CAATEX

Coordinated Arctic Acoustic Thermometry Experiment

Acoustic networks - in an Integrated Arctic Ocean Observing System

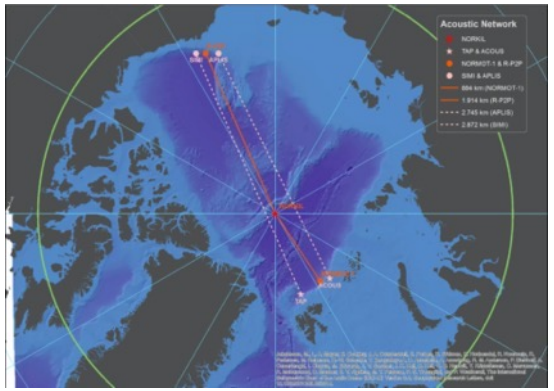
Hanne Sagen, Environmental and Remote Sensing Center, Bergen, Norway
Matthew A. Dzieciuch, Scripps Institution of Oceanography, University of California, San Diego, USA
Peter F. Worcester, Scripps Institution of Oceanography, University of California, San Diego, USA
Espen Storheim, Environmental and Remote Sensing Center, Bergen, Norway
Florian Geyer, Environmental and Remote Sensing Center, Bergen, Norway
Stein Sandven, Environmental and Remote Sensing Center, Bergen, Norway

Acoustic systems in relevance to larger programs

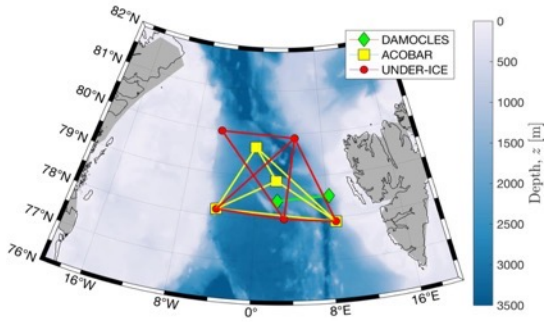
- The **United Nations Ocean decade** to achieve SDG14: ‘Conserve and sustainably use the ocean, seas and marine resources for sustainable development’. Existing ocean research and observing systems must be sustained and improved significantly to achieve this.
- Recommendations from OCEANOBS19:
- **By 2029**, the Arctic should prominently demonstrate that it has a **fully developed, implemented, and sustained ocean observing system** that meets at a minimum, Earth System prediction needs – but also meets other critical Arctic Societal Benefit Needs (Lee et al. 2019)
- PILOT A SUSTAINED **MULTIPURPOSE ACOUSTIC NETWORK** FOR PASSIVE ACOUSTICS, TOMOGRAPHY, UNDERWATER GEOPOSITIONING AND COMMUNICATIONS IN INTEGRATION WITH ARCTIC OBSERVING SYSTEMS COVERING THE CENTRAL ARCTIC OCEAN , WITH EVENTUAL TRANSITION TO GLOBAL COVERAGE. (Howe et al. 2019, Worcester et al. 2020)

