

## European Satellite Snow Monitoring Activities

Background material for participants to the Workshop on European Snow Monitoring Perspectives, Darmstadt, 4-5 December 2012.

### Overview

<b>Title</b>	<b>ESA DUE GlobSnow &amp; GlobSnow-2</b>
<b>Objective</b>	<p><i>The aim of the project is the production of global long term records of snow parameters intended for <b>climate research purposes on hemispherical scale.</b></i></p> <p><i>Information on two essential snow parameters: snow water equivalent (SWE) and fractional snow extent (SE), provided for a period of 33 years and 17 years respectively.</i></p> <p><i>The GlobSnow datasets contain satellite-retrieved information on snow extent (SE) and snow water equivalent (SWE) extending as far to the past as feasible using the selected sensor-families. The current SE dataset is based on optical data from Envisat AATSR and ERS-2 ATSR-2 sensors covering the <b>Northern Hemisphere</b> between 1995 to 2012.</i></p> <p><i>The SWE record is based on the time series of measurements by two different space-borne passive microwave sensors (SMMR and SSM/I) spanning 1979 to 2012 covering <b>Northern Hemisphere.</b></i></p> <p><i>Both products are provided on a daily, weekly and monthly basis. In addition to the long term series of SE and SWE, a demonstration near-real time (NRT) snow service has been implemented. Both the historical datasets and the NRT products have been made available for the user community through the GlobSnow website.</i></p> <p><a href="http://www.globsnow.info/">http://www.globsnow.info/</a></p>
<b>Programme</b>	GlobSnow & GlobSnow-2 projects are funded by ESA under the DUE programme through May 2014.
<b>Sustainability</b>	Project duration is from Oct 2008 through May 2014, with Funding from ESA. Long term data records will be openly available through the GlobSnow-website after the project lifetime, although the development of methodologies and reprocessings of the datasets will cease after the end of the project.

## Individual Snow Products – GlobSnow hemispherical SWE “ECV”

<b>Product Name</b>	<b><i>GlobSnow Northern Hemisphere Snow Water Equivalent Product</i></b>
<b>Description</b>	<p>Maps of snow water equivalent, combining satellite-based passive microwave measurements with ground-based weather station data in a data assimilation scheme.</p> <p>Product is intended especially for climate research purposes.</p> <p>Of the currently existing datasets of SWE, is the closest one to fulfil requirements of a well validated hemispherical ECV (essential climate variable).</p> <p>Algorithm is developed within the ESA DUE GlobSnow, development efforts led by FMI, assisted by Environment Canada and GAMMA.</p> <p>Production of the long-term datasets by utilizing FMI super computer infrastructure.</p>
<b>Spatial Coverage</b>	<p>Northern hemisphere, excluding Greenland, glaciers and mountains</p> <p>Map Projection: Polar stereographic, Equal-Area Scalable Earth Grid (EASE-Grid)</p> <p>Pixel spacing: ca 25 km</p>
<b>Temporal Coverage</b>	<p>Time series of daily, weekly and monthly data from 1979 to present</p> <p>time-series continuously extended via NRT demonstration service</p>
<b>Producers</b>	FMI
<b>Data Source(s)</b>	SSMIS on-board DMSP satellites, SMMR on-board Nimbus-7 snow depth measurements from ground based synoptic weather station network
<b>Data Policy</b>	<p>Free and open</p> <p>distribution via: <b><a href="http://www.globsnow.info">www.globsnow.info</a></b></p>
<b>Source</b>	<p><a href="http://www.globsnow.info">http://www.globsnow.info</a></p> <p>contact: kari.luojus@fmi.fi</p>

## Individual Snow Products – GlobSnow hemispherical SE “ECV”

<b>Product Name</b>	<b>GlobSnow Northern Hemisphere Fractional Snow Extent Product</b>
<b>Description</b>	<p>This product provides the hemispherical scale fractional snow extent per pixel (given in per-cent) calculated from optical satellite data. Automatic cloud screening is applied. Information on the accuracy of snow product is also provided, (based on intercomparison with very high resolution satellite images and in-situ data).</p> <p>Algorithm has been developed within the ESA DUE GlobSnow, development efforts led by SYKE, assisted by ENVEO, NR, GAMMA and FMI. University of Bern, MeteoSwiss, ZAMG and Norut will assist in the future development efforts.</p> <p>Production of the long-term datasets by utilizing FMI super computer infrastructure.</p>
<b>Spatial Coverage</b>	<p>Northern hemisphere</p> <p>Map Projection: Geographic (Latitude / Longitude)</p> <p>Pixel spacing: 0.01 deg; (ca. 1km)</p>
<b>Temporal Coverage</b>	<p>Time series of daily, weekly and monthly data from 1995 to present</p> <p>time-series continuously extended via NRT demonstration service</p>
<b>Producers</b>	FMI & SYKE
<b>Data Source(s)</b>	<p>ERS-2 ATSR-2 (1995-2002) &amp; Envisat AATSR (2002-2012)</p> <p>Suomi NPP/VIIRS data (10/2012- onwards)</p>
<b>Data Policy</b>	<p>Free and open</p> <p>distribution via: <b><a href="http://www.globsnow.info">www.globsnow.info</a></b></p>
<b>Source</b>	<p><a href="http://www.globsnow.info">http://www.globsnow.info</a></p> <p>contact: kari.luojus@fmi.fi</p>