

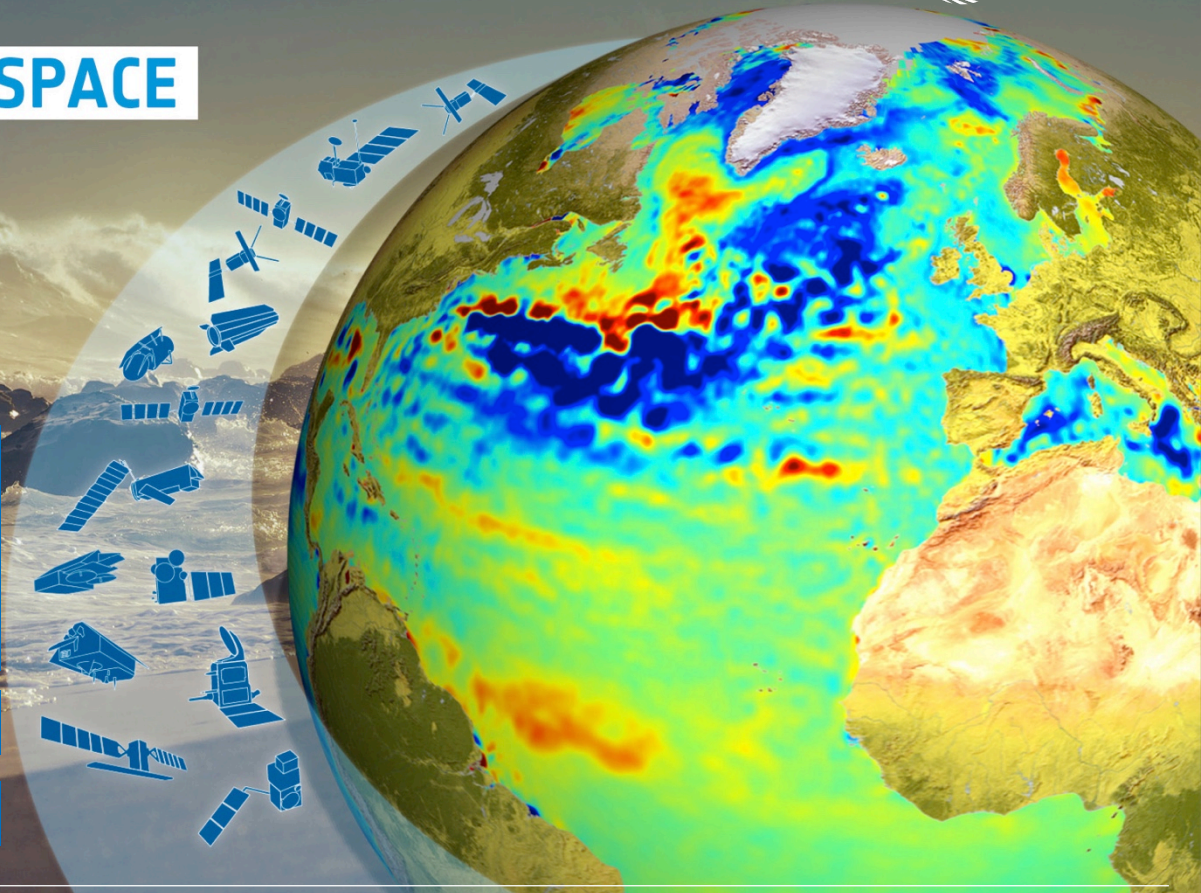
# → ATLANTIC FROM SPACE WORKSHOP

23–25 January 2019  
National Oceanography Centre  
Southampton, UK

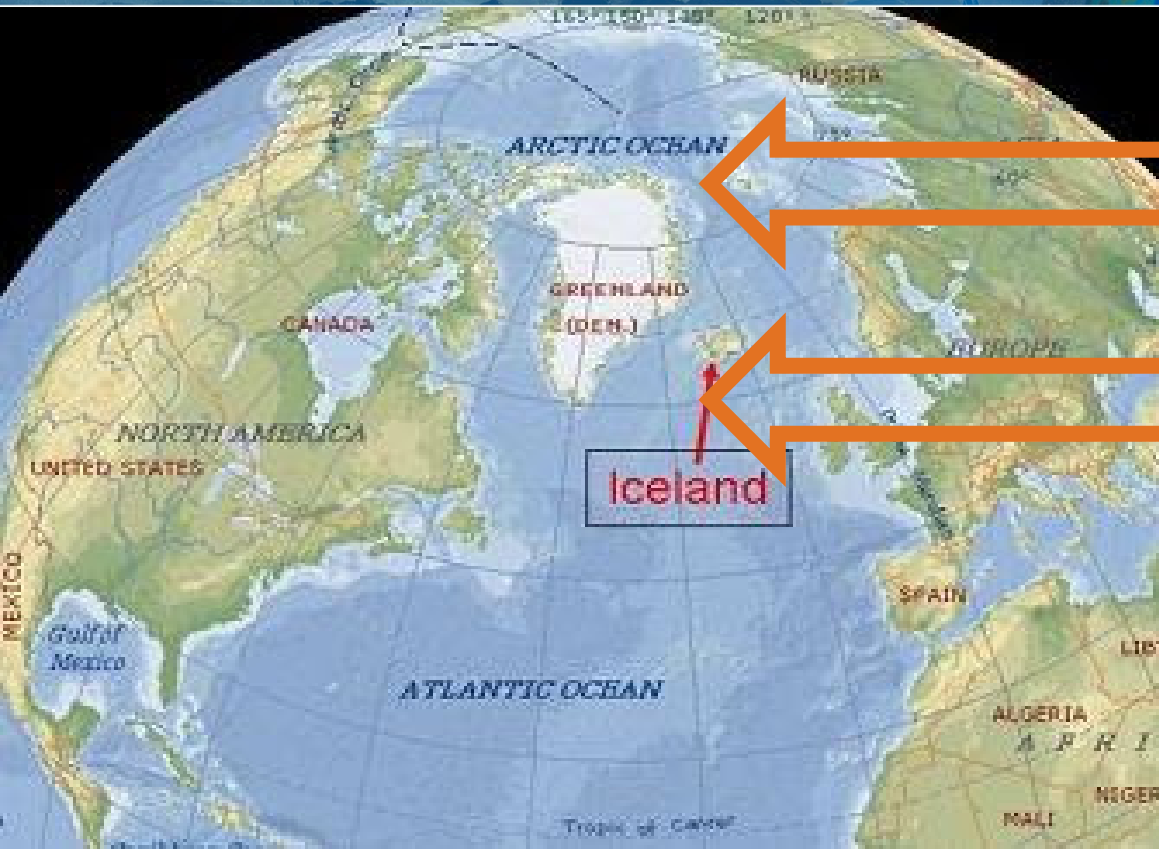
Challenges for Maritime  
Traffic Monitoring within the  
North Atlantic and Arctic –  
How can Space Technology  
provide solutions?

Robert Lynch & Maria Looney

Cork Institute of Technology



# Geographical Considerations



Arctic

North-Atlantic



# Who owns the Arctic?



In summary, the United Nations Convention on the Law of the Sea (UNCLOS) Treaty grants significant undersea portions of the Arctic to **Canada, the United States, Russia, Norway and Denmark**. These nations gain claim to the natural resources on, above and beneath the ocean floor up to 200 miles from their shoreline.

