

1st Dissemination Workshop

D6.7 and D6.10

Deliverable D6.7: Preparation and conduction of the 1st dissemination workshop

Deliverable D6.10: 1st summary report on user coordination and training

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SEN3APP

**Processing Lines And Operational Services Combining Sentinel And In-Situ
Data For Terrestrial Cryosphere And Boreal Forest Zone**

FP7 Grant agreement No 607052

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Acronym:

EC :	European Commission
EO :	Earth Observation
EU :	European Union
FMI :	Finnish Meteorological Institute
FSC :	Fractional snow cover
HR :	High resolution
JRC :	Joined Research Centre
GIS :	Geographical Information System
NSDC :	National Satellite Data Centre
MAVI :	Agency for Rural Affairs Finland
NDVI :	Normalized difference vegetation index
NDWI :	Normalized difference water index
QA4EO :	Quality Assurance for Earth Observations
SYKE :	Finnish Environment Institute
SWE :	Snow Water Equivalent
VHR :	Very high resolution

1. INTRODUCTION

1. 1.1. PURPOSE

This report combines both deliverables D6.7 and D6.10 as agreed with the project officer. The purpose of this report is to give some information on preparation and conduction phase of the 1st dissemination workshop and summarise some conclusions from the event with future reflections on the work of the project.

2. PREPARATION AND CONDUCTION OF THE 1ST DISSEMINATION WORKSHOP

2. 2.1 PREPARATION OF THE 1ST DISSEMINATION WORKSHOP

1st Dissemination workshop was held on November 19, 2016 at the FMI in Helsinki, Finland. November workshop was remain mainly Finland-based, due to the two end-users MAVI and FORTUM being in Finland and the position of the Sodankyla NSDC in the project. However, the project streamed the workshop, a possible second workshop in Austria, and maybe a larger European event in the end. The consortium felt that this makes more sense for the end-users due the two from Finland. However all invitations were sent to all possible links and end-users to participate either coming to workshop or via internet as the workshop was broadcasted on air via YouTube.

The workshop was divide into two sessions; morning and afternoon. The agenda and advertisement can be given below and also found in the link:

http://sen3app.fmi.fi/project/workshops/ws1/EU_SEN3APP_workshop_1.pdf

In our project we work closely with our selected end-users. So they are already aware of our SEN3APP project and also the Finnish Initiative for Sentinel Collaborative Ground Segment in general. We wanted to start with an overview of the SEN3APP project and Soadnkyla NSDC in order to give a detailed information of the Finnish Initiative for Sentinel Collaborative Ground Segment and status update with Sentinels. We thought that this is important for our end-users and also potential new end-users who hear about the project and Sentinels first time. We continued to present with the SEN3APP products and services offered by each partner. We also asked our end-users to present their interest, needs and expectations from the SEN3APP project.

We reserved afternoon sessions for detailed discussions with our selected end-users. There were representatives from both MAVI and FORTUM. There were two meeting room reserved for discussions parallel with the end-users.



SEN3APP: Stakeholder WORKSHOP

November 19, 2015, Finnish Meteorological Institute, Helsinki-Finland

AGENDA

09:00-09:25 Registration & Coffee

09:25-09:30 Opening & Welcoming

09:30-09:40 Overview of EU FP7 SEN3APP project-Ali Nadir Arslan

09:40-10:00 Finnish Initiative for Sentinel Collaborative Ground Segment-Jyri Heilimo

10:00-10:20 Sentinel-based FSC data combined with Northern Hemisphere SWE by FMI –Kari Luojus

10:20-10:40 Optical products from Sentinel-2 and Suomi-NPP/VIIRS by VTT – Yrjö Rauste

10:40-10:50 SYKE Product Portfolio – Olli-Pekka Mattila

10:50-11:00 Satellite products for agricultural subsidies control: Application for MAVI- Markus Törmä

BREAK (11:00-11:20)

11:20 -11:40 Sentinel-1, 2,3 based snow and glacier products by ENVEO - Gabriele Bippus

11:40-12:00 Ice Velocity from Sentinel-1 data, glacier velocity service by GAMMA-Andreas Wiesmann

12:00-12:20 Control with remote sensing at the Agency of Rural Affairs - Anders Munck

12:20-12:40 Potential to utilize satellite-based snow products by Fortum- Johan Andersson

LUNCH (12:40-14:00)

14:00-17:00 Parallel meetings with USERS

The workshop will also be broadcasted on air via Youtube. Please mark it so in the registration form that you will follow the workshop online. The video will be available on workshop page, as well as reachable by the link that will be sent to participants.

