

CryoLand Glacier Services and Products

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CryoLand Glacier Products



Product type	Spatial Resolution	Temporal Coverage	Coverage	Grid / Projection	Implemen- tation order	Sensor
Glacier outlines	1 – 30 m	Annually	Local, regional (on user request)	Lat/Lon / WGS84, UTM / WGS84	1	High resolution Optical, SAR
Snow/ice area on glaciers	1 – 30 m	Annually	Local, regional (on user request)	Lat/Lon / WGS84, UTM / WGS84	2	High resolution Optical, SAR
Glacier lakes	1 – 30 m	Daily (in case of emergency) / Seasonally / Annually	Local (on user request)	Lat/Lon / WGS84, UTM / WGS84	2	High resolution Optical, SAR
Glacier Ice velocity	3 – 100 m	Annually	Local (on user request)	Lat/Lon / WGS84, UTM / WGS84	3	SAR

Processing Line of Glacier Area Product





Product information:

- A standardized, semi-automated processing line using MS (V)HR satellite data and DEM as input: ice snow detection automatic, manual post-processing required over debris covered and cast shadowed areas.
- Product generated on <u>User</u>
 <u>Request:</u> selected glaciers in Austria, Greenland, Kyrgyzstan, Bhutan, and Norway
- Products generated according to GLIMS and INSPIRE standards and coordinated with Glaciers CCI project

Glacier Area Maps in Norway





Red: Glacier outlines of Tverrabreen from Landsat (30m) scene of 9 Aug 2003 Yellow: Glacier outlines of Tverrabreen from Quickbird (4m) scene of 27 Aug 2012

Glacier Area Maps in Norway





Red: Glacier outlines of Tverrabreen from Landsat (30m) scene of 9 Aug 2003 Yellow: Glacier outlines of Tverrabreen from Quickbird (4m) scene of 27 Aug 2012

Glacier Area Maps for Hohe Tauern Alps



Extent of Glacier Lakes

CryoLand

Greenland

Disko

Bay

- Glacier Lake Extent derived from optical satellite data and SAR data
- Method applies classification and manual post-
- processing and uses existing lake boundaries
- Glacier Lake Extent of multiple years for lakes in
 - Greenland
 - Switzerland
 - Nepal
 - Kyrgyzstan
 - Bhutan



Outburst event of Lake Tininnilik, observed between 2010/06/28 (red) and 2010/07/05 (blue) using Envisat ASAR. Comparison with lake outlines mapped from Landsat 7 ETM+ of 2010/08/17 (white). 5 T km

Lumding Tsho Glacier Lake (Nepal)





Lake outlines from TerraSAR-X April 2009 (blue) and May 2010 (green) and from Sentinel-1 October 2014 (red).

Ice Surface Velocity Product





Spot5 image of Breidamerkurjökull. Glacier calving into marginal lake (Univ. Iceland)

3-D Ice Surface Velocity Components





Ice Surface Velocity on Vestfonna – Austfonna (Svalbard, Norway)



ERS-1/2 1995/1996 InSAR & offset-tracking (courtesy by EU FP6 project INTEGRAL)

60°F

30°E

0°E

30°W

ERS-2 2011 InSAR & offset-tracking (processing GAMMA)

