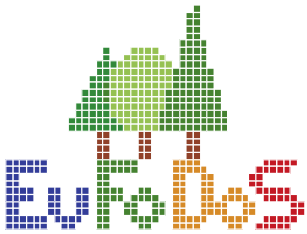

D440.1 Service Utility Report
for Core and DS Components of each Service Case

Issue 1

EUFODOS – Improved Information of Forest Structure and Damages

Project co-funded by the European Commission
Seventh Framework Cooperation Programme
FP7-SPACE-2010-1
Small and medium-scale focused research

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Task	User Validation of Core and DS Services
Lead contractor for this deliverable	EURAC
Editor	Marc Zebisch
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Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services):	
RE spec	Restricted to ……	
CP / LV	Document status is: completed or living	CP
CO	Confidential, only for members of the consortium (including the Commission Services)	x

ISSUE RECORD

Version	Date	Author(s)	Reason for modification	Status
1.0	2012-05-31	Marc Zebisch	Based on first UUA questionnaire	Internal

Executive Summary:

To assess the service utility for the user, EURAC has designed an interactive questionnaire which was discussed with the EUFODOS user board in advance. All 6 users answered the questionnaire after they received the demonstrator products for the EUFODOS Downstream Services by their respective service provider and received an user training. The results in short:

- State of work
  - The state of work is in accordance with the work plan of the project.
  - For several case studies, damage maps could not yet provided since there has not been a significant event which could be used for a demonstrators
  - Instead, the service provider where providing forest parameter maps as agreed in the SLA. Even some additional products were produced. (e.g. Core Service products for case studies without coverage from GEOLAND demonstrators).
- Functionality and utility of the DS-Services
  - All users rated the demonstration products very positively
  - The DS-Services are not replacing existing services but offering complementary or new information
  - The level of integration was mostly rated as high and the ease of integration as easy
  - Most important benefits were time saving, rapid availability and easy comprehensibility of the products
  - Potential constraints include the dependency of the users towards the service provider and the potentially higher cost if additional data is needed
- Sustainability of the service. Even if in this demonstrator phase no definite answer can be given some interesting aspects became obvious:
  - Users are very interested in sustaining the services and would be willing to pay for selected services.
  - Important for all services based on High Resolution data would be the availability of SENTINEL 2 data, which would reduce cost and allow for a higher update cycle and a more rapid availability of the service
  - For more than 2/3 or the products updates are planed within the project duration. For 1/3 updates are also planned after the end of the product.
- Assessment of Procedures and recommended Improvements
  - The negation phase and the production phase for the demonstrator products was in general rated as very good.
- Assessment of Impacts and Value Statement
  - In this early stage of EUFODOS the impact on the workflow at the user cannot yet be fully assessed.
- Overall Evaluation and Outlook
  - All users evaluated the demonstrator products as good or very good.
- Suggestions for further improvments included
  - a regular update of changes
  - consideration of other damage types (e.g. snow load)
  - more near-real time assessment
  - information on regeneration of areas
  - monitoring effect of climate change (upper forest border, development of natural forest associations)
  - Users stated that they would like to use the second phase of EUFOFOS to better streamline ideas on new potential services.

Table of Contents

1. Introduction and objective

The objectives of WP 440 - User Validation of Core and DS Services are according to the DOW:

- To ensure a consistent independent, comprehensive assessment of the value of the services by the users
- Validation of the Core products and their utility (direct and within the service) for each of the services independently
- To ensure consistent recommendations for further improvements of the FDS

To reach this goal EURAC as the responsible project partner of WP440 developed an interactive questionnaire which was answered by all users after having received the first demonstrators of their DS products the user training which was finalized by all partners in May 2012. EURAC received the answered questionnaires of all users until May 2012, which is two month later than expected. Therefore the production of this Deliverable D440.1 was delayed by 2 month, but still in the time frame of the first phase of EUFODOS.

2. The questionnaire

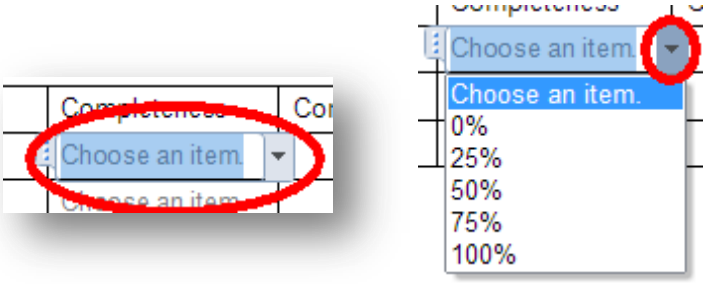
The questionnaire was structured in six sections:

1) Name and contact details of user
2). State of Work
3) (Expected) Functionality and Utility of the FDS
4) Assessment of Procedures and recommended Improvements
5) Assessment of Impacts and Value Statement
6) Overall Evaluation and Outlook

A full copy of the answered questionnaire of each user can be found in Annex 2

The structure and some of the questions have been inspired by similar User Utility Assessment questionnaires from the projects GSE forest and GEOLAND.

To facilitate answering to the questions and to generate a consistent scheme of answers, most of the questions in the questionnaire had to be answered in tables. For many answers dropdown menu with defined options were used.



A first draft of the questionnaire was presented on the first EUFODOS Partner Meeting in October 2012 and discusses with the users and improved in a dedicated user session. In November a user phone conference was performed to review the final draft of this User Utility questionnaire.

3. Results

In the following section an analysis of the answers is presented, following the structure of the questionnaire. All 6 addressed EUFODOS users replied to the questionnaire. Please find the full responses in Annex 2.

1) Name and contact details of user (see DoW)

The users in EUFODOS are:

- Styrian Forestry Board, Austria
- Nadleśnictwo Świeradów, Poland
- Stora Enso Oyj, Finland
- ThüringenForst – Anstalt öffentlichen Rechts, Germany
- Executive Forest Agency, Department Security and Forest Protection ,Bulgaria
- Department of Forest Planning, Autonomous Province of Bolzano/Bozen, Italy
- Environment Agency Austria (this user is getting storm damage related products, and has not participated in the current UUA as this event did not happen yet. However, EAA is very well informed on the technical development and the testing results of the 'EUFODOS Change Detection' toolbox).

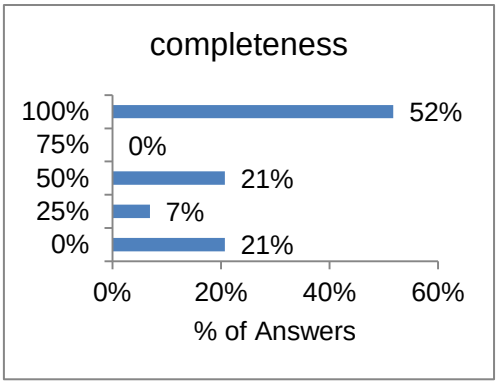
Besides Stora Enso of Finland, which is a company, the other users represent public administrations on a regional or national level. To ease the reading of the report, in the following the users are referred by their country.

2) State of Work

Downstream service products in EUFODOS can in general be classified in two classes: Forest attributes like forest type, stem volume etc. which are independent of forest damage and mapping of recent forest damages (in most cases storm damages).

All service providers have provided already demonstrators for products defined in the SLA to the users. 10 Products are already rated as complete. For many products the demonstrator does not yet comprise the area of the final product and is therefore rated as 50%. The few products which were rated as 0% are either not yet scheduled according to the SLA or are cases of a storm damage assessment, where no storm occurred within the project period. In general the state of work is in line with the work plan of EUFODOS.

Some users (Poland and Germany) agreed with their service providers on additional products which have not been covered in the SLA (e.g. Core Service Products) and will be included in a new version of the SLA.

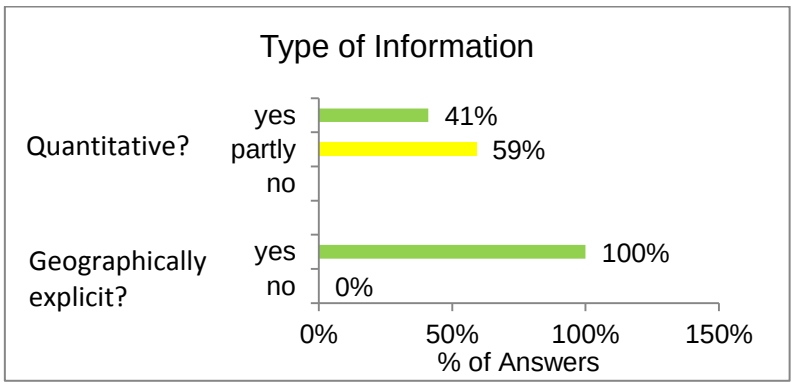


3) (expected) Functionality and Utility of the FDS

3.1) Integration into work practise

3.1.1) Which information do you receive from the FDS?

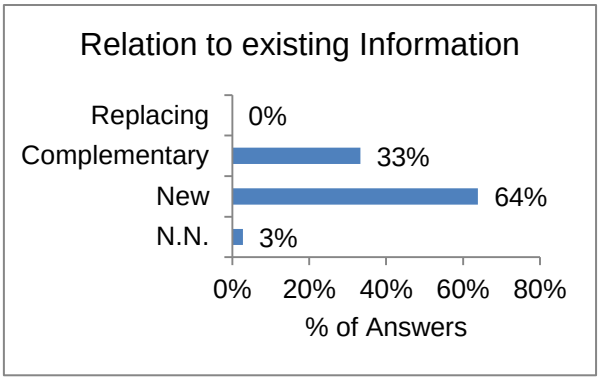
Information of all downstream services is geographically explicit. Also all services are at least partly quantitative or fully quantitative. Quantitative information includes for instance crown/canopy volume or stem volume, while non-quantitative information or partly quantitative information is for instance on forest type or damaged area.



Remark: Obviously, the question about quantitative data was a little bit misleading. Some users interpreted for instance “forest type” as a quantitative information, others classified this as “non quantitative”. To be consistent, all answers which are of nominal type (e.g. forest classes) where re-classified into a new class “partly quantitative”. Only ordinal and cardinal information was ranked as quantitative.

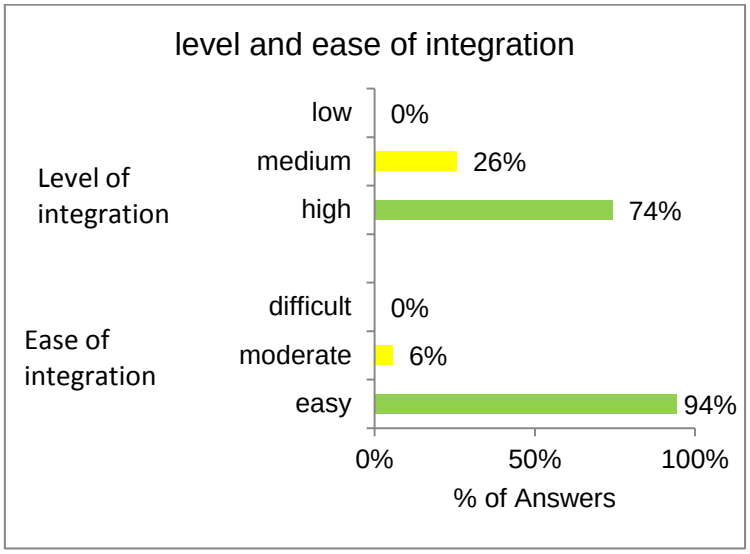
3.1.2) Relation to existing information

In all cases, DS-services where not replacing information. In most cases, they were complementary to existing information or even providing new information (64% of all products). Where data is complementary it often provides either more complete information (coverage), more accurate information or additional parameters compared to existing information.



3.1.3) Ease of integration into the existing operational setup

The level of integration was ranked as "medium" or "high", the ease of integration mostly as "easy". This was usually explained by the fact that the technical requirements for the downstream services were set by the user. Standard formats (e.g. ESRI formats) allow for an easy integration. Particularly when the products contain a lot of new information, the level of integration in the workflow of the users is ranked as "medium" (instead of high).



