

Scientists have front row seat to Arctic warming

November 10 2015, by Clement Sabourin



Ice chunks float in the Northwest Passage near the CCGS Amundsen, a Canadian research ice-breaker navigating in the Canadian High Arctic

Prodding glacial sludge with their hands, a huddle of scientists marvel at the sight of a strange-looking millipede wriggling out of a sample lifted from the Arctic seabed.

On the deck of the Canadian Coast Guard icebreaker Amundsen, a

group of researchers in hard hats and cold weather survival gear search through a slimy heap of clay soil pulled by the ship's crane from 70 meters below.

Slipping a thermometer into the pile stirs a nest of odd-looking creatures. The temperature within is -1.8 degrees Celsius (29 Fahrenheit).

"Whatever you may think, the region is pretty rich in biodiversity," says Laure de Montety, an Arctic taxonomy expert from the University of Quebec in Rimouski.

The Arctic Ocean is also the smallest and least studied in the world. To identify the critters, they will have to turn to the expedition records of 19th-century explorers, in hopes of finding a match.

As the polar ice caps retreat due to global warming, researchers like de Montety have flocked to the far north to "get a good idea of the region before the arrival of too many ships and any dramatic changes due to warming," she explains.

Mapping Arctic biodiversity

Each summer, the Amundsen now acts as a floating laboratory for about 40 scientists.

The top of the world has already warmed by three degrees Celsius since the beginning of the industrial age and scientists fear a tipping point has been reached, spurring tremendous changes in the Arctic ecosystem.

That led this group to redouble efforts to catalogue the region's unique biodiversity and discover any hidden secrets before they are gone.

Day and night, the scientists sift through ocean floor sediment and water samples.

In recent years, the Amundsen's trawling nets have plucked several fish from Arctic waters that would normally be found in the warmer Atlantic or Pacific oceans.

Sand eels, for example, have moved into the Beaufort Sea and the Northwest Passage, threatening indigenous species including Arctic cod, which are a favorite food of beluga whales and seals.

"The sea ice continues to disappear—who knows what the region will look like in 20, or 30 years," says marine biologist Solveig Bourgeois, working in a tiny laboratory in the ship's stern.

"We have to hope that local organisms will adapt."

When the polar ice retreats in the summer, algae that normally grows beneath it also disappears, depriving many micro-organisms of their primary food source. Over the long term, the impact could ripple up the food chain, she explains.

Working alongside Bourgeois, a team is attempting to free a device known on board as the "torpedo," whose cable is snagged in frozen pulleys.

Once dropped into the frigid waters, the meter-long metal cylinder shuttles between the seabed and surface to extract ocean data.

Complex ocean systems

The goal is to understand how the Arctic Ocean is mixing with the Atlantic and Pacific Oceans, and how currents are formed.

"We must know this in order to create good climate models," says Jody Klymak, an oceanographer in charge of the project.

"If you want to understand how the Arctic is changing, it's important to understand how currents are changing—it's fundamental," adds the University of Victoria professor.

It has been nearly a century since Norwegian explorer Fridtjof Nansen proved that the Arctic is in fact an ocean, fed by 10 percent of the world's rivers as well as the Atlantic and the Pacific.

But it was only when the ice cap started to retreat in summer that researchers began studying its inner workings.

For Amundsen mission chief Roger Francois, it is important to quickly gather as much data as possible about this pristine region because "the changes occurring in the Arctic influence what happens far beyond this place."

The melting ice caps risk reducing the salinity of the world's oceans, says the Belgian researcher, which could change ocean currents and affect the movement of warmth and cold between the poles and the Equator, causing lasting climate upheaval.

The Arctic is very complex, Francois adds, and our knowledge about it is limited so there are "still many surprises to come."

© 2015 AFP

Citation: Scientists have front row seat to Arctic warming (2015, November 10) retrieved 26 April 2024 from <https://phys.org/news/2015-11-scientists-front-row-seat-arctic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.