Lie of the land beneath glaciers influences impact on sea levels

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Fresh research into glaciers could help scientists better predict the impact of changing climates on global sea levels.

Scientists have shown for the first time that the terrain beneath glaciers influences how much glacier melt contributes to fluctuations in sea levels.

Researchers say the study will improve their understanding of how ice sheet movements have affected sea levels in the past, and will enable more accurate projections of future change.

Scientists from the University of Edinburgh studied the Slessor glacier in the Weddell Sea bay in Antarctica, and found surprising evidence that ice thickness in the region has not changed markedly since the past ice age.

Researchers say that this is because during the last ice age, sea levels were lower, which would be expected to extend the land over which the ice travelled slowly towards the sea, thickening as it went. However, a large trough in the land caused the glacier to float instead, moving more quickly and preventing its thickening.

This means the ice thickness has not varied markedly with climate or sea level change and has had little impact on sea levels or the volume of ice in Antarctica.

Being able to anticipate the dynamics of the ice sheet in response to changing climates helps scientists predict shifts in global sea levels.

The study, funded by the Natural Environment Research Council and Scottish Alliance for Geoscience, Environment and Society, was published in Earth and Planetary Science Letters and unveiled at the International Symposium of Antarctic Earth Sciences in Edinburgh.

Dr Andrew Hein, of the University of Edinburgh's School of Geosciences, said: "This finding is remarkable. We expected to show that the Slessor glacier had thinned significantly since the last ice age, in common with other glaciers in Antarctica. But it is possible to step off the glacier and on to rocks that have been untouched by ice for more than 100,000 years. To understand the behaviour of big glaciers, it is important to understand their landscapes."

Provided by University of Edinburgh

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