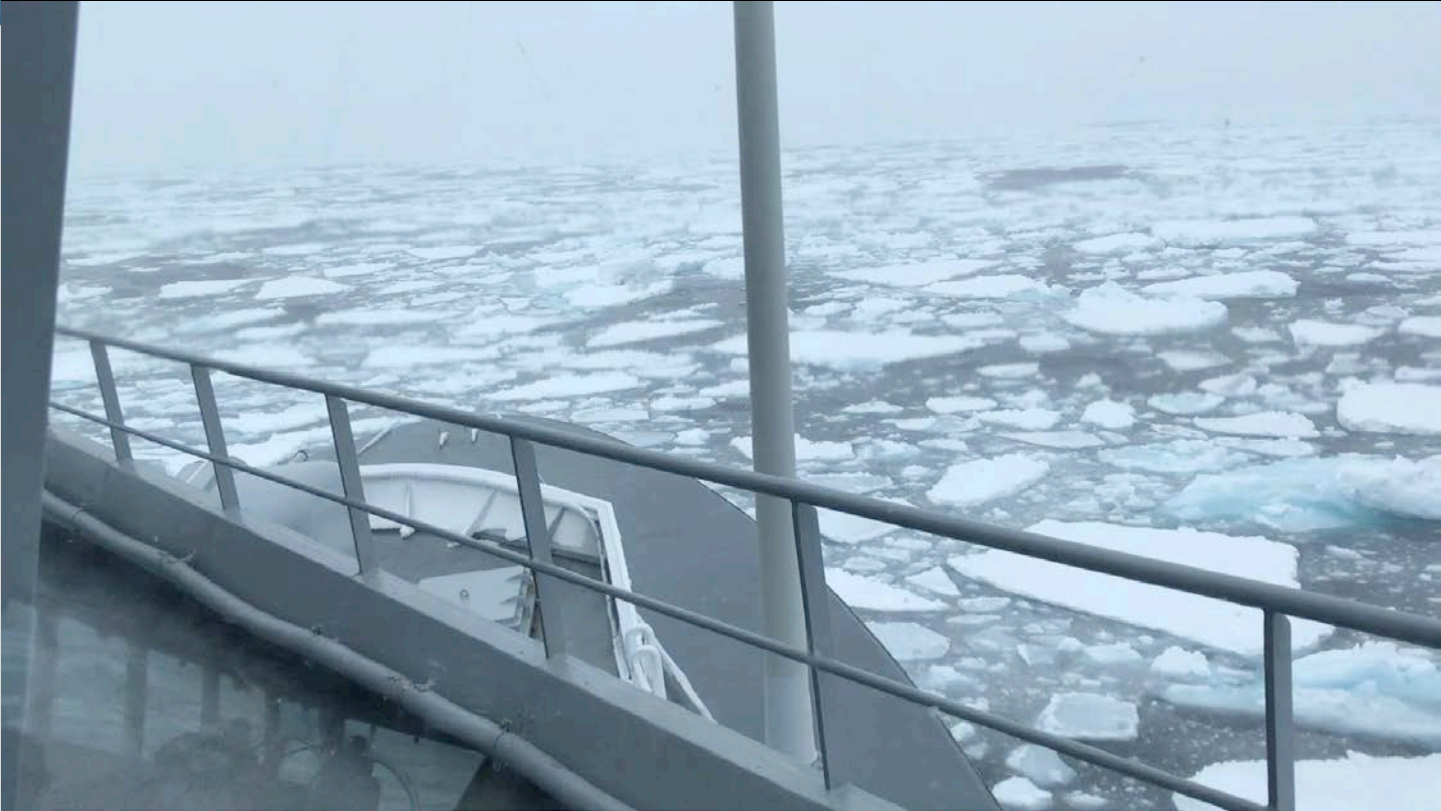


- Highly variable and dynamic ice cover;
- Ice build-up on vessels;
- Changing wave climate;
- Almost 24 hour darkness in winter;
- Extreme air and water temperatures;
- Lack of specific navigational aids;
- Crews lack experience in Arctic waters;
- Remoteness – far removed from help;
- Lack emergency preparedness network;
- Lack of Common Information Sharing platforms.

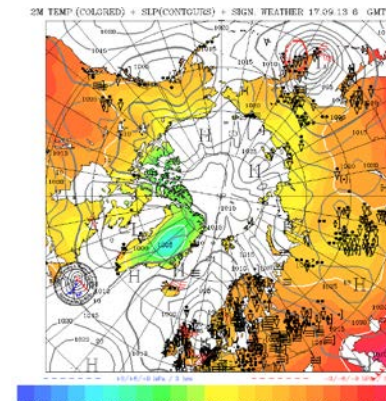
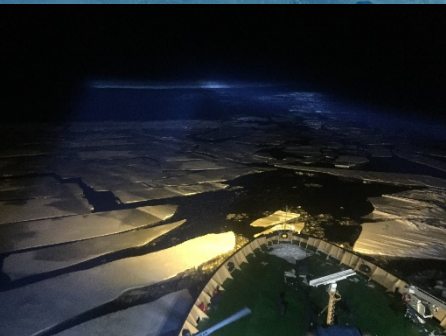