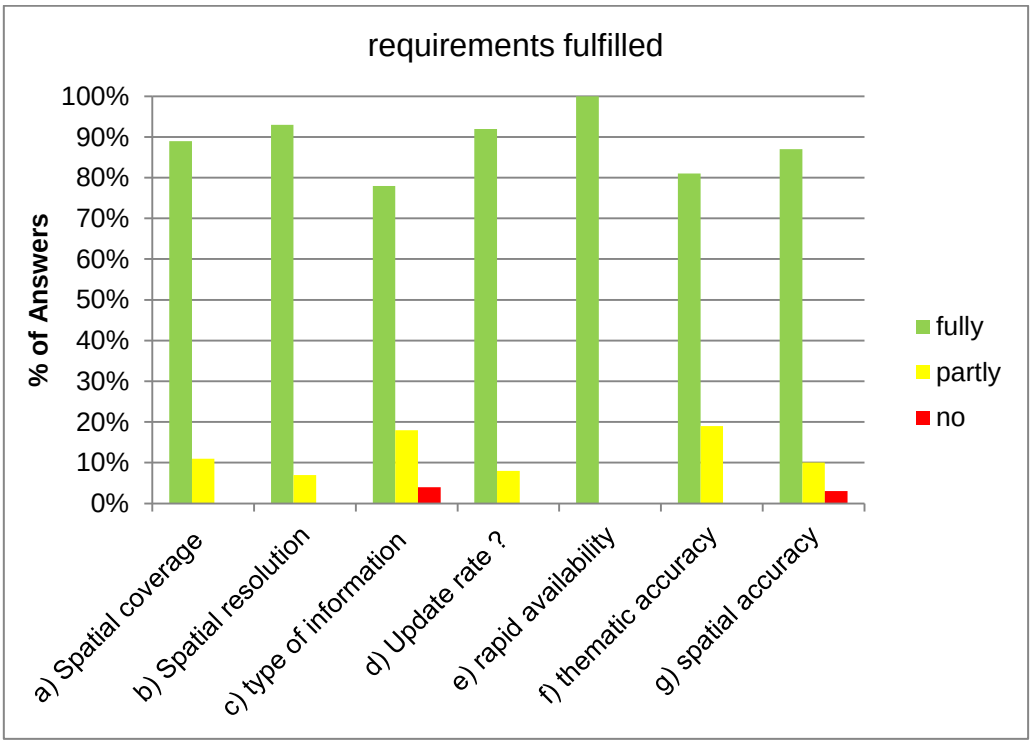
3.2) Improvements / constraints and benefits

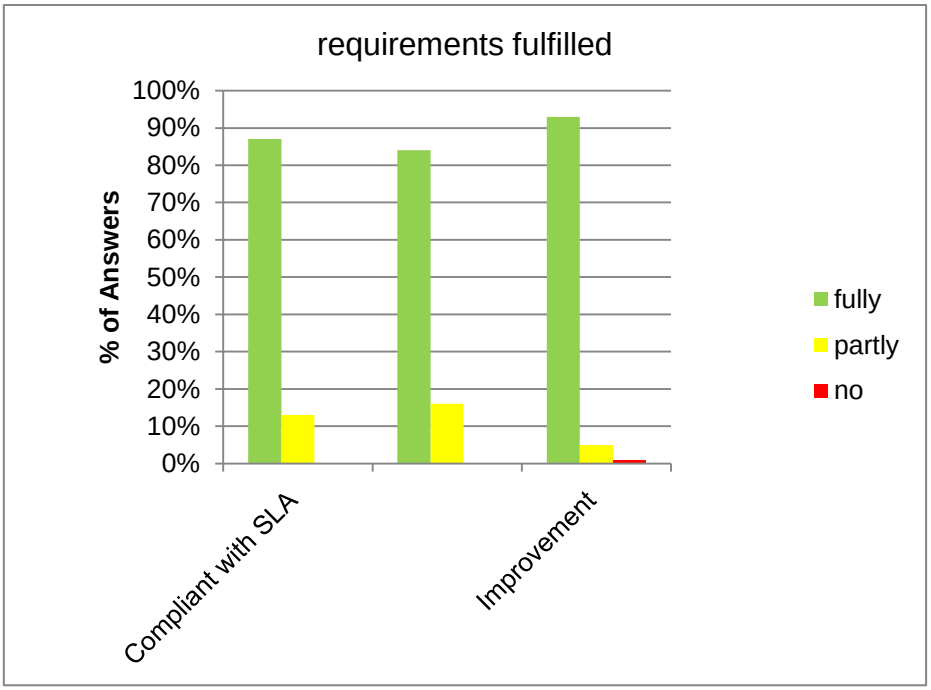
3.2.1 Are the technical specifications of the FDS products which you (will) receive

- compliant with the SLA?
- Do they meet the requirements for integration?
- Do they improve the situation compared to your currently available information?
- Do specific constraints hinder the integration of the FDS into you operational work?

For almost all aspects most users state that the requirements are fully fulfilled and the DS-Services improve the situation compared to the current available information. Things which can be improved include the thematic and spatial accuracy. Several products could not yet be assessed completely since they are either in an early stage or not yet produced (e.g. storm damage assessment in case study without storm damage so far). This also affects the issue of rapid availability which is either not relevant or could, until now, only be simulated.
Particular for forest damage map one constraint which was mentioned is, that damage maps cannot reveal if a "damage" is really due to storm or, instead, a potential forest use (clear cut).

	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Total	Total %
a) Spatial coverage (completeness)	Fully:6 Partly: 1	Fully:7 Partly: 2	Fully:12 Partly	Fully:25 Partly: 3	Fully:89% Partly: 11%
b) Spatial resolution	Fully:6 Partly: 1	Fully:8 Partly: 1	Fully:12 Partly	Fully:26 Partly: 2	Fully:93% Partly: 7%
c) type of information sufficient	Fully:5 Partly: 2	Fully:6 Partly: 3	Fully:10 Partly No: 1	Fully:21 Partly:5 No: 1	Fully:78% Partly:18% No: 4%
d) Update rate ?	Fully:6 Partly	Fully:6 Partly: 1	Fully:12 Partly: 1	Fully:24 Partly: 2	Fully:92% Partly: 8%
e) rapid availability	Fully:6 Partly	Fully:9 Partly	Fully:12 Partly	Fully:27 Partly: 0	Fully:100% Partly: 0%
f) thematic accuracy	Fully:6 Partly: 1	Fully:7 Partly: 2	Fully:9 Partly: 2	Fully:22 Partly: 5	Fully:81% Partly: 19%
g) spatial accuracy	Fully:6 Partly: 1	Fully:10 Partly: 1	Fully:10 Partly:1 No: 1	Fully:26 Partly:3 No: 1	Fully:87% Partly:10% No: 3%
Total	Fully:41 Partly: 6	Fully:53 Partly: 10	Fully:77 Partly:4 No: 2	Fully:171 Partly:20 No: 2	
Total %	Fully:87% Partly: 13%	Fully:84% Partly: 16%	Fully:93% Partly:5% No:2%		Fully:87% Partly:10% No: 1%

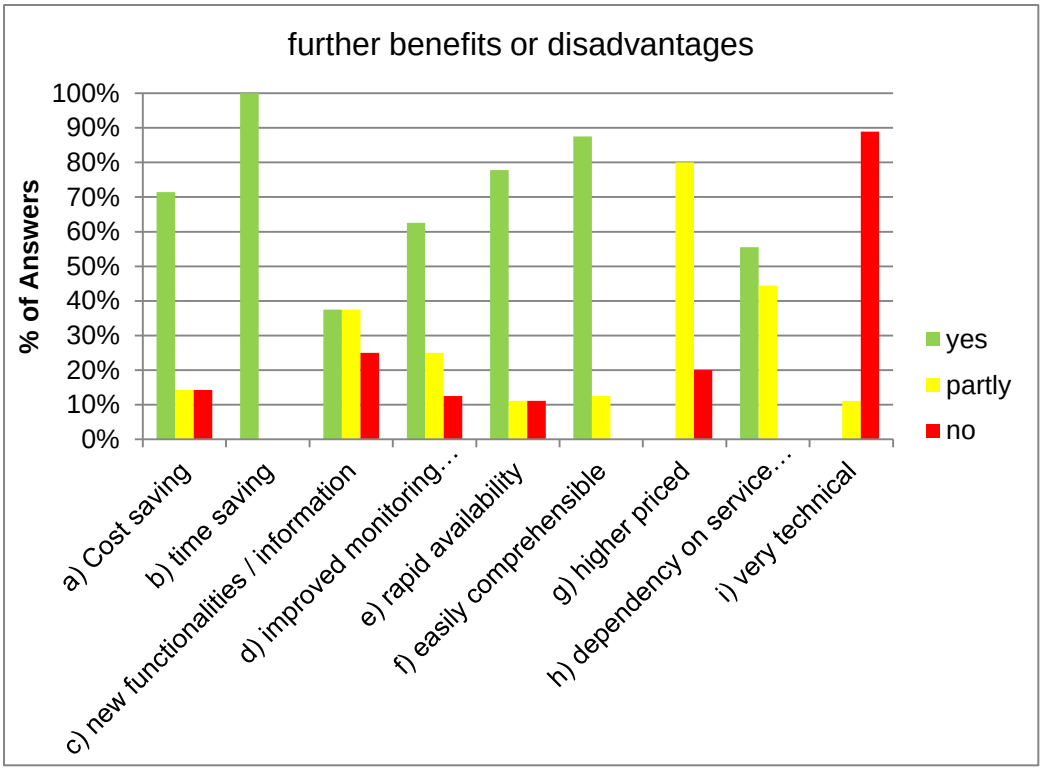




3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

The benefit on which all users agreed to 100% is time saving. Other important benefits include an easy comprehensibility of the data, the rapid availability of information, cost saving and improved monitoring capabilities. New functionalities are the least benefit. Important constraints and disadvantages include the high dependency on the service provider. Also potential additional high costs for data and the service are perceived as a potential disadvantage. Particular data which needs to be freshly acquired (like LIDAR) could be very costly.
For products which are now based on high resolution data, the new Sentinel 2 satellites would significantly improve aspects like costs, update rate and rapid availability.

Also for the aspect benefits and advantages, many products need a more in-depth assessment by the user, since they were just recently provided. An interesting next step would be an evaluation of the data by local foresters through field work.



3.2.3 Any other benefits or constraints which have not been mentioned yet?

- Private forest owners in Poland may not be willing to pay for forest DS-services. Potential alternative is that the state forest authorities take over this task
- Storm damage: Important is not so much a detection of the damage (this is usually fulfilled by local foresters through field work) but an accurate mapping and documentation of the damaged area.
- The availability of EO data and the resolution has increased, which is a clear advantage. On the other hand the higher resolution implies more effort to cover larger areas.

3.3) How sustainable is the service for you?

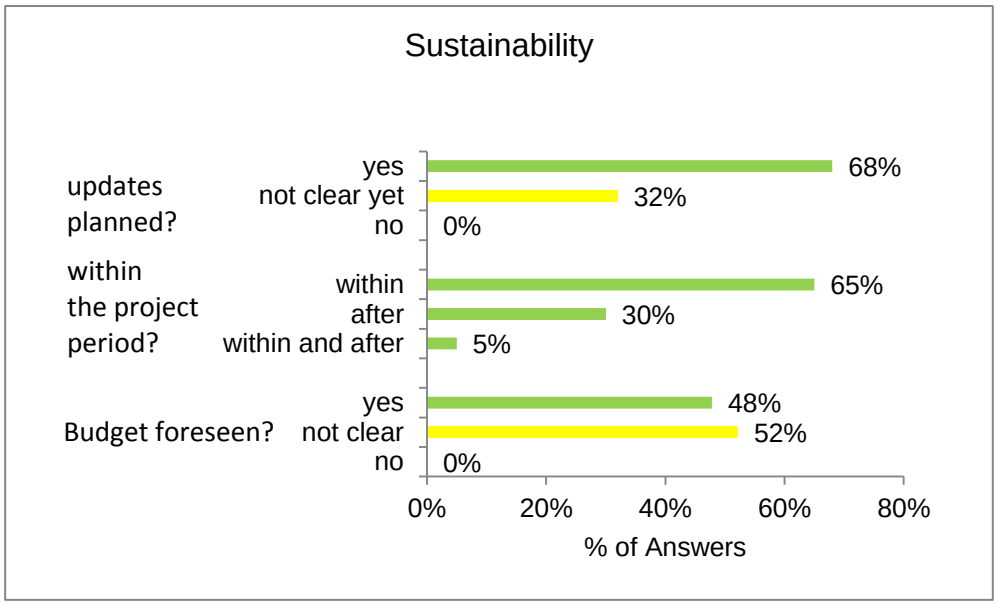
3.3.1) are for any of these products updates planned?

