



PROJECT OVERVIEW





PROCESSING LINES AND OPERATIONAL SERVICES COMBINING SENTINEL AND IN-SITU DATA FOR TERRESTRIAL CRYOSPHERE AND BOREAL FOREST ZONE

SEN3APP

PROJECT COORDINATION:

BUDGET INFO:

Total amount: **2,916,586 €**

% EC Co-funding: **2,212,191 €**

DURATION: Start: **01/12/13** - End: **01/12/16**

PROJECT'S IMPLEMENTORS:

Coordinating Beneficiary: **FMI**

Associated Beneficiary(ies): **SYKE, VTT, GAMMA , ENVEO**

Helsinki





OBJECTIVES:

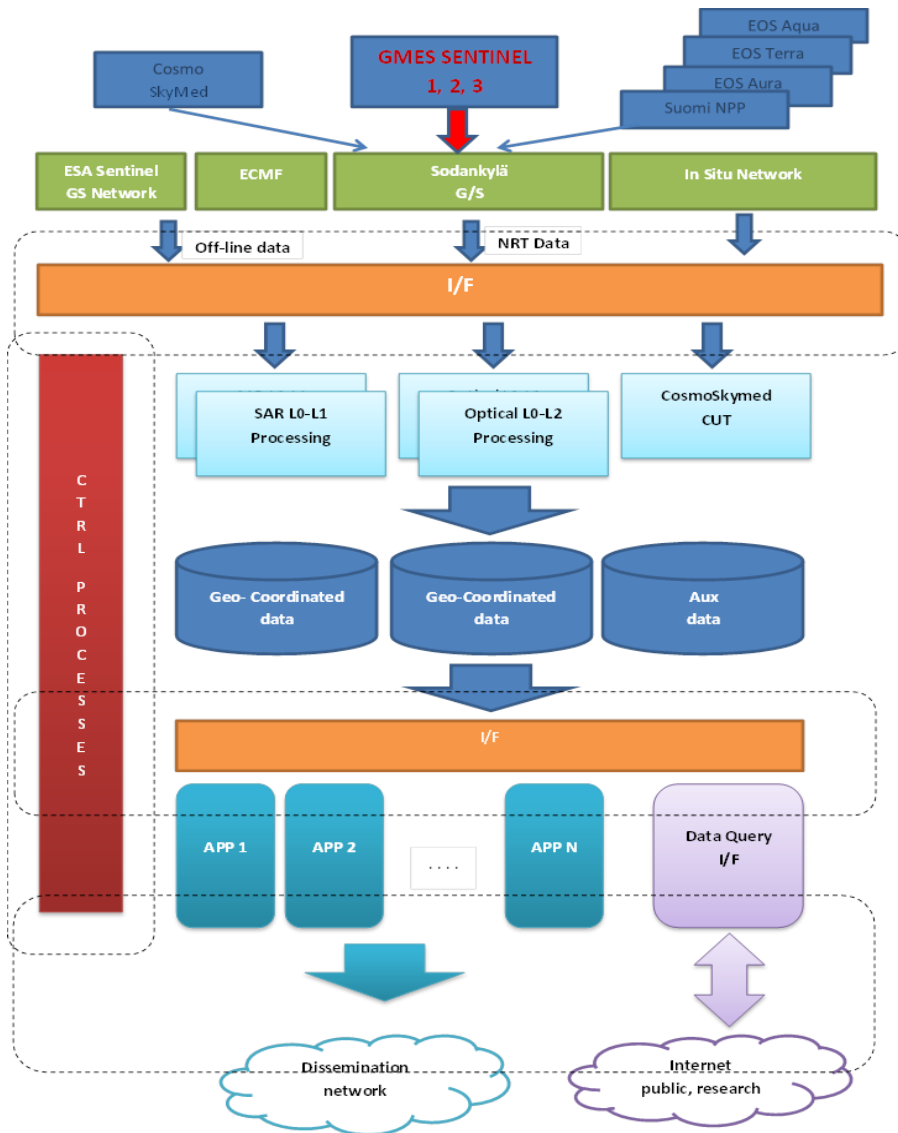
SEN3APP is concerned with the development, implementation, operationalization and validation of Sentinel data processing lines for cryospheric (terrestrial) and land cover/phenology applications. Both global and regional applications are included, focusing to high latitudes of the Earth and other parts of the cryosphere:

- **Global and regional snow cover: snow water equivalent (swe), snow extent, snow melt line, fractional snow cover (FSCA), wet (melting) snow area**
- **Glaciers: extent, snow/ice maps, glacier displacement maps**
- **Water bodies including the mapping of extent of (seasonally varying) water areas and lake/river ice processes**
- **Soil freezing and thawing processes (tundra, boreal forests, wetlands and alpine regions) and concurrent changes in forest vegetation**
- **Permafrost subsidence**
- **Intra-annual monitoring of ecosystem functioning, based on time-series of vegetation indices relevant in northern boreal zone**
- **Monitoring of inter-annual changes in land cover**
- **Intermediate products such as cloud-screened surface reflectance.**



The overall objective of the proposed project is to provide end-users with products and services relevant to:

- ✓ Numerical Weather Prediction (NWP): land surface processes and albedo
- ✓ Local/regional scale climate change studies and planning of adaptation strategies
- ✓ Ecosystem studies & assessment of ecosystem services
- ✓ Evaluation of nutrient leaching caused by different land use and management practices for implementation of Water Framework directive objectives
- ✓ Hydrological forecasting and monitoring including hydro-power industry, flood prevention and water resources assessment
- ✓ Carbon balance monitoring and assessment
- ✓ Environmental monitoring including disasters, forest diseases and crop yield
- ✓ Construction and logistics as to soil frost and permafrost (roads, buildings, timber collection)

