



Despite frequent headlines about a warming planet, melting sea ice, and rising oceans, climate analysts pointed to a seeming bright spot this week: During Southern Hemisphere winters, sea ice in the Antarctic, the floating chunks of frozen ocean water, is actually increasing.

In fact, in late September, satellite data indicated that Antarctica was surrounded by the greatest area of sea ice ever recorded in the region: 7.51 million square miles (19.44 million square kilometers), the U.S. National Snow and Ice Data Center announced Thursday. Even so, it's a slow rate of growth—about one percent over last year—not nearly enough to offset melting in the Arctic, which broke records just weeks ago.

National Geographic asked Eric Rignot, a NASA researcher and earth systems professor at UC Irvine, whether the data is good news, and what it means for the rise of global sea levels, which are fueled by melting ice.

This Antarctic record seems counter to what we often hear about sea ice shrinking. How can we explain growing sea ice?

If the world was warming up uniformly, you would expect the sea ice cover to decrease in the Antarctic, but it's not. The reason for that is because the Antarctic is cooler than the rest of the world. It's warming up as well but not as fast as other places.

So you have the warming world and a cold Antarctica, and the difference between the two is increasing. That makes the winds around Antarctica move a little bit faster. There's also a difference that comes from the depletion of ozone in the stratosphere in the Antarctic, which

makes the stratosphere colder.

That's the leading explanation for what we're seeing in the Antarctic, but you have to acknowledge that the effect is very small.

How does this news relate to other studies showing that the melting of Antarctic continental ice is contributing to a rise in sea level?

[Growing sea ice] has no effect whatsoever on sea level, because sea ice is already floating on the ocean. It does not displace sea level. It's frozen seawater, so whether it's frozen or liquid, it doesn't change the sea level.

While Arctic sea ice is decreasing, the Antarctic is now slightly increasing. Why is there so much variation between Arctic and Antarctic ice?

Well we have a continent on the South Pole. On the North Pole we have nothing but ocean. In the Arctic you see full-fledged warming of the atmosphere and the ocean, plus increased ice transport [out of the region, which removes cold air and water]. So all of these effects contribute to reduce the sea ice cover in the Arctic.

In the Antarctic, you have to think of it as its own climate system. It's a big continent isolated from the rest of the world. It has ocean all around it. It has wind regimes that blow clockwise around it and isolate it. It acts differently from the Arctic, which is completely connected to the rest of the North Hemisphere.

Considering we regularly hear about the planet's stressed climate system, is this good news?

Really, it's consistent with our understanding of a warming world. Some of the regional details are not something we can easily predict. But the general trends of decay of the sea ice cover and decay of the Greenland ice sheets and ice caps is in line with what we expect.

The Antarctic has not been warming up as fast as the models thought. It's warming up, but slower. So it's all consistent with a warming planet.