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

For more than 2/3 or the products updates are planed within the project duration. For 1/3 updates are also planned after the end of the product. For almost ½ of the DS-products a budget for future updates is foreseen, which is a good indicator for a potential sustainability of the services. On the other hand, users stated that it is difficult to plan a budget for any activities beyond 2013. Therefore, this information could only be rated as an indicative information.

A likely case for updates, where a budget could be available, are the cases of upcoming forest damages like a storm event or fire. Also some of the forest parameter layers are already planned to be performed for larger areas.

For sustainability the availability of Sentinel 2 data would be crucial.



3.4) Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on you working activities /practice.

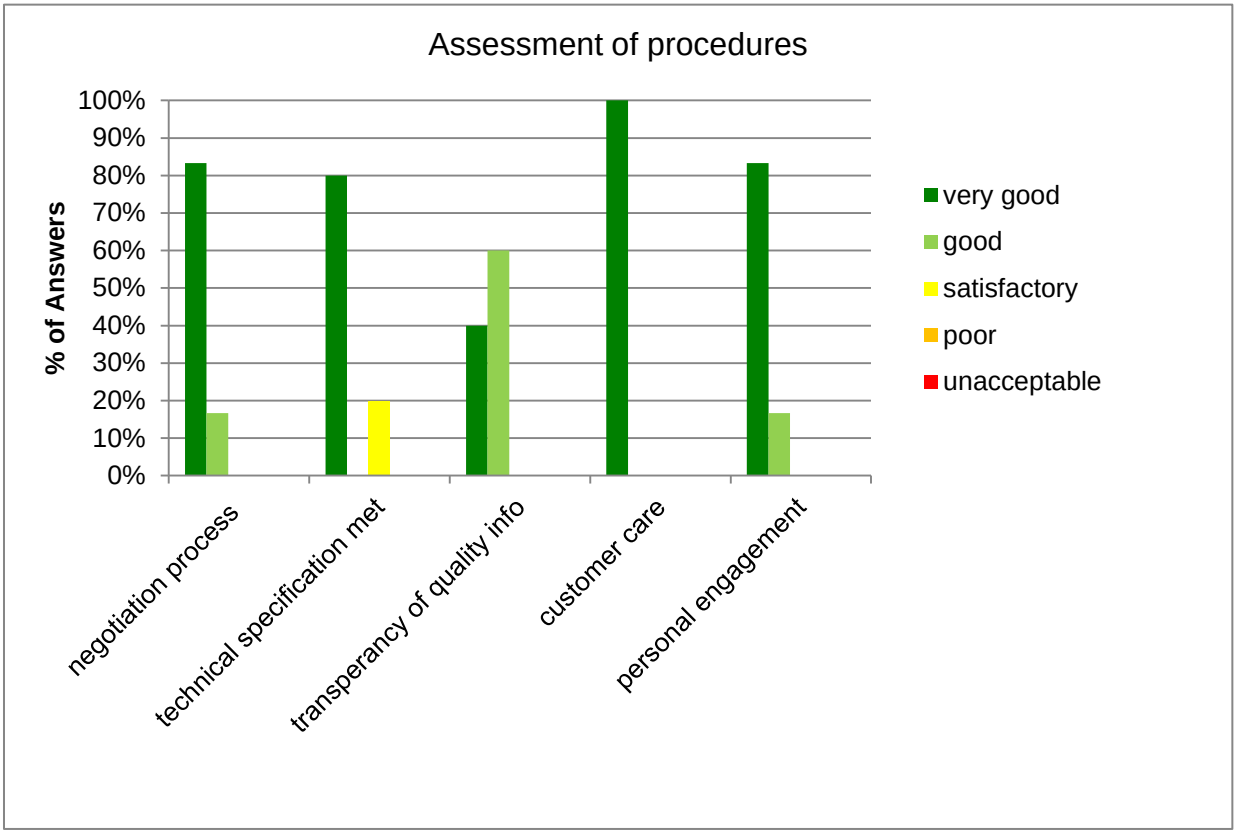
Some excerpts from comments made by users:

- The results on storm damage were rated as very useful and should be evaluated by local foresters. (Italy)
- Products are innovative and will enhance the capabilities of forest authorities for the protection and the control of forest areas. (Bulgaria)
- The mapping of whole procurement areas in a consistent manner is of great value. The total stem volume and species composition, especially the separation of pine and spruce is important in locating the most potential areas for wood procurement. More detailed information based on this overall mapping is then acquired from the located specific targets. (Finland)
- The new type of information derived from LIDAR data enables the Styrian Forestry Board to integrate the derived functional forest parameters into its Forest GIS. As the data is delivered in an ESRI shapefile format it is guaranteed that the staff can easily integrate and process it. These information layers will strengthen the overall interpretation and analytic capacities within the Board's duties. (Austria)

4) Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 3): very good, good, satisfactory, poor, unacceptable

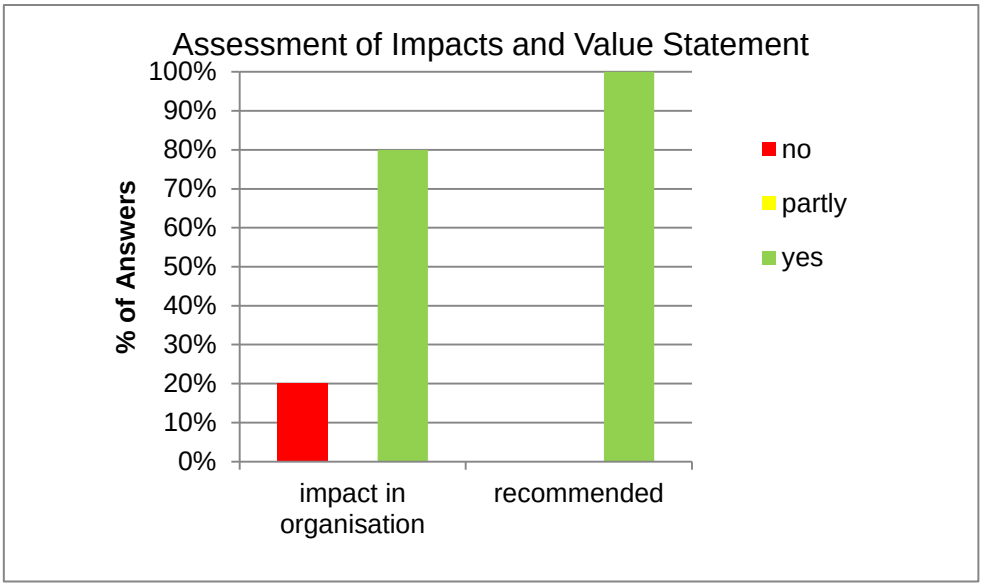
In general the production of the DS-services in the demonstrator phase was rates as very good. All users rated the customer care as very good.



5) Assessment of Impacts and Value Statement

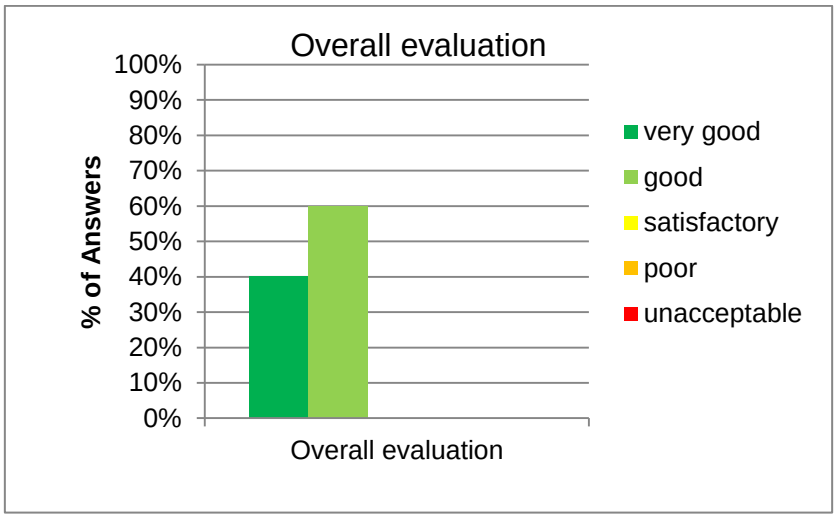
In this demonstrator phase the real impact of the DS-Services on the work practise of the users could not yet be finally evaluated. It is clear, that the spatial extent of the DS-services had to be expanded since the demonstrator often covers only a smaller subset. One interesting aspect mentioned was that forest damage maps are often change maps which also cover management activities, including unplanned or not recorded activities which could be tracked through the DS-service.

Most users would recommend the service to other institutions but also here, first the users have to evaluate the final product.



6) Overall Evaluation and Outlook

All users evaluated the demonstrator products as good or very good.



Suggestions for further improvments included

- a regular update of changes
- consideration of other damage types (e.g. snow load)
- more near-real time assessment
- information on regeneration of areas
- monitoring effect of climate change (upper forest border, development of natural forest associations)

Users stated, that they would like to use the second phase of EUFOFOS to better streamline ideas on new potential services.

Annex 1: Abbreviations

ALU-FR	Albert-Ludwigs-Universität Freiburg
BMLFUW	Austrian Federal Ministry for Agriculture, Forestry, Environment and Water Management
CS	Core Service
DEM	Digital Elevation Model
DN	Digital Number
DS	Downstream service
DSM	Digital Surface Model
DSS	Downstream Services
EAA	Federal Environment Agency Austria
EU	European Union
EUFODOS	European Forest Downstream Services
EURAC	European Academy Bozen/Bolzano
FD	Forest Downstream
FDS	Forest Downstream Service
FELIS	Department of Remote Sensing and Landscape Information Systems, University Freiburg, Germany
Fodis	Forest Damage Information System
GAF	GAF AG, Consultant and main contractor
GIS	Geographic Information System
GMES	Global Monitoring for Environment and Security
GUI	Graphical User Interface
HR	High Resolution
HW	Hardware
INSPIRE	Infrastructure for Spatial Information in Europe
IPR	Intellectual Property Rights
JR	Joanneum Research
kNN	k-nearest neighbor algorithm
LFD-STMK	Landes Forstdirektion Steiermark
LIDAR	Light Detection and Ranging
LMSC	Land Montoring
LULC	Land Use / Land Cover
MMU	Minimum Mapping Unit
NDSM	Normalised Digital Surface Model
RE	RapidEye
ReSAC	Remote Sensing Application Center, Bulgaria
SAFER	GMES Fast Track Services and Applications for Emergency Response
SAR	Synthetic Aperture Radar
SATChMo	Seasonal and Annual Change Monitoring (Service Portfolio within Geoland2)
SLA	Service Level Agreement
SME	Small and Medium Enterprise

SP	Service Provider
SW	Software
UUA	User Utility Assessment
VTT	Technical Research Centre of Finland

Annex 2: questionnaires answered by service providers

1. Name and contact details of user - Austria

Your name: DI Heinz Lick

Your institution: Styrian Forestry Board

Your contact details: FA10C Forstwesen (Forstdirektion)

Brückenkopfgasse 6, 8020 Graz

Email: heinz.lick@stmk.gv.at

Phone: +43 316 877-4534

2. State of Work

2.1) Please shortly list the expected Forest Downstream products for your service case according to the Service Level Agreement (SLA).

Product	Description (Name)
P1	Ortho-Image-Map
P2	Functional Forest Parameters

2.2) Please select for each of the above mentioned products the state of completeness in % (drop-down list) and add comments if applicable, for instance reasons for delay, etc.

Product	Completeness	Comment
P1	100%	Rapideye Orthoimage was generated in July 2011
P2	50%	Parameters for the small “Hohentauern” Testsite have been derived, but further modifications have to be done in Phase 2

3. (expected) Functionality and Utility of the FDS

3.1 Integration into work practise

3.1.1) Which information do you receive from the FDS?
Please describe, which exact information each of the FDS product will be provided (based on the SLA).