3. 2.2 CONDUCTION OF THE 1ST DISSEMINATION WORKSHOP

1st Dissemination workshop under the name “EU FP7 SEN3APP Project Stakeholder Workshop” is organized to be held in Finnish Meteorological Institute, Helsinki in November 19, 2015.

The workshop has lasted the whole day, including the parallel meetings with the users which are after the lunch. The agenda can still be downloaded from the project website.

Call for the workshop

The call for the workshop is made by the project website, both in the “News” and “Notice Board” sections. [1][2] The call includes a registration form, agenda and the hyperlink to the webpage prepared for the workshop.

A registration form for the workshop has been prepared using Google Forms. The form includes name, surname, affiliation and e-mail address information of the participant and also an option for participant who would like to follow the workshop from the broadcast that would be done on YouTube. [2] **31** participants has filled the registration form, as **7** of them would follow the workshop by the broadcast.

Online Broadcast

The whole workshop is broadcasted online on YouTube during the day. For the broadcast, the software “XSplit Broadcaster” is used. The software is free to use with some graphical restrictions that does not prevent the required visibility.

With the software, one can set up a layout which can include audio and video sources like camera, microphone, various types of files and external streams. The layout seen below is set up for the workshop. The layout includes the presentation screen on the left upper part, the camera view of the presenters face on the right upper part, a further camera view on the left middle part, the agenda under the presentation and the partner logos on the bottom.

Current status of Pan-European & Alpine Fractional Snow Cover Products

Products Specifications	Pan-European	Alpine
Domain	72°N 11°W – 35°N 50°E	Full Alpine ridge and lowlands
Temporal resolution	1 day	1 day
Projection	LatLon/WGS84	LatLon / WGS84, or as requested by users
Pixel size	0.005° (ca 500 m)	0.0025° (ca 250 m)
Latency time	< 1 day	< 1 day
Status	Pan-European	Alpine
Sensor	MODIS (Backup: VIIRS, Future: Sentinel-3)	MODIS (Backup: VIIRS, Future: Sentinel-3)
Uncertainty information	Unbiased RMSE provided per pixel for each daily product, validation with snow maps from high and very high resolution optical satellite data	Periodic validation with snow maps from high resolution optical satellite data
Archive	Daily snow maps from 2000 – present	Daily snow maps from 01/10/2012 – present
Processing status	Fully operational in NRT	Fully operational in NRT

Products are accessible through the CryoLand GeoPortal: <http://www.cryoland.eu>

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 09:40-10:00 Finnish Initiative for Sentinel Collaborative Ground Segment - *Jari Hellema*
 10:00-10:20 Sentinel-based FSC data combined with Northern Hemisphere SWE by FMI - *Kari Loden*
 10:20-10:40 Optical products from Sentinel-2 and Suomi-NPP/VIIRS by VTT - *Eveliina Ruoste*
 10:40-10:50 SYKE Product Portfolio - *Outi Peltola-Mantila*
 10:50-11:00 Satellite products for agricultural subsidies control: Application for MAVI - *Merja Tormala*

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 BREAK (11:00-11:20)
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 11:40-12:00 Ice Velocity from Sentinel-1 data, glacier velocity service by GAMMA - *Andreas Hassenauer*
 12:00-12:20 Control with remote sensing at the Agency of Rural Affairs - *Anders Mann*
 12:20-12:40 Potential to utilize satellite-based snow products by Fortum - *Johannes Andersson*
 LUNCH (12:40-14:00)
 14:00-17:00 Parallel meetings with USERS

Figure 2.1: Broadcasting layout [3]

The broadcast is available in 1080p resolution as well as with lower resolution versions on YouTube. The video is embedded in the workshop webpage. [4]

Participation

About 25 – 30 people has participated the workshop in person and about 6 viewers in average has followed the broadcast with a peak of ten viewers. Number of the viewers along the video timeline can be seen in the chart below. The chart timeline doesn't correspond exactly to the video timeline, because some parts of the original live stream aren't included in the recording because of the connection variability and other technical faults. It should also be noted that the workshop starts at 46:15 of the broadcast, as the broadcast was started for some time before to check the quality and convenience.



