

D1.12 DATA MANAGEMENT PLAN (V2) OPERATIONAL SUSTAINABLE FORESTRY WITH SATELLITE-BASED REMOTE SENSING

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DOCUMENT STATUS SHEET

Version	Date	Pages	Changes
V1	28/12/2018	26	First version of the document

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1. INTRODUCTION

1.1. PURPOSE

This document corresponds to deliverable **D16- D1.12 Data Management Plan (v2)**. The goal of this document is record the relevant aspects of making data FAIR – findable, accessible, interoperable and re-usable, including what data the project will generate, whether and how it will be made accessible for verification and re-use, and how it will be curated and preserved. Through this DMP, it can be defined certain datasets to remain closed according to the principle “as open as possible, as closed as necessary”.

During the project lifetime, the Data Management Plan (DMP) will be issued and updated in four documents:

Table 1-1. MySustainableForest DMP versions planned

Deliverable Number	WP1 Deliverable Nº	Title	Lead Beneficiary	Type	Dissemination Level	Due Date (in months)
D06	D1.11	Data Management Plan (v1)	GMV	ORDP	PU	4
D16	D1.12	Data Management Plan (v2)	GMV	R	PU	12
D30	D1.13	Data Management Plan (v3)	GMV	R	PU	24
D46	D1.14	Data Management Plan (v4)	GMV	R	PU	36

1.2. SCOPE

This document is structured according to the following sections:

- Section 1 (present chapter) defines the purpose of the document and the contents’ scope.
- Section 2 includes the list of applicable documents and additional references to be taken into account during the project life cycle. It also contains the definitions and acronyms.
- Section 3 contains the **comparison** between DMP (v1) and DMP (v2).
- Section 4 describes **DMP (v1) implemented actions**, during year 2018.
- Section 5 contains **DMP (v2) implementation plan**, for year 2019.

2. APPLICABLE AND REFERENCE DOCUMENTS

2.1. APPLICABLE DOCUMENTS

The following documents, of the exact issue shown, form part of this document to the extent specified herein. Applicable documents are those referenced in the Contract or approved by the Approval Authority.

Table 2-1. Applicable Documents

Ref.	Title	Code	Version	Date
[AD.1]	Grant Agreement Nº 776045—MySustainableForest	Ares(2017)5215238	1.0	25/10/2017
[AD.2]	Copernicus Space Component Data Access Portfolio: Data Warehouse 2014 - 2020	DAP	2.0	05/04/2018
[AD.3]	Signed_ESA_DWH_License_MSF		1.0	17/04/2018

2.2. REFERENCE DOCUMENTS

The following documents, although not part of this document, amplify or clarify its contents. Reference documents are those not applicable and referenced within this document. They are referenced in this document in the form [RD.X]:

Table 2-2. Reference Documents

Ref.	Title	Code	Version	Date
[RD.1]	Relevant terms and definitions used for the updated pan-European indicators for sustainable forest management http://www.foresteuropa.org/sites/default/files/3AG_UPI_Updated_Terms_Definitions.pdf		1.0	03/06/2015
[RD.2]	EC guidelines on Data Management in Horizon 2020: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf		3.0	26/07/2016
[RD.3]	D1.11 Data Management Plan (v1)	D6_D1.11	1.0	20/09/2018
[RD.4]	D12_D1.2_DWH use for 2018	D12_D1.2	1.0	04/12/2018
[RD.5]	D13_D1.3_DWH request for 2019	D13_D1.3	1.0	04/12/2018

2.3. Acronyms and Definitions

The following acronyms have been used across this document:

Table 2-3. Acronyms

Acronym	Full term
AD	Applicable document
AOI	Area of Interest
CSCDA	Copernicus Space Component Data Access
DAP	ESA Data Access Protocol
DIAS	Data and Information Access Services
DMP	Data Management Plan
DWH	European Space Agency Data Warehouse
EO	Earth Observation
ESA	European Space Agency
FAIR	Findable, Accessible, Interoperable and Re-usable
HR	High Resolution
MR	Medium Resolution



Acronym	Full term
USGS	United States Geological Survey
VHR	Very High Resolution
WP	Work Package

3. COMPARISON BETWEEN DMP V1 AND V2

MySustainableForest handles a remarkable amount of data from remote sensors and in situ measurements across 14 AOI's. **Simplification is the key difference and improvement between the two versions of the DMP issued thus far (DMP v1 & v2).**

The simplification of DMP v2 is an answer to the guidelines given by EC's Expert Reviewers during the RV1 meeting (Madrid, 25/09/2018) and the RV1 Review Report (Participants Portal 30/11/2018).

