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Mapping the World's glaciers from space: Results from the ESA project GlobGlacier

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The ESA project GlobGlacier aims at making a substantial contribution to current efforts of mapping the World's glaciers from satellite data using (semi-)automated techniques. For this purpose a number of key regions have been identified in close cooperation with the user group of the project and based on a set of criteria (e.g. filling the gaps in current inventories, or their potential contribution to sea-level rise). Apart from glacier outlines and terminus positions, a couple of further data products are created by the project: late summer snowlines (LSSL), topographic information, elevation changes and velocity fields. While most of the products are created from optical sensors like Landsat TM/ETM+ as available from the glovis.usgs.gov website, some of them will also utilize radar sensors and LIDAR data. The inventory data are mainly created for the year 2000 (+/- a few years) to have a good temporal match with the SRTM DEM. In selected regions, multi-temporal data sets will be used for change assessment. The new data sets will be integrated in the existing databases of GLIMS and WGMS.

With this contribution we provide an overview of the current status of the project as well as its major achievements. Outlines for several thousand glaciers have already been created in many of the key regions. This includes parts of Alaska (Chigmit Mts., Kenai Peninsula, Chugach Mts.), Arctic Canada (Devon, Bylot, Baffin Island), West Greenland (Disko Island, Nuussuaq, Svartenhuk), Norway (Svartisen, Jostedalsbreen), India (Kashmir) and the European Alps. The products LSSL, topography and elevation changes were also produced for several hundred glaciers and surface velocity fields have been derived for more than 50 glaciers from radar and optical sensors. Topographic information for each glacier is obtained from freely available DEMs (e.g. SRTM, ASTER GDEM) and elevation changes are derived from DEM differencing as well as repeat track altimetry using the GLAS and RA-2 instruments. Some of the key regions act as integration sites where more than one product is created.