Figure 2.2: Number of viewers of the broadcast on broadcast timeline [3]

3. 1ST SUMMARY REPORT ON USER COORDINATION AND TRAINING

3.1. User collaboration FMI-FORTUM

Following the Dissemination workshop, a bilateral meeting between FORTUM and FMI representatives was held. The items that were discussed are as follows:

- Representing FMI's High Resolution SWE Product in FORTUM's Online GIS-tool (GISela)
 - Adding Color Codes to the maps being disseminated by FMI, how can this be addressed?
 - Access to GISela configuration information is required, how can that be achieved?
 - Reviewing FORTUM's Operations and Needs with Regard to EO based Snow data
 - Comparison and assessment of the reliability of snow data from various sources is currently the primary concern for FORTUM. This information is used to judge whether or not the currently implemented hydrological forecast models are "on the right track, or not".
 - Currently snow data comparison and assessment is only conducted visually by comparing maps from various sources.
 - Accuracy and assessment of FMI's High Resolution SWE Product's reliability is a primary concern for FORTUM.
- Possibility of Creating an Analytical Snow Data Comparison Tool
 - In order to create an analytical snow data comparison tool, FMI needs to know exactly which data sources FORTUM is currently using and how does FORTUM access this data?
 - Given that access to the data sources is attainable, the comparison tool could do the following:
 4. Maps of absolute and relative difference between sets of data (pixel based and area based).
 5. Maps of deviation from long term average for each data set (pixel based and area based).
 6. Comparison of snow condition evolution over time with all available data (pixel based and area based).

As for the next steps, FMI pledges to create a prototype of the suggested comparison tool to further advance an understanding of common goals, as during the bilateral discussion such

an understanding was not clearly reached. The comparison tool would in essence address the question of data reliability and comparison through an analytical approach, instead of a purely visual assessment from various sources, which FORTUM has indicated as being challenging at times to do. It was also agreed that further efforts to improve the integration FMI's high resolution SWE product to FORTUM's Online GIS-tool (GISela) will continue.

3.2. User collaboration SYKE-MAVI

The collaboration for dedicated product development for Agency for Rural Affairs Finland (MAVI) was started in early 2014. The first meeting was organized in mid-May. Since then, there have been six meetings between the Finnish Environment Institute and MAVI (see table 1.). MAVI is the coordinating agency in distribution and control of national and EU agricultural subsidies.

MAVI had some previous experience of using remote sensing, but there had only been preliminary tests for developing crop classification from optical satellite data. The main challenge in the beginning was the gap of knowledge, both ways. SYKE remote sensing experts did not have the understanding and information on the mechanism behind the

Table 1. Collaboration meeting schedule between SYKE and MAVI.

Meeting schedule with MAVI		
Number	Date	Topics
1	13.5.2014	Introduction of SEN3APP to MAVI Introduction of MAVI's needs for remote sensing MAVI's previous experience in remote sensing
2	12.9.2014	MAVI's previous crop-classifications with HR-VHR data SYKE comments on previous studies Appraisal of classification methods for SEN3APP
3	28.1.2015	Subsidies control mechanism of MAVI (schedule) Data transfer between MAVI and SYKE in summer 2015 and planning field observations by SYKE Appraisal of NDVI mosaics and Sentinel-1 test imagery
4	7.5.2015	Example datasets from Landsat-8 presented to MAVI Example datasets from Sentinel-1 presented to MAVI Planning data production and delivery for pilot summer 2015 Planning MAVI participation to the SEN3APP User Workshop in autumn 2015
5	19.11.2015	In conjunction with the SEN3APP User Workshop at FMI Summer 2015 in the light of SEN3APP satellite products for MAVI Planning 2016 product development and data delivery Preparation for pre-operational products Validation planning
6	25.1.2016	Evaluation of Sentinel-1 time-series derived crop-classification by SYKE Possibilities of continuation of collaboration and product development after SEN3APP Delivery schedule and mechanism for classification delivery to MAVI in summer 2016
7	Scheduled March 2016	Evaluation of processing chain Evaluation of data products Confirmation of data delivery procedure and schedule for summer 2016

national and EU agricultural subsidies control, nor did MAVI have the experience in pre-processing and classification of remote sensing data. The discussions during the meetings have been invaluable for developing the understanding between the parties and building the capacity for MAVI to implement use of remote sensing data in their work. MAVI had had two pilot projects, which were reviewed in the beginning of the user consultation meetings.

