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News Release

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Antarctic study identifies melting ice sheet's role in sea level rise

Loss of ice in Antarctica caused by a warming ocean could raise global sea levels by three metres, research suggests.

Scientists carrying out fieldwork in the region have assessed the landscape to determine how the West Antarctic ice sheet might respond to increasing global temperatures.

In the first study of its kind, researchers were able to gauge how levels of ice covering the land have changed over hundreds of thousands of years. They did so by studying peaks protruding through ice in the Ellsworth Mountains, on the Atlantic flank of Antarctica.

The team assessed changes on slopes at various heights on the mountainside, which indicate levels previously reached by the ice sheet. They also mapped the distribution of boulders on the mountainside, which were deposited by melting glaciers. Chemical technology – known as exposure dating – showed how long rocks had been exposed to the atmosphere, and their age.

Their results indicate that during previous warm periods, a substantial amount of ice would have been lost from the West Antarctic ice sheet by ocean melting, but it would not have melted entirely. This suggests that ice would have been lost from areas below sea level, but not on upland areas.

The study shows that parts of the West Antarctic ice sheet have existed continuously for at least 1.4 million years.

The study, published in *Nature Communications*, was carried out by researchers at the University of Edinburgh with Northumbria University and the Scottish Universities Environmental Research Centre. It was supported by the Natural Environment Research Council and the British Antarctic Survey.

Dr Andrew Hein, of the University of Edinburgh's School of GeoSciences, joint leader of the study, said: "Our findings narrow the margin of uncertainty around the likely impact of the West Antarctic Ice Sheet on sea level rise. This remains a troubling forecast since all signs suggest the ice from West Antarctica could disappear relatively quickly."

Ranked among the top universities in the world

Professor John Woodward of the University of Northumbria, who co-led the study, said: “It is possible that the ice sheet has passed the point of no return and, if so, the big question is how much will go and how much will sea levels rise.”

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