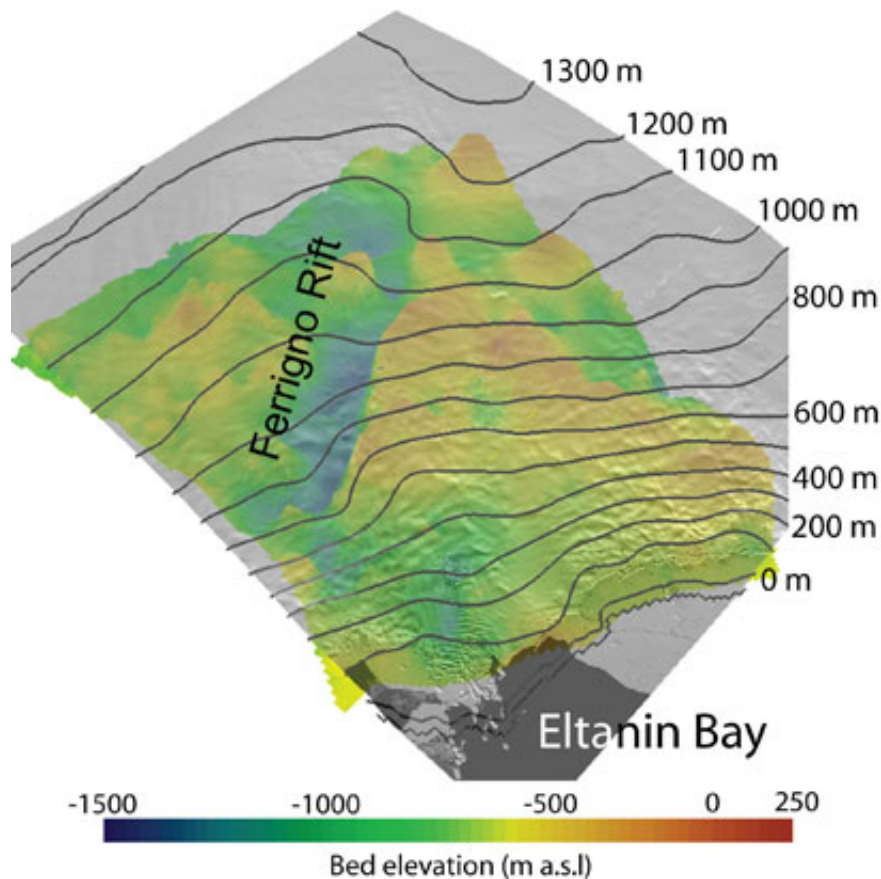


# Hidden rift valley discovered beneath West Antarctica reveals new insight into ice loss

July 25 2012



Map of Eltanin Bay.

Scientists have discovered a one mile deep rift valley hidden beneath the ice in West Antarctica, which they believe is contributing to ice loss from this part of the continent.

Experts from the University of Aberdeen and [British Antarctic Survey](#) (BAS) made the discovery below Ferrigno [Ice](#) Stream, a region visited only once previously, over fifty years ago, in 1961, and one that is remote even by Antarctic standards.

Their findings, reported in *Nature* this week reveal that the ice-filled ancient rift basin is connected to the warming ocean which impacts upon contemporary ice flow and loss.

The [West Antarctic Ice Sheet](#) is of great scientific interest and societal importance as it is losing ice faster than any other part of Antarctica with some [glaciers](#) shrinking by more than one metre per year.

Understanding the processes that influence ice loss from [West Antarctica](#) is important to improve predictions of its future behaviour in a warming world.

Dr Robert Bingham, a [glaciologist](#) working in the University of Aberdeen's School of [Geosciences](#) and lead author of the study, discovered the rift valley whilst undertaking three months of fieldwork with British Antarctic Survey in 2010.

Dr Bingham, whose [fieldwork](#) was funded by the UK's Natural Environment Research Council (NERC) said: "Over the last 20 years we have used satellites to monitor ice losses from Antarctica, and we have witnessed consistent and substantial ice losses from around much of its [coastline](#).

"For some of the glaciers, including Ferrigno Ice Stream, the losses are especially pronounced, and, to understand why, we needed to acquire data about conditions beneath the ice surface."

The team gathered the data using an ice-penetrating [radar system](#) towed

behind a skidoo driven across the relatively flat ice surface, over a distance of 1500 miles – greater than that between London and Athens.

Dr Bingham continued: "What we found is that lying beneath the ice there is a large valley, parts of which are approximately a mile deeper than the surrounding landscape.

"If you stripped away all of the ice here today, you'd see a feature every bit as dramatic as the huge rift valleys you see in Africa and in size as significant as the Grand Canyon.

"This is at odds with the flat ice surface that we were driving across – without these measurements we would never have known that it was there.

"What's particularly important is that this spectacular valley aligns perfectly with the recordings of ice-surface lowering and ice loss that we have witnessed with satellite observations over this area for the last twenty years."

Co-author and geophysicist Dr Fausto Ferraccioli from British Antarctic Survey added: "The newly discovered Ferrigno Rift is part of a huge and yet poorly understood rift system that lies beneath the West [Antarctic Ice Sheet](#).

"What this study shows is that this ancient rift basin, and the others discovered under the ice that connect to the warming ocean can influence contemporary ice flow and may exacerbate ice losses by steering coastal changes further inland."

Professor David Vaughan, from British Antarctic Survey leads Ice2sea, a major EU-funded FP7 research programme to improve projections of global and regional sea-level. He said, "Thinning ice in West Antarctica

is currently contributing nearly 10 per cent of global sea level rise. It's important to understand this hot spot of change so we can make more accurate predictions for future sea level rise."

The research in *Nature* is part of the British Antarctic Survey Icesheets Programme, which examines the role of ice sheets in the Earth System, and the processes that control ice-sheet change. It monitors current change and sets this in context with the past allowing more accurate projections for increases in global sea level to be made.

**More information:** Inland thinning of West Antarctic Ice Sheet steered along subglacial rifts by Robert G. Bingham, Fausto Ferraccioli, Edward C. King, Robert D. Larter, Hamish D. Pritchard, Andrew M. Smith, David G. Vaughan is published in the journal *Nature*.

Provided by British Antarctic Survey

Citation: Hidden rift valley discovered beneath West Antarctica reveals new insight into ice loss (2012, July 25) retrieved 20 March 2024 from <https://phys.org/news/2012-07-hidden-rift-valley-beneath-west.html>

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