

Cold front: Researchers explore arctic land and sea at Navy ICEX

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Ice Camp Sargo, located in the Arctic Circle, serves as the main stage for Ice Exercise 2016. ICEX 2016 is a five-week exercise designed to research, test and evaluate operational capabilities in the region. It allows the US Navy to assess operational readiness in the Arctic, increase experience in the region, advance understanding of the Arctic environment and develop partnerships and collaborative efforts. Credit: US Navy photo by Mass Communication Specialist 2nd Class Tyler Thompson/Released

As the Navy's Ice Exercise (ICEX) 2016 winds to a close this week in the frigid waters of the Arctic Ocean, officials at the Office of Naval Research (ONR) today reported new scientific research that took place during the event that will enhance our understanding of, and ability to safely operate in, Arctic maritime environments.

ICEX, a biennial, multi-week exercise sponsored by the Navy's Arctic Submarine Laboratory, is designed to test submarine capabilities in the Arctic—as well as provide a [base camp](#) for cooperative scientific research. The temporary camp sits on a thick piece of floating sea ice approximately 200 miles north of Barrow, Alaska.

This year, for the second time in a row, the ICEX base camp had to be evacuated when cracks in the ice were discovered—proving anew the importance of better understanding the changing region.

"ONR sponsors an active Arctic research program, and ICEX provides a unique and valuable opportunity for our researchers," said Chief of Naval Research Rear Adm. Mat Winter. "Increasing our understanding of the dynamic Polar environment will help ensure future naval operations in the region are conducted safely and efficiently."

One of the significant ONR-sponsored projects involved the launch of an unmanned underwater vehicle (UUV) to measure temperature, salinity and ambient noise conditions beneath the surface—factors that can dramatically impact the effectiveness of sonar operations. Sonar is a naval technology that uses sound in the water to detect and track submarines, popularly known by the famed "ping" signals shown in movie and television depictions.

The ONR UUV collected data within a submerged layer of warm water, known as the Beaufort Lens, which is flowing into the Arctic from the Pacific Ocean. This knowledge could prove essential for improved

detection, classification and tracking of vessels.

In related efforts, ONR-sponsored students from the Naval Postgraduate School measured and analyzed the loss of transmission signals over different frequencies as sound penetrated the warm layer of the Beaufort Lens. Other students studied characteristics under the ice at the sea-ice interface.

ONR's Arctic and Global Prediction program also supported Naval Research Laboratory work during the exercise that used airborne and space-based synthetic aperture radar to develop methods to remotely determine the thickness and age of Arctic sea ice floes.

"The Arctic Ocean is a dynamic and particularly challenging maritime environment," said Capt. Robin Tyner, military deputy to ONR's Ocean Battlespace Sensing department. "As the changing environment opens the region for expanded maritime and naval activity, knowledge of that environment, and the ability to accurately predict weather and ice movement, will become increasingly important."

The U.S. Navy Arctic Roadmap 2014-2030 assigns ONR lead responsibility for improving Arctic assessment and prediction, and developing comprehensive computer models to support ocean, [ice](#) and atmospheric forecasts.

Provided by Office of Naval Research

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