



GlobGlacier: A new ESA project to map the worlds glaciers from space

F. Paul (1), A. Kaab (2), H. Rott (3), A. Shepherd (4), T. Strozzi (5)

(1) Department of Geography, University of Zurich, (2) Department of Geosciences, University of Oslo, (3) Environmental Earth Observation (Enveo), Innsbruck, (4) School of Geosciences, University of Edinburgh, (5) Gamma Remote Sensing, Guemligen (fpaul@geo.uzh.ch)

Changes of glaciers and ice caps are key indicators of climatic change, mostly due to their enhanced and well recognizable reaction to small climatic variations. They have thus been selected as one of the essential climatic variables (ECVs) in the global climate observing system (GCOS) and their monitoring is organized in a tiered strategy within the global terrestrial network for glaciers (GTN-G). Within GTN-G, annual measurements of mass balance (about 50 glaciers) and length changes (550 glaciers) are performed and in the world glacier inventory (WGI) detailed data exist as point information for about 71'000 glaciers, which is c. 40% of the estimated 160'000 glaciers worldwide. Thus, (1) the current sample of glaciers with annual measurements is very small and might be not representative for the changes at a global scale and (2) the WGI is not complete and difficult to use for change assessment (point data). As melting glaciers and ice caps might provide an even larger contribution to global sea level rise in the coming decades than the two continental ice sheets, there is an urgent necessity to generate more complete and representative data sets.

While the large potential of multispectral satellite data for glacier mapping is already utilized by the GLIMS initiative to create a digital database of glacier outlines, the full potential of satellite data for determination of glacier mass balance or length changes in a systematic way remain to be explored. As the required techniques for mapping glacier snow lines, topography, elevation changes or velocity fields (all indicative for mass balance) do already exist, one remaining challenge is their integrated and sys-

tematic application to a large set of glaciers. The here presented new ESA project GlobGlacier aims at exploring and applying the existing methods to already archived satellite data in order to contribute to existing databases (GLIMS, WGI) and observation programs (WGMS). GlobGlacier is one of ESAs data user element (DUE) activities that responds to the needs of some major users groups, which are actively involved in defining the products and assessment of the service. In this contribution we give an overview on the products that will be generated by GlobGlacier, their mutual dependencies and the available methodologies. We further illustrate the organization of the project (workpackages) and the proposed schedule for the project deliverables. We conclude with an overview of the expected results and their relevance for future glacier monitoring and change assessment.