

Title: Observing the changing Arctic Ocean with acoustics

Time: 29 April 2026

Presenters: Hanne Sagen (NERSC) and Peter Worcester (SIO-UCSD)

Abstract: The Arctic Ocean is warming faster than any other region of the planet. This warming is causing ice to melt and creating a more open ocean with less, thinner, and younger sea ice. Monitoring the changes are crucial to understanding potential impacts in the region. Acoustics is playing a unique role in the long-term observation of the changing Arctic Ocean.

Duration: a 40-minute presentation followed by a Q&A session

Audience: Policy makers, researchers, consultants and educators

Goal: inform public how on underwater sound is used to observe the Arctic Ocean

Webinar outline:

- The changing Arctic and why acoustics has a unique role to play in observing the Arctic Ocean
 - How is the Arctic Ocean changing?
 - How can underwater acoustics be used to observe the Arctic Ocean?
 - Ocean acoustic tomography/thermometry
 - Passive acoustic monitoring
 - What are soundscapes?
<https://dosits.org/science/sounds-in-the-sea/what-are-soundscapes/>
 - How is acoustics used to monitor Arctic marine mammals?
<https://dosits.org/people-and-sound/investigate-marine-animals/how-is-acoustics-used-to-monitor-arctic-marine-mammals/>
 - Underwater positioning
 - Underwater GPS
<https://dosits.org/galleries/technology-gallery/navigation-technology/underwater-gps/>
- How ocean acoustic tomography works
 - How is sound used to measure ocean temperature and global climate change?
 - How is sound used to measure temperature in the ocean?

<https://dosits.org/people-and-sound/research-ocean-physics/how-is-sound-used-to-measure-temperature-in-the-ocean/>

- How is sound used to measure global climate change?
<https://dosits.org/people-and-sound/research-ocean-physics/how-is-sound-used-to-measure-global-climate-change/>
- How does sound travel in the Arctic Ocean?
 - Propagation Modeling
<https://dosits.org/science/advanced-topics/propagation-modeling/>
 - How does sea ice affect how sound travels?
<https://dosits.org/science/movement/sea-ice/>
- The technology: sources, receivers, moorings
 - Deep-sea acoustic moorings
 - Acoustic Tomographic Mooring
<https://dosits.org/galleries/technology-gallery/observing-ocean-currents-and-temperature/acoustic-tomographic-mooring/>
 - Underwater acoustic sources
 - Projector/sound source
<https://dosits.org/galleries/technology-gallery/basic-technology/projector-sound-source/>
 - What is source level?
<https://dosits.org/science/advanced-topics/source-level/>
 - Ocean Acoustic Tomography Transmission
<https://dosits.org/galleries/audio-gallery/anthropogenic-sounds/ocean-acoustic-tomography-transmission/>
 - ATOC Transmission
<https://dosits.org/galleries/audio-gallery/anthropogenic-sounds/atoc-transmission/>
 - Underwater acoustic receivers
 - Hydrophone/receiver
<https://dosits.org/galleries/technology-gallery/basic-technology/hydrophonereceiver/>
 - Hydrophone arrays
<https://dosits.org/galleries/technology-gallery/basic-technology/hydrophone-arrays/>
- CAATEX, HiAOOS, and how these experiments pave the way for a sustained Arctic Ocean observing system