Geophysical Research Abstracts
Vol. 13, EGU2011-13055, 2011
EGU General Assembly 2011

Estimating glacier mass changes by high resolution GRACE estimates and other remote sensing data

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The Gravity Recovery and Climate Experiment (GRACE) is a U.S./German satellite mission, which provides global high resolution estimates of the Earth's gravity field and its variability in time. The two satellites were launched in 2002, and monthly data of the Earth's gravity field are available since then. The aim of this project is to estimate mass changes of glaciers directly by GRACE and indirectly by other remote sensing data over the last eight years. The results of these estimates are independent and, therefore, can be compared and evaluated. Previous studies have mainly focused on the large ice sheets Greenland and Antarctica. Mass loss of these areas contributes to a high amount to sea level rise, but also mountain glacier areas influence changes in sea level. Due to the resolution of the GRACE estimates and the amplitude of changes in glacier mass, these smaller glacier areas are more difficult to identify by GRACE. But the processing technique has evolved, and the temporal and spatial resolution has improved. A test area of mountain glaciers still has to be chosen.
This project is still in its initial phase and just at the beginning of research. It is connected to the interdisciplinary project CLIVAR-Hydro at the Technical University of Munich. The overall goal of this project is the detection of the continental water storage variations for selected large river basins by a multi-sensor approach.