Product	Type of information (e.g. forest type, damage type, stem volume, …)	Quantitative? (y/n)	Geographically explicit (GIS layer? (y/n)
P1	Forest Type	yes	yes
P2a	Improved Forest density	yes	yes
P2b	Improved Natural growth classes	yes	yes
P2c	Tree / Stand height	yes	yes
P2d	Vertical Stand Structure	yes	yes
P2e	Crown / Canopy volume	yes	yes
P2f	Natural regeneration >1.3m	yes	yes
P2g	Understorage	yes	yes
P2h	Roughness	no	yes

3.1.2) Are the FDS Products…

- *replacing an existing activity/information? (yes/no). If yes: which?*
- *Complementary to existing activity/information (yes/no). If yes: which?*
- *A completely new activity/information (yes/no)*

Product	Replacing?	Comple-mentary?	New?	Replacing / complementary to which on-going activity or already used information system?, comments
P1	no	yes	no	RE orthoimage is a new kind of sensor, covering an area of app. 5000km²; is complementing aerial orthophotos
P2a	yes	yes	yes	This type of information is not existing for the entire region
P2b	no	no	yes	This type of information is not existing for the entire region
P2c	yes	yes	yes	This type of information is not existing for the entire region
P2d	no	no	yes	This type of information is not existing for the entire region
P2e	no	no	yes	This type of information is not existing for the entire region
P2f	no	no	yes	This type of information is not existing for the entire region
P2g	no	no	yes	This type of information is not existing for the entire region
P2h	no	no	yes	This type of information is not existing for the entire region

3.1.3) How would you evaluate the (expected) level and ease of integration into the existing operational setup?
Consider aspects like

- Consistence with operational workflow of your activities
- Skills of your staff (technical, thematic)
- Technical requirements (Hardware and software, data format, …)

Product	Level of integration	Ease of integration	comments
P1	medium	easy	Raster images are standard data sets in GIS environments
P2a	high	easy	Raster images are standard data sets in GIS environments
P2b	high	easy	ESRI .shp files; easy to handle
P2c	high	easy	ESRI .shp files; easy to handle
P2d	high	easy	ESRI .shp files; easy to handle
P2e	high	easy	ESRI .shp files; easy to handle
P2f	high	easy	ESRI .shp files; easy to handle
P2g	high	easy	ESRI .shp files; easy to handle
P2h	high	easy	derivation postponed to Phase2

3.2 Improvements / constraints and benefits

3.2.1 Are the technical specifications of the FDS products which you (will) receive

- *compliant with the SLA?*
- *Do they meet the requirements for integration?*
- *Do they improve the situation compared to your currently available information?*
- *Do specific constraints hinder the integration of the FDS into you operational work?*

If necessary to distinguish between products, please create a copy of this table for each single product!

Product 1

	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	yes	yes	
b) Spatial resolution	fully	yes	yes	
c) type of information sufficient	fully	yes	yes	
d) Update rate ? (Updates are not planned within the project period)	fully	yes	yes	
e) rapid availability	fully	yes	yes	

f) thematic accuracy	fully	yes	yes	
g) spatial accuracy	fully	yes	partly	Orthophotos are available every 3-5 years; RE imagery can be acquired in shorter periods if required

Product 2

	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	partly	yes	In relation to Phase 1
b) Spatial resolution	fully	yes	yes	
c) type of information sufficient	partly	partly	yes	Natural regeneration is only derived for trees higher >1.3m; Roughness delayed
d) Update rate ? (Updates are not planned within the project period)	fully	yes	yes	
e) rapid availability	fully	yes	yes	For the P2 product no speed is required
f) thematic accuracy	partly	partly	yes	Natural regeneration is only derived for trees higher >1.3m; Roughness delayed
g) spatial accuracy	partly	partly	yes	Still in progress

3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

Product 1

	Relevance (yes, partly, no)	Description
a) Cost saving	yes	Large coverage with a good price per km², spatial resolution is acceptable compared to aerial photos
b) time saving	yes	Fast access of data, fast processing
c) new functionalities / information	partly	RGB and NIR bands included, but RGB and CIR aerial photographs are also available in the GIS
d) improved monitoring capabilities	yes	High temporal resolution of the RE sensor offer new capabilities
e) rapid availability	yes	RE system enables a nearly daily coverage (on demand)
f) easily comprehensible	yes	Raster imagery are easy to process and easy to handle
g) higher priced	no	Price per km² is not much, but total costs are still higher
h) dependency on the	yes	Our internal SW and personal resources are not sufficient

availability of the service provider		
i) very technical	no	

Product 2

	Relevance (yes, partly, no)	Description
a) Cost saving	yes	Compared to terrestrial ascertainment. It is a new type of data with large coverage
b) time saving	yes	Compared to terrestrial ascertainment
c) new functionalities / information	yes	The parameters are available for the first time, only some parameters are available as random samples
d) improved monitoring capabilities	no	Monitoring as such is not foreseen at the moment.
e) rapid availability	no	Is not needed, as the derivation of these parameters is not time critical
f) easily comprehensible	yes	ESRI shapefiles are easy to handle in the Forest GIS, also definitions are state-of-the-art
g) higher priced	partly	LIDAR data are not cheap, but the derivation of forest parameters can be performed in a cost effective way
h) dependency on the availability of the service provider	yes	SW is complex and personal resources are not sufficient
i) very technical	no	ESRI shapefiles can be handled easy in a GIS environment

3.2.3 Any other benefits or constraints which have not been mentioned yet?

The derivation of some of the parameters might not be feasible from the currently available LIDAR data sets. This affects the products “natural regeneration” and eventually “roughness of ground surface”. There have to be more investigations in Phase 2 of EUFODOS by the SP and meetings for clarification of these undertakings.

How sustainable is the service for you?

3.3.1) are for any of these products updates planned?

Product	Updates planned?	Within the project duration and/or after the end of the project?	Description (e.g. frequency of updates)
P1	yes	within and after the project	For instance in case of forest damage after a storm event satellite imagery will be requested
P2	not clear yet	after the end of the project	It is not clear yet if and when a new LIDAR survey will be organized

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

Product	Budget available?	Description
P1	yes	In case of storm damage it is highly feasible that satellite imagery will be requested
P2	not clear yet	It is planned to generate the forest parameters for the entire state of Styria

3.3 Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on your working activities /practice.

The Styrian Forestry Board has a legal mandate to monitor the conditions of protective forests in the mountainous terrain of the Alps. Therefore the Forest Management Administration needs detailed, province-level information about the structure and state of the forests. Most inventory techniques for the mapping of forests employed by forestry management departments to date have relied on aerial photography and ground-based surveys. However, owing to the high cost of data collection, these inventories were prepared only for smaller forest sites and at infrequent intervals or from sample data of the Austrian Forest Inventory. Protective forests are also located on hardly accessible terrain which made it almost impossible to procure information from there. While providing key statistical data on larger regions, these surveys do not allow the derivation of the spatial (wall to wall) distribution of the various forest function parameters. However, it is exactly this area-level information, which is needed for many planning procedures and analytical studies.

Now this new type of information derived from LIDAR data enables the Styrian Forestry Board to integrate the derived functional forest parameters into its Forest GIS. As the data is delivered in an ESRI shapefile format it is guaranteed that the staff can easily integrate and process it. These information layers will strengthen the overall interpretation and analytic capacities within the Board's duties.

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Your institution:

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2. State of Work

2.1) Please shortly list the expected Forest Downstream products for your service case according to the Service Level Agreement (SLA).

Product	Description (Name)
P1	Forest Cover Map
P2	Storm Damage Map
P3	Forest Vitality Map

2.2) Please select for each of the above mentioned products the state of completeness in % (drop-down list) and add comments if applicable, for instance reasons for delay, etc.

Product	Completeness	Comment
P1	100%	To be adopted into SLA
P2	0%	No storm has occurred in the test area, yet. Monthly imaging of test area is going on. If storm occurs in 2012, demo product will be accomplished.
P3	50%	Is still in development. It is necessary to compare analysis results with field samples. This could not be done in 2011, but is planned for new image acquisitions in 2012.

3. (expected) Functionality and Utility of the FDS

3.1 Integration into work practise

3.1.1) Which information do you receive from the FDS?
Please describe which exact information each of the FDS product will provide (based on the SLA).

Product	Type of information (e.g. forest type, damage type, stem volume, …)	Quantitative? (y/n)	Geographically explicit (GIS layer? (y/n)
P1	Forest/Non-Forest	no	yes
P2	Storm Damage (yes/no)	no	yes
P3	Continuous Forest Vitality Layer with 100 steps color ramp.	no	yes

3.1.2) Are the FDS Products…

- *Replacing an existing activity/information? (yes/no). If yes: which?*
- *Complementary to existing activity/information (yes/no). If yes: which?*
- *A completely new activity/information (yes/no)*

Product	Replacing?	Comple-mentary?	New?	Replacing / complementary to which on-going activity or already used information system?, comments
P1	no	yes	no	
P2	no	no	no	No storm yet, assessment still in need
P3	no	yes	no	Assessment still in need

3.1.3) How would you evaluate the (expected) level and ease of integration into the existing operational setup?
Consider aspects like

- Consistence with operational workflow of your activities
- Skills of your staff (technical, thematic)
- Technical requirements (Hardware and software, data format, …)

Product	Level of integration	Ease of integration	comments
P1	high	easy	
P2	high	easy	
P3	Choose an item.	Choose an item.	Still completely uncertain.

3.2 Improvements / constraints and benefits

3.2.1 Are the technical specifications of the FDS products which you (will) receive

- *compliant with the SLA?*
- *Do they meet the requirements for integration?*

- *Do they improve the situation compared to your currently available information?*
- *Do specific constraints hinder the integration of the FDS into you operational work?*

If necessary to distinguish between products, please create a copy of this table for each single product!

SLA will be changed and Forest Cover Mapping will be integrated.

Forest Cover Mapping	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	yes	yes	Private forest
b) Spatial resolution	fully	yes	yes	
c) type of information sufficient	fully	yes	yes	Only for private forest
d) Update rate ? (Updates are not planned within the project period)	fully	yes	yes	
e) rapid availability	Choose an item.	Choose an item.	Choose an item.	Not applicable
f) thematic accuracy	fully	yes	yes	
g) spatial accuracy	fully	yes	yes	

Although an alternative test area was analysed (Saxony), the results cannot be confirmed by the EUFODOS user.

Storm Damage Mapping	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet
b) Spatial resolution	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet
c) type of information sufficient	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet
d) Update rate ? (Updates are not planned within the project period)	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet
e) rapid availability	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet
f) thematic accuracy	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet
g) spatial accuracy	Choose an item.	Choose an item.	Choose an item.	No storm damage mapped, yet

New definitions for the product have to be elaborated and the SLA changed accordingly.

Forest Vitality Mapping	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	yes	no	Improvements yes/no still to be assessed
b) Spatial resolution	fully	yes	no	Improvements yes/no still to be assessed
c) type of information sufficient	Choose an item.	Choose an item.	Choose an item.	still to be assessed
d) Update rate ? (Updates are not planned within the project period)	partly	partly	Choose an item.	More time near delivery of vitality map expected and foreseen in 2012 (in 2011 product was developed and is still in development)
e) rapid availability	partly	partly	Choose an item.	More time near delivery of vitality map expected and foreseen in 2012 (in 2011 product was developed and is still in development)
f) thematic accuracy	Choose an item.	Choose an item.	Choose an item.	still to be assessed, definitions have to be found as well as assessment scheme
g) spatial accuracy	fully	yes	Choose an item.	

3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

Forest Cover Mapping	Relevance (yes, partly, no)	Description
a) Cost saving	Choose an item.	Not clear yet; seemingly impossible to estimate
b) time saving	yes	For private forest, no or insufficient information available: therefore a service for the creation of this information would save time
c) new functionalities / information	no	Digital forest boundaries and integration into forest GIS are a common practice
d) improved monitoring capabilities	yes	For private forest, no or insufficient information available
e) rapid availability	yes	
f) easily comprehensible	yes	
g) higher priced	Choose an item.	Not clear yet; impossible to estimate
h) dependency on the availability of the service provider	partly	Forestry directorate is dependent on service provider but forest boundaries could also be extracted from RapidEye data by Polish service providers
i) very technical	no	

Storm Damage Mapping	Relevance (yes, partly, no)	Description
a) Cost saving	yes	If requirements are met
b) time saving	yes	If requirements are met
c) new functionalities / information	partly	Spatial extent of damages probably better represented
d) improved monitoring capabilities	partly	If requirements are met
e) rapid availability	yes	If requirements are met
f) easily comprehensible	yes	
g) higher priced	Choose an item.	Still needs assessment
h) dependency on the availability of the service provider	yes	
i) very technical	no	

Forest Vitality Mapping	Relevance (yes, partly, no)	Description
a) Cost saving	Choose an item.	Still needs assessment
b) time saving	Choose an item.	Still needs assessment

c) new functionalities / information	Choose an item.	Still needs assessment
d) improved monitoring capabilities	Choose an item.	Still needs assessment
e) rapid availability	yes	
f) easily comprehensible	Choose an item.	Still needs assessment
g) higher priced	Choose an item.	Still needs assessment
h) dependency on the availability of the service provider	yes	
i) very technical	no	

3.2.3 Any other benefits or constraints which have not been mentioned yet?

Forest Cover Mapping

Borders in Polish state forest a quite correct, but the possibility to use this data is seen only useful for the private forest. However, the private forest makes out only 20% of the entire forest area. The private forest owners are probably not willing to spend money for forest cover mapping. The information the state forest authorities have about private forest could be better. It is possible that the state forest would integrate remote sensing based forest cover maps in order to have better information about private forest properties available. In fact, important areas

in the South of Poland have already been mapped for forest cover based on RapidEye data, but an GMES service or similar is not in need, because they did and they like to accomplish the task themselves and they only need the satellite images.

