

Exploring Northwest Passage, scientists and students will make first live, interactive broadcasts from fabled frontier

For citizen scientists, teachers, students, and the public worldwide via Facebook Live: 1st interactive events from Northwest Passage

PROVIDENCE, RHODE ISLAND, USA, June 21, 2018 /EINPresswire.com/ -- The Arctic Ocean, with its vast icy islands and peninsulas, was once known as terra incognita - the unknown land - the planet's last great un-navigated maritime frontier.

This summer, a team of scientists and students, conducting research aboard the One Ocean Expeditions' vessel Akademik Ioffe, will offer select museums, as well as classrooms and citizen scientists worldwide, an opportunity to explore with them in real time a dramatically changing Arctic Ocean, and to discuss their research in the first-ever live, interactive broadcasts from the fabled Northwest Passage.



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It is important for people everywhere on Earth to understand how this region affects all citizens.”

Gail Scowcroft, Northwest Passage Project Director

From August 23 to Sept. 13, the University of Rhode Island's Inner Space Center (ISC), with major funding from the U.S. National Science Foundation and additional support from the Heising-Simons Foundation, will conduct the innovative [Northwest Passage Project](#) research expedition with a team of natural and social scientists, students, and a professional film crew. This ground-breaking opportunity is also supported by One Ocean Expeditions as a key marine partner, having operated in Arctic waters for over 20 years.

Research to aid understanding of / document climate change effects

Aboard the Akademik Ioffe, the team will collect water, ice, and air samples to advance understanding of and document the effect climate change is having on the environment and biodiversity in the Canadian Arctic Archipelago.

The project will help fill significant gaps in critical scientific data about the region, using of a suite of

oceanographic instruments throughout the ship's 22-day transit.

The expedition's chief scientist, Dr. Brice Loose of the University of Rhode Island Graduate School of Oceanography, is coordinating and leading the research into the exchange of greenhouse gases between the water and atmosphere, and changes in distribution and abundance of two vulnerable levels of the Arctic food web - plankton and seabirds.

A suite of high-tech tools: 1st autonomous underwater glider flight to collect information in NW Passage water column

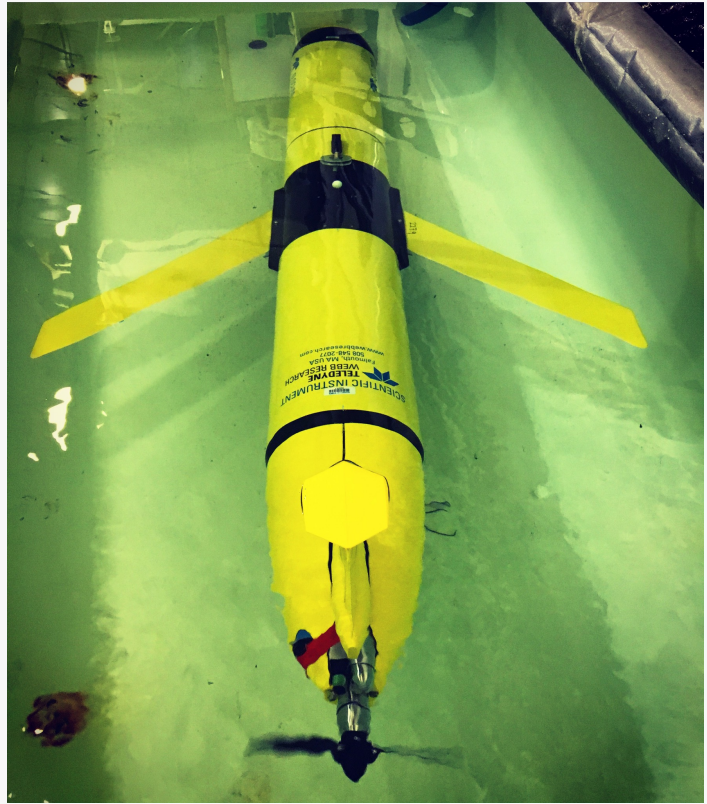
Plans include deployment of the Slocum Glider, an autonomous underwater vehicle (AUV), to be retrieved after sampling the waters of eastern Lancaster Sound - a critical choke point in the Northwest Passage between the Beaufort Sea and Baffin Bay.

