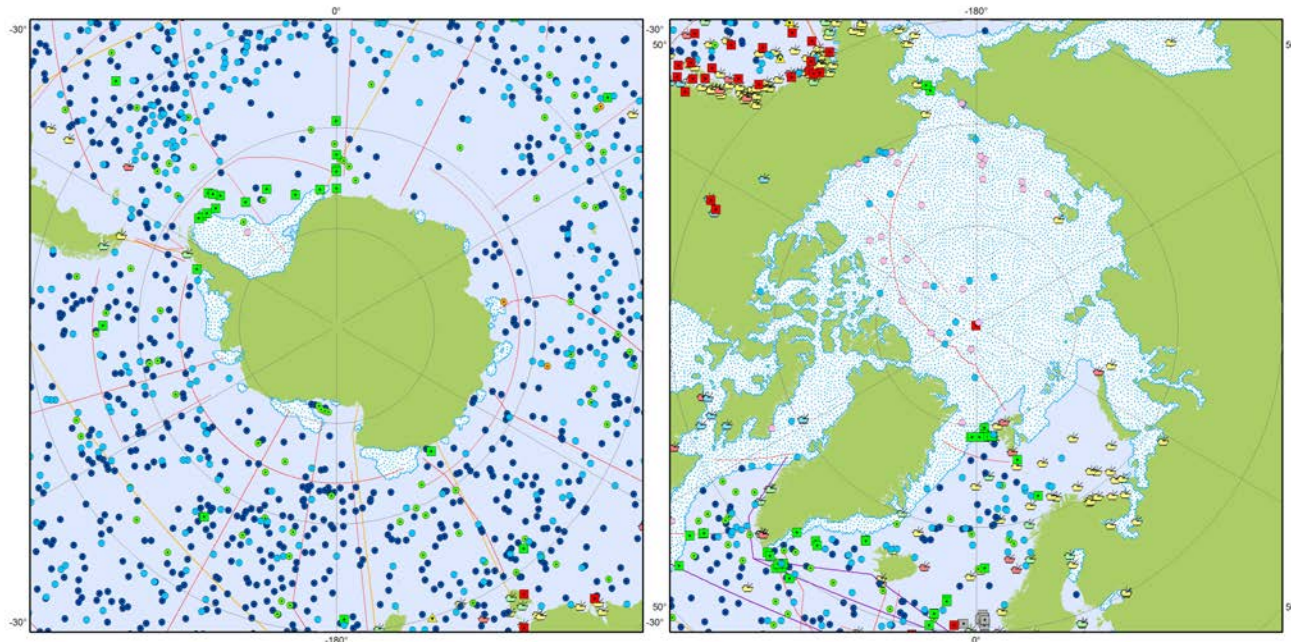
Main in-situ Elements of the Global Ocean Observing System

June 2016

Argo	DBCP	OceanSITES	SOT	ASAP Radiosondes (7)
• Argo (3758)	• Surface Drifter (1442)	■ Platforms (331)	• VOS-Clim-Automated (103)	— SOOP XBTs (46)
• Deep-Argo (16)	■ Fixed Platform (104)	GO-SHIP	• VOS-Clim-Manned (354)	
• Bio-Argo (275)	• Ice Buoy (29)	— GO-SHIP (61)	• VOS-Automated (147)	
	■ Moored Buoy (474)		• VOS-Manned (1161)	
	▲ Tsunameter (46)			