The DMP v2 reduces the number of actions to carry out and the volume of data to process (see Table 3-1 below); comparatively, the DMP v1 involved a more laborious process in order to fulfil for standardization objectives (database structure, metadata standard, naming convention, etc).

Table 3-1. Key differences between DMP (v1) and DMP (v2).

DMP v1 (2018)	DMP v2 (2019)
<ul style="list-style-type: none"> ■ Establish the principles for recording project data (Reported In [RD.3]) ■ Indexing project's data (Reported In [RD.3]) ■ Survey of partners' data availability (Reported In [RD.3]) ■ Calculation of EO data source (Reported In [RD.3]) ■ Data standardization (Reported In [RD.3]) ■ Selection of software tools for data analysis (Reported In [RD.3]) ■ Establishment of quality assurance procedures (Reported In [RD.3]) ■ Request partners' data (initiated in v1. Implemented in subsequent versions of the DMP) ■ EO and field data collection (initiated in v1. Implemented in subsequent versions of the DMP) ■ Products generation (initiated in v1. Implemented in subsequent versions of the DMP) 	<ul style="list-style-type: none"> ■ Request partners' data ■ EO and field data collection ■ Products generation

The reduction of data volume to be processed in DMP v2 will also be achieved through a reduction in the number of VHR products, AOIs and discarding the use of archive data, as summarised in Table 3-2.

Table 3-2. Data reduction between DMP (v1) and DMP (v2).

VHR ESA DAP data	DMP v1	DMP v2
AOIs	14	11
Area to service	27,516 Km ²	8,230 Km ²
Archive VHR data	Yes	No

4. DMP (V1) IMPLEMENTED ACTIONS, DURING YEAR 2018

This section presents the results of the implementation of the pending **three actions** of DMP(v1) (3.):

- Request partners' data.
- EO and field data collection.
- Product generation.

4.1. REQUEST PARTNERS' DATA

The survey of partner's data availability ([RD.3], section 4.1) produced the following number of data entries:

- **125** data sets were **available** at the beginning of the project.
- **42** data sets were to be **gathered** during project's lifetime.

These data sets were requested to the partners according to the work plan for the generation of products (0). In total **73 data sets** were requested and stored in the MSF platform (Table A-6).

4.2. EO AND FIELD DATA COLLECTION

There are three source types of Earth Observation (EO) data sets:

- VHR and HR **ESA CSCDA quota** satellite data.
- **Free** satellite data. These data sets are obtained at ESA SCI HUB (<https://scihub.copernicus.eu/>) for Sentinel data and USGS (<https://earthexplorer.usgs.gov/>) for Landsat.
- **LIDAR** data, provided by MSF local partners.

The collection of VHR and HR **ESA CSCDA quota** satellite data is detailed in "D12 D1.2 DWH use for 2018" ([RD.4]). Quota data were not used for the generation of product planned at DMP(v1) because of the delays and problems encountered in the data request process to the ESA CSCDA. These issues made impossible to incorporate VHR and HR data in the production plan of DMP(v1). The requested data to ESA CSCDA during DMP(v1) ([RD.4]) will be incorporated in the DMP(v2) production (0).

Free satellite data were the **main input** for the generation of **MSF products** during DMP(v1) (40 products over 8 AOIs, see 0 below).

These products were designed to be trials in order to evaluate the production methodology, these products were not designed to constitute the definitive production. Table 4-1) below summarises the free satellite data listed in ANNEX B.

Table 4-1. Resume table of free satellite data collection during DMP(v1)

Sensor	Optical / SAR	Number of requests	Number of images	Total image surface (Km2)	Applicable services and products
Landsat5	Optical	7	30	67,386	S1 P6
Landsat8	Optical	6	30	20,274	S1 P6
Sentinel1	SAR	5	7	3,559	S1 P5; S2 P1; S2 P2; S3 P1
Sentinel2	Optical	7	21	72,430	S1 P1; S1 P4; S1 P7; S1 P8; S2 P1; S2 P2; S3 P1