# Operational challenges in the Arctic | North Atlantic





# Maritime Navigation Challenges



Author | Atlantic from Space Workshop | 23-25/01/2019 | Slide 7





Lack of **information sharing** between: coast guards, emergency authorities, and other stakeholders involved in SAR operations  
needs for

**technological innovation** particularly in communications networks and connections, navigation, survival and rescue equipment



SEDNA Enabling technologies

Big Data Integration & Connectivity

Safe Arctic Shipping Intelligence

Safe Arctic Ship

Anti-icing Solutions

Safe Arctic Bridge

Risk-based Design Framework

Safe Arctic Operations

Low Flash Point Fuels Safety Assessment

Advanced Environmental Forecasting

Arctic Navigation Assistance

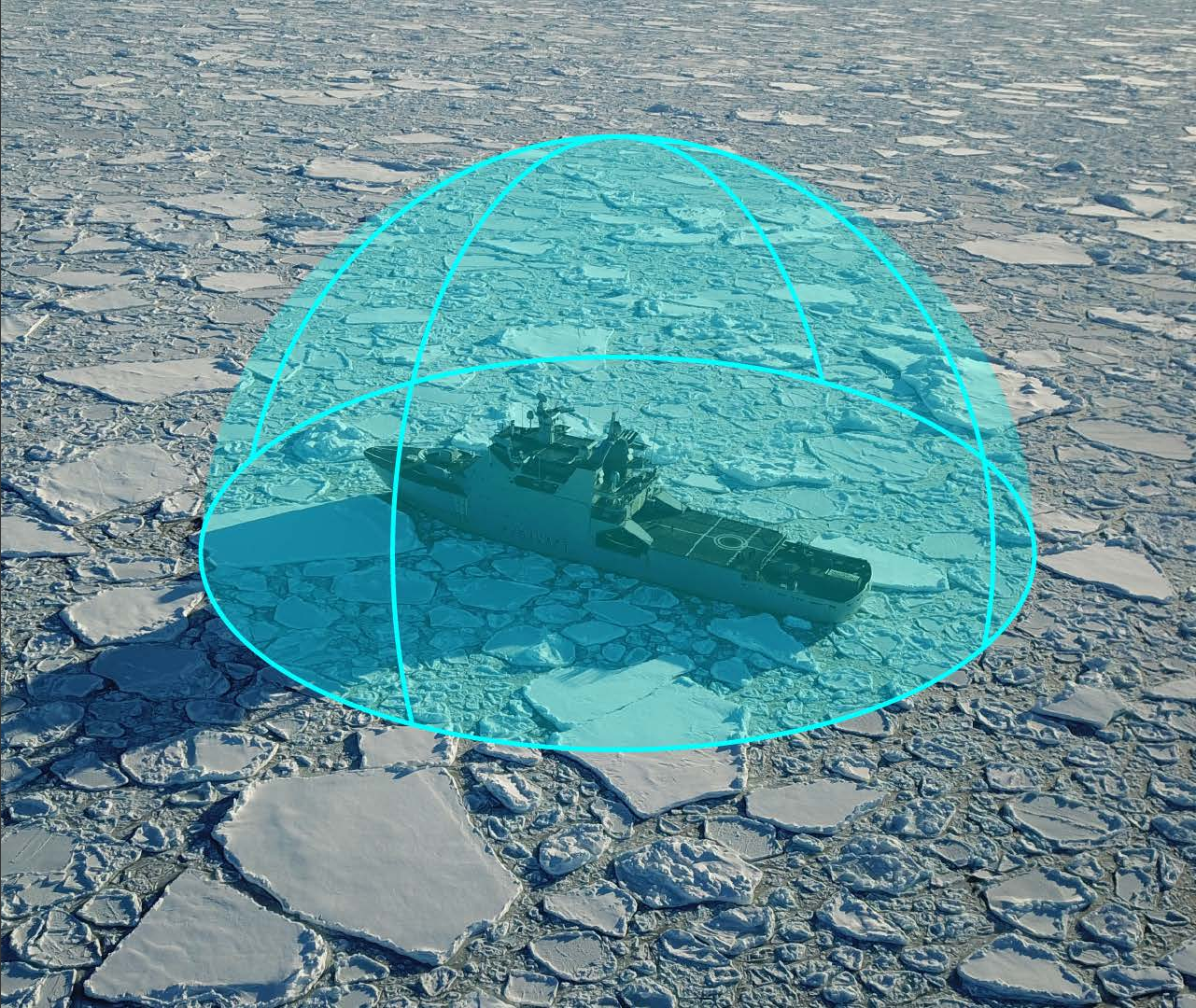
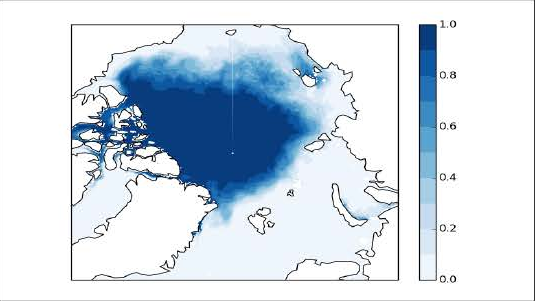
Arctic Voyage Optimization