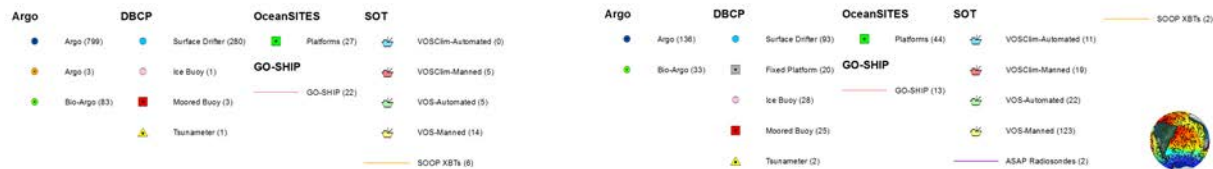


But even a powerful approach can struggle in the Arctic



Main in-situ Elements of the Global Ocean Observing System

June 2016



The Arctic is Different

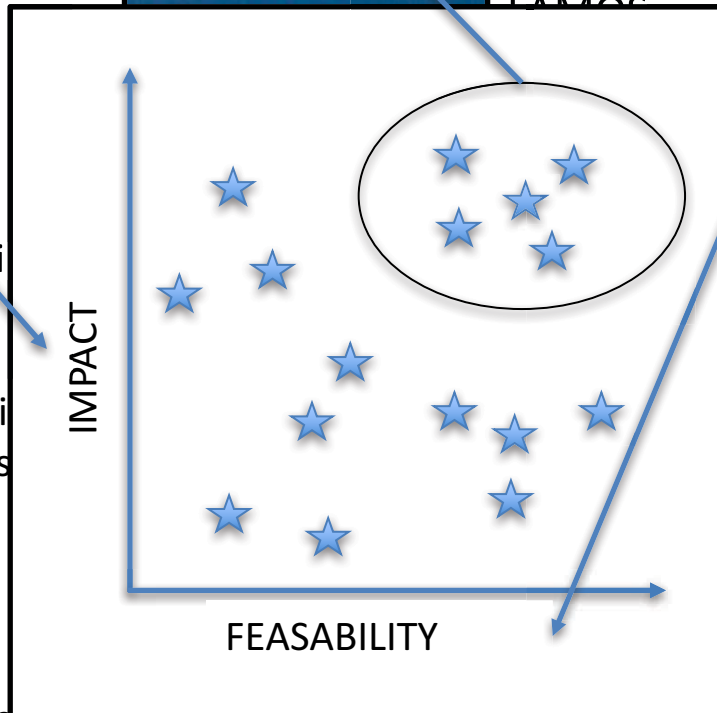
Societal Benefits

Essential Arctic Variables

Observing Networks, Large Programs

Example from STPI/SAON - Arctic Observing Framework

1. Disaster Preparedness
2. Environmental Quality
3. Food Security
4. Fundamental Understanding of Arctic Systems
5. Human Health
6. Infrastructure and Operations
7. Marine and Coastal Ecosystems and Processes
8. Natural Resources
9. Resilient Communities
10. Sociocultural Services
11. Terrestrial and Freshwater Ecosystems and Processes
12. Weather and Climate



Ocean: GOOS, AOOS, IOOS, FAMOC

GCW, GTN-G, GTN-P, ALM, PCN, IABP
 GAW, IASOA, DOE-
 O, PAG
 LEO, EYES NORTH,
 ators: ArcticFROST
 CBMP, TEON, ABOVE,
 N, TEON

US AON

Backward Problem: Forward Problem



Employ “Stratics” = Strategy + Tactics

Research Networks

Foster Well-Organized
Networks

Towards Tactical Tasks

Entrain Into Bigger Picture

SAON + National

Sustain Development of Strategic Vision/Framework
Built Upon Core Community Efforts

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Backward Problem: Forward Problem





Photo: David Gaspard / ArcticNet



AOS 2018 - Davos, Switzerland

Learn More

ARCTIC OBSERVING SUMMIT
Design, identification and implementation of a pan-Arctic Observing System
www.arcticobservingsummit.org

THE SUMMIT
The Arctic Observing Summit (AOS) is an international, biennial forum of scientists, managers, scientists, observers, policy commentators and the public. Over the past few years, it has provided the design, development and implementation of a comprehensive, coherent and sustainable Arctic observing system. The International Panel of Arctic Change (IPAC) leads the planning and management of the summit, a biennial Arctic Observing Summit (AOS) year.

THE CHALLENGES
The rate of current Arctic environmental change is unprecedented, with impacts already visible in the landscape. The Arctic region is a global hot spot for climate change and is a key area for understanding and addressing the global climate system. The Arctic region is also a key area for understanding and addressing the global climate system. The Arctic region is also a key area for understanding and addressing the global climate system.

AOS-2018 - Save the Date!
AOS-2018 will be held in Davos in 2018. AOS-2018 is a pan-Arctic forum for scientists, managers, policy commentators and the public. Over the past few years, it has provided the design, development and implementation of a comprehensive, coherent and sustainable Arctic observing system. The International Panel of Arctic Change (IPAC) leads the planning and management of the summit, a biennial Arctic Observing Summit (AOS) year.

PARTNERS AND COLLABORATORS
Observing system program data from a range of environments and data sets are available. Observing system program data from a range of environments and data sets are available. Observing system program data from a range of environments and data sets are available.

AOS 2018 - Davos, Switzerland

Arctic Observing Summit 2018 - Save the date!

Learn More

SEARCH



Arctic Observing News

The first **synthesis documents** to guide AOS discussions have been uploaded [here!](#)

AOS 2016 **white papers** and **poster abstracts** **now available!**

AOS 2013 white papers now published online in **Arctic** Volume 68 (Supp.1) 2015 and as hardcopy.



3 Relevant AGU Sessions

The Role and Impact of a Pan-Arctic Observing Network in Delivering Societal Benefits (PA035)

Description: <https://agu.confex.com/agu/fm17/preliminaryview.cgi/Session26759>

Foundations for Sustained Arctic Observing: Connecting Observational Networks to Societal Benefit (C012)

Description: <https://agu.confex.com/agu/fm17/preliminaryview.cgi/Session27058>

Indicators of Arctic Climate Variability and Change (C018)

Description: <https://agu.confex.com/agu/fm17/preliminaryview.cgi/Session27233>

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Too chaotic? Still have questions?



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noaa.gov



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Thank You!

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 - ARCUS Seminar Series recordings: <https://goo.gl/Wymkd7>
 - Sea Ice experts in the Directory of Arctic Researchers: <https://goo.gl/NKmXz2>
 - Sea Ice Outlook reports for 2017: <https://goo.gl/NGqBFU>
 - Opportunities to participate in ARCUS' Defend Arctic Research campaign: <https://goo.gl/aagB5s>
- Please consider becoming an ARCUS member!
<https://goo.gl/u4662D>



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Value criteria for US AON Tasks

Observations become more **valuable** when more
people **use** them.

ACCESSIBLE | RELEVANT | MULTI-PURPOSE



Courtesy Henry
Huntington