The Evolution of Multipurpose acoustic networks in the Arctic

Basin wide system
TAP and ACOUS 1994, 1999

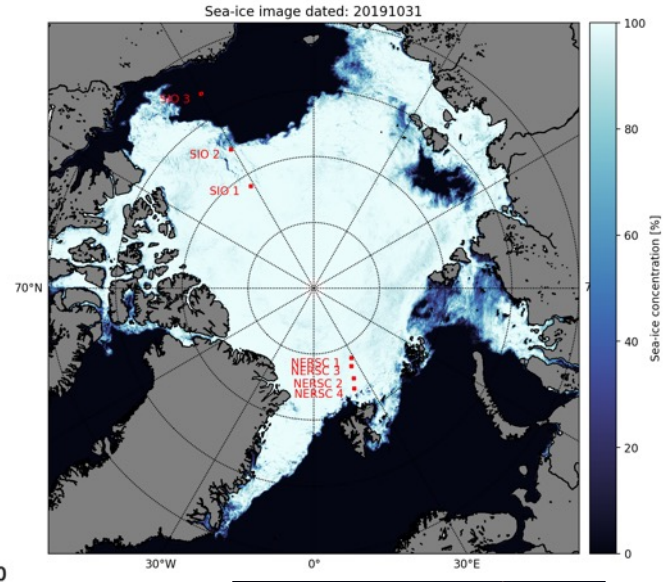


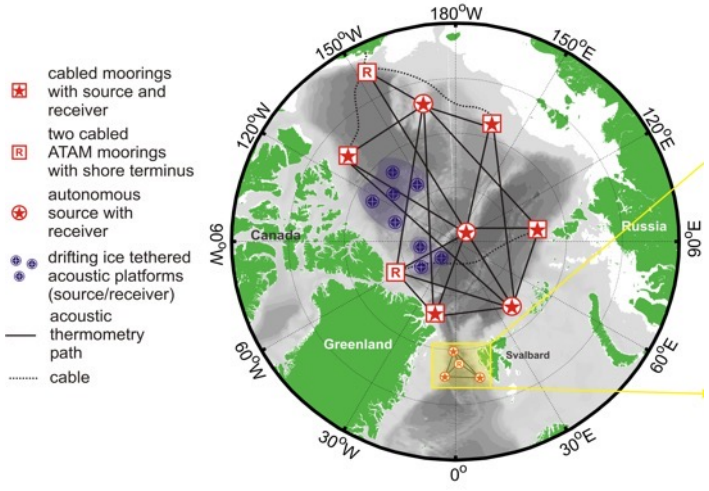
Regional Multipurpose Acoustic Networks

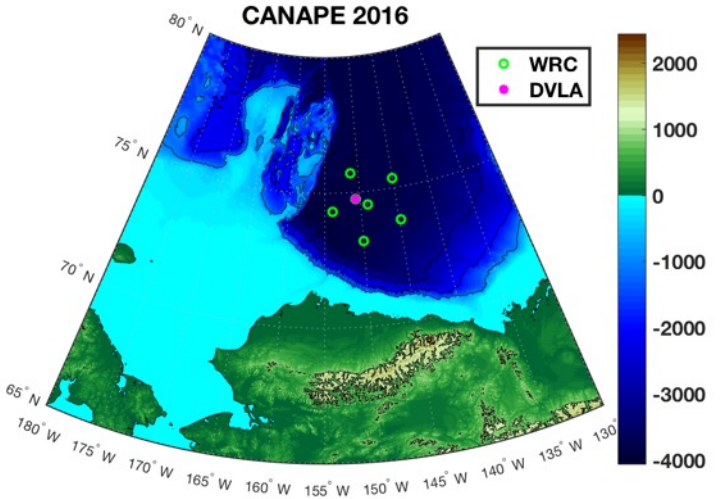


Fram Strait 2007-2016

