

Intensified ice sheet movements do not affect rising sea levels

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Meltwater is rapidly increasing the tempo of glacial movements on the rim of the Greenland ice sheet. Over the long term, however, this process is interrupted as meltwater drains away via broad channels, as a result of which ice movement decreases once again. Ultimately, this is not a cause of accelerated sea level rise.

These are the findings presented by researchers from Utrecht University in the 4 July issue of the scientific journal *Science*.

Scientists from around the world are closely monitoring the Greenland ice sheet, as accelerated glacial melting is believed to cause rising sea level. The theory is that increased volumes of meltwater accelerate the movement of ice to warmer low-lying areas and, consequently, even more intensified glacial melting. Utrecht University researchers, however, insist that this is not how the process actually works in the long term.

GPS measurements

Since the early 1990s, Utrecht University scientists have tracked the movement of the West Greenland ice sheet using GPS measurements. During warmer weather, the ice appears to move – over the course of a few days – as much as four times faster, because the meltwater acts as lubricant between the ice and the subsoil.

As a result, the ice sheet moves more rapidly to lower and warmer areas. It seems, however, that over time larger channels form in the ice that are able to drain off the increased volumes of meltwater.

As a result, the water pressure on the ground once again decreases, as does the tempo of the ice movement. Over the long term, therefore, the feedback mechanism between the glacial melting and ice sheet movement contributes little to rising sea levels.

Citation: R.S.W. van de Wal, W. Boot, M.R. van den Broeke, C.J.P.P. Smeets, C.H. Reijmer, J.J.A. Donker, J. Oerlemans. Large and Rapid Melt-Induced Velocity Changes in the Ablation Zone of the Greenland Ice Sheet. *Science*, 4 July 2008.

Source: Utrecht University

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