Field measurements during DMP(v1) consisted in gathering wood quality parameters for Service 2 products. Field measurements gathering wood quality parameters were carried out in five AOIs (CFRI1, CFRI2, Madera+, RAIZ1 and RAIZ2). Table 4-2 below summarises the wood quality field measurements performed during 2018:

Table 4-2. Wood quality field measurements gathered during DMP(v1)

AOIs acronym	Measured parameter	Data role (Input / Validation)	Designed for MSF products	Number plots measured
CFRI1	Basic wood density	Input/Validation	S2 P1 Wood Density Ranking	16
	Standing tree sound velocity	Input		16
	Outer Wood density variation by ring			16
	Cavitation, leaf surface	Validation		3
CFRI2	Basic wood density	Input/Validation		10
	Standing tree sound velocity	Input		10
	Outer Wood density variation by ring			10
	Cavitation, leaf surface	Validation		3
MADERA+1	Basic wood density	Input/Validation		25
	Height/diameter	Input		25
RAIZ1	Basic wood density	Input/Validation	8	
RAIZ3	Basic wood density		9	

LIDAR data were collected over four AOIs during DMP(v1), covering 11,582 Km²:

Table 4-3. LIDAR data gathered/processed during DMP(v1)

AOIs acronym	Number of measurement dates	Total data surface (Km ²)	Applicable services and products
CFRI1 and CFRI2	1	1,089	S1 P1, S1 P9
FORESNA1 (contains FORESNA2)	1	10,391	S1 P1, S1 P9
UFE1	1	102	S1 P1, S1 P9

4.3. PRODUCT GENERATION

Using the partner's data (4.1) and EO / field data (4.2) **40 trial products** were generated over **eight AOIs** in DMP(v1). The individual descriptions of these products are detailed in the section ANNEX C.

Table 4-4. Resume of generated products DMP(v1)

Product code	Product name	AOIs acronym	Output number
S1 P1	FOREST MASK	CFRI1, CFRI2, FORESNA1, FORESNA2, RAIZ1, RAIZ2, RAIZ3, RAIZ4	10
S1 P4	MAIN FOREST TYPES		9
S1 P6	FOREST AGE		8
S1 P7	BURNT SCARS	FORESNA1	1
S1 P8	CLEAR-CUTS		1
S1 P9	Dem Elevation		1
S5 P1	Basin And Stream Network	CFRI1, CFRI2, FORESNA2	3
S5 P2	Biodiversity-Habitat Fragmentation	CFRI1, CFRI2, FORESNA2, RAIZ1, RAIZ2, RAIZ3, RAIZ4	7
		Total	40

5. DMP (V2) IMPLEMENTATION PLAN

The current DMP(v2) focusses on four tasks:

- Request partner’s data.
- EO data collection.
- Field data collection
- Generation of products.

The figure below depicts the timeline of the referred tasks:

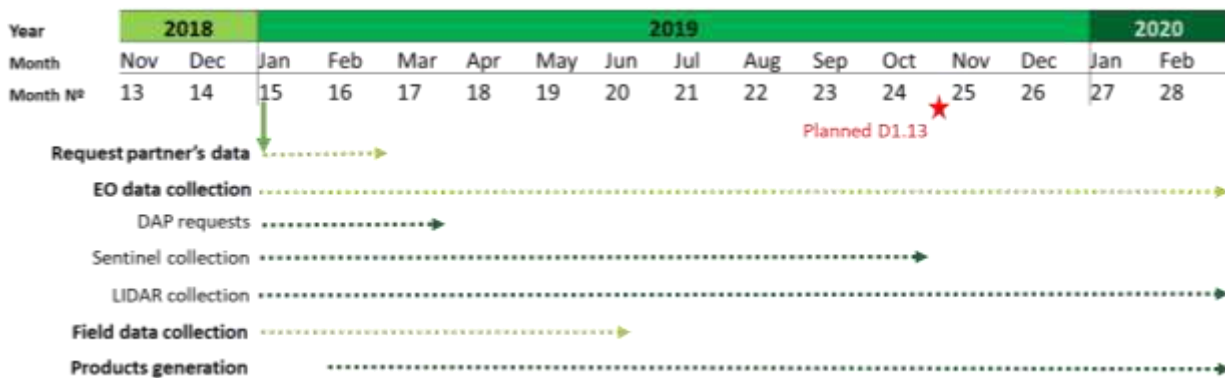


Figure 5-1. Timeline of DMP v2 for 2019

5.1. REQUEST PARTNER’S DATA.

Request of partner’s data does not consist only in the collection of the remaining **94 partners’ data sets** (see 4.1 above). This action also implies the evaluation of the data usability and quality. Data usability is related with the data role in products generation: data entries will be divided between input data (for products’ generation) and validation data (for accuracy measurement of output products). The quality measurement will be done by the MSF partner responsible of each AOIs (RAIZ, FORESNA, CNPF, CFRI, UFE, FOAL).

