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Satellites shed light on Greenland Ice Sheet response to warming

Parts of Greenland's ice sheet have been found to be less vulnerable to climate warming than was thought – a discovery that could have a small but beneficial impact on sea level forecasts.

Satellite images have revealed that despite dramatic increases in ice melt across Greenland in recent years, the speed of ice movement in some areas has slowed down rather than accelerated.

The finding, observed on a sector of the ice sheet that terminates on land rather than in the ocean, will help scientists improve predictions of how quickly Greenland's ice will be lost in a warming climate.

Until recently, scientists thought that the increased volumes of meltwater from Greenland's ice in response to climate warming would speed up the motion of all parts of the ice sheet by helping the ice slide more rapidly.

However, their latest study shows that in recent decades, ice movement in some areas that terminate on land has slowed down rather than accelerated. The discovery suggests that further increases in ice melting, fuelled by climate change, may further slow movement of these sectors of the ice sheet.

A team of researchers from the University of Edinburgh used satellite data to track the shift of ice features such as crevasses in an 8000km² area of Greenland over three decades. They found that, despite a 50 per cent rise in meltwater from the ice surface in recent years, overall movement in the past 10 years was slower than in previous decades.

They found that this was caused by large amounts of meltwater produced in summer producing channels at the base of the ice sheet, which drain away water efficiently, slowing the glacier's movement the subsequent winter.

Scientists say more research is needed to understand the movement of other parts of the ice sheet, which terminate in the ocean and which have seen acceleration in recent decades.

The study, published in *Nature*, was carried out in collaboration with the Université Savoie Mont-Blanc in France and the University of Sheffield.

Ranked among the top universities in the world

Andrew Tedstone of the University of Edinburgh's School of GeoSciences, who led the study, said: "A large sector of the Greenland Ice Sheet has slowed down, despite sustained warming in the past decade. However, the ice sheet's overall contribution to sea level rise continues to accelerate in two ways – through increases in surface melting and the movement of glaciers which terminate in the ocean."

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