

Scary warming at poles showing up at weird times, places

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Scientists are seeing surprising melting in Earth's polar regions at times they don't expect, like winter, and in places they don't expect, like eastern Antarctica.

New studies and reports issued this week at a major Earth sciences conference paint one of the bleakest pictures yet of dramatic and dangerous warming in the Arctic and Antarctica. Alaskan scientists described to The Associated Press Tuesday never-before-seen melting and odd winter problems, including permafrost in 25 spots that never refroze this past winter and wildlife die-offs.

The National Oceanic and Atmospheric Administration Tuesday released its annual international Arctic report card, detailing the second warmest Arctic on record and more than a dozen different problems, including record low winter sea ice in parts of the Arctic, increased toxic algal blooms, which are normally a warm water problem, and changes in weather in the rest of the country that can be attributed to what's happening in the Arctic.

"The Arctic is experiencing the most unprecedented transition in human history," report lead author Emily Osborne, chief of Arctic research for NOAA, said Tuesday.

University of Colorado environmental science program director Waleed Abdalati, who was NASA's chief scientist and was not part of the NOAA report or any of the studies, said what's happening is a big deal.

"It's a new Arctic. We've gone from white to blue," Abdalati, an ice scientist said. He said he normally wouldn't use the word "scary" but it applies to what's happening.

And that means other problems.

"Continued warming of the Arctic atmosphere and ocean are driving broad change in the environmental system in predicted, and, also, unexpected ways," the NOAA report said.

One of the most noticeable problems was a record low sea ice in winter in the Bering Sea in 2017 and 2018, report card authors and other outside scientists said.

In February—the depth of winter—the Bering Sea "lost an area of ice the area of Idaho," said Dartmouth University engineering professor Donald Perovich, a co-author of the Arctic report card.

This is a problem because the oldest and thickest sea ice is being lost, down 95 percent from 30 years ago. In 1985, about one sixth of all the Arctic sea ice was thick multi-year ice, now it is maybe one-hundredth, Perovich said.

University of Alaska Fairbanks marine mammal biologist Gay Sheffield not only studies the record low ice, but she lives it daily in Nome, far north on the Bering Sea.

"I left Nome and we had open water in December," Sheffield said in an interview at the American Geophysical Union scientific conference in Washington. "It's very much impacting us."

She mentioned the recent death of someone driving on ice that would normally be thick at this time but wasn't.

"Having this area ice free is having this massive environmental change," Sheffield said, adding there's been a "multi-species die off" from starvation because of the changes that lack of winter sea ice has had on ocean life. "That should get everyone's attention." She said that includes the first spring mass die off of seals along the Bering Strait.

Normally there's an east-west separation of cold and warm water in the Bering Sea that drifts from year to year, but this year the warm water reaches all the way up to the Bering Strait and that's changed sea life, Sheffield said.

Ornithologist George Divoky who has been studying the black guillemots of Cooper Island for 45 years noticed something different this year. In the past, 225 nesting pairs of the seabirds would arrive at his island. This past winter it was down to 85 pairs showing up, but only 50 laid eggs and only 25 had successful hatches. He blamed the lack of winter sea ice.

"It looked like a ghost town," Divoky said.

With overall melting, especially in the summer, herds of caribou and wild reindeer have dropped about 55 percent—from 4.7 million to 2.1 million animals—because of the warming and the flies and parasites they bring, said report card co-author Howard Epstein of the University of Virginia.

University of Alaska Fairbanks permafrost researcher Vladimir Romanovsky said he was alarmed by what happened to the permafrost—ground that stays below freezing years on end. This past year, Romanovsky found 25 spots that he regularly monitored that used to freeze in January, then February, but never froze this year. They haven't been frozen since early 2017. His work is yet to be published and isn't part of NOAA's Arctic report.

This means areas that store heat-trapping carbon, especially methane, may let more of the gases escape into the air and also is difficult for buildings, roads and pipelines constructed on the concept of frozen ground, he said.

Because of warming, the Arctic is "seeing concentrations of algal toxins moving northward" infecting birds, mammals and shellfish to become a public health and economic problem, said report card co-author Karen Frey.

And the warmer Arctic and melting sea ice has been connected to shifts in the jet stream—the currents that move weather fronts in the air—that have brought extreme winter storms in the East in the past year, Osborne said.

But it's not just the Arctic. NASA's newest space-based radar, Icesat 2, in its first couple of months has already found that since 2008, the Dotson ice shelf in west Antarctica has lost more than 390 feet (120 meters) in thickness since 2003. That's bigger than the Statue of Liberty, said radar scientist Ben Smith of the University of Washington.

Another study released Monday by NASA found unusual melting in parts of East Antarctica, which scientists had generally thought was stable and perhaps even gaining in ice.

Four glaciers at Vincennes Bay has lost nine feet of ice thickness since 2008, said NASA scientists Catherine Walker and Alex Gardner. That's not as fast a loss as in western Antarctica. But loss of ice sheets in Antarctica could lead to massive rise in sea level.

"We're starting to see change that's related to the ocean," Gardner said. "Believe it or not this is the first time we're seeing it in this place."

All these paint a consistent picture, scientists said.

"There's a message that Earth is telling us," former NASA chief scientist Abdalati said. "We can choose to hear it or we can choose to ignore it."

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