Despite these considerations, the state forest could be willing to pay for such a service, if they receive money from the Polish government or from EU-funds, etc.

The Polish state forest is obliged to update every year the map layers. Aerial ortho-maps are only recommended to be implemented every decade, but they are no "must". It seems, that RapidEye images are very useful to update the forest information (harvest areas).

Storm Damage Mapping

The Polish state forest will probably pay for such a service. The maximum time lapse between the storm damage and the provided storm damage maps is **5 days (average storm event)**. After the storm has occurred, every regional department has to deliver the information about the damages to the forest districts managers. In practice, just after the storm the manager will send out his field personnel to measure the damages. Important is the accurate estimation of the damage intensities (trees fallen or broken, trees still standing). This is unlikely to be well estimated using optical high resolution satellite images.

Only in extreme cases (severe storms spread over large area), satellite based storm damage mapping could become relevant for a first estimate of the damage extents.

Forest Vitality Mapping

First results suggest that vitality monitoring is only meaningful for designated stands under risk (e.g. pure larch stands, pure spruce mature stands, or pure pine stands). Entire forest areas with high level of complexity (species mixes, crown densities, different features of herbaceous and shrub layer) seem to introduce too much uncertainty.

3.3 How sustainable is the service for you?

3.3.1) are for any of these products updates planned?

Product	Updates planned?	Within the project duration and/or after the end of the project?	Description (e.g. frequency of updates)
P1	Choose an item.	Choose an item.	Still needs assessment
P2	Choose an item.	Choose an item.	Still needs assessment
P3	Choose an item.		Still needs assessment

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

Product	Budget available?	Description
P1	Choose an item.	Still needs assessment
P2	Choose an item.	Still needs assessment
P3	Choose an item.	Still needs assessment

3.4 Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on you working activities /practice.

Still needs assessment

4. Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 3): very good, good, satisfactory, poor, unacceptable.

Additional comments on improvements are welcome.

4.1 How do you consider the negotiation process of the Service Level Agreement and other administrative procedures between you and your service provider?

Assessment	Comment
very good	

4.2 How would you assess the process of quality assurance with respect to:

	Assessment	Comment
a) degree to which the technical specification from the SLA are met?	satisfactory	Some aspects have to be re-defined
b) transparency of quality related information (are you able to assess the quality of the product by the information given by the service provider)?	good	For forest vitality, better assessment is possible after vegetation period of 2012 (2011 product development, 2012 product testing and assessment)

4.3 How would you rate the level of customer (user) care and general attention to the customer's (user's) requirements? (how is the quality of contact between SP and user)

Assessment	Comment
very good	

4.4 How would you assess your personal engagement with the service provider?

Assessment	Comment
very good	

5. Assessment of Impacts and Value Statement

5.1 Does the FDS within your organisation has an impact on or can be used for other activities than those initially specified in the SLA ?

Assessment	Comment
Choose an item.	Not clear yet

5.2 Would you or do you recommend the FDS also to other institutions within your working area (forestry, agriculture, nature protection etc), region or network. Please name the institution and the respective contact person.

Assessment	Institutions
yes	General Department of the State Forest, Regional Department Wroclaw, Forest Research Institute Warsaw, and the other forest districts

6. Overall Evaluation and Outlook

6.1 Please give an overall evaluation of the service

Assessment	Comment
Choose an item.	A thorough evaluation can be expected by the end of 2012

6.2 Do you have any suggestions for future improvements or expansion of the downstream service or ideas for new services which you would like to add?

No.

Completed! Thank you for your cooperation!!!

7. Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 4): very good, good, satisfactory, poor, unacceptable.

Additional comments on improvements are welcome.

4.1 How do you consider the negotiation process of the Service Level Agreement and other administrative procedures between you and your service provider?

Assessment	Comment
very good	A very constructive and fast discussion enabling an efficient work flow for the generation of the SLA.

4.2 How would you assess the process of quality assurance with respect to:

	Assessment	Comment
a) degree to which the technical specification from the SLA are met?	very good	Based on the high experience of the SP in the forestry topic the technical specifications could be elaborated with high quality using currently available technologies. SP gives detailed feedback on feasibilities and drawbacks for each of the parameters to be delivered.
b) transparency of quality related information (are you able to assess the quality of the product by the information given by the service provider)?	very good	The related topic – protective forest – has been mutually discussed and therefore it was possible for us to assess transparently the information to be received from the FDS products. We are deeply involved in the thematic, as well in the technical – designing phase.

4.3 How would you rate the level of customer (user) care and general attention to the customer's (user's) requirements? (how is the quality of contact between SP and user)

Assessment	Comment
very good	The SP is keen to update and contact us regularly and inform us on new developments ASAP. Furthermore regular meetings guarantee that all requirements are addressed. Also technical constraints are mutually discussed in order to find solutions. For instance the derivation of the parameter "natural regeneration" has shown limitations with the existing LIDAR data sets, and more thoroughly investigated in Phase2.

4.4 How would you assess your personal engagement with the service provider?

Assessment	Comment
very good	We have a very good cooperation with the SP as he is keen to give us not only all needed information, but keep us informed on current developments. As foresters we appreciate that there is a high understanding of forest issues at the SP's place.

8. Assessment of Impacts and Value Statement

5.1 Does the FDS within your organisation has an impact on or can be used for other activities than those initially specified in the SLA ?

Assessment	Comment
yes	P1 is an orthophoto product over an area of 5000km² which can be incorporated into the GIS, and thus be used for several purposes. P2 is a set of forest parameters to be used for other purpose else. Additionally the nDSM may be of interest for other investigations too, such as hydrological or geomorphological themes.

5.2 Would you or do you recommend the FDS also to other institutions within your working area (forestry, agriculture, nature protection, etc.), region or network. Please name the institution and the respective contact person.

Assessment	Institutions
yes	All State related Forestry Boards can use the derived information, not only in Austria but also in countries with mountainous terrain, and for spatial planning, nature protection purposes, as well as in hydrology departments, and all institutions related to torrent and avalanche control.

9. Overall Evaluation and Outlook

6.1 Please give an overall evaluation of the service

Assessment	Comment
very good	The currently and forthcoming FDS products are unique for the planning of protection measures in protective forests. Until recently there was no information available from the terrain beneath forest crown cover. Now it is possible to get a DTM from beneath. Also the other parameters were hard to derive in the past by conventional means as it was impossible to calculate them over the entire province. For instance tree heights were measured with a device called “Relaskope” tree by tree in the field and thus it was impossible to perform these measurements over large regions. Also “vertical stand structure” could not be derived in the past with feasible means over large regions. LFD-STMK can state that we have been waiting for many years to obtain these parameters on a comprehensive base for their incorporation into the management plans. Now it is possible not only to optimize the latter, but also to analyse regions in inaccessible environments too. We are able to get a complete surface – and beneath the forest canopy - information of the entire State of Styria, which was not available before this new technologies evolved.

6.2 Do you have any suggestions for future improvements or expansion of the downstream service or ideas for new services which you would like to add?

Monitoring of forest area in terms of:

- Regularly update of changes
  - clear-cutting, forest roads, damage induced changes
  - Increase of forest area
  - Upper forest border
- Development of natural forest associations and/or species (climate change)
- Natural regeneration

Completed! Thank you for your cooperation!!!

1. Name and contact details of user - Finland

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2. State of Work

2.1) Please shortly list the expected Forest Downstream products for your service case according to the Service Level Agreement (SLA).

Product	Description (Name)
P1	Stem Volume Map by Tree Species (pine, spruce, broadleaved trees) using Spot equivalent data in Finland (ground resolution 20 m)
P2	Stem Volume Map by Tree Species (pine, spruce, broadleaved trees) using Spot equivalent data in Russia (ground resolution 20 m)
P3	Stem Volume Map by Tree Species (pine, spruce, broadleaved trees) using Spot equivalent and VHR data (ground resolution 1 m) in Finland
P4	Stem Volume Map by Tree Species (pine, spruce, broadleaved trees) using Spot equivalent and VHR data (ground resolution 1 m) in Russia
P5	Stem Volume Map by Tree Species (pine, spruce, broadleaved trees) using RapidEye data (ground resolution 6 m) in Finland

2.2) Please select for each of the above mentioned products the state of completeness in % (drop-down list) and add comments if applicable, for instance reasons for delay, etc.

Product	Completeness	Comment
P1	50%	The area of the primary AOI (Area-Of-Interest) defined in SLA (Annex 1) is 13 000 km2. An IRS-LISS-3 frame of size 13 000 km2 processed so far, but it overlaps with the AOI with only about 45%.
P2	100%	100 % of the AOI area defined in SLA (Annex 1). Data 60 m resolution.
P3	0%	
P4	0%	
P5	25%	Demo product preliminary version established.

3. (expected) Functionality and Utility of the FDS

3.1 Integration into work practise

3.1.1) Which information do you receive from the FDS?
Please describe, which exact information each of the FDS product will provide (based on the SLA).

Product	Type of information (e.g. forest type, damage type, stem volume, …)	Quantitative? (y/n)	Geographically explicit (GIS layer? (y/n)
P1	Species-wise stem volume, total stem volume	yes	yes
P2	Species-wise stem volume, total stem volume	yes	yes
P3	Species-wise stem volume, total stem volume	yes	yes
P4	Species-wise stem volume, total stem volume	yes	yes
P5	Species-wise stem volume, total stem volume	yes	yes

3.1.2) Are the FDS Products…

- *replacing an existing activity/information? (yes/no). If yes: which?*
- *Complementary to existing activity/information (yes/no). If yes: which?*
- *A completely new activity/information (yes/no)*

Product	Replacing?	Comple-mentary?	New?	Replacing / complementary to which on-going activity or already used information system?, comments
P1	no	yes	no	Complements the activities in wood procurement. Information of species not automatically available from other sources.
P2	no	yes	Choose an item.	As for P1 above.
P3	no	yes	Choose an item.	As for P1 above.
P4	no	yes	Choose an item.	As for P1 above.
P5	no	yes	Choose an item.	As for P1 above.

3.1.3) How would you evaluate the (expected) level and ease of integration into the existing operational setup?
Consider aspects like

- Consistence with operational workflow of your activities
- Skills of your staff (technical, thematic)
- Technical requirements (Hardware and software, data format, …)

Product	Level of integration	Ease of integration	comments
P1	high	easy	The product information is well suited for the current operations. Use does not require extraordinary skill for usage.
P2	high	easy	As for P1 above.
P3	high	easy	As for P1 above.
P4	high	easy	As for P1 above.
P5	high	easy	As for P1 above.

3.2 Improvements / constraints and benefits

3.2.1 Are the technical specifications of the FDS products which you (will) receive

- *compliant with the SLA?*
- *Do they meet the requirements for integration?*
- *Do they improve the situation compared to your currently available information?*
- *Do specific constraints hinder the integration of the FDS into you operational work?*

If necessary to distinguish between products, please create a copy of this table for each single product!

