Greenland glacier study will help improve sea level forecasts

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(PhysOrg.com) -- Predicting sea levels could become more accurate thanks to a new discovery about how melting ice in the summer affects the movement of glaciers.

Scientists studying the Greenland ice sheet have revealed a close link between ice movement and summer ice melt.

The research, published in *Nature Geoscience* and involving scientists from Newcastle University, showed that in summer, surface meltwater drains to the bed of the ice sheet, enabling it to slide quickly towards the

sea - at times, more than twice as fast in summer compared with winter.

If summers continue to become longer and warmer, glacier acceleration caused by meltwater will reach further inland, drawing down ice from a larger area of the ice sheet.

Researchers say this ice movement, which is similar to that found in Alpine glaciers, demonstrates that the ice sheet is highly sensitive to changes in climate. The study will give scientists more information to help improve predictions of sea level rise in response to climate change.

Experts from the Universities of Edinburgh, Aberdeen, Aberystwyth and Newcastle used Global Positioning System (GPS) receivers and climatic sensors to track a 35km section on the western edge of the ice sheet. Their findings showed how changes in surface meltwaters controlled the movement of waters underneath the ice sheet and the rate at which the ice slid over its bed.

Newcastle lead Dr Matt King, said the results took us a step closer to understanding how the ice sheet responds to changes in air temperature.

"It's clear that Greenland has played a role in sea level rise in the past and will continue to in the future," explains Dr King.

"The question is, "how much?" - understanding the role of surface warming is going to be critical to getting that answer right.

"A large part of these new results are thanks to advances in the GPS analysis done here at Newcastle University - even if the ice moves a thumb's width we can see it and use that to help understand why it moved."

Provided by Newcastle University