

Antarctic Peninsula glaciers in widespread retreat, study finds

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The first comprehensive study of glaciers around the coast of the Antarctic Peninsula reveals the real impact of recent climate change.

Results from the study by researchers at British Antarctic Survey (BAS) and U.S. Geological Survey (USGS) published this week in the journal *Science*, show that over the last 50 years 87% of 244 glaciers studied have retreated, and that average retreat rates have accelerated.

A glacier is a 'river of ice', usually flowing between mountains that formed on bedrock by the compaction and recrystallization of snow. Ice shelf is the floating extension of the grounded ice sheet. It is composed of freshwater ice that originally fell as snow, either in situ or inland and brought to the ice shelf by glaciers. As they are already floating any disintegration (like Larsen B) will have no impact on sea level. Sea level will rise only if the ice held back by the ice shelf flows more quickly onto the sea.

BAS and USGS analysed more than 2000 aerial

photographs dating from 1940, and over 100 satellite images from the 1960s onwards, to calculate the position of glacier fronts along the coast of the Antarctic Peninsula. These historical records reveal previously unknown patterns of change.

Lead author, Alison Cook said, "Fifty years ago, most of the glaciers we looked at were slowly growing in length but since then this pattern has reversed. In the last 5 years the majority were actually shrinking rapidly. The retreat began at the northern, warmer tip of the Antarctic Peninsula and, broadly speaking, moved southwards as atmospheric temperatures rose. This region has shown dramatic and localised warming – around 2°C in the last 50 years – but this is not the only factor causing the changes. It's a complex picture.

On average the glaciers we studied retreated by 50 m per year in the last five years, faster than at any other time in the last fifty years. However 32 glaciers go against the trend and are showing minor advance. Had we not studied such a large number of glaciers we may have missed the overall pattern. It's the change from advance to retreat that suggests warming is the key cause, but these glaciers clearly show a more complex response than neighbouring ice shelves."

BAS Glaciologist, Dr David Vaughan is a co-author of the paper. He said, "These glacier retreat patterns combined with dramatic ice shelf break-ups leave us in no doubt that the Antarctic Peninsula ice sheet is extremely sensitive to recent warming. What we still need to determine is whether or not the warming in this area has its roots in human-influenced global warming. Either way, continuing retreat of glaciers in this area is important because it could allow more ice to drain from further inland and contribute to sea level rise. The current effect may be small in global terms, but this research takes us a step closer to understanding the cause and predicting the future."

Source: British Antarctic Survey

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