Basin wide Thermometry



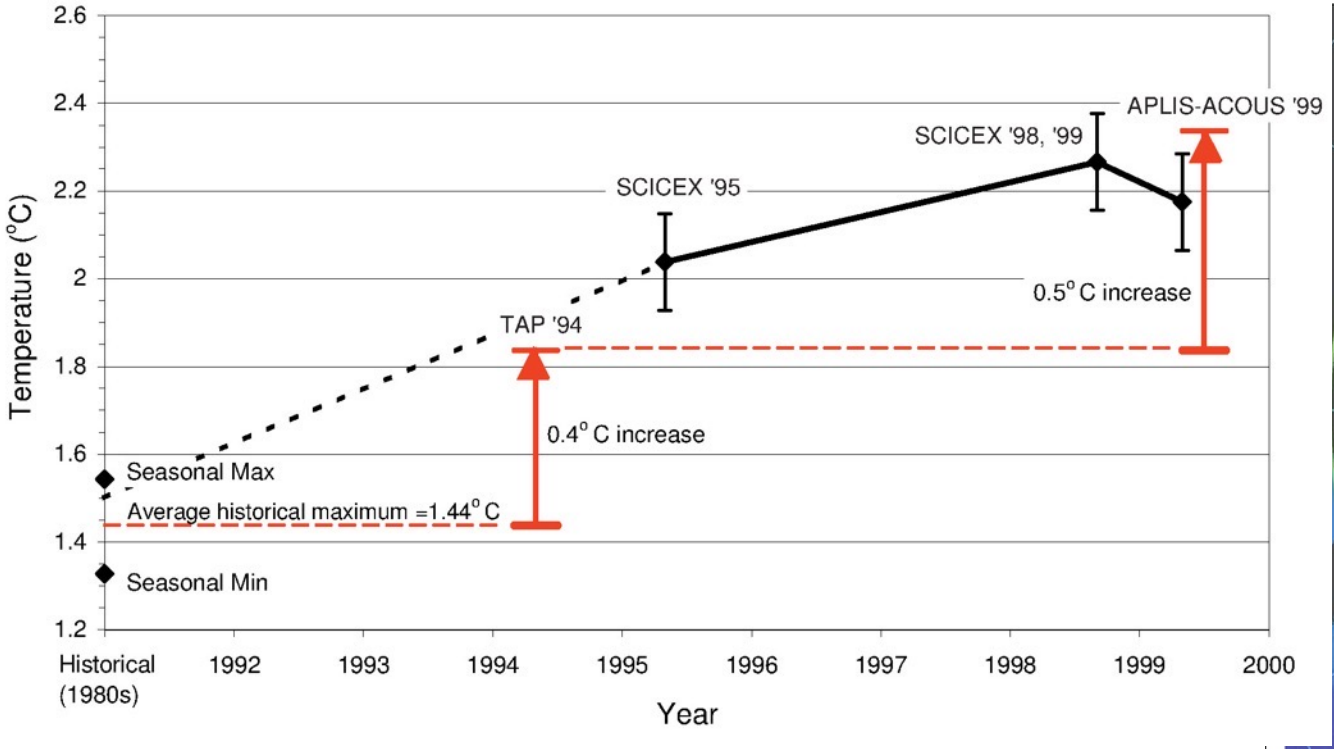


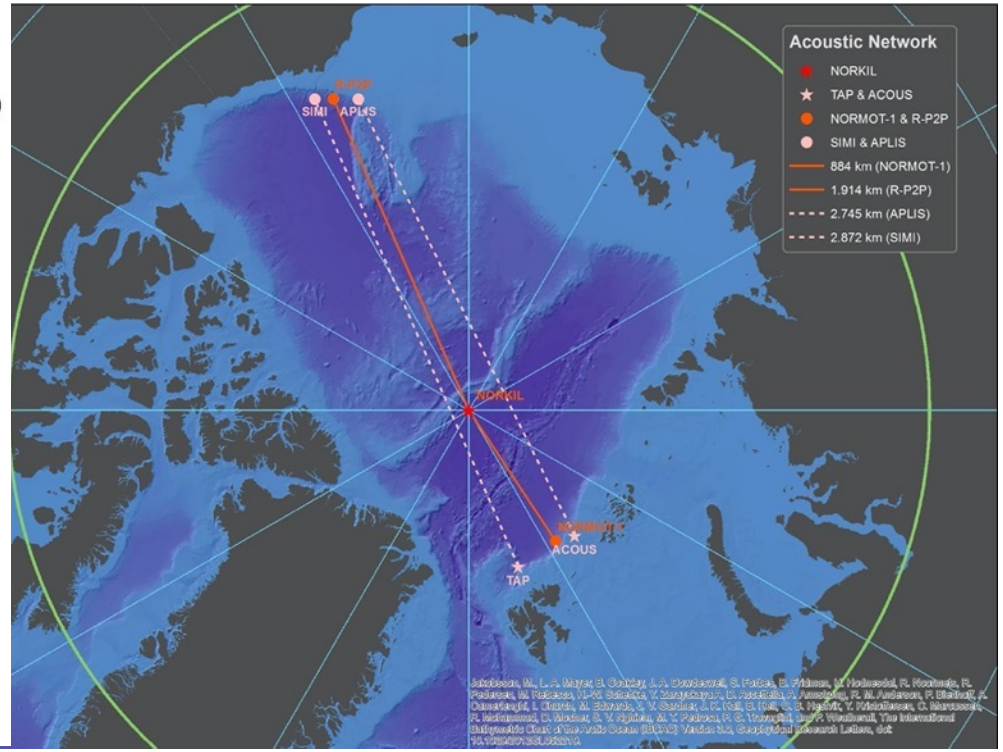


VISION: MIKAHALEVSKY ET AL. 2015

Beaufort Sea 2016-2027

Trans-arctic experiments in 1994 and 1999





MIKAHALEVSKY ET AL.

What has happened with the mean ocean temperature in the Arctic Basin ?

