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Snow and glacier monitoring service using Earth Observation data

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Snow cover and glaciers, storing large amounts of fresh water, respond sensitively to climate change. Accurate inventories and monitoring of these resources is therefore important for climate impact assessment, water resources management, and hydrology. The Project "ASaG – Preparation for a GMES Downstream service for snow and glacier Monitoring in Alpine Regions", supported by the Austrian Research Promotion Agency (FFG), aims at the implementation of a satellite-based services for spatially detailed monitoring of snow cover and glaciers over extended area.
Algorithms and processing lines for retrieval of snow extent from medium resolution optical and SAR satellite imagery are further improved in the project in order to optimally match the needs of users. The snow cover products are generated using data of the MODIS sensor operating on the Terra platform of NASA. The products are made available in near real time and are used in pre-operational tests for initialization and validation of hydrological models and distributed snow process models. Statistical snow information like snow area – elevation curves are generated for user specified basins using this information for runoff simulation and forecasting and for water management tasks. For mountain glaciers a processing line has been implemented for satellite-based products on glacier area, outlines, glacier zones (snow, ice) and ice velocity maps to be used for updating glacier inventories. The glacier products are generated for major Austrian glacier regions using new high resolution optical satellite data (SPOT-5) and SAR (TerraSAR-X, Cosmo-Skymed). The products comply with the European rules for geospatial information according to the INSPIRE directive in order to ensure interoperability of the data sets and are made accessible to users via internet. Project results are also exploited in wider within the EC-FP7 project "CryoLand - GMES Service Snow and Land Ice", a GMES Downstream Service developed under the lead of ENVEO (started in February 2011).