

CryoLand – Copernicus Service Snow And Land Ice



CryoLand Project Dissemination Workshop

Nordic

Oslo, Oct. 8th 2014



CryoLand – Copernicus Service Snow And Land Ice



Group discussion

KSAT (Hans Eilif Larsen)



Open group discussion on resulting **products** and **service**

User feedback on:

- CryoLand Services
- CryoLand products
- User Requirements
- User Support

How do the CryoLand services make value for the user?



- Does the products and services cover the user needs?
- Have the requirements been met?
- What value could potentially be enabled at the users side using the data?
- Will the users continue to use the data and the service?
- Are there any new requirements or modifications needed?
- Would it be relevant purchasing if commercial available, within what budget?



- **Business optimization**
 - Hydropower/energy industry
 - Support production optimization
 - Support market optimization
- **Disaster & risk monitoring driven**
 - Input to flood modeling
 - (Input to snow avalanche risk)
- **Environmental, climate and wildlife interests**
 - Water quality
- **Meteorological?**
- **Knowledge and research**

- Critical SLA elements?
 - Product quality
 - Delivery
 - Requirements to the provider
 - Need of user support
- Need of training
- Costs?

Which barriers exist which have to be taken care of?



- Hydrology models being used as best practice today
 - Level of integration possibilities of FSC-data into hydrology models?
 - How to combine FSC-data into “hydrology/SWE-models”?

- Partly weather dependent / clouds
 - Continuous monitoring?
 - Cloud classification vs Snow detection

- Several missions, including SAR will increase
 - coverage
 - reliability
- Improved products being more operationally
 - regular
 - more useful for the users
- Distributed/gridded hydrology-models
 - Innovative hydropower companies started promising experiments

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Sustainable service provision?

KSAT (Hans Eilif Larsen)



- Services in operational phase
- Service provider continuation plan
- Discussion and feedback from the group
- How new users might use the CryoLand products and services?

- Interest among users (and/or stakeholders)
- Funding / payment
 - A mandate to operate

- Data access
- Availability of sustainable sensors
 - Including «fallback» solutions

1. Commercially driven
 - Hydropower/energy industry
 - Support production optimization
 - Support market optimization
2. Public national interest driven
 - Disaster & risk driven
 - Flood risk
 - Avalanche risk
 - Environmental
 - Regulatory driven
 - Infrastructure
3. Public "Union" interest driven
 - Environmental interests
 - Knowledge and research



- Governmental service provider
 - SYKE
 - FMI
- Industrial / commercial service providers
 - KSAT
 - ENVEO
- Research product providers
 - NORUT
 - NR
 - ENVEO



Downstream services

- Scandinavian Snow Products
 - KSAT, NR, NORUT
- Baltic Sea region Snow Products
 - SYKE / (FMI)
- Lake and River ice products
 - NORUT
- Baltic Sea region Lake ice products (LIE)
 - SYKE
- Glacier Products
 - ENVEO

Proposed Core services (to Copernicus office)

- Pan European FSC - Fractional Snow Extent
 - ENVEO / (SYKE)
- Pan-European Snow Water Equivalent (SWE) product
 - FMI

CryoLand downstream snow services



Product type	Spatial resolution	Temporal Coverage	Coverage	Latency time	EO sensors	Status
Snow extent, regional	250 m	Daily, full year*	Scandinavia	<1 day	MODIS, ASAR (archived), [Sentinel S1, S3]	Operational
Snow extent, regional	250 m – 500 m	Daily, full year	Baltic Sea area	<1 day	MODIS, ASAR (archived), [Sentinel S1, S3]	Operational
Wet snow area	100 m	Daily, melting period	Regional, local	<1 day	Radarsat-2 ASAR (archived), [Sentinel S1]	Operational (Norway using Radarsat) Requires S1
Snow Surface Wetness	1000 m	Daily	Regional, South-Norway	<1 day	MODIS, [Sentinel S3]	Demonstration product
Snow Surface Temperature	1000 m	Daily	Regional South-Norway	<1 day	MODIS, [Sentinel S3]	Demonstration product



CryoLand snow products proposed as Copernicus Land Monitoring Core Services



Product type	Spatial resolution	Temporal Coverage	Coverage	Latency time	EO sensors	Status
Snow extent, Pan-European	500 m	Daily, full year	35N – 72 N 11W – 50E	<1 day	MODIS, [Sentinel S3]	Operational
Snow Water Equivalent (Low res) Pan-European	10 – 25 km	Daily, dry snow season	35N – 72 N 11W – 50 E	<2 day	SSMI/S, AMSR2	Operational



CryoLand Glacier and lake / river ice products

Product type	Coverage	Grid / Projection	Latency time	Sensor	Status
Glacier outlines	Local, regional (on user request)	Lat/Lon / WGS84, UTM / WGS84	3 months	High resolution Optical, SAR	Operational (on user request)
Snow/ice area on glaciers	Local, regional (on user request)	Lat/Lon / WGS84, UTM / WGS84	3 months	High resolution Optical, SAR	Operational (on user request)
Glacier Ice velocity	Local (on user request)	Lat/Lon / WGS84, UTM / WGS84	3 months	SAR	Operational (on user request)
Glacier lakes	Local (on user request)	Lat/Lon / WGS84, UTM / WGS84	3 months, 10 days (quick analysis, hours (emergency)	High resolution Optical, SAR	Operational (on user request)
Lake ice extent (4 classes)	Local (Finland)	Lat/Lon / WGS84	< 1 days	MODIS/Terra , Sentinel	Operational
River ice jam, flood inundation area	TBD	Lat/Lon / WGS84	3 days (ice jams: < 1 day)	High res. SAR (1-30 m)	on user request and data availability

- Provider KSAT (In co-operation with NORUT and NR)
- SFC - Scandinavian Multisensor Optical / SAR - daily
- SCF - Scandinavian Multitemp. optical (MODIS) – daily
- SCAW - Norwegian Snow Wetness – daily
 - KSAT will conditionally continue provide the existing products within the CryoLand Geoportal for 2015 season, commercial terms
 - Developing and organize distribution
 - Products will not be delivered free of charge after mid-winter 2015 (cost or payment model not decided)
 - Changes will be applied during 2015, new sensors may be integrated
 - For the optical based products, limitation during the darkest months (Nov/Dec/Jan/Feb) for the areas at high latitudes
 - SAR products will provided during the winter