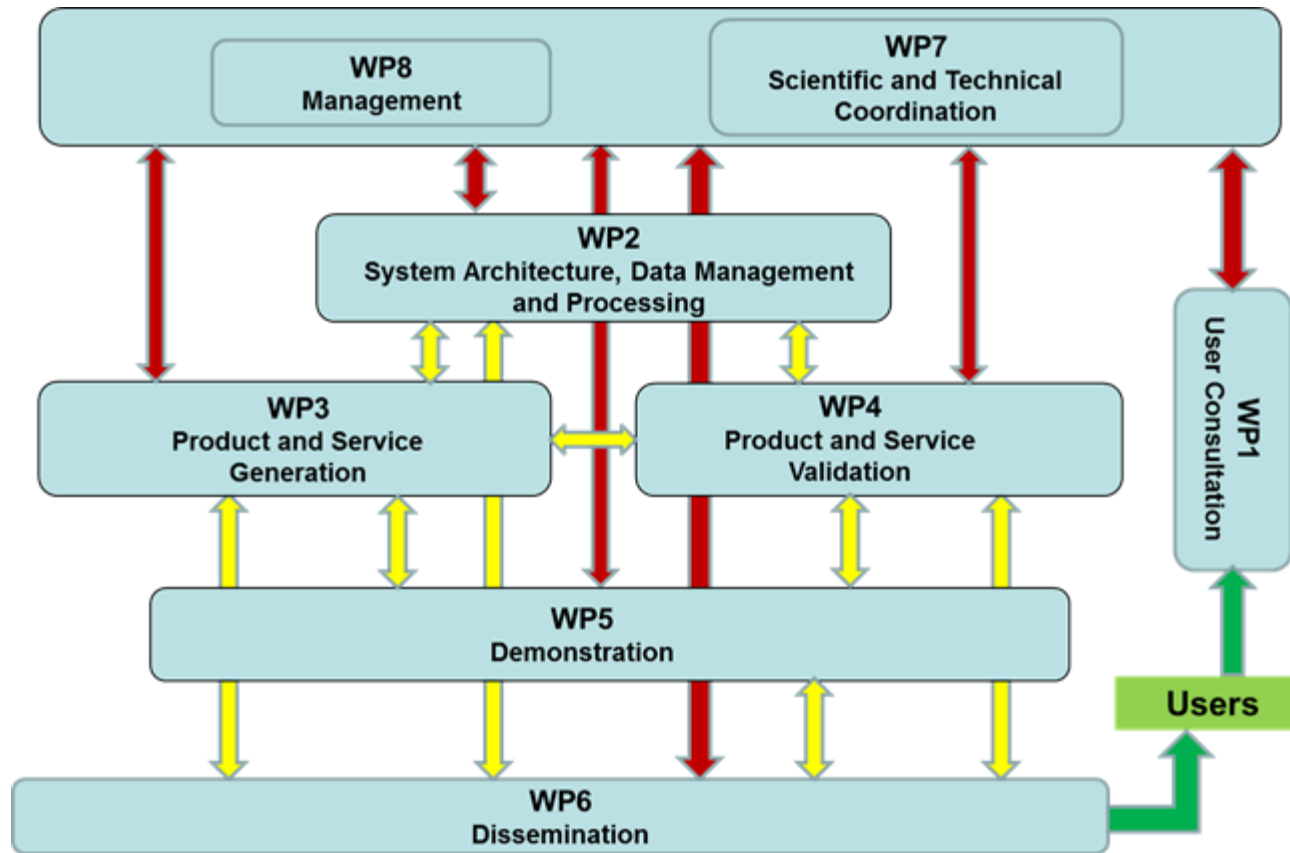


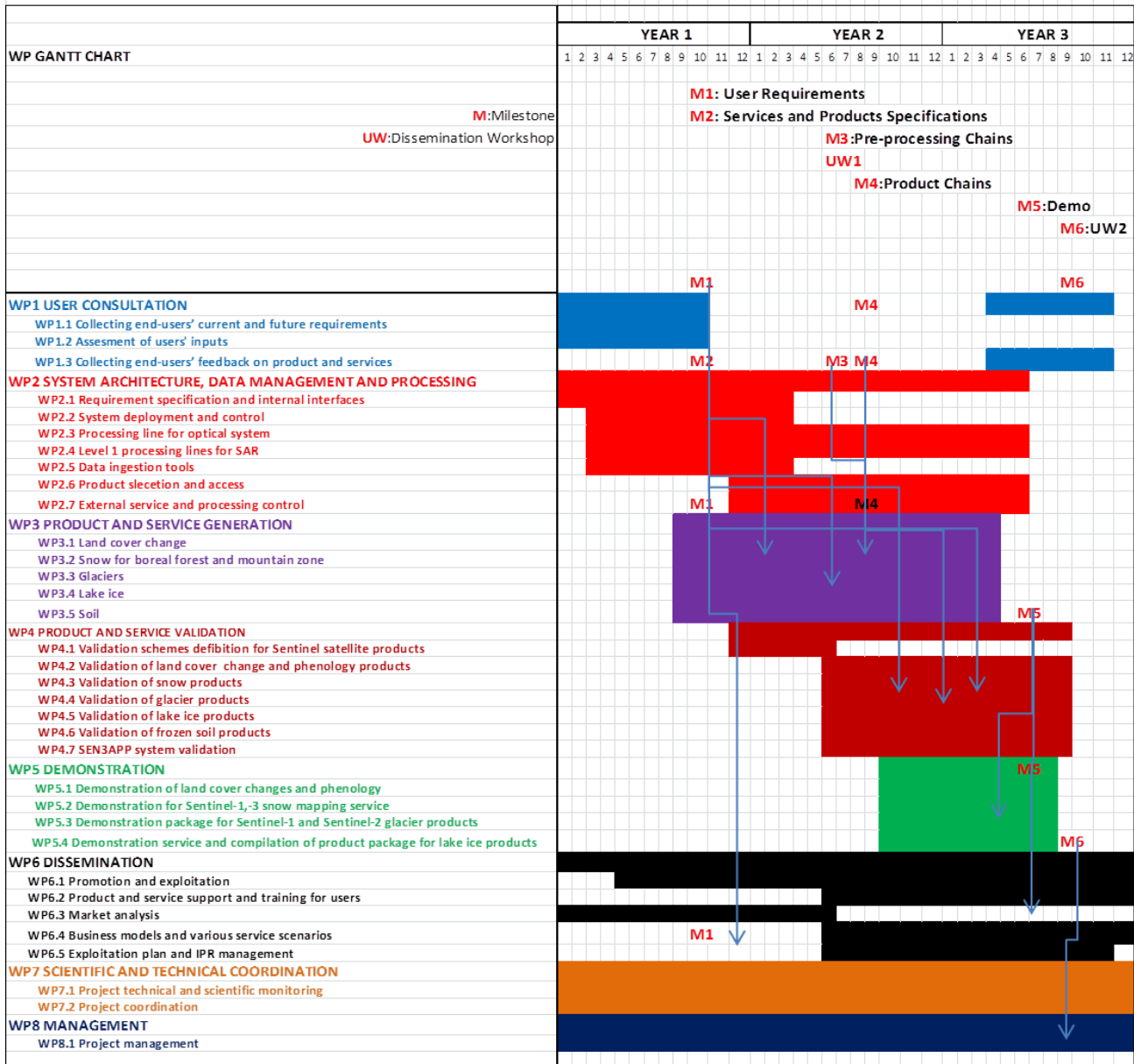
Proposed system structure for service provision including satellite and in situ data acquisition from various sources.

