



The RETREAT-project: derivation and distribution of remotely sensed variables for glaciers and ice caps outside of the polar ice sheets

Peter Friedl, Matthias Braun, Thorsten Seehaus, Stefan Lippl, and Philipp Malz

Institute of Geography, University of Erlangen-Nuremberg, Germany (peter.friedl@fau.de)

The ice masses of the world's glaciers and ice caps are important storages of freshwater that are highly affected by climate change. Continuous glaciological monitoring provides key information on glacier evolution, which is essential for e.g. assessing global sea level rise, as well as for regional water resource and natural hazard management. Although glaciological field measurements are important data sources, they are not feasible over large and inaccessible regions. In contrast, radar satellite remote sensing allows to derive continuous time series of glaciological parameters over large areas, independent of weather conditions or daylight.

We present the concept and first results of the RETREAT-project that primarily aims at generating glaciological products from radar remote sensing for glaciers and ice caps in five regions outside of the polar ice sheets (i.e. High-mountain Asia, Patagonia, Alaska, Svalbard and Novaya Zemlya). The data will comprise dense time series of ice velocities, as well as glacier outlines, generated by applying well established intensity offset tracking and interferometry techniques to archived and new available Sentinel-1 acquisitions. For this, more than 6000 Sentinel-1 scenes per year (> 45 TB data volume), acquired in interferometric wide swath single look complex format, will be automatically processed in a high-performance computing environment. Additionally, ice velocities from other sensors, maps of ice surface elevation and surface elevation change from TanDEM-X differential interferometry, as well as further glaciological datasets (e.g. glacier inventories, altimetry and digital elevation models) will be provided, where available. All products will be continuously updated, and the data are planned to be distributed to the scientific community, educators, political decision makers and interested citizens via an interactive open access WebGIS portal.