5.2. EO DATA COLLECTION.

Earth Observation (EO) data will be acquired in three lines:

- DAP quota data.
- Sentinel1 SAR and Sentinel2 optical data.
- LIDAR data

DAP and Sentinel data to be collected are recorded in the document “DWH request for 2019” [RD.5]. This data collections can be resumed in the following key points:

- The **DAP quota datasets** will be reduced from **five** in DMP(v1) ([RD.3]) **to two** in DMP(v2):
 - ADD_012a New acquisition_standard_Optical_VHR1.
 - ADD_016b New acquisition_standard_SAR_VHR1.
- **Only new acquisition** data will be requested to **ESA DAP** in DMP(v2) because the lack of archive data ([RD.4]).
- **Only VHR data** will be requested to **ESA DAP** in DMP(v2) ([RD.5]).
- The **optical data** requested to **ESA DAP** has a total surface of **5,230 Km²** ([RD.5]) for **11 AOIs**.

- The **SAR data** requested to **ESA DAP** has a total surface of **3,000 Km²** ([RD.5]) for **10 AOIs**.
- **Sentinel1 SAR** data has a planned surface of **142,042 Km²** ([RD.5]) for **all MSF AOIs** ([RD.5]).
- **Sentinel1 SAR** data will be requested for a maximum of **32 different acquisition dates** depending on the products to be deployed in each AOI.
- **Sentinel 2 optical** data has a total planned surface of **579,293 Km²** for **all MSF AOIs** ([RD.5]).
- **Sentinel 2 optical** data will be requested for a maximum of **31 different acquisition dates** depending on the products to be deployed in each AOI.

Because the previous experience in DWH request [RD.4] most of DAP request of quota data will be done in the first quarter of 2019 to avoid delays in the production. Sentinel1 and Sentinel 2 will be collected using ESA DIAS that allows to manipulate and process the data without downloading the entire tile or image to local process servers.

LIDAR datasets to be collected during DMP(v2) are listed in the following table:

Table 5-1. Resume table of LIDAR data during DMP(v2)

AOIs acronym	Number of measurement dates	Total data surface (Km2)	Notes
FOAL	1	pending	Pending the selection of FOAL AOI
FORESNA1 and FORESNA2	1	10,391	New LIDAR flight
RAIZ3	1	6	New LIDAR flight
UFE1	1	102	New LIDAR flight

5.3. FIELD DATA COLLECTION.

The table below lists the planned field data collection of wood quality parameters during 2019:

Table 5-2. Planned field data measurements during DMP(v2)

AOIs acronym	Measured parameter	Data role (Input / Validation)	Designed for MSF products	Number of measured plots
CNPf2	Sound speed in standing tree	Input/Validation	S2P2 Wood Stiffness	pending
	Green wood density	Input		pending
	Dynamic elasticity modulus	Input/Validation		pending
FORESNA2	Sound speed in standing tree	Input/Validation	S2 P1 Wood Density Ranking	28
	Green wood density	Input		28
	Dynamic elasticity modulus	Input/Validation		28
UFE1	Basic wood density	Input/Validation		pending
	Sound speed in standing tree	Input		pending

5.4. PRODUCTS GENERATION.

MSF consortium have defined **28 products for forest management**. These products can be done from different input data: Sentinel1, Sentinel2, LIDAR, quota satellite data (optical and SAR), field measurements or other MSF products.

