Hottest Arctic on record triggers massive ice melt (Update)

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The Arctic region is continuing to warm up more than twice as fast as the rest of the planet, which is also expected to mark its hottest year in modern times

The Arctic shattered heat records in the past year as unusually warm air triggered massive melting of ice and snow and a late fall freeze, US government scientists said Tuesday.

The grim assessment came in the Arctic Report Card 2016, a peer-

reviewed document by 61 scientists around the globe issued by the US National Oceanic and Atmospheric Administration.

The NOAA report covers from October 2015 to September 2016, a period it said the Arctic's average annual air temperature over land was the highest on record.

"The report card this year clearly shows a stronger and more pronounced signal of persistent warming than any previous year in our observational record" going back to 1900, NOAA Arctic Research Program director Jeremy Mathis told the American Geophysical Union conference in San Francisco, where the report was released.

"Those warming effects in the Arctic have had a cascading effect through the environment."

The environment has steadily declined since scientists started doing the annual report card, now in its 11th year, co-author Donald Perovich said.

"When it started, you kind of had to listen closely because the Arctic was whispering change," said Perovich, who works at Dartmouth College's Thayer School of Engineering in New Hampshire.

"Now it is not whispering anymore. It is speaking change. It is shouting change."

Warming twice as fast

The Arctic region is continuing to warm up more than twice as fast as the rest of the planet, which is also expected to mark its hottest year in modern times.

Climate scientists say the reasons for the rising heat include the burning

of fossil fuels that emit heat-trapping gases into the atmosphere, southerly winds that pushed hot air from the mid-latitudes northward, as well as the El Nino ocean warming trend, which ended mid-year.

The Arctic's annual air temperature over land was 6.3 degrees Fahrenheit (3.5 degrees Celsius) higher than in 1900, the report said.

The sea surface temperature in the peak summer month of August 2016 reached nine degrees Fahrenheit (five degrees Celsius) above the average for 1982-2010 in the Barents and Chukchi seas and off the east and west coasts of Greenland.

"Warm air and ocean temperatures in the fall led to a record-breaking delay in fall freeze-up," Perovich said, noting that the Arctic sea ice minimum from mid-October to late November was the lowest since the satellite record began in 1979.

It was also 28 percent less than the average for 1981-2010 in October.

Scientists added a section to the report about noteworthy records set in October and November 2016, even though that extended beyond the report's typical time span.

On thin ice

More of the ice that freezes in the Arctic winter is thin, made of only a single year's worth of freeze rather than thicker, more resistant ice built up over multiple years.

In 1985, almost half (45 percent) of Arctic sea ice was called "multi-year ice."

Now, just 22 percent of the Arctic is covered in multi-year ice. The rest

is first-year ice.

In Greenland, the ice sheet continued to shrink and lose mass as it has every year since 2002, when satellite measurements began.

Melting also started early in Greenland last year, the second earliest in the 37-year record of observations, and close to the record set in 2012.

Record-low snow

The springtime snow cover in the North American Arctic hit a record low in May, when it fell below 1.5 million square miles (four million square kilometers) for the first time since satellite observations began in 1967.

This melting, combined with retreating sea ice, has allowed more sunlight to penetrate the ocean's upper layers, stimulating widespread algae blooms.

The Arctic's people and animals are also suffering from the climate changes.

Ocean acidification is adding new stress for ocean creatures that need calcium carbonate to build shells, affecting people in the region who rely on fish for food.

And small mammals known as shrews are increasingly becoming infected with parasites that were once known to infect shorebirds, suggesting a northerly shift of some species.

The Arctic could be free of summer ice by the 2040s, Perovich said, adding that the changing temperatures are already affecting people who live in the region.

Asked by reporters if the report was tailored to the current political environment in the United States—with President-elect Donald Trump declaring climate change a Chinese hoax and preparing a cabinet that will include climate change deniers—Mathis said no.

"This is the best possible science that we can do," he said. "It is beyond reproach."