World Meteorological Organization
Global Cryosphere Watch

Snow Watch

The main goals of Snow Watch are to assess the maturity and accuracy of snow products, improve the reporting of and access to in situ snow measurements, promote the exchange of snow data and information for snow cover monitoring, and identify critical snow-related issues that need to be addressed in GCW.



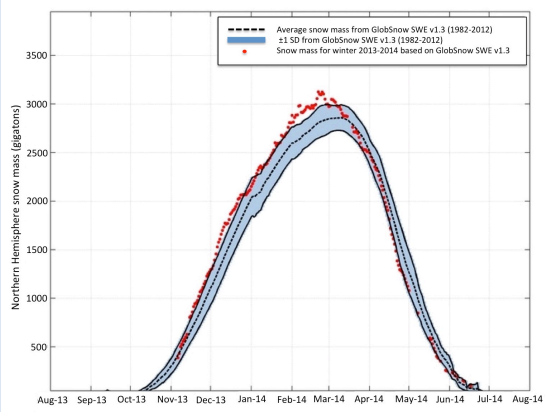
Snow Watch Activities

Current Snow Watch activities include:

- a satellite snow product validation and intercomparison project (ESA SnowPEX),
- a product inventory and self-assessment of products by principal investigators,
- a global snow data rescue project,
- "Snow Trackers" for snow cover extent and snow water equivalent (SWE),
- efforts to standardize snow-related nomenclature, and
- Improving reporting practices and real-time data for in situ snow measurements on the GTS network, enabling wider access to these observations.

Snow Watch: Development of Integrated Products

Snow Watch is making major advances in snow cover observation, monitoring and exchange of data and products from in-situ and satellite sources as part of GCW's goal to provide authoritative cryospheric information. Team members are drawn from across the global snow community.



FMI Northern Hemisphere SWE tracking product developed for WMO GCW

Credits for the photographs: Dave Halpin and Peter Toose (Environment Canada)

Examples of Snow Watch activities

Product(s)	Type	Organization	Description	Period	Areal Coverage	Resolution	Variables	Frequency
GlobSnow SWE	Satellite	European Space Agency, Finnish Met. Agency	Combination of climate station snow depth observations and forward microwave emission model simulations with SMMR and SSM/I satellite passive microwave data	1979-	Non-alpine Northern Hemisphere	25 km	SWE	Daily; weekly; monthly
GlobSnow Snow Extent	Satellite	European Space Agency, Finnish Met. Agency	Estimation of fractional snow covered area from SCAmod algorithm	1995-	Northern Hemisphere	0.01 deg	Fractional Snow Cover	Daily; weekly; monthly
NASA Standard AMSR-E	Satellite	NASA	19 and 37 GHz Tb difference; enhancements for vegetation and grain size evolution; distinction between shallow and deep snow	2002-2011	Northern Hemisphere	25 km	SWE	Daily; pentad; monthly
NASA Prototype AMSR-E	Satellite	NASA	Combination of numerical techniques, snow emission modeling and climatology	2002-2011	Northern Hemisphere	25 km	SWE	Daily; monthly
NOAA AMSR2 Snow Products	Satellite	NOAA	Variation of NASA AMSR-E methodology	2014-	Global	25 km	Snow Cover, Depth, SWE	Daily

Snow Watch snow dataset inventory

globalcryospherewatch.org/reference/snow_inventory.php

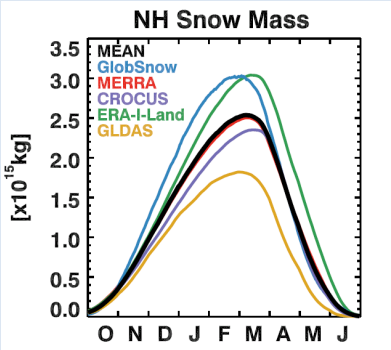
A searchable summary of currently available in situ, satellite-derived and reanalysis-driven snow datasets including information on documented caveats/issues. It is a living document with ongoing updates and additions.

ESA SNOWPEX
Satellite Snow Product Intercomparison and Evaluation Experiment

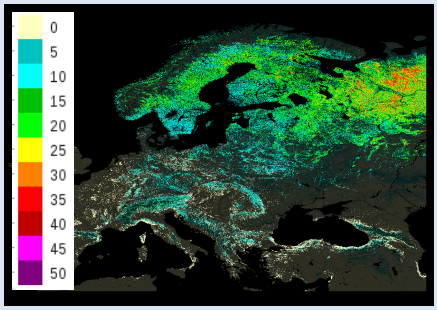
- The goal of SnowPEX is to assess the quality of current satellite-based snow extent and snow water equivalent products, and to develop guidelines for improvement.
- SnowPEX will obtain a quantitative understanding of the uncertainty in remotely sensed products through a coordinated and consistent evaluation exercise using ground reference measurements, high resolution optical imagery, and reanalysis and land surface model products.
- The GCW Snow Watch Team is supported in part by the SnowPEX program.

Participating snow extent and snow water equivalent products, and details on reference datasets are available at: http://snowpex.enveo.at

Project deliverables and supporting documentation are available at: http://calvalportal.ceos.org/263



The climatologies of Northern Hemisphere snow water mass (SWM; 1981-2010) vary by up to 50%



Disagreement between fractional snow covered area products reaches 40% particularly in forested areas