The direct data reception is carried out at the Sodankylä station which is part of the Sentinel collaborative ground segment



The SEN3APP work plan is organized as 8 interacting WPs, each of which are broken down into sub-WPs (= Tasks).







List of Products

Product/Service	Service provider	Sensor	Projection/Datum	Spatial coverage	Spatial resolution	Geometric accuracy	Temporal frequency	Yearly delivery time period	Thematic accuracy	Thematic range
FSC	SYKE	Sentinel 3 SLSTR	Geographic/WGS84	North-east Europe	0.005° and 0.05°	< 0.5 pixel	Daily	1 March – 31 May	15% FSC	[1, 100] FSC
FSC on lake Ice	SYKE	Sentinel-3 SLSTR	Geographic/WGS84	Largest lakes in North-east Europe	0.005°	< 0.5 pixel	2-3 days a week	1 February – 31 May	15% FSC	[1, 100] FSC
Land cover change indicator – regional	SYKE	Sentinel 3 OLCI	LAEA (etrs 1989)	North-east Europe	300 m	< 0.5 pixel	Annual	November-December	tbd	[1, 100] %
Land cover change indicator - local	SYKE	Sentinel 2 MSI	ETRS-TM35Fin	Local: sites to be decided	MMU 1 ha	< 0.5 pixel	Annual	November-December	tbd	0/1
Phenology – seasonal characteristics	SYKE	Sentinel 3 OLCI	LAEA (etrs 1989)	North-east Europe	MMU 1 km ²	< 0.5 pixel	Annual	November-December	tbd	Start, maximum and end of growing season
Glacier ice velocity maps	GAMMA	Sentinel-1	Geographic/WGS84	Specific examples	50m	< 10m	seasonal or annual		To be determined	
Lake ice state	GAMMA	Sentinel-1	Geographic/WGS84	Specific examples	20m	< 10m	weekly	Oct - May	To be determined	Not frozen, frozen, bottom-fast
Freeze/thaw maps	GAMMA	Sentinel-1	Geographic/WGS84	Specific examples	50m	< 10m	weekly	Oct - May	To be determined	thawed, frozen
Reflectance	VTT	Sentinel-2 MSI	TBD/WGS84	North Europe	20 m	< 0.5 pixel	Every 3 days	Year round	n/a	n/a
Reflectance	VTT	Sentinel-3 OLCI	TBD/WGS84	North Europe	300 m	< 0.5 pixel	Every 1.5 days	Year round	n/a	n/a