Freshwater export from the Arctic can have dramatic impacts on ocean circulation inside the Canadian Arctic Archipelago, as well as globally when it discharges into the North Atlantic Ocean.

The glider will be deployed for more than 10 days and will focus on water column measurement of temperature, salinity, dissolved oxygen, chlorophyll-a fluorescence, colored-dissolved organic matter fluorescence, and optical backscattering (the reflection of waves, particles, or signals back to the direction from which they came). This suite of measurements will provide a high resolution view of the Lancaster Sound currents, water masses, and primary biology.

Scientific research areas

* The physics of Arctic ocean circulation: Transpolar water drift through the Canadian Arctic Archipelago (CAA)



An autonomous underwater vehicle will be deployed for the first time to sample for two weeks waters of eastern Lancaster Sound - a critical choke point in the Northwest Passage



Emmy Award-winning director David Clark will produce and direct a two-hour television documentary, Frozen Obsession, which will explore the changing Arctic by documenting the NPP expedition

Scientists will investigate the increased freshwater storage and export from the upper Arctic ocean due to a warming Arctic. As ice melting occurs, increased freshwater is accumulating in the Arctic, resulting in a large freshwater anomaly.

Freshwater inputs can have dramatic impacts on ocean circulation, particularly when freshwater is discharged into the North Atlantic Ocean from the Arctic. The CAA, and particularly Northwest Passage, is one of the principal conduits for freshwater transport from the Arctic Ocean to the North Atlantic.

* The concentration and isotopic composition of methane and carbon dioxide in the Arctic Ocean and atmosphere are of great interest, as both are greenhouse gases and the sources and flux of both between the ocean and atmosphere are important components of the global climate system.

The Arctic Ocean generally absorbs carbon dioxide, but ice cover limits air-sea exchange. Measuring carbon dioxide and its isotopic composition can provide information about the carbon system's sources and fluxes into the atmosphere. Methane, a more potent greenhouse gas than carbon dioxide, is found throughout the Arctic Circle, and the Arctic appears to be an ever growing source of methane to the atmosphere. Methane is found in land-based permafrost and as methane ice or methane hydrates, which are distributed along the seafloor.

With less sea ice cover, there can be an increased flux of methane into the atmosphere from the ocean. However, some microbes in ocean water use methane as a food source. If microbial breakdown of methane is rapid enough, it may serve to offset the methane that escapes to the atmosphere. There is little data to provide estimates of this methane breakdown in Arctic water. The Project will study this microbial breakdown of methane and the rate at which it occurs in the Northwest Passage region.

* Ecosystem surveys of Arctic habitats in transition: Distribution and abundance of zooplankton and phytoplankton

As the waters of the Arctic warm and the sea ice cover decreases, the Arctic surface ocean ecosystem is anticipated to undergo considerable changes. Habitats are changing and moving, perhaps disappearing, and species distribution and abundance also may be changing rapidly.

To observe phytoplankton and zooplankton, the Northwest Passage Project will periodically conduct plankton net tows in the upper water column (100m and less). The contents of the nets will be catalogued. The organisms collected in these net tows will be counted with a laboratory bench-top Flowcam.

The Flowcam counts and images micrometer size particles using an imaging microscope. This provides the ability to identify and quantify 'particles' from some sampled volume. These particles can be sediments, phytoplankton, or even zooplankton. This imaging system will generate a library of images for each run and store them for processing later.

* Ecosystem surveys of Arctic habitats in transition: Distribution and abundance of seabirds

News release in full: <http://bit.ly/2K4e1Yd>

Photos: <http://bit.ly/2HqbqH9>

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