Biologists lead international team to track Arctic response to climate change

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Last summer was the highest ice retreat in the Arctic record, and eight of the last ten years have seen the lowest ice on record. An international team of scientists will track the biological response to sea ice retreat and the resulting environmental changes. Credit: Photo by Lee Cooper/University of Maryland Center for Environmental Science

Biologists Jackie Grebmeier and Lee Cooper from the University of Maryland Center for Environmental Science's Chesapeake Biological Laboratory have been visiting the chilly area north of Alaska near the

Bering Strait for more than 20 years, but it's only in the last few years that they have seen things really start to change. And fast. Last summer was the highest ice retreat in the Arctic record, and eight of the last ten years have seen the lowest ice on record.

"We're seeing the highest sea ice retreat in the whole Arctic," said Jackie Grebmeier, research professor at the University of Maryland Center for Environmental Science's Chesapeake Biological Laboratory and chair of the International Pacific Arctic Group. "It's the most productive part of the Arctic, and it's in the U.S.' backyard."

At the end of February, they travel to Seattle gather an international team of scientists to establish a Distributed Biological Observatory in the North American Arctic. Funded by a five-year award from the National Science Foundation, researchers from Japan, Korea, China, Canada, Russia, and the United States will systematically track the biological response to sea ice retreat and the resulting environmental changes in the Bering and Chukchi Seas to the west and north of Alaska.

"It has been projected that there won't be ice in the summer in the Arctic Ocean by 2050," said research professor Lee Cooper. "But the ice is disappearing faster than all of the models."

Through observing stations in five "hot" spots, scientists will monitor everything from the temperature and salinity of the water and the amount of zooplankton (fish food) swimming around in the waters to clams clinging to the shores and how many birds, walruses, and polar bears continue to call the area home. The goal is to observe and document how the Arctic creatures are responding to climate change and track those ecosystem changes under further loss of sea ice.

In Arctic food webs, even small changes can have large cascading effects on higher organisms. Intense studies of these areas will help scientists to

better understand how climate change affects Arctic biology, and how these changes in turn affect the Earth system. No ice in the summer means thinner ice that melts faster in the winter. It's multi-year ice that keeps the Arctic cold, and helps control weather around the world.

"When you change sea ice, you change climate and weather patterns that affect us throughout the U.S.," said Grebmeier, who represents the United States on the International Arctic Science Committee.

A decline in sea ice has other implications, as well. Fishing might move north. Ships from China might take a shortcut through the Bering Strait to reach destinations in Europe instead of the long trip across the Indian Ocean and through the Suez Canal. Oil companies could more easily access oil reserves for more of the year. People who live in the Arctic are also interested in these changes, as increased use of the waterways can lead to contamination of fisheries, pollution, and shifts in their economy.

"When you go up there you really see changes," said Grebmeier. "We're like the frogs in the pot here. But up there, just in the past 20 or 30 years, the changes have been quite obvious."

More information: arctic.cbl.umces.edu/

Provided by University of Maryland Center for Environmental Science

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