Safe Arctic Navigation

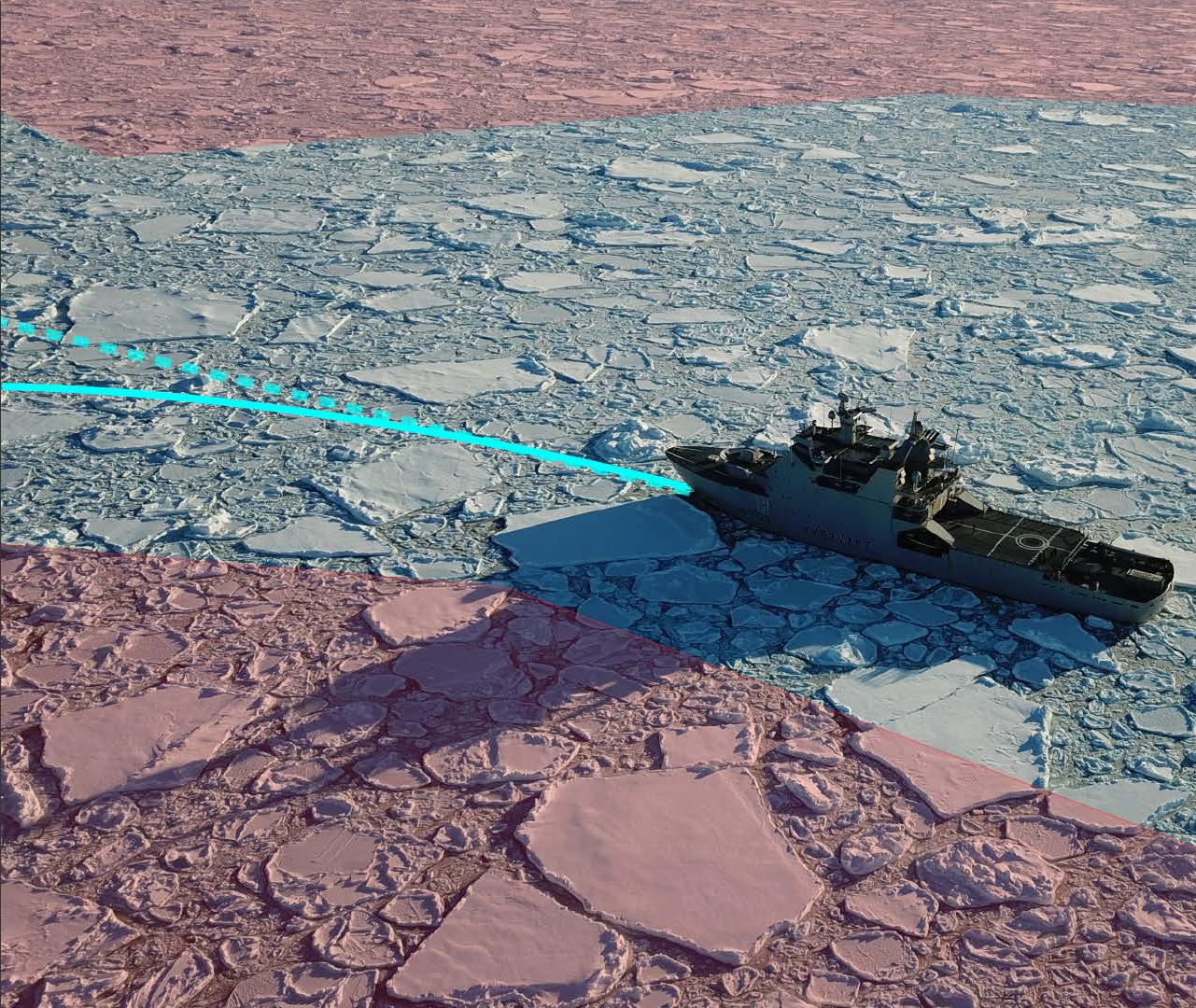
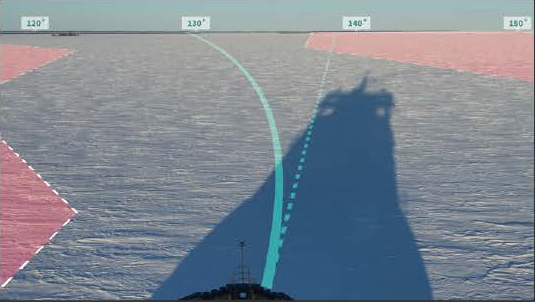
# Navigation assistance