	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	partly	yes	yes	Estimate accuracy should be better
b) Spatial resolution	partly	partly	yes	
c) type of information sufficient	partly	partly	no	
d) Update rate ? (Updates are not planned within the project period)	fully	yes	yes	Depends on availability or EO image data.
e) rapid availability	fully	yes	yes	Depends on availability or EO image data. The production of the FDS product is not a bottleneck in the process.
f) thematic accuracy	fully	partly	partly	More thematic accuracy required. This depends heavily on quality and amount available reference data.
g) spatial accuracy	fully	yes	no	

3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

	Relevance (yes, partly, no)	Description
a) Cost saving	yes	Reduces the amount of expensive field work
b) time saving	yes	As for a) above.
c) new functionalities / information	partly	Species composition for large areas (not easily available from aerial imagery/laser data)
d) improved monitoring capabilities	partly	As for c) above.
e) rapid availability	yes	Depends on availability or EO image data.
f) easily comprehensible	yes	
g) higher priced	Choose an item.	Will be specified later!
h) dependency on the availability of the service provider	partly	
i) very technical	no	The meaning of this item not clear! Interpreted as: the product interpretation does not need support from the service provider.

3.2.3 Any other benefits or constraints which have not been mentioned yet?

- The availability of EO imagery has improved during the last years

  \+ better reliability in updating forest maps
- The spatial resolution of the images has increased

  \+ better accuracies (slightly; no drastic improvement)

  \- more effort needed to cover large areas

3.3 How sustainable is the service for you?

3.3.1) are for any of these products updates planned?

Product	Updates planned?	Within the project duration and/or after the end of the project?	Description (e.g. frequency of updates)
P1	yes	after the end of the project	Yearly updates/Finland. Some areas may need more frequent monitoring.
P2	not clear yet	after the end of the project	An overview first needed. Then updates with better spatial resolution desirable.
P3	not clear yet	after the end of the project	As for P1 above.
P4	not clear yet	after the end of the project	TBD (To be defined)
P5	not clear yet	after the end of the project	The possibilities of the RapidEye data have to be examined first.

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

Product	Budget available?	Description
P1 – P5	yes	A certain financial budget reserved for EO data based monitoring at Stora Enso. Whether the service is purchased outside, or done in-house, depends on the product prices. Situation not clear yet.

3.4 Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on you working activities /practice.

The mapping of whole procurement areas in a consistent manner is of great value. The total stem volume and species composition, especially the separation of pine and spruce is important in locating the most potential areas for wood procurement. More detailed information based on this overall mapping is then acquired from the located specific targets.

4. Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 3): very good, good, satisfactory, poor, unacceptable.

Additional comments on improvements are welcome.

4.1 How do you consider the negotiation process of the Service Level Agreement and other administrative procedures between you and your service provider?

Assessment	Comment
very good	

4.2 How would you assess the process of quality assurance with respect to:

	Assessment	Comment
a) degree to which the technical specification from the SLA are met?	Choose an item.	To be completed
b) transparency of quality related information (are you able to assess the quality of the product by the information given by the service provider)?	Choose an item.	To be completed

4.3 How would you rate the level of customer (user) care and general attention to the customer's (user's) requirements? (how is the quality of contact between SP and user)

Assessment	Comment
very good	

4.4 How would you assess your personal engagement with the service provider?

Assessment	Comment
good	

5. Assessment of Impacts and Value Statement

5.1 Does the FDS within your organisation has an impact on or can be used for other activities than those initially specified in the SLA ?

Assessment	Comment
no	The extent of the geographical coverage of the service to be widened.

5.2 Would you or do you recommend the FDS also to other institutions within your working area (forestry, agriculture, nature protection etc), region or network. Please name the institution and the respective contact person.

Assessment	Institutions
yes	Forestr industry, forest authorities (public sector)

6. Overall Evaluation and Outlook

6.1 Please give an overall evaluation of the service

Assessment	Comment
good	Service as expected. Improvement of the thematic accuracy desired.

6.2 Do you have any suggestions for future improvements or expansion of the downstream service or ideas for new services which you would like to add?

To be completed later.

1. Name and contact details of user - Germany

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2. State of Work

2.1) Please shortly list the expected Forest Downstream products for your service case according to the Service Level Agreement (SLA).

Product	Description (Name)
P1	Fast Storm Damage Assessment
P2	Storm Damage Assessment
P3	Insect infested Damage Assessment

Since start of the EUFODOS project, no major storm event occurred over Thuringia and insect infested damages (biotic damages) have been very marginal in summer 2011 because of the weather conditions (cold and rainy summer). Therefore it has been agreed between the user ThüringenForst, the University of Freiburg as well as the service provider GAF AG, to include the production of the HR Forest Core Layers based on IMAGE2009, which have been not available through geoland2, for the whole area (16.171 km²) of the Federal State of Thuringia. The HR Forest Core layers serve as a major input data set for the Forest Downstream Services to be developed in EUFODOS. In addition ThüringenForst can provide feedback about the usefulness of the HR Forest Core layers for new potential downstream applications on a federal state level. GAF AG is subcontractor in the GIO Land project and responsible for the production of the HR Forest and Sealing Layers in Lot 2 and Lot 3 (Eastern, Middle and Western Europe incl. Ireland and UK), the HR Forest Core Layers for Thuringia have been produced in accordance with the new specifications (which have been revised since geoland2), laid down by EEA (European Environmental Agency), the agency responsible for GIO Land project.

In addition it has been agreed to produce a map of forest changes due to Forest Operations and damages (e.g. caused by snow). The produced HR Forest Core Layers as well as the Image 2009 datasets (mainly IRS and Spot) have been used as input to map these changes (reference year 2011) based on RapidEye data available through Image 2012 and the so called RESA fund. Another change map has been produced to detect changes between RapidEye data from 2009 and 2011. This will allow in phase 2 of EUFODOS to better quantify the potential to include the HR Forest Core layers and its base images into a potential downstream service to map forest changes because of (un-)planned forest operations and (a)biotic damages. These products, which have been not part of the SLA are listed in the following table:

Table 1: Overview about the new introduced services and products during phase 1 of EUFODOS

Product	Description (Name)
Core1	Tree Cover Density
Core2	Forest Type Map
Core3	Tree Cover Map
P4	Forest Change Map due to Forest Operations and Damages (based on HR Forest Core Layers,

	Image2009 and RapidEye from 2010, 2011)
P5	Forest Change Map due to Forest Operations and Damages (based on RapidEye data from 2009, 2010 and 2011)

2.2) Please select for each of the above mentioned products the state of completeness in % (drop-down list) and add comments if applicable, for instance reasons for delay, etc.

Product	Completeness	Comment
P1	0%	No major storm occurred over Thuringia since the beginning of EUFODOS. Therefore it was not possible for the SP to provide any kind of Downstream Service to ThüringenForst. Damage Assessment has been done on a smaller scale (e.g. damages due to snow) and has been delivered as a separate product (see P4)
P2	0%	See comment to P1
P3	50%	No major bark beetle damages occurred in phase 1 over Thuringia. Therefore the SP was able to provide the reference map on Spruce stands (intact spruce) based on Image 2009. The class non-intact spruce stands based on RapidEye data from 2011 has not been produced due to the above mentioned situation.
Core 1	100%	The HR Tree Cover Density product has been delivered covering the whole state of Thuringia (due to cloud problems in Image 2009, one area in the south-eastern part of Thuringia has not been mapped).
Core 2	100%	The HR Forest Type map product has been delivered covering the whole state of Thuringia (due to cloud problems in Image 2009, one area in the south-eastern part of Thuringia has not been mapped).
Core 3	100%	The HR Tree Cover map product has been delivered covering the whole state of Thuringia (due to cloud problems in Image 2009, one area in the south-eastern part of Thuringia has not been mapped).
P4	100%	The Forest Change Map has been produced for 4 forest districts as agreed between the User and the SP.
P5	100%	The Forest Change Map has been produced for 1 forest districts as agreed between the User and the SP.

3. (expected) Functionality and Utility of the FDS

3.1 Integration into work practise

3.1.1) Which information do you receive from the FDS?
Please describe, which exact information each of the FDS product will provide (based on the SLA).

Product	Type of information (e.g. forest type, damage type, stem volume, …)	Quantitative? (y/n)	Geographically explicit (GIS layer? (y/n)
P1	Not relevant as nothing had been delivered	no	yes
P2	Not relevant as nothing had been delivered	no	yes
P3	Spruce Type Map (classes spruce stands, other forest and non-forest)	no	yes
Core 1	Tree Cover Density on a pixel basis (continuous raster layer with values between 0 and 100% per pixel)	yes	yes
Core 2	Forest Type Map with 0.5 ha MMU and a minimum tree cover density of 10% (thematic raster layer with classes Broadleaved Forest, Coniferous Forest and Non Forest)	no	yes
Core 3	Tree Cover Map on a pixel basis derived from the Tree Cover Density product (thematic raster layer with the classes Trees and absence of Trees)	no	yes
P4	Change Map (shapefile providing polygons for changes between Image 2009 and RapidEye data from 2010/2011)	no	yes
P5	Change Map (shapefile providing polygons for changes between RapidEye data from 2009 and RapidEye data from 2010/2011)	no	yes

3.1.2) Are the FDS Products…

- *replacing an existing activity/information? (yes/no). If yes: which?*
- *Complementary to existing activity/information (yes/no). If yes: which?*
- *A completely new activity/information (yes/no)*

Product	Replacing?	Comple-mentary?	New?	Replacing / complementary to which on-going activity or already used information system?, comments
P1	Choose an item.	Choose an item.	yes	The service/product would provide especially quicker information which would have been not available within the given time frame using comparable methods.
P2	Choose an	Choose	yes	The service/product would provide detailed information on

	item.	an item.		storm damaged areas. This kind of information would not be available in such a detail without the service.
P3	Choose an item.	Choose an item.	yes	The delivered map of spruce stands is a new product and builds the basis for mapping bark beetle damages. The provided map based on Image 2009 would have not been spatially explicit available with in-house given information.
Core 1	Choose an item.	Choose an item.	yes	A new product, which would not be available otherwise.
Core 2	Choose an item.	Choose an item.	yes	In the GSE FM project a forest type map with similar but not the same specifications has been produced based on Images from 2005 and 2006. Therefore the delivered product can serve as an update of the existing map.
Core 3	Choose an item.	Choose an item.	yes	A new product, which would not be available otherwise.
P4	Choose an item.	Choose an item.	yes	The update cycle of the forest inventory (state forest with approx. 40% forest area in Thuringia) is 10 years. The information (forest changes) derived from the delivered product is available not only for the state forest but also other forest areas in Thuringia and the update cycle can be increased (annual update possible)
P5	Choose an item.	Choose an item.	yes	The update cycle of the forest inventory (state forest with approx. 40% forest area in Thuringia) is 10 years. The information (forest changes) derived from the delivered product is available not only for the state forest but also other forest areas in Thuringia and the update cycle can be increased (annual update possible)

3.1.3) How would you evaluate the (expected) level and ease of integration into the existing operational setup?
Consider aspects like

- Consistence with operational workflow of your activities
- Skills of your staff (technical, thematic)
- Technical requirements (Hardware and software, data format, …)

Product	Level of integration	Ease of integration	comments
P1	medium	easy	The products have been delivered in accordance with software and data format requirements of the user. Technical and thematic skills are available in-house to use, interpret and further add value to the delivered products. As these products are providing information, which is new and/or was not available before, the average level of integration is rated as medium at this stage.
P2	medium	easy	
P3	high	easy	
C1	medium	easy	
C2	high	easy	
C3	medium	easy	
P4	high	easy	
P5	medium	easy	

3.2 Improvements / constraints and benefits

3.2.1 Are the technical specifications of the FDS products which you (will) receive

- *compliant with the SLA?*

- *Do they meet the requirements for integration (ist eine sinnvolle Nutzung der Daten möglich)?*
- *Do they improve the situation compared to your currently available information?*
- *Do specific constraints hinder the integration of the FDS into you operational work?*

If necessary to distinguish between products, please create a copy of this table for each single product!

P1 - Fast Storm Damage Assessment	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	Choose an item.	Choose an item.	The specified product has not been delivered (see description under "State of Work"). Therefore no feedback can be provided in Phase 1.
b) Spatial resolution	Choose an item.	Choose an item.	Choose an item.	
c) type of information sufficient	Choose an item.	Choose an item.	Choose an item.	
d) Update rate	Choose an item.	Choose an item.	Choose an item.	
e) rapid availability	Choose an item.	Choose an item.	Choose an item.	
f) thematic accuracy	Choose an item.	Choose an item.	Choose an item.	
g) spatial accuracy	Choose an item.	Choose an item.	Choose an item.	

