Evaluation and Quality assessment of GlobSnow-2 version 2 products

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Snow is an important indicator for climate change. Within the ESA DUE GlobSnow-2 project algorithms for the Snow Extent (SE) and Snow Water Equivalent (SWE) extending over the northern hemisphere have been improved, and version 2 products are generated. These snow products are derived from optical (ESA ERS-2 ATSR-2 and Envisat AATSR and NOAA AVHRR) and passive microwave (Nimbus-7 SMMR, DMSP SSM/I and Aqua AMSR-E) Earth observation satellite data, respectively. Currently, the GlobSnow-2 SWE product for the northern hemisphere has been processed for the period 1979 to 2011, and the GlobSnow-2 SE product is generated from 1995 to present. These long-term records of snow parameters have great potential for observing the seasonal and the long-term variability of the land cryosphere on the northern hemisphere, in particular with respect to climate change.

For the usefulness of the GlobSnow-2 data series derived from Earth observation satellite data assessing the accuracy of the SE and SWE products is crucial. For a representative quality assessment of products extending over large areas and long time periods, as the GlobSnow-2 SE and SWE records, spatially and temporarily distributed reference data as well as a commonly used evaluation strategy are needed.

One focus of the GlobSnow-2 project is on the intercomparison of the version 2 products with other long-term snow products available for European, hemispheric and global scale from different sensor and derived by different algorithms. Additionally, the evaluation of the GlobSnow-2 products with the ground truth is an important issue. As approximation for the ground truth, snow areas are mapped for selected study sites from high resolution satellite data, as available e.g. from Landsat or SPOT satellites. These maps are used for intercomparison with the GlobSnow-2 products, taking into account different surface classes such as forested, non-forested, mountainous, or plain areas. Also in-situ measurements available for multiple years at a few locations are used for estimating the accuracy of the GlobSnow-2 products at these points. As the spatial resolution of the GlobSnow-2 products and the in-situ measurements are very different this intercomparison is a challenging task.

In this talk we present an overview on the quality assessment activities in the ESA DUE GlobSnow-2 project, and show results from different approaches for the SE and SWE products evaluations.