

UAF researchers to study Arctic spring on the Sikuliaq

By Lauren Frisch

University of Alaska Fairbanks researchers have received \$2.2 million to study Arctic marine ecosystems while on board the Sikuliaq, the research vessel owned by the National Science Foundation and operated by the UAF School of Fisheries and Ocean Sciences.

The project will help researchers better understand the processes that prime oceans for summer productivity and better anticipate changes resulting from declining ice cover.

Six SFOS researchers, along with staff, students and international collaborators, will study oceanography and food web dynamics in the northern Bering Sea and southern Chukchi Sea through the North Pacific Research Board's Arctic Integrated Ecosystem Research Program.

Fieldwork in early spring 2017 and 2018 will take place on board the ice-capable Sikuliaq, a \$200 million vessel that arrived at its home port of Seward in March 2015.

"We are excited about this project because in a lot of respects this project is exactly why we built the Sikuliaq," said Seth Danielson, an SFOS research associate professor and the project's lead principal investigator. "We are seeking to head to the ice edge right in the shoulder season between winter and the summer months."

The researchers will measure growth rates, oxygen consumption rates, productivity rates, sinking rates of particles and how quickly currents affect the flow of water and materials from south to north. They'll take samples from the water column and the seafloor sediments.

Andrew McDonnell, SFOS assistant professor and principal investigator, explained that most fieldwork for these regions has been done between July and September, because that's traditionally when access to the region has been easier.

But "biological activity in the late spring — late May through June — sets the stage for energy flow and ecosystem processes for the rest of the summer," he said.

Danielson said this "spring bloom" is one of the most biologically important events of the year.

"We hope to measure the system during or just after this annual peak in phytoplankton growth so that we can better understand how the energy stored in the phytoplankton during spring is subsequently passed on to



support fishes, clams and crabs as well as the marine mammals that feed on them," he said.

The research will help explain connections between physical and biological systems. This will be critical for managers looking to preserve thriving Arctic ecosystems as sea ice concentrations continue to decline.

The UAF research team includes Danielson (studying physical oceanography) and McDonnell (particles) but also Sarah Hardy (benthic invertebrates), Russell Hopcroft (zooplankton), Dean Stockwell (nutrient chemistry and phytoplankton) and Arny Blanchard (biostatistics).

Four other Arctic Integrated Ecosystem Research Program projects are also focused in the Bering and Chukchi seas. Two research teams led by NOAA will study physical and biological systems in the Chukchi Sea in the summer and fall. A University of Washington group will focus on marine mammals and the underwater sound environment. A social science project will investigate Chukchi coastal communities' understanding of and responses to environmental change.

The AIERP is sponsored by the North Pacific Research Board, the Collaborative Alaskan Arctic Studies Program, the Bureau of Ocean Energy Management, and the Office of Naval Research Marine Mammals and Biology Program, along with in-kind support from the National Oceanic and Atmospheric Administration and UAF. ■