

The mysteries of Antarctic sea ice

July 28 2014, by Dr James Renwick

The world is unmistakably warming, melting glaciers and raising sea levels world-wide.

Massive loss of sea ice in the Arctic is one of the most well-known features of [climate change](#). But strangely, there is more sea ice forming every winter over the oceans around the Antarctic continent. The increases are small, around one percent every 10 years, but the trend is definitely upwards. The increases are small, around one percent every 10 years, but the trend is definitely upwards. There are lots of ideas to potentially explain how this is happening in a warming world but we really don't know why.

How to explain the increasing trend, in the face of widespread global warming and climate change, is one of the major open questions in climate science today.

Antarctic sea ice is a critical component of the climate, affecting global energy cycles and providing a home for many species of marine life. The annual cycle of Antarctic sea ice growth and decay is one of the largest seasonal signals on earth, roughly doubling the effective size of the Antarctic continent between February and September. Almost all the sea ice forms afresh every year, growing from the Antarctic coast out over the turbulent southern oceans, as the sun disappears below the horizon for the cold and dark Antarctic winter.

While the total ice area is increasing, there are very different things happening in different regions. South of New Zealand, near the Ross

Sea, is where the ice increase is largest. Over the other side of the Pacific, near the Antarctic Peninsula, sea ice is actually disappearing as fast as it is in the Arctic. There are other pluses and minuses all around the Antarctic coast which all add up to a small overall rise in sea ice area.

So what's going on? Our best understanding right now is that trends in the winds and the ocean waves that push the sea ice around are causing the trends in [sea ice](#) area. But what's causing the trends in the winds and the waves? Good question—it looks like it might just be 'natural variation' in the climate.

At this stage, what might happen next is anyone's guess and is a hotly pursued research topic—the 'natural variations' might change around at any time and the small increases might turn into large decreases next year. Or not.

To improve our understanding, we need to unravel the complex interactions between winds, waves, the oceans, and the seasonal cycle of ice growth and decay. Drilling in to what's happening over the Ross Sea and near the Antarctic Peninsula at different times of year might be the way forward, to give us a clearer picture of exactly what is going on, what's driving the changes we see, and where things might be going in the future.

Provided by Victoria University

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