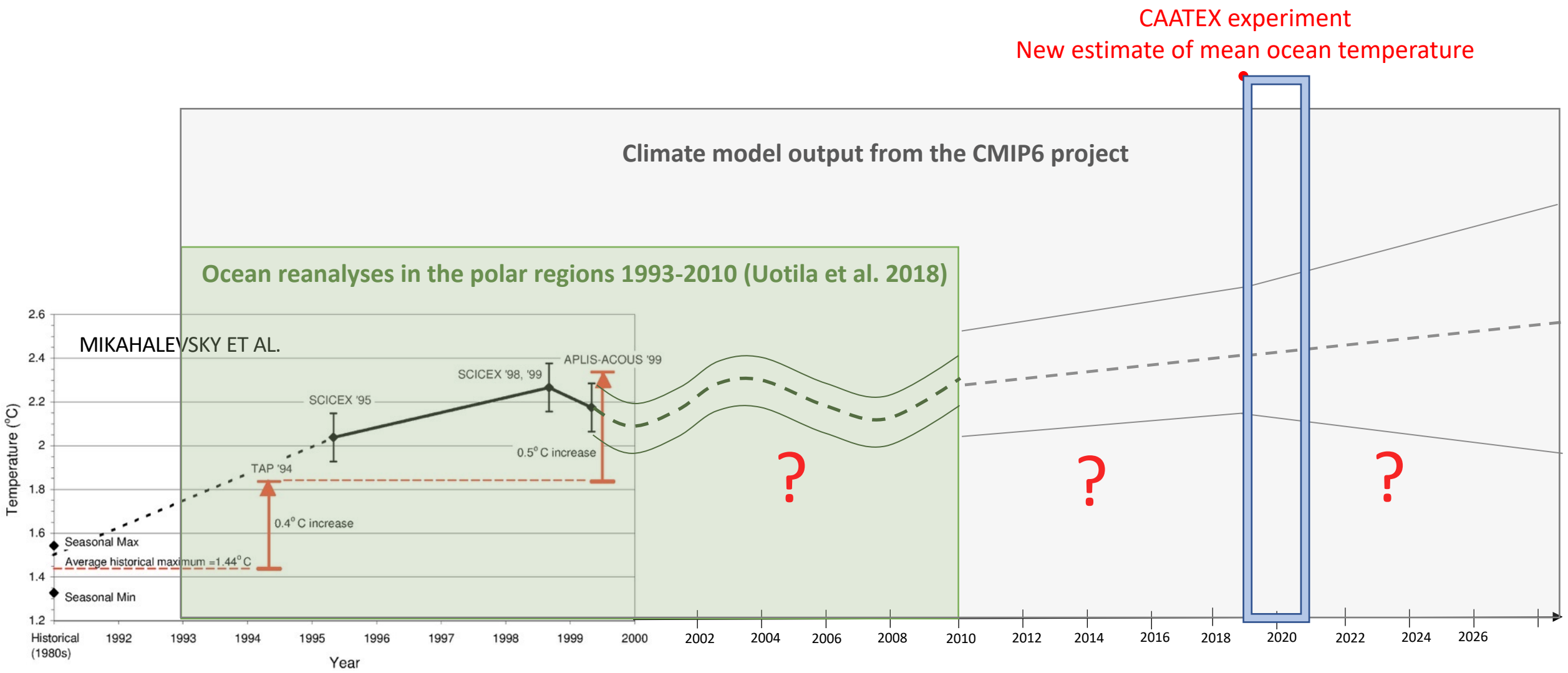


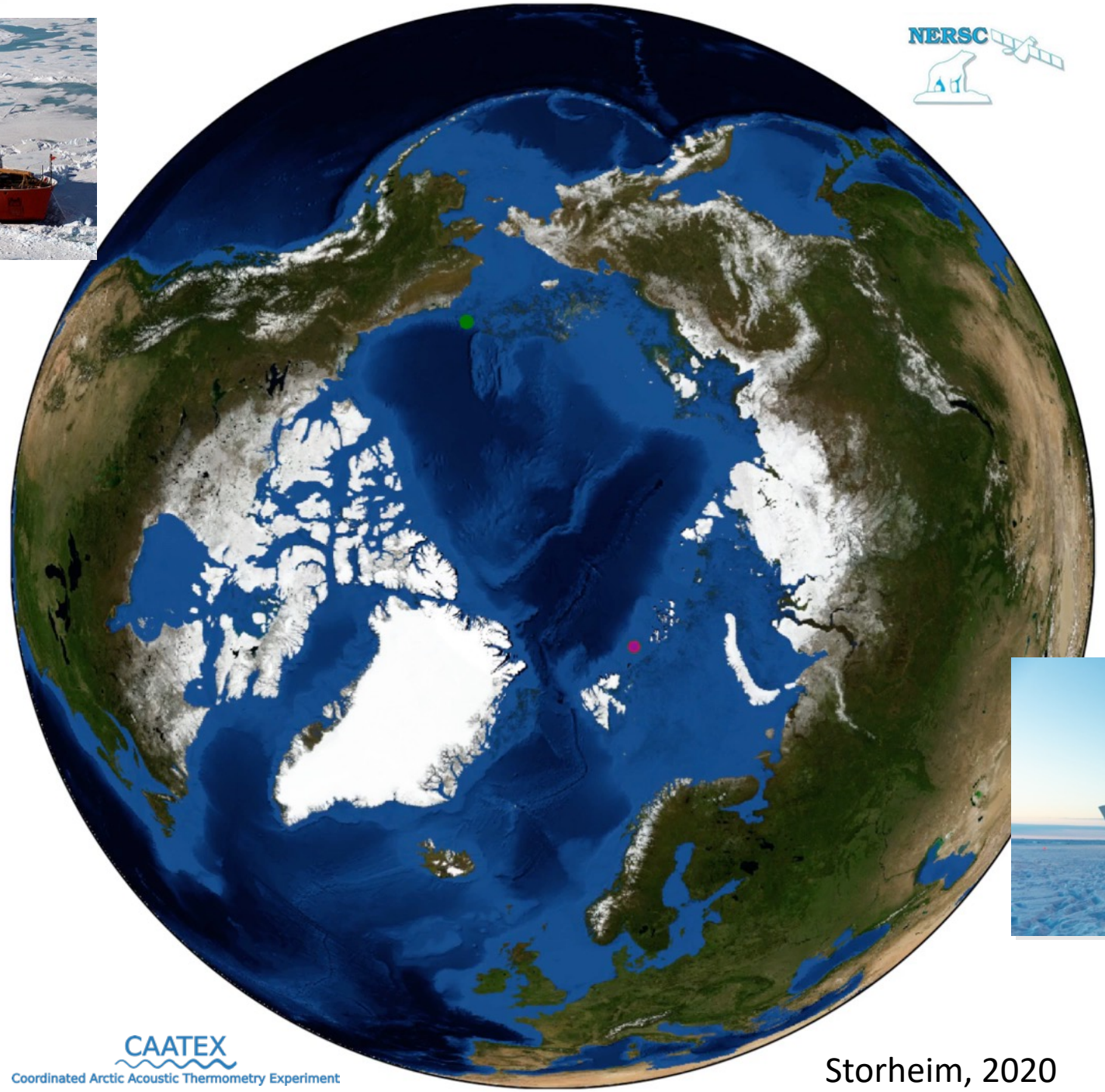
Figure by Helene Langehaug

USCGC Healy

Deployment
3.9-14.10 2019

Planned recovery
18.08.2020 –
22.10.2020

Project Lead:
Matthew Dzieciuch
SIO



NERSC

The Research Council of Norway

KV Svalbard
Departure/Return LYR
Deploy
14.08 2019- 9.9 2019

Recover
17.07 2020- 9.8 2020

Project Lead:
Hanne Sagen, NERSC

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Storheim, 2020

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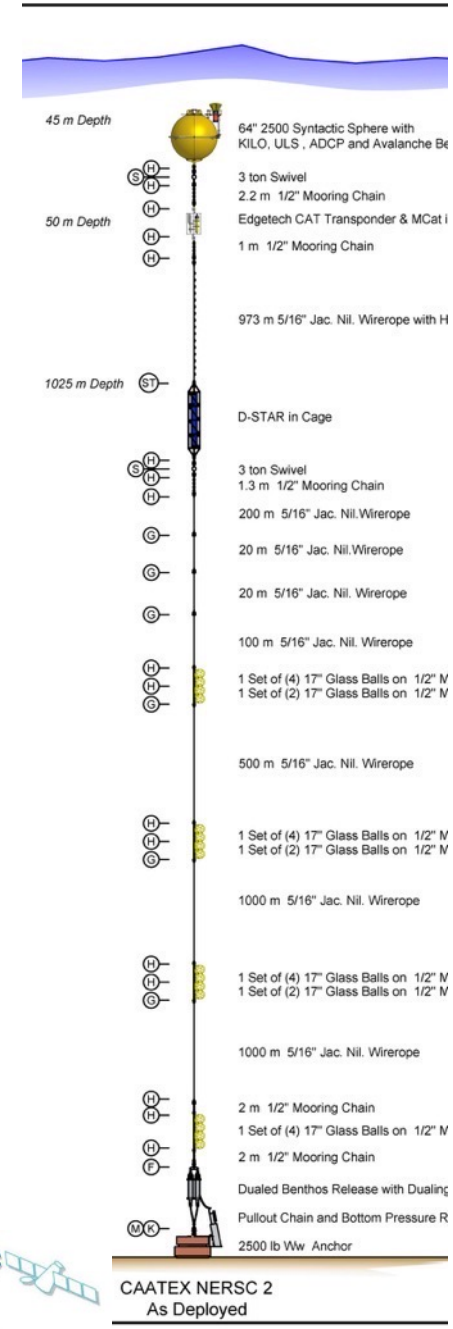
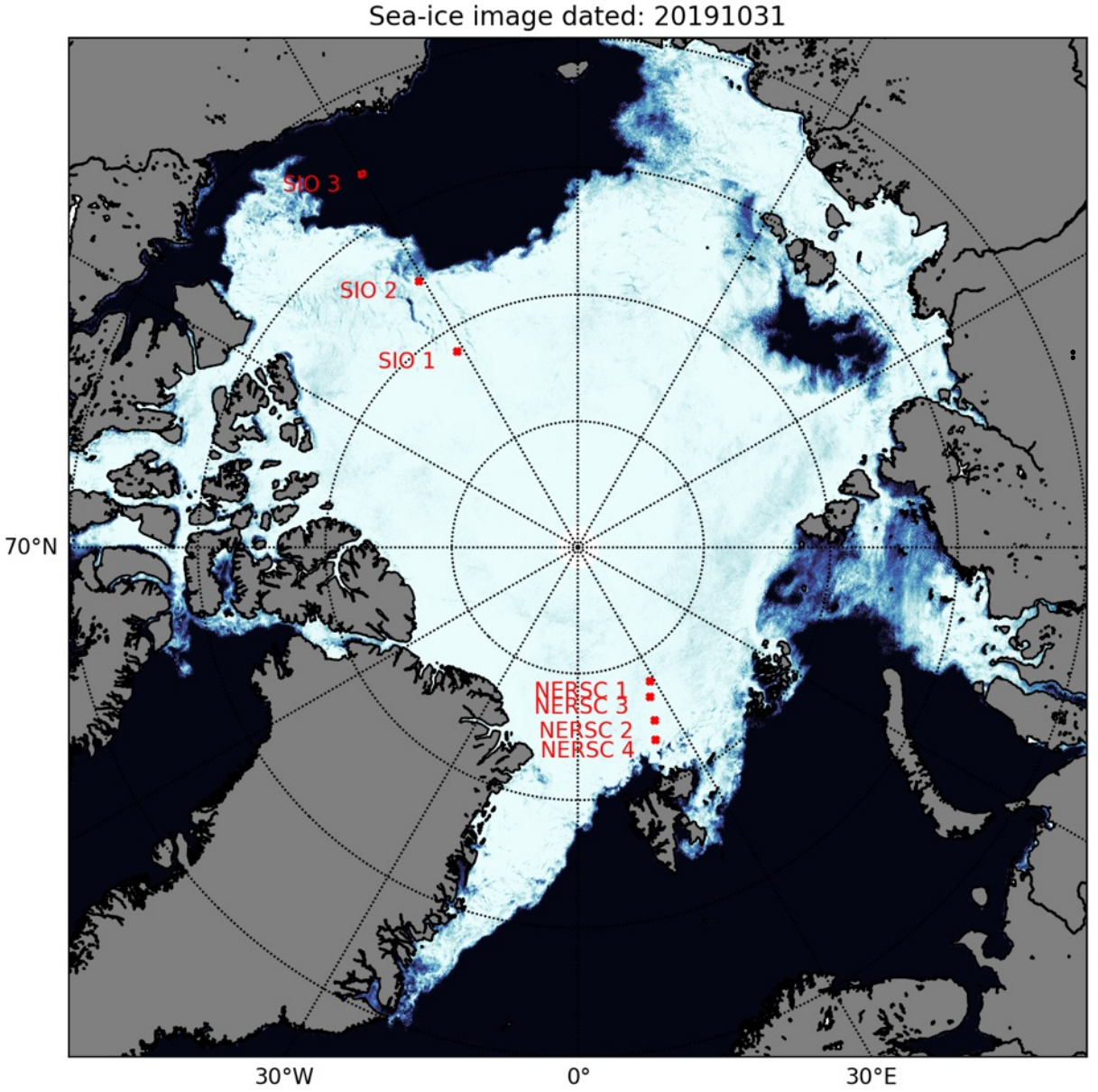
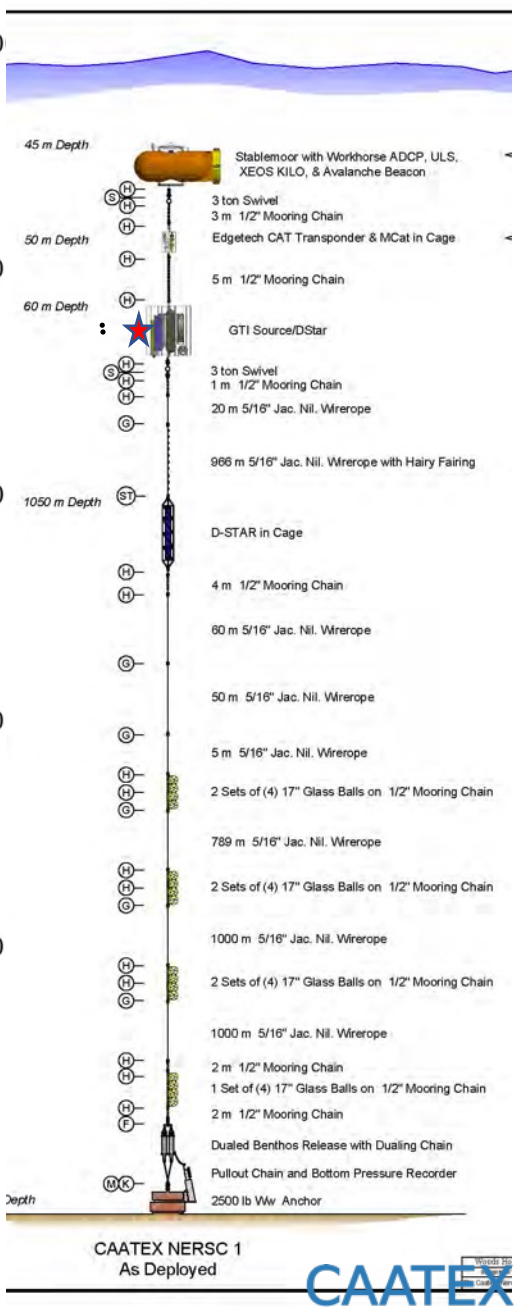