P2 - Storm Damage Assessment	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	Choose an item.	Choose an item.	The specified product has not been delivered (see description under "State of Work"). Therefore no feedback can be provided in Phase 1.
b) Spatial resolution	Choose an item.	Choose an item.	Choose an item.	
c) type of information sufficient	Choose an item.	Choose an item.	Choose an item.	
d) Update rate	Choose an item.	Choose an item.	Choose an item.	
e) rapid availability	Choose an item.	Choose an item.	Choose an item.	
f) thematic accuracy	Choose an item.	Choose an item.	Choose an item.	
g) spatial accuracy	Choose an item.	Choose an item.	Choose an item.	

P3 – Insect Infested Damage Assessment	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	yes	yes	As mentioned before, no major damages due to bark beetle occurred in Summer 2011. Therefore only the Spruce Type Map has been evaluated. The update rate has not been rated as it was not possible to produce the main product in phase 1. It is foreseen to provide this product in Phase 2.
b) Spatial resolution	fully	yes	yes	
c) type of information sufficient	fully	yes	yes	
d) Update rate	Choose an item.	Choose an item.	Choose an item.	
e) rapid availability	fully	yes	yes	
f) thematic accuracy	fully	yes	yes	
g) spatial accuracy	fully	yes	yes	

C1 – Tree Cover Density	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	Choose an item.	yes	As this product was not part of the SLA (but delivery was agreed on between user and SP at a later stage in the project), the part "Compliance with SLA" has not been filled. The requirements are given by EEA to produce the HR Forest Core Layers. Therefore this part has not been rated by ThüringenForst.
b) Spatial resolution	Choose an item.	Choose an item.	yes	
c) type of information sufficient	Choose an item.	Choose an item.	yes	
d) Update rate	Choose an item.	Choose an item.	yes	
e) rapid availability	Choose an item.	yes	yes	
f) thematic accuracy	Choose an item.	yes	yes	
g) spatial accuracy	Choose an item.	yes	yes	

C2 – Forest Type Map	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	Choose an item.	yes	As this product was not part of the SLA (but delivery was agreed on between user and SP at a later stage in the project), the part "Compliance with SLA" has not been filled. The requirements are given by EEA to
b) Spatial resolution	Choose an item.	Choose an item.	yes	
c) type of	Choose an	Choose an item.	yes	

information sufficient	item.			produce the HR Forest Core Layers. Therefore this part has not been rated by ThüringenForst.
d) Update rate	Choose an item.	Choose an item.	yes	
e) rapid availability	Choose an item.	Choose an item.	yes	
f) thematic accuracy	Choose an item.	Choose an item.	yes	
g) spatial accuracy	Choose an item.	Choose an item.	yes	

C3 – Tree Cover Map	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	Choose an item.	yes	As this product was not part of the SLA (but delivery was agreed on between user and SP at a later stage in the project), the part "Compliance with SLA" has not been filled. The requirements are given by EEA to produce the HR Forest Core Layers. Therefore this part has not been rated by ThüringenForst.
b) Spatial resolution	Choose an item.	Choose an item.	yes	
c) type of information sufficient	Choose an item.	Choose an item.	yes	
d) Update rate	Choose an item.	Choose an item.	yes	
e) rapid availability	Choose an item.	yes	yes	
f) thematic accuracy	Choose an item.	yes	yes	
g) spatial accuracy	Choose an item.	yes	yes	

P4 – Change Map	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	yes	yes	As this product was not part of the SLA (but delivery was agreed on between user and SP at a later stage in the project), the part "Compliance with SLA" has not been filled. The requirements have been laid down in a separate agreement between user and SP. As also agreed, the thematic accuracy of the product will be assessed by the user (using internal data) within the next months.
b) Spatial resolution	Choose an item.	yes	yes	
c) type of information sufficient	Choose an item.	yes	yes	
d) Update rate	Choose an item.	yes	yes	
e) rapid availability	Choose an item.	yes	yes	

f) thematic accuracy	Choose an item.	Choose an item.	Choose an item.	
g) spatial accuracy	Choose an item.	yes	yes	

P5 – High Resolution Change Map	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	Choose an item.	yes	yes	As this product was not part of the SLA (but delivery was agreed on between user and SP at a later stage in the project), the part "Compliance with SLA" has not been filled. The requirements have been laid down in a separate agreement between user and SP. As also agreed, the thematic accuracy of the product will be assessed by the user (using internal data) within the next months.
b) Spatial resolution	Choose an item.	yes	yes	
c) type of information sufficient	Choose an item.	yes	yes	
d) Update rate	Choose an item.	yes	yes	
e) rapid availability	Choose an item.	yes	yes	
f) thematic accuracy	Choose an item.	Choose an item.	Choose an item.	
g) spatial accuracy	Choose an item.	yes	yes	

3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

	Relevance (yes, partly, no)	Description
a) Cost saving	partly	Cost savings can be expected, in case the CORE products will be regularly (e.g. all 3 years) available for free through EEA/ESA. Other services such as "Fast Storm damage assessment" might not save cost in comparison to used methods, but will provide spatial explicit data within a very short time frame.
b) time saving	yes	Compared to field campaigns or aerial photo interpretation, the delivered EO based services can be produced within a shorter time frame and therefore it is assumed that it will save time.
c) new functionalities / information	yes	Some of the products provide information, which have not been available so far (e.g. Tree Cover Density).
d) improved monitoring capabilities	yes	The potential of higher repetition rates/update frequency provide an important improvement related to monitoring capabilities. In addition, not only state forest can be monitored but also forest, managed by other authorities (e.g. private, communal,…)
e) rapid availability	yes	Most of the services can provide data faster than before.
f) easily comprehensible	yes	All technical requirements (data format, projection,...) are in line with the user requirements and can be easily integrated into the working environment of the user.
g) higher priced	partly	Some services might not save cost but will provide information, which would otherwise not be available (e.g. Fast Storm Damage Assessment)
h) dependency on the availability of the service provider	partly	Related to the Core Service products, no dependency from a single service provider is expected as the production will be tendered out by EEA. Some Downstream services could also be provided by other Service Providers. The Downstream Service on "Rapid Storm Damage Assessment" is very demanding related to the available infrastructure of the Service Provider. The Service is based on 24/7 availability of the SP and also the capacity to provide large scale mapping within a very short time frame. Here GAF AG might not the only one who can provide such a downstream service, but has the full infrastructure already available for the service implementation.
i) very technical	no	As mentioned before, the data can be easily integrated into the software environment of the user. The results can be easily interpreted by technical staff of the user.

3.2.3 Any other benefits or constraints which have not been mentioned yet?

The additional production and delivery of the HR Forest Layers to ThüringenForst provides a good basis to think about further potential Downstream Services and internal use of the Core layers.

3.3 How sustainable is the service for you?

3.3.1) are for any of these products updates planned?

Product	Updates planned?	Within the project duration and/or after the end of the project?	Description (e.g. frequency of updates)
P1	yes	within project duration	In case of a storm event over Thuringia, the service provision is foreseen within EUFODOS. Further implementation after EUFODOS is possible but has to be discussed in more detail on issues such as cost, coverage,...
P2	yes	within project duration	In case of a storm event over Thuringia, the service provision is foreseen within EUFODOS. Further implementation after EUFODOS is possible but has to be discussed in more detail on issues such as cost, coverage,...
P3	not clear yet	within project duration	Maybe (depended on Production of Core-Service production in GIO-Land project)
C1	yes	within project duration	The delivery of the HR Forest Layer based on Image 2012 is foreseen by End of 2013 (according to the specifications of the GIO-Land project). There might be potential, that the HR Forest layers are available within the project duration (depending on the EO data availability and production progress within the GIO-Land project).
C2	yes	within project duration	
C3	yes	within project duration	
P4	yes	Choose an item.	Updates are foreseen on request
P5	yes	Choose an item.	Updates are foreseen on request

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

Product	Budget available?	Description
P1	yes	In case of a real storm event over Thuringia, budget can be made available for the Downstream Service.
P2	yes	In case of a real storm event over Thuringia, budget can be made available for the Downstream Service.
P3	yes	
C1	no	Not relevant
C2	no	Not relevant
C3	no	Not relevant
P4	not clear yet	Results have to be further evaluated. Update possibility could be 3 to 5 years
P5	not clear yet	Results have to be further evaluated. Update possibility could be 3 to 5 years

3.4 Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on you working activities /practice.

The services have to be fully integrated (see rating in chapter 3.1.3) into the working practices before concluding comments can be provided. Parts of P3 as well as C2 have already been implemented.

4. Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 3): very good, good, satisfactory, poor, unacceptable.

Additional comments on improvements are welcome.

4.1 How do you consider the negotiation process of the Service Level Agreement and other administrative procedures between you and your service provider?

Assessment	Comment
very good	No problems encountered during the negotiation process. The service specifications as well as possible problems have been openly discussed between User and Service Provider.

4.2 How would you assess the process of quality assurance with respect to:

	Assessment	Comment
a) degree to which the technical specification from the SLA are met?	very good	The rating is not based on the SLA, as it was not possible to produce these products (due to reasons mentioned before). The other products have been delivered according to the technical specifications, which have been agreed between User and SP.
b) transparency of quality related information (are you able to assess the quality of the product by the information given by the service provider)?	good	Quality related Information provided by the SP is adequate to understand the quality of the product. For specific products an internal quality assessment is foreseen (especially related to a new service).

4.3 How would you rate the level of customer (user) care and general attention to the customer's (user's) requirements? (how is the quality of contact between SP and user)

Assessment	Comment
satisfactory	It was always possible during SLA negotiations as well as the project implementation, to discuss user based needs and requirements and adjust the service and product specifications if necessary.

4.4 How would you assess your personal engagement with the service provider?

Assessment	Comment
very good	Exchange of information was always possible. SP was always open to discuss service related issues.

5. Assessment of Impacts and Value Statement

5.1 Does the FDS within your organisation has an impact on or can be used for other activities than those initially specified in the SLA ?

Assessment	Comment
yes	During meetings between SP and User as well as the training workshop in May 2012, several possibilities have been discussed to also use the delivered products for other purposes as it was planned. Based on available In-house data (at ThüringenForst), further product enhancements are planned to also cover other questions not directly related to the assessment of storm or insect infested damages.

5.2 Would you or do you recommend the FDS also to other institutions within your working area (forestry, agriculture, nature protection etc), region or network. Please name the institution and the respective contact person.

Assessment	Institutions
yes	Nature Protection Forestry institutions AFL (GIS-Cooperation of the Federal States in Gemany

6. Overall Evaluation and Outlook

6.1 Please give an overall evaluation of the service

Assessment	Comment
good	Further development work has to be done because of missing damage events

6.2 Do you have any suggestions for future improvements or expansion of the downstream service or ideas for new services which you would like to add?

Several options for future improvements, expansion of downstream services as well as potential new services have already pre-discussed during the training workshop. It is planned to further streamline the ideas for the phase 2 of EUFODOS.

1. Name and contact details of user - Bulgaria

Your name: Spas Tumbev and Vladimir Konstantinov

Your institution: Executive Forest Agency, Department Security and Forest Protection

Your contact details:

Email: tumbev@iag.bg, vl_konstantinov@iag.bg

Phone: +359 (0) 885841359, +359 (0) 888386732

2. State of Work

2.1) Please shortly list the expected Forest Downstream products for your service case according to the Service Level Agreement (SLA).

Product	Description (Name)
P-05	Service: Rapid mapping for disaster management
P-05-1	Forest Cover Map
P-05-2	Forest Type Map
P-05-3	Fire Extent Map
P-05-4	Fire Type Map
P-05-5	Damaged Forest Map
P-05-6	Damaged Forest Map – according to forest type and age
P-05-7	Damaged Forest Map – according to forest type and crown density

2.2) Please select for each of the above mentioned products the state of completeness in %(drop-down list) and add comments if applicable, for instance reasons for delay, etc.

Product	Completeness	Comment
P-05	100%	
P-05-1	100%	
P-05-2	100%	
P-05-3	100%	
P-05-4	100%	
P-05-5	100%	
P-05-6	100%	

P-05-7	100%	

3. (expected) Functionality and Utility of the FDS

3.1 Integration into work practise

3.1.1) Which information do you receive from the FDS?
Please describe, which exact information each of the FDS product will provide (based on the SLA).