During the first pilot summer of 2015, MAVI was provided with pre-processed satellite imagery and some simple interpretation from the imagery, during MAVI's control visits to farms. MAVI had also additional small pilot project in summer 2015, where high-resolution (HR) and very high resolution (VHR) data was provided by Joined Research Centre (JRC) and classification made by Blom Kartta Oy. These data were made available to SYKE after the season, additionally to the field information gathered by MAVI. SYKE also collected some reference information from summer 2015 from fields close to Helsinki. The summer was also used to collect satellite imagery for further development of the products and to gain experience on the new Sentinel-1 satellite. The main conclusion after the first pilot season was, that pre-processed satellite imagery and simple interpretations are not directly usable to MAVI, as expected, so further development of the products started in autumn 2016.

The summer 2015 data collection was continued and data further analysed by the end of 2015. In the SEN3APP User Workshop and in the latest user meeting with MAVI in January 2016, the product development was directed towards direct information simple classifications (e.g. winter time vegetation), which address the information requested by European Commission (EC) and the national authorities. This data will be interpreted at SYKE and delivered in table format to MAVI, with the parcel-ID's as linking variable. This information derived from the satellite data, instead of providing classified images, makes data transfer easier and simplifies the information, and the user does not need own expertise in remote sensing as much as working with imagery data. This requires the comprehensive documentation and validation information for the products, which is the goal of WP4 in providing the QA4EO- framework documentation.

Next meeting with MAVI will take place in early March 2016. With MAVI-product the demonstration phase will be also the next pilot phase, where the new approach is on trial. There are also active discussion and opportunity seeking how to continue the development work of the remote sensing products for agriculture to assist MAVI and the regional administration in their work. Possibilities to produce information that could be useful for the individual farmer is also under review, in order to make full use of the products and processing chains developed.

3.2.1 User collaboration SYKE Remote Sensing Group – SYKE Freshwater Centre

The snow and lake ice products developed in SEN3APP will also be used internally at SYKE. SYKE has long in-situ data time-series from field observations for snow and lake ice, these time-series date back to end of 19th century at best. Many of the observations are manual and difficult to automate (e.g. snow courses, lake ice phenology etc.). There is now pressure to reduce the number of in-situ observations and this raises the interest towards remote sensing data to compensate for lack of in-situ data.

Snow data is used by the hydrological modelling group of SYKE, who constantly monitor the hydrological surface water network and use the model to e.g. in warnings for flooding. Lake ice data is of interest to the hydrological modelling group, but also to the group responsible of the in-situ observation network. The long-time series of observations of e.g. lake ice dating back to time before the satellite data should be continued and remote sensing data is the natural means to do this.

The hydrological modelling group and the group on hydrological observations are constantly consulted for their insight on the data currently provided. The development of the snow products in WP3 is foreseen to improve their usability for hydrological modelling. This needs to be consulted from the internal SYKE users during and after the demonstration phase.

3.2.2. User collaboration SYKE Remote Sensing Group – SYKE Natural Environment Centre

The research at Natural Environment Centre benefits from the FSC (fractional snow cover) and NDVI (Normalized difference vegetation index) and NDWI (Normalized difference water index) time-series, which are derived from optical satellite data. The time-series are used to generate dates for phenological events. These events can be correlated with moth phenology.

The collaboration is currently done in EC funded EU FP7 CLIPC- project, where indicators for climate change monitoring. There is therefore a constant dialogue between SYKE (and other European environment research instances) ecologists and SYKE remote sensing experts. The aim in SEN3APP is to create support for deriving the indicators more efficiently, through developing the processing chains for FSC, NDVI and NDWI indices and further processing of the satellite data time-series. Here the feedback from the ecology research community is invaluable.

4. REFERENCES

- [1] SEN3APP Home, SEN3APP, 2016, <http://sen3app.fmi.fi>
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- [4] EU FP7 SEN3APP Project Stakeholder Workshop, SEN3APP, 2016, http://sen3app.fmi.fi/?page=Workshop_1