Table 5-3. MSF products

Service	Products	Service	Products
SERVICE 1 Forest Site Characterization	P1 Forest mask P2 Stand delineation P3 Forest Infrastructures P4 Main forest types P5 Stand height P6 Forest age P7 Burnt scars P8 Clear cuts P9 DEM-Elevation, slope, aspect P10 Site Index	SERVICE 2 Wood Characterization	P1 Wood Density Ranking P2 Wood Stiffness P3 Strength Class P4 Stand Density
SERVICE 3 Biomass and CO2 stocking	P1 Above Ground Biomass-CO2 Stock	SERVICE 4 Forest Condition	P1 Biotic Damages P2 Drought Estimation P3 Wind-Damages P4 Snow-Damages P5 Forest Vitality P6 Frost-Damages
SERVICE 5 Ecosystem Vulnerabilities	P1 Basin and stream network P2 Biodiversity-Habitat Fragmentation P3 Flood Risk Indicator P4 Soil Erosion Risk Indicator	SERVICE 6 Socioeconomic Conditions	P1 Physical wood accounts P2 Physical supply and use of wood P3 Land Physical Asset Account

Table 5-4 and Table 5-5 below show the production plan under DMP v1 and DMP v2, the latter notably reduced. .

Table 5-4. Production plan in DMP(v1)

		CFR11	CFR12	CNPF1	CNPF2	FORESNA1	FORESNA2	MADERA+1	RAIZ1	RAIZ2	RAIZ3	RAIZ4	UFEL	FOAL1	FOAL2
Product name	Main input														
S1 P1 Forest mask	VHR														
	Sentinel														
	LIDAR														
S1 P2 Stand delineation	VHR														
S1 P3 Forest Infrastructures	VHR														
S1 P4 Main forest types	VHR														
	Sentinel2														
S1 P5 Stand height	VHR														
	Sentinel														
	LIDAR														
S1 P6 Forest age	Sentinel														
S1 P7 Burnt scars	Sentinel														
S1 P8 Clear cuts	Sentinel														
S1 P9 DEM-Elevation	VHR														
	LIDAR														
S1 P10 Site Index	LIDAR														
S2 P1 Wood Density Ranking	Sentinel and LIDAR														
S2 P2 Wood Stiffness															
S2 P3 Strength Class															
S2 P4 Stand Density	LIDAR														
S3 P1 AGB	VHR														
	Sentinel														
	LIDAR														
S4 P1 Biotic Damages	VHR														
	Sentinel														
S4 P2 Drought Estimation	VHR														
	Sentinel														
S4 P3 Wind-Damages	VHR														
	Sentinel														
S4 P4 Snow-Damages	VHR														
	Sentinel														
S4 P5 Forest Vitality	VHR														
	Sentinel														
S4 P6 Frost-Damages	VHR														
	Sentinel														

Table 5-5. Production plan in DMP(v2)

		CFR11	CFR12	CNPF1	CNPF2	FORESNA1	FORESNA2	MADERA+1	RAIZ1	RAIZ2	RAIZ3	RAIZ4	UFE1	FOAL1	FOAL2
Product name	Main input														
S1 P1 Forest mask	VHR														
	Sentinel														
	LIDAR														
S1 P2 Stand delineation	VHR														
S1 P3 Forest infrastructures	VHR														
S1 P4 Main forest types	VHR														
	Sentinel														
S1 P5 Stand height	VHR														
	Sentinel														
	LIDAR														
S1 P6 Forest age	Sentinel														
S1 P7 Burnt scars	Sentinel														
S1 P8 Clear cuts	Sentinel														
S1 P9 DEM-Elevation	VHR optical														
	LIDAR														
S1 P10 Site Index	LIDAR														
S2 P1 Wood Density Ranking	Sentinel and LIDAR														
S2 P2 Wood Stiffness	Sentinel and LIDAR														
S2 P3 Strength Class	Sentinel and LIDAR														
S2 P4 Stand Density	LIDAR														
S3 P1 AGB	VHR optical														
	Sentinel														
	LIDAR														
S4 P1 Biotic Damages	VHR														
	Sentinel														
S4 P2 Drought Estimation	VHR														
	Sentinel														
S4 P3 Wind-Damages	VHR														
	Sentinel														
S4 P4 Snow-Damages	VHR														
	Sentinel														
S4 P5 Forest Vitality	VHR														
	Sentinel														
S4 P6 Frost-Damages	VHR														
	Sentinel														