CAATEX NERSC 2
As Deployed



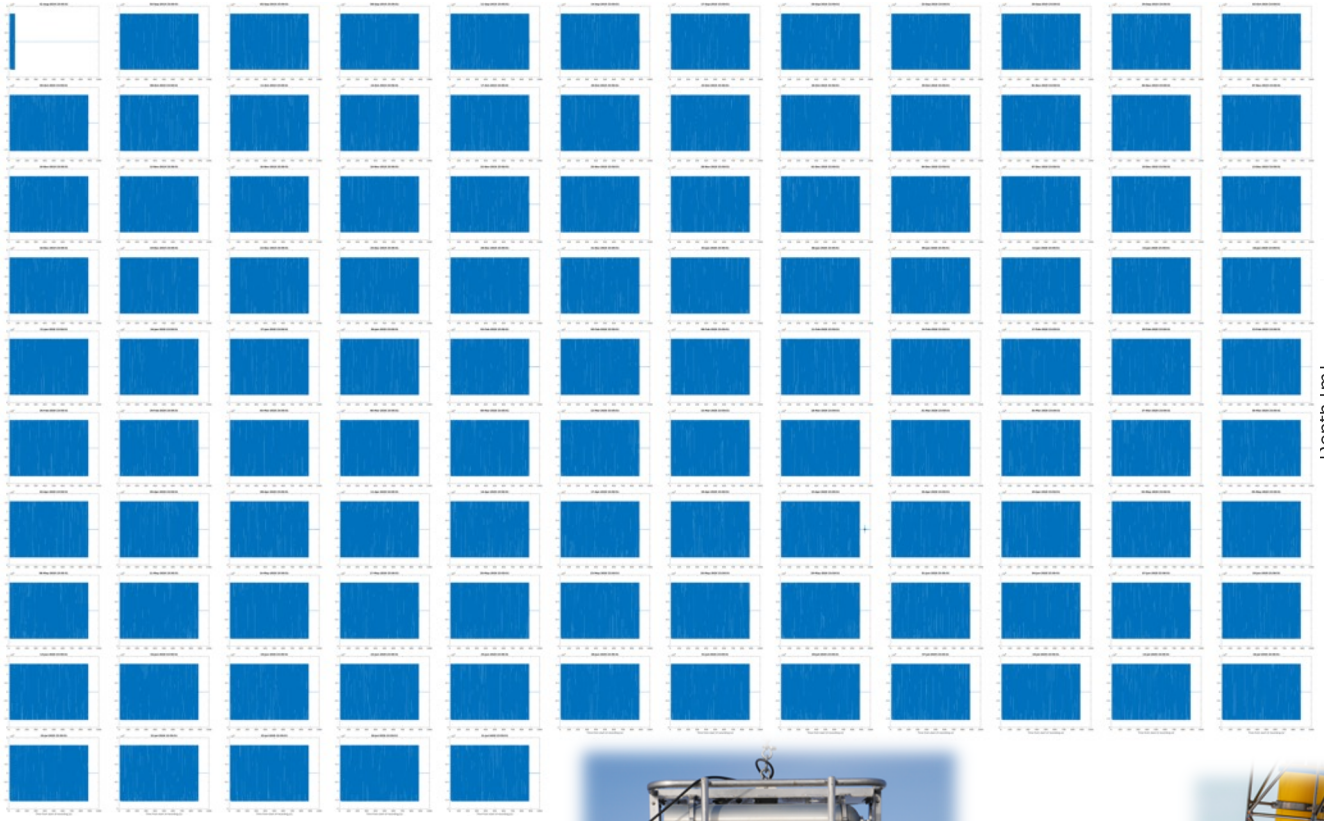
Ice concentration from University of Bremen (G. Heygster)



CAATEX NERSC 1
As Deployed

112/112 transmissions

The source signal is a 15 minute long M-sequence at 35 Hz



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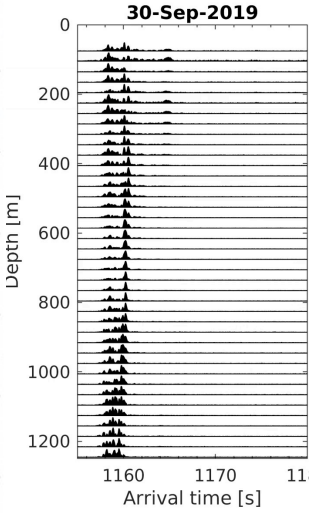
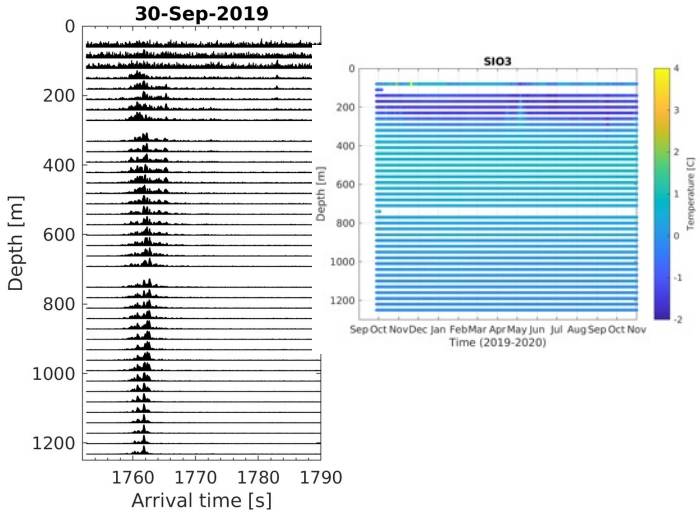
NERSC1 -> SIO1 – 1700 km