# Arctic weather forecasting



# Voyage optimization





## ARCSAR Project description, in brief

The ARCSAR network will address the Arctic and North-Atlantic (ANA) region, preparing to cope with the Security and safety threats that will result from increased commercial activity in the region including traffic through the Northern passages, cruise traffic, and offshore oil and gas activity.

**21 partners from 13 countries**

**Norway, Iceland, Faroe Islands, UK, Ireland, Italy, USA, Germany, Finland, Sweden, New Zealand, Canada, Russia**

The cold climate, long distances and lack of infrastructure makes dealing with disaster a challenging task in this region.



**The ARCSAR project will:**

- Establish and support a new Arctic and North Atlantic Security and Emergency Preparedness Network
- Gain an increased understanding of target areas for improvements in security and emergency capabilities
- Monitor innovation and research for better security, disaster risk and crisis management
- Investigate more efficient use of competence development infrastructure for practitioners and other actors
- Identify critical barriers, gaps in capacity, competence and infrastructure of professional security and emergency response practitioners
- Identify common platforms and opportunities for joint emergency response in the region
- Stimulate partnership for sufficient response capability



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 786574

**PARTNERS IN THE NETWORK: 21 PARTNERS FROM 13 COUNTRIES**



# In Summary



- Geographically an extremely vast and harsh environment
- Geopolitically complex and potentially volatile
- Satellite technology limitations impose significant challenges within the maritime domain:
  - Navigation safety/accuracy
  - Sea ice and weather forecasting
  - Situational awareness
  - Communications
  - Emergency Preparedness
  - Search and Rescue
- Fostering of cross border collaborations and engaging in further research innovations are critical to ensuring safe North-Atlantic and Arctic activities into the future

## STRENGTHENING, INTEGRATING AND SUSTAINING ARCTIC OBSERVATIONS, FACILITATING ACCESS TO ARCTIC DATA, AND SHARING ARCTIC RESEARCH INFRASTRUCTURE:

- A properly resourced, comprehensive effort is needed to identify strengths and gaps in the current set of systems, sensors, networks, and surveys used to observe the Arctic; [ARCSAR & SEDNA Research Project](#)
- Observing and data systems, at different spatial and temporal scales, should emerge from co-design, co-production, and co-management processes with relevant stakeholders and rights-holders embracing free, ethical, and open data sharing, adhering to the “FAIR” data principles (Findable, Accessible, Interoperable, Reusable); [ARCSAR Research Project](#)
- To build an Arctic Observing System that is comprehensive, coordinated, sustainable, and fills current observational gaps, all existing assets and activities, including indigenous knowledge, must be leveraged to the greatest extent. [ARCSAR Research Project](#)