ANNEX A. DATA RECORD TABLE

Table A-6 Partners' data sets stored in MSF database

ID	AOI acronym	Classification	Input / Validation / Output	Access level (open / restricted)	Name	Acquisition date	Notes
4	RAIZ1	FOREST INVENTORY DATA	Input / Validation	Restricted	Sampling-base field forest inventory	2002-2017	In 2016: 6 plots with: measurement tree coordinates, DBH and height. All other years: DBH and height.
7		AERIAL IMAGES	Validation		Photogrammetry dataset	2016 - 2017	October 2016 and July/August 2017
9		LULC	Input / Validation		Land Use Land Cover changes (The Navigator Company)	on-going sampling	
10	RAIZ2	FOREST INVENTORY DATA	Input / Validation	Restricted	Sampling-base field forest inventory	2017	plot georeferenced, tree DBH and height. land use characterization
11		LULC		Open	Land Use Land Cover 2010 (COS 2010)		
13	RAIZ3	FOREST INVENTORY DATA	Input / Validation	Restricted	Sampling-base field forest inventory	2002-2017	All other years: DBH and height in each tree within each plot/parcel
18	CNPF1	LULC	Input	Open	Raster CES OSO (Cesbio-Theia)	2016	
24		FOREST INVENTORY DATA			Forest inventory data at individual tree and plot level	2008	density, height
25	CNPF2	LULC	Input	Open	Raster CES OSO (Cesbio-Theia)	2016	
43	CFRI1	FOREST INVENTORY DATA	Validation	Restricted	Regular forest inventory (stand level)	summer 2013	Data collected within regular forest inventory for creation of forest management plans: stand delineation, stand level forest variables – stand height, mean dbh, annual increment, stand volume
44		FOREST INVENTORY DATA		Open	Forest inventory data at individual tree and plot level	2017-2018	RTK GNSS records of plot centers (SD≤10 cm), tree position (azimuth and distance from plot center), diameter at breast height, tree height, crown diameter (in 2 or 4 directions), qualitative characteristics, tree cores, etc.
45	CFRI2	FOREST INVENTORY DATA	Validation	Restricted	Regular forest inventory		This relates to operational map used by Croatian State forests for construction of the forest managerial plans (To be improved by MSF). Additional supplementary plot scale information is available.

ID	AOI acronym	Classification	Input / Validation / Output	Access level (open / restricted)	Name	Acquisition date	Notes
51	UFE1	OTHER FOREST MAPS	Validation	Open	UFE_Maps of management plan	2012	
52	FOAL1	AOI	Input	Open	AOI		
53	FOAL2	AOI	Input	Open	AOI		
54	UFE1	FOREST INVENTORY DATA	Input	Open	UFE_Permanent_plots_Borky	2003, 2008, 2012	
55					UFE_Permanent_plots_Sobesice	2013	
57		AOI			UFE1_AOI_UTM33N_WGS84		Produced 28/02/2018
58	CNPF1	AOI	Input	Open	zonesCentreL93		
59	CNPF2	AOI	Input	Open	zone_NA		
60	FORESNA1	FOREST MAPS	Input	Open	OCUPAC_PoI_MCA_VE2012	2012	
61		AOI			AOI_FORESNA_UTM_30N_ETRS89		
62	RAIZ1	AOI	Input	Open	CasePilotRAIZ_DataSites		
63	CFRI1	AOI	Input	Open	CFRI1_AOI_UTM33N_WGS84		
64	CFRI2	AOI	Input	Open	MSF_AOI_2_Croatia_EPSG_4326		
65	FORESNA1	TOPOGRAPHIC	Input / Validation	Open	Topográfica_CAD_1/5000	1990-1998	-
66		TOPOGRAPHIC			Topográfica_CAD_1/10000	1990-1998	-
67		TOPOGRAPHIC			Topográfica_SIG_1/5000	1999-2013	-
68		TOPOGRAPHIC			Topográfica_SIG_1/10000	1999-2013	-

ID	AOI acronym	Classification	Input / Validation / Output	Access level (open / restricted)	Name	Acquisition date	Notes
69		TOPOGRAPHIC			Topográfica_Continua_SIG_1/5000	1999-2013	-
70		TOPOGRAPHIC			Topográfica_BTA_1/5000	2014	-
71		TOPOGRAPHIC			Topográfica_BTA_1/25000	2014	-
72		TOPOGRAPHIC			Topográfica_BTA_BASE_1/25000	2014	-
73		TOPOGRAPHIC			Mallas_cartografia	2014	-
74		GEOLOGY	Input		Mapa_Geologico_25000	2010	Mask of Geologic
75	GEOMORPHOLOGY			Mapa_Geomorfológico	2007	Map	
76		FOREST MAPS	Input / Validation		Mapa_Forestal	2014	Map
77	FOREST INFRASTRUCTURES			Pistas_forestales	2011	Forest roads classified by