NERSC1 -> SIO3 – 2600 km



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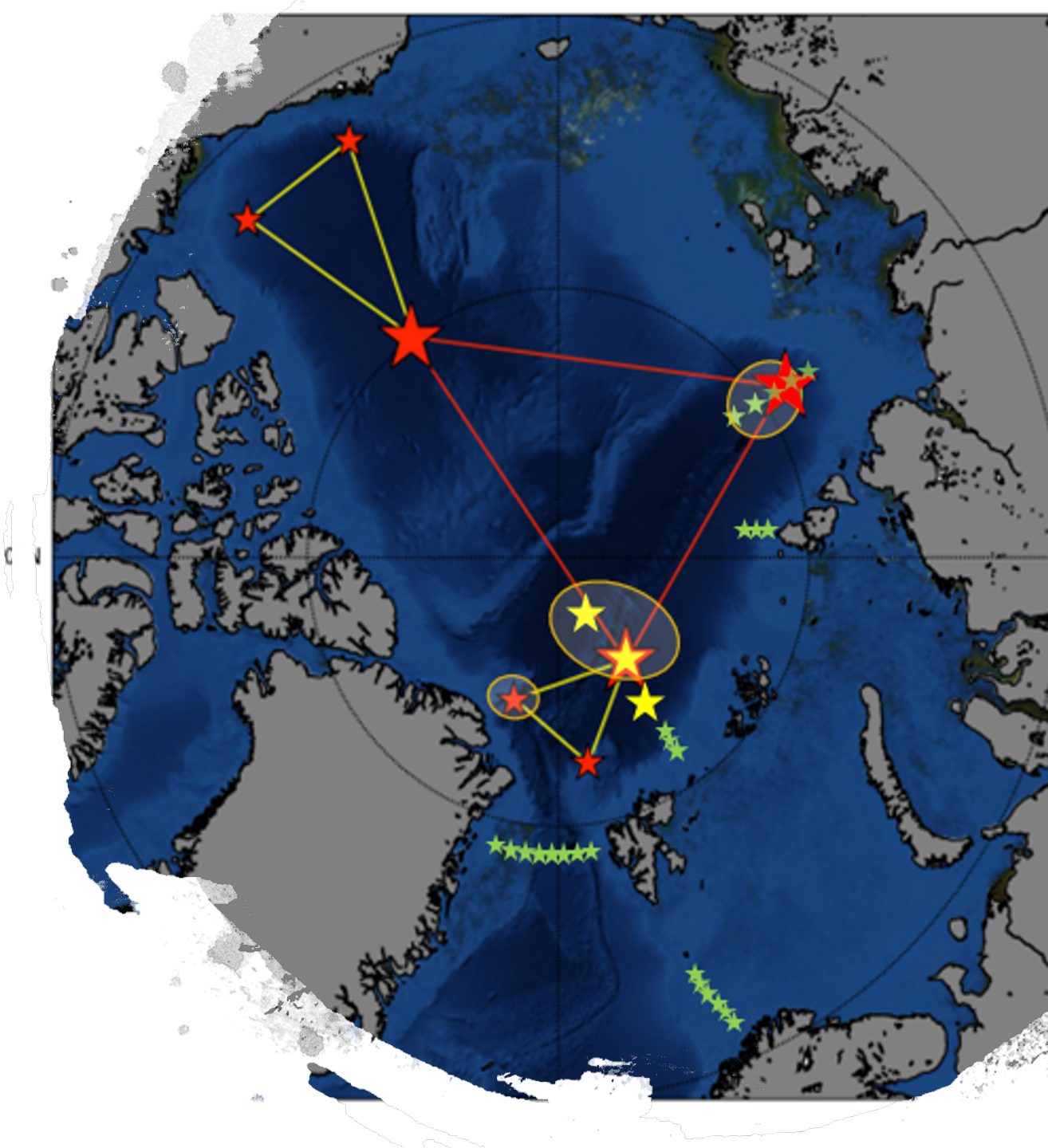
The vision of future nested Multipurpose Acoustic Networks in the Arctic

- MULTIPURPOSE ACOUSTIC NETWORK FOR PASSIVE ACOUSTICS,
- TOMOGRAPHY/THERMOMETRY
- UNDERWATER GEOPOSITIONING OF FLOATS AND GLIDERS
- ACOUSTIC MOORINGS WILL BE EQUIPPED WITH OCEANOGRAPHIC SENSOR
- THE ACOUSTIC NETWORK WILL COMPLEMENT OCEANOGRAPIC MOORING ARRAYS.



International collaboration

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The Research Council of Norway

INTAROS

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