Product	Type of information (e.g. forest type, damage type, stem volume, …)	Quantitative? (y/n)	Geographically explicit (GIS layer? (y/n)
P-05-1	Forest and non-forest area in the area of interest	Yes (	yes
P-05-2	Forest type according to the Forest Management Programs	yes	yes
P-05-3	Total burnt area	yes	yes
P-05-4	Total burnt area divided in crown and surface fire	yes	yes
P-05-5	Total area of the burnt forest cover (three types of maps: based on satellite image, forest management program, updated forest management program)	yes	yes
P-05-6	Total area of the burnt forest cover divided by the forest type and age	yes	yes
P-05-7	Total area of the burnt forest cover divided by the forest type and crown density	yes	yes

3.1.2) Are the FDS Products…

- *replacing an existing activity/information? (yes/no). If yes: which?*
- *Complementary to existing activity/information (yes/no). If yes: which?*
- *A completely new activity/information (yes/no)*

Product	Replacing?	Comple-mentary?	New?	Replacing / complementary to which on-going activity or already used information system?, comments
P-05-1	no	yes	no	Forest Management Program
P-05-2	no	yes	no	Forest Management Program
P-05-3	no	no	yes	In few cases when the fire is big fire extent map is prepared based on in-situ observations
P-05-4	no	no	yes	In few cases when the fire is big fire extent map is prepared based on in-situ observations – not always separation of crown and surface fire is made
P-05-5	no	no	yes	As above with comment that only crown fire is analysed
P-05-6	no	no	yes	

P-05-7	no	no	yes	

3.1.3) How would you evaluate the (expected) level and ease of integration into the existing operational setup?
Consider aspects like

- Consistence with operational workflow of your activities
- Skills of your staff (technical, thematic)
- Technical requirements (Hardware and software, data format, …)

Product	Level of integration	Ease of integration	comments
P-05-1	medium	moderate	
P-05-2	medium	moderate	
P-05-3	high	easy	
P-05-4	high	easy	
P-05-5	high	easy	
P-05-6	high	easy	
P-05-7	high	easy	

3.2 Improvements / constraints and benefits

3.2.1 Are the technical specifications of the FDS products which you (will) receive

- *compliant with the SLA?*
- *Do they meet the requirements for integration?*
- *Do they improve the situation compared to your currently available information?*
- *Do specific constraints hinder the integration of the FDS into you operational work?*

If necessary to distinguish between products, please create a copy of this table for each single product!

	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	fully	fully	
b) Spatial resolution	fully	fully	fully	
c) type of information sufficient	fully	fully	fully	
d) Update rate ? (Updates are not planned within the project period)	fully	partly	partly	Update could be done if necessary and new disaster event happen in the same area
e) rapid availability	fully	fully	fully	The demo product was based on historic event. The real service in terms of time frame would be assessed when

				new disaster occur
f) thematic accuracy	fully	fully	partly	
g) spatial accuracy	fully	fully	fully	

3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

	Relevance (yes, partly, no)	Description
a) Cost saving	yes	
b) time saving	yes	
c) new functionalities / information	yes	
d) improved monitoring capabilities	yes	
e) rapid availability	yes	
f) easily comprehensible	partly	Still training of the users is needed
g) higher priced	partly	
h) dependency on the availability of the service provider	yes	
i) very technical	partly	

3.2.3 Any other benefits or constraints which have not been mentioned yet?

No.

3.3 How sustainable is the service for you?

3.3.1) are for any of these products updates planned?

Product	Updates planned?	Within the project duration and/or after the end of the project?	Description (e.g. frequency of updates)
P-05-1	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.
P-05-2	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.
P-05-3	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.
P-05-4	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.
P-05-5	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.
P-05-6	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.
P-05-7	yes	within the project duration	If fire event occur update of the product is planned, but this is true also for other natural disaster – snowfall, landslides, storm, flood etc.

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

Product	Budget available?	Description
P-05-1	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.
P-05-2	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.
P-05-3	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.
P-05-4	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.
P-05-5	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.
P-05-6	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.

P-05-7	not clear yet	Because EFA is public administrative body, the budget for the year 2014 and later is not clear yet.

3.4 Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on you working activities /practice.

Products developed by ReSAC meet predetermined goals and will be implemented in the work of EFA in the future. These kinds of products are innovative and will enhance the capabilities and capacity of the EFA for the protection and control of forest areas.

4. Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 3): very good, good, satisfactory, poor, unacceptable.

Additional comments on improvements are welcome.

4.1 How do you consider the negotiation process of the Service Level Agreement and other administrative procedures between you and your service provider?

Assessment	Comment
good	Some delay in SLA finalisation was experienced

4.2 How would you assess the process of quality assurance with respect to:

	Assessment	Comment
a) degree to which the technical specification from the SLA are met?	very good	
b) transparency of quality related information (are you able to assess the quality of the product by the information given by the service provider)?	good	Some more details on thematic accuracy are needed.

4.3 How would you rate the level of customer (user) care and general attention to the customer's (user's) requirements? (how is the quality of contact between SP and user)

Assessment	Comment
very good	More information than requested is delivered.

4.4 How would you assess your personal engagement with the service provider?

Assessment	Comment
very good	

5. Assessment of Impacts and Value Statement

5.1 Does the FDS within your organisation has an impact on or can be used for other activities than those initially specified in the SLA ?

Assessment	Comment
yes	The products could be used by other departments of the EFA

5.2 Would you or do you recommend the FDS also to other institutions within your working area (forestry, agriculture, nature protection etc), region or network. Please name the institution and the respective contact person.

Assessment	Institutions
yes	Other agencies in Ministry of Agriculture and Foods and Ministry of Environment and Waters

6. Overall Evaluation and Outlook

6.1 Please give an overall evaluation of the service

Assessment	Comment
very good	

6.2 Do you have any suggestions for future improvements or expansion of the downstream service or ideas for new services which you would like to add?

In the course of product development, EFA asked ReSAC for further evaluate the damage caused by snow-plough, that took place at the end of 2011, For EFA will be important to have a product that can perform real-time assessment of all types of damage in forest areas.

Completed! Thank you for your cooperation!!!

1. Name and contact details of user - Italy

Your name: Günther Unterthiner

Your institution: Amt für Forstplanung – Autonome Provinz Bozen

Your contact details:

Email: guenther.unterthiner@provinz.bz.it

Phone: +39 0471 41 53 40

2. State of Work

2.1) Please shortly list the expected Forest Downstream products for your service case according to the Service Level Agreement (SLA).

Product	Description (Name)
P1	Base data on forest and potential risk on forest
P2	Event maps
P3	After event monitoring product (recovery)
P4	Spatially explicit Forest Damage Information System (FODIS)

2.2) Please select for each of the above mentioned products the state of completeness in % (drop-down list) and add comments if applicable, for instance reasons for delay, etc.

Product	Completeness	Comment
P1	0%	First demonstrator will be ready for the next PP meeting in Vienna in June 2012
P2	50%	Demonstrator ready
P3	50%	Demonstrator for MODIS scale ready
P4	0%	Will be subcontracted until end of summer 2012

3. (expected) Functionality and Utility of the FDS

3.1 Integration into work practise

3.1.1) Which information do you receive from the FDS?
Please describe, which exact information each of the FDS product will provide (based on the SLA).

Product	Type of information (e.g. forest type, damage type, stem volume, …)	Quantitative? (y/n)	Geographically explicit (GIS layer? (y/n)
P1		no	yes
P2	Changed areas (damage + timber harvesting)	no	yes
P3	Larix phenology (indication for damage and recovery) through NDVI	yes	yes
P4		Choose an item.	Choose an item.

3.1.2) Are the FDS Products…

- *replacing an existing activity/information? (yes/no). If yes: which?*
- *Complementary to existing activity/information (yes/no). If yes: which?*
- *A completely new activity/information (yes/no)*

Product	Replacing?	Comple-mentary?	New?	Replacing / complementary to which on-going activity or already used information system?, comments
P2	no	yes	yes	Complementary to existing registered timer harvesting and forest damage records. New is the spatial explicit character
P3	no	yes	yes	Complementary to existing forest damage records

3.1.3) How would you evaluate the (expected) level and ease of integration into the existing operational setup?
Consider aspects like

- Consistence with operational workflow of your activities
- Skills of your staff (technical, thematic)
- Technical requirements (Hardware and software, data format, …)

Product	Level of integration	Ease of integration	comments
P1	high	easy	
P2	high	easy	Can be fully integrated in P4
P3	medium	easy	Integration depends on quality. Recovery information not yet foreseen in existing workflows
P4	high	easy	Will be designed according to our needs

3.2 Improvements / constraints and benefits

3.2.1 Are the technical specifications of the FDS products which you (will) receive

- *compliant with the SLA?*
- *Do they meet the requirements for integration?*
- *Do they improve the situation compared to your currently available information?*
- *Do specific constraints hinder the integration of the FDS into you operational work?*

If necessary to distinguish between products, please create a copy of this table for each single product!

P2	Compliant with SLA	Requirements fulfilled	Improvement compared to current information	Constraints / further improvements needed
a) Spatial coverage (completeness)	fully	partly	yes	
b) Spatial resolution	fully	yes	yes	
c) type of information sufficient	fully	partly	yes	Partly because only information on change. Supposed damage could also be timber harvest
d) Update rate ? (Updates are not planned within the project period)	Choose an item.	Choose an item.	Choose an item.	In an operational mode (based on Sentinel 2) a 3-4 month update rate would be optimal
e) rapid availability	fully	yes	yes	
f) thematic accuracy	fully	yes	yes	
g) spatial accuracy	fully	yes	yes	

3.2.2 Will the FDS products provide one of the following further benefits or disadvantages?

	Relevance (yes, partly, no)	Description
a) Cost saving	no	
b) time saving	yes	
c) new functionalities / information	no	
d) improved monitoring capabilities	yes	
e) rapid availability	partly	For smaller or undetected damage: yes
f) easily comprehensible	yes	
g) higher priced	partly	Depending on data costs. With Sentinel 2 not
h) dependency on the availability of the service provider	partly	Since only complementary information. P2 yes
i) very technical	no	

3.2.3 Any other benefits or constraints which have not been mentioned yet?

3.3 How sustainable is the service for you?

3.3.1) are for any of these products updates planned?

Product	Updates planned?	Within the project duration and/or after the end of the project?	Description (e.g. frequency of updates)
P1	not clear yet	Choose an item.	
P2	yes	within project duration	Within project based on RE. After project based on Sentinel 2
P3	not clear yet	Choose an item.	
P4	Choose an item.	Choose an item.	A system not a dataset. Not updated needed.

3.3.2) is there any financial budget available or foreseen to continue the service after the end of the EUFODOS project?

Product	Budget available?	Description
P1	not clear yet	
P2	yes	
P3	not clear yet	
P4	yes	

3.4 Overall analysis of utility

Please provide concluding comments on the overall utility in terms of impact of the products/services on you working activities /practice.

The product as presented during the user training looked very promising. Particular the identification of areas damaged by storm could be very useful for a proper documentation of storm damages. The results already reveal that remote sensing can provide a more complete image than mapping on the ground. The next step would be to let the result evaluate by local foresters.

4. Assessment of Procedures and recommended Improvements

This part addresses the assessment of the process of the development of the FDS. Possible answers for all questions in 3): very good, good, satisfactory, poor, unacceptable.

Additional comments on improvements are welcome.

4.1 How do you consider the negotiation process of the Service Level Agreement and other administrative procedures between you and your service provider?

Assessment	Comment
very good	

4.2 How would you assess the process of quality assurance with respect to:

	Assessment	Comment
a) degree to which the technical specification from the SLA are met?	very good	
b) transparency of quality related information (are you able to assess the quality of the product by the information given by the service provider)?	very good	

4.3 How would you rate the level of customer (user) care and general attention to the customer's (user's) requirements? (how is the quality of contact between SP and user)

Assessment	Comment
very good	

4.4 How would you assess your personal engagement with the service provider?

Assessment	Comment
very good	

5. Assessment of Impacts and Value Statement

5.1 Does the FDS within your organisation has an impact on or can be used for other activities than those initially specified in the SLA ?

Assessment	Comment
yes	Damage maps are in reality change maps and could also be used to identify unplanned and planned / known and unknown timber harvest.

5.2 Would you or do you recommend the FDS also to other institutions within your working area (forestry, agriculture, nature protection etc), region or network. Please name the institution and the respective contact person.

Assessment	Institutions
yes	

6. Overall Evaluation and Outlook

6.1 Please give an overall evaluation of the service

Assessment	Comment
good	

6.2 Do you have any suggestions for future improvements or expansion of the downstream service or ideas for new services which you would like to add?

Further development of P1 forest mask with a five years inteval

Completed! Thank you for your cooperation!!!