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## Arctic as vacation paradise

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Associated Press

Washington — Scientists have found what might have been the ideal ancient vacation hotspot with a 23-degree average temperature, alligator ancestors and palm trees.

And it's smack in the middle of the Arctic.

First-of-its-kind core samples dug up from deep beneath the Arctic Ocean floor show that, 55 million years ago, an area near the North Pole was practically a subtropical paradise, three new studies show.

The scientists say their findings are a glimpse backward into a much warmer-than-thought polar region heated by run-amok greenhouse gases that came about naturally.

Skeptics of man-made causes of global warming have nothing to rejoice over, however. The researchers say their studies appearing in Thursday's issue of Nature also offer a peak at just how bad conditions can get.

“It probably was (a tropical paradise) but the mosquitoes were probably the size of your head,” said Yale geology professor Mark Pagani, a study co-author.

And what a watery, swampy world it must have been.

“Imagine a world where there are dense sequoia trees and cypress trees like in Florida that ring the Arctic Ocean,” said Pagani, a member of the multinational Arctic Coring Expedition that conducted the research.

Millions of years ago, Earth experienced an extended period of natural global warming. About 55 million years ago, however, there was a sudden supercharged spike of carbon dioxide that accelerated the greenhouse effect.

Scientists already knew this “thermal event” happened but are not sure what caused it. Perhaps massive releases of methane from the ocean, the continent-sized burning of trees, lots of volcanic eruptions.

Many experts figured that while the rest of the world got really hot, the polar regions were still comfortably cooler, maybe about 11 degrees.

The new research found, however, that the polar average was closer to 23C. So instead of Boston-like weather year-round, the Arctic was more like Miami North. Way north.

“It's the first time we've looked at the Arctic, and man, it was a big surprise to us,” said study co-author Kathryn Moran, an oceanographer at the University of Rhode Island. “It's a new look to how the Earth can respond to these peaks in carbon dioxide.”

It's enough to make Santa Claus break into a sweat.

The temperature, based on core samples that act as a climatic time capsule, was probably the year-round average, but because data are so limited, it might also have been just the summertime average, researchers said.

What's troubling is that this hints that future projections for warming, several degrees over the next century, may be on the low end, said study lead author Appy Sluijs of the Institute of Environmental Biology at Utrecht University in the Netherlands.

It shows that what happened 55 million years ago was proof that too much carbon dioxide – more than four times current levels – can cause extreme global

warming, said another co-author Henk Brinkhuis at Utrecht University.

Purdue University atmospheric sciences professor Gabriel Bowen, who was not part of the team, praised the work and said it showed that “there are tipping points in our (climate) system that can throw us to these conditions.”

The new research also gave scientists the idea that a simple fern may have helped pull Earth from a hothouse to an icehouse by sucking up massive amounts of carbon dioxide. Unfortunately, this natural solution to global warming was not exactly quick: It took about a million years.

With all that heat and with massive freshwater lakes forming in the Arctic, a fern called Azolla started growing and growing. Azolla, still found in warm regions today, grew so deep, so wide that eventually it started sucking up carbon dioxide, Mr. Brinkhuis theorized. And that helped put the cool back in the Arctic.

Mr. Bowen said he has a hard time accepting that part of the research, but Mr. Brinkhuis said the studies show that tonnes upon tonnes of thick mats of Azolla covered the Arctic and moved south.

“This could actually contribute to push the world to a cooling mode,” Mr. Brinkhuis said, but only after it got hotter first. Then it would take at least 800,000 years to cool back down. It's not something to look forward to, he said.

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