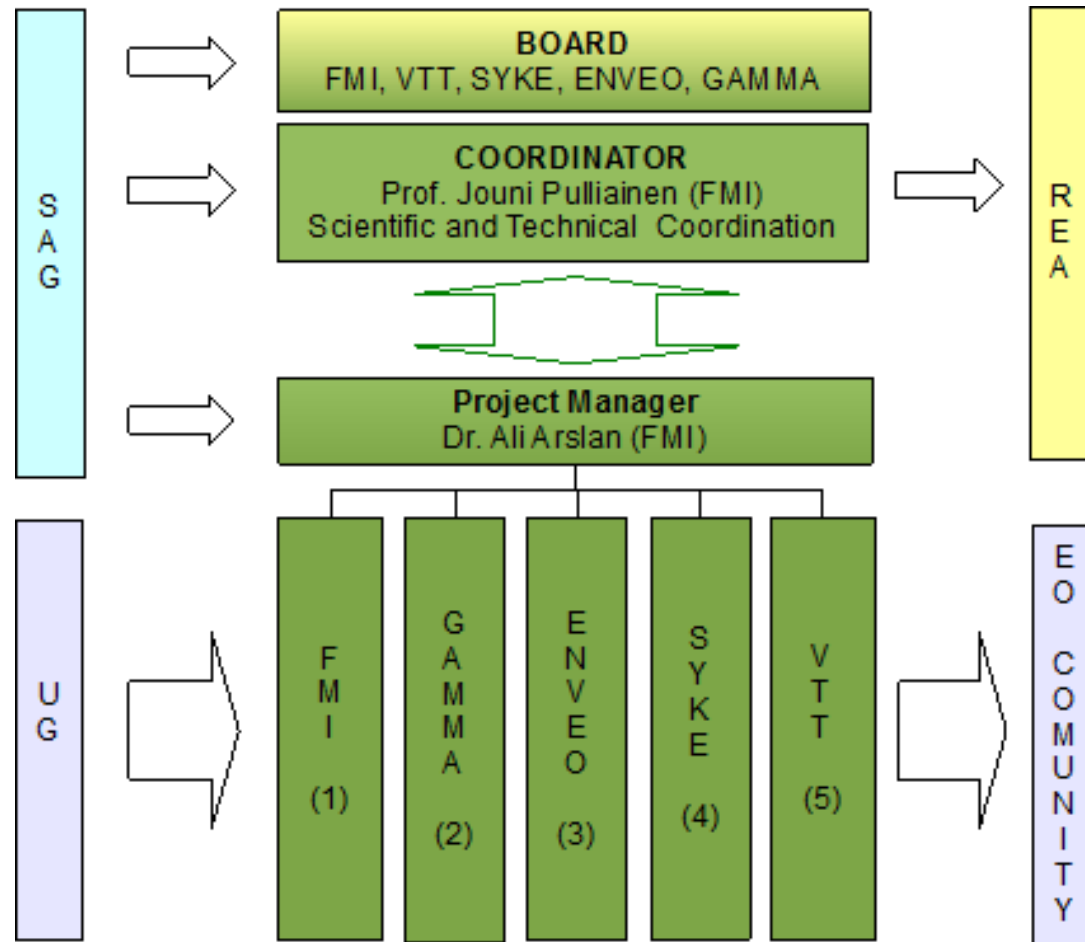


List of Products

	Provider	Instrument	Priority	Notes
FSC	SYKE	S3 SLSTR	1	
FSC on Lake Ice	SYKE	S3 SLSTR	2	
Land cover change indicator - regional	SYKE	S3 OLCI	2	
Land cover change indicator - local	SYKE	S2 MSI	1	
Phenology - seasonal characteristics	SYKE	S3 OLCI	3	
Glacier ice velocity maps	GAMMA	S1	1	
Lake ice state	GAMMA	S1	2	
Freeze/thaw maps	GAMMA	S1	3	No demos
Reflectance	VTT	S2 MSI	1	Prerequisite for SYKE products
Reflectance	VTT	S3 SLSTR	1	Prerequisite for SYKE products
			1	Highest priority
			2	
			3	Lowest priority



Project organization structure





Project Review Meetings Planned

Meeting	Planned time	Location	Required participants
KO meeting	M1	Helsinki	All
Review meeting	M9	Bern	All
Review meeting	M19	Innsbruck	All
Review meeting	M27	Brussels	All
Review meeting	M36	Helsinki	All



Project Details by Each Work Package by WP Leaders

- **Scope, Goals, Objectives**
 - A summary of the stated problem that is being resolved
 - A summary of the technology / methodology being used on the WP
 - What the WP is intended to accomplish
 - What WP is not intended to accomplish
- **Timeline**
 - Key milestones
 - Key target dates
- **Identified challenges and risks**



WT1

List of work packages

Project Number ¹	607052	Project Acronym ²	SEN3APP
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LIST OF WORK PACKAGES (WP)

WP Number ⁵³	WP Title	Type of activity ⁵⁴	Lead beneficiary number ⁵⁵	Person-months ⁵⁶	Start month ⁵⁷	End month ⁵⁸
WP1	User Consultation and feedbacks	OTHER	1	10.00	1	38
WP2	System Architecture, Data Management and Processing	RTD	5	65.00	1	30
WP3	Product and Service Generation	RTD	2	51.00	9	28
WP4	Products and Services Validation	RTD	4	47.00	12	33
WP5	Demonstration	DEMO	3	26.00	20	30
WP6	Dissemination and exploitation	OTHER	1	15.00	1	38
WP7	Scientific and Technical Coordination	RTD	1	2.00	1	38
WP8	Management	MGT	1	6.00	1	38
Total				222.00		