A New Suite of Northern Hemisphere Snow and Ice Earth System Data Records

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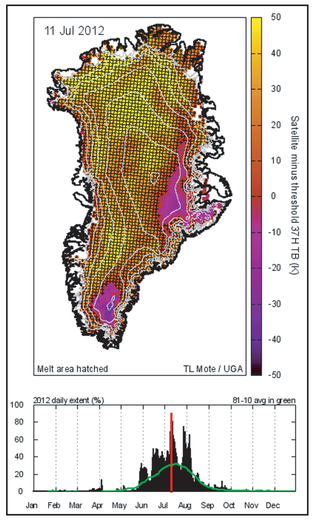
Project Goals

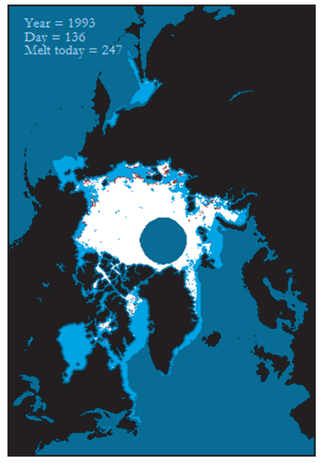
This NASA MEaSUREs (Making Earth System data records for Use in Research Environments) project seeks to:

1. Assess compliance of current Northern Hemisphere terrestrial, sea ice and Greenland snow data records with National Research Council Climate Data Record characteristics.
2. Merge NH snow and ice data products into Earth System Data Records (ESDRs).
3. Provide state-of-the-art NH cryospheric ESDRs in multiple formats and on multiple time steps for the research community, decision-makers, and stakeholders.



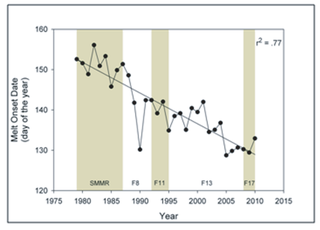
Greenland Snow Melt

[Above] Maximum surface melt extent observed on July 11, 2012. Generated from gridded brightness temperatures from the Nimbus-7 SMMR and DMSP series of SSM/I and SSMIS passive microwave radiometers. [T. Mote]

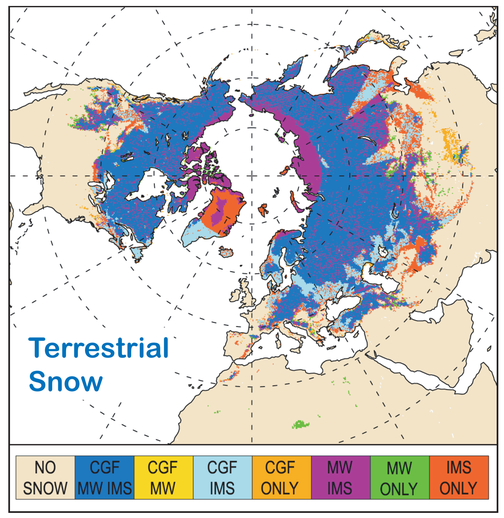


Snow Melt Onset on Sea Ice

[Left] Locations of melt onset on May 16, 1993. Red indicates current melt, light blue shows regions where melt onset began prior to this day. White areas are regions where melt has yet to begin. Graph under map shows annual average melt onset dates for the Arctic region and the sensors which collect brightness temperatures for melt date calculation. [M. Anderson]



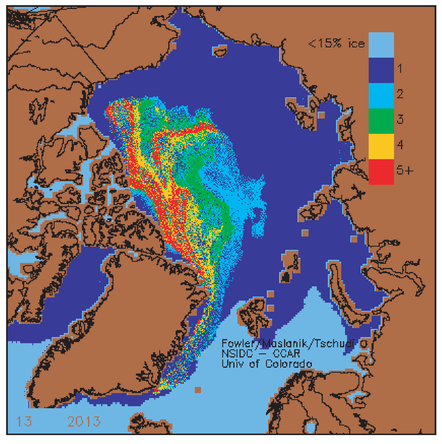
Cryospheric ESDRs



[Above] Maximum snow cover extent (SCE) for Feb. 1, 2006. Merged layer codes show individual sources reporting snow. Blue and beige show areas where all sources agree. Sources include the Interactive Multisensor Snow and Ice Mapping System (IMS), MODIS Cloud Gap Filled imagery (CGF), and microwave snow extent (MW). [D. Robinson, D. Hall, T. Mote]

Sea Ice Age

[Right] Ice Age for week 13 of 2013 (Mar. 25 - 31). Value of "1" indicates first year ice, which has not survived a melt season. "2" shows second year ice, having survived one melt season, etc. Oldest ice is depicted in red (5+ years). [C. Fowler, J. Maslanik, M. Tschudi]

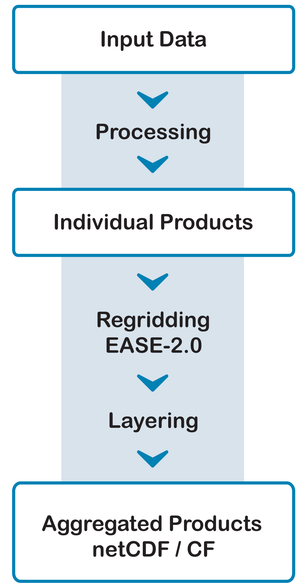


Generating Merged Products

Goals of the project include generating a series of high-quality cryospheric ESDRs for the user community. Input data is processed into individual products, which are then used as building blocks in aggregated products.

Individual snow sectors (continental, sea ice, and Greenland) are produced, then fused into hemispheric snow products. Below is a list of products to be submitted for distribution at the National Snow and Ice Data Center (NSIDC).

Aggregated products will be produced in EASE-Grid version 2.0 at 25km and 100km resolutions. Output in netCDF will conform to Climatological Forecasting (CF) convention standards.



	Product Title	Years	Temporal Resolution	Spatial Resolution	Components
Snow and Ice Sectors	Terrestrial Snow High Resolution	1999-2010	Daily	25km	IMS Snow, Microwave, MODIS CGF
	Terrestrial Snow Low Resolution	1967-2010	Weekly	100km	NOAA Visible Snow, Microwave
	Sea Ice Characterization	1979-2010	Daily	25km	Sea Ice Extent, Ice Age, Melt Onset
	Greenland Surface/Near Surface Melt	1979-2010	Daily	25km	Microwave
Fused Hemispheric	State of Cryosphere High Resolution	1999-2010	Daily	25km	Snow and Ice Extent, State of Melt
	State of Cryosphere Low Resolution	1979-2010	Weekly	100km	Snow and Ice Extent, State of Melt

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