

# Tracking the retreat of Arctic ice

August 2 2015, by Céline Serrat

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Now there is liquid water even in the coldest months, the glaciers are retreating at a rate of hundreds of metres per year, and alien species

from warmer climes are making the bay their home, say longtime residents of the sparsely-populated town on the Norwegian island of Spitsbergen.

"In the 1990s, we could cross the bay in snow mobiles," recalled Juergen Graeser, a technician at the Franco-German Awipev research station which collects weather, atmospheric and chemical data.

"The last time we could walk on it was in the winter of 2003-04."

And since 2007, the Kongsfjorden fjord or bay that carves into the island's west coast, "has not frozen over once", said Sebastien Barrault, a research adviser for the Kings Bay logistics company.

These days, the bay in winter more closely resembles its summery self: a vast expanse of water dotted with icebergs and patches of ice sheet, framed by glaciers.

Just 1,000 kilometres (621 miles) south of the north Pole, the island's climate was always mild for its high latitude (79 degrees) due to a warm ocean current that runs along its west coast.

But the Arctic has warmed more than any other region on Earth—a phenomenon some scientists have linked to feedback from sea ice loss and changes in atmospheric and ocean circulation caused by overall planet warming.

The region has warmed about 1.0 to 1.2 degrees Celsius (1.8-2.16 degrees Fahrenheit) in each of the past two decades—far exceeding the global 0.8 C average since the pre-industrial era.

In March, US officials said Arctic sea ice had reached its lowest winter point since satellite observations began in the late 1970s—raising

concerns for [sea level rise](#) and the survival of polar bears and marine creatures which depend on the ice.

The shrinking of sunlight-reflecting ice sheets and glaciers, in turn, leads to more heat being absorbed by land and sea.



This aerial view taken on July 20, 2015 shows the Kronebreen glacier with red traces of sediments near the scientific base of Ny-Alesund

## **Mackerel? In the Arctic?**

Ny-Alesund, the world's northernmost permanent human settlement, is caught up in the transformation and offers the perfect vantage point for scientists studying the rate and effects of global warming.

Oceanographer Philippe Kerherve has come to the erstwhile coal mining village to study sediment transportation by glaciers—compressed masses of ice and rock that "flow" slowly over land.

Glaciers cover about 60 percent of Spitsbergen. One of the biggest among them, Kronebreen, sports a massive two kilometre-wide crack in its facade, and has receded by a kilometre since 2012.

Glacier flow usually is faster in the summer months, when ice melts into water, sweeping up crushed rock and mud between the glacier and the land surface, and dumping it into the bay.

But the flows are getting stronger.

"With global warming, there is more melt and more rocky sediment. It is the rich marine ecosystem of the fjords that will be more and more affected," said Kerherve.



French oceanographer Philippe Kerherve takes samples from the Kongsfjorden fjord near the scientific base of Ny-Alesund on July 21, 2015

Species throughout the food chain, everything from krill and seaweed, shell fish, fish and mammals like seals, may suffer from too much mud being dumped into the bay that provides their food, shelter and breeding grounds.

Add to this competition from new species arriving in the area, possibly aided by climate change-induced sea current changes.

"We are now seeing species that are not normally found in the Arctic," said Barrault, staring out over Kongsfjorden.

"The Atlantic cod now travel all the way here, and we are starting to see mackerel," he said.

Barnacle geese which emigrate every year from Scotland, have since 2007 "suddenly advanced their migration by 15 days," said ornithologist Maarten Loonen.

"They are adapting to the earlier arrival of spring here."

UN climate talks are meant to deliver a global pact in Paris by year-end to peg average [global warming](#) to 2 C, the level at which scientists believe we may avoid the worst climate impacts.

But they warn that at current rates, the world is heading for double that rate, or more.

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