Scientists raise eyebrows at Antarctic ice expansion

Story by Lorand Pottino

Ice Sheet Records Surprising Mass Gain

Between 2021 and 2023, the Antarctic Ice Sheet gained mass at an average rate of approximately 108 gigatons per year, stunning researchers who had been tracking decades of ice loss. From 2021 to 2023, Antarctica gained some of that lost ice back following a long trend of substantial ice loss.

This turnaround caught climate scientists off guard, particularly since it comes at a time when global temperatures continue to climb. Here's the thing: from 2011 to 2020, the Antarctic Ice Sheet was losing ice at a rate of 142 gigatons per year, but between 2021 and 2023, the trend reversed with the ice sheet gaining approximately 108 gigatons per year.

That's not just a slowing of ice loss, it's an actual reversal that nobody saw coming.

East Antarctica Defies Expectations

The most notable gains were in East Antarctica's Wilkes Land and Queen Mary Land region, including the Totten, Denman, Moscow University, and Vincennes Bay glacier basins. These four major glacier systems had been hemorrhaging ice for years.

Four glaciers in eastern Antarctica flipped from accelerated ice loss to significant mass gain during this period. It's hard to say for sure, but the shift appears dramatic when you look at the satellite data.

These weren't small glaciers quietly tucked away in some forgotten corner of the continent. These glaciers had been losing mass at an accelerating rate from 2011 to 2020, driven by surface melting and faster ice discharge into the ocean, but now appear to have partially recovered.

In a warmer climate the atmosphere can hold more moisture, which raises the likelihood of extreme weather such as the heavy snowfall which caused the recent mass gain in East Antarctica, according to research fellow Tom Slater from Northumbria University. The precipitation anomaly wasn't subtle.

The gains were linked to unusual precipitation patterns, which may be temporary. Total net accumulation of snow has been far above average for the March 2024 to February 2025 period, by nearly 200 billion tons, with the excess snowfall primarily located along the Dronning Maud Land coast, central East Antarctica, and the Getz Ice Shelf area of West Antarctica.
To put that in context, the average annual total surface mass balance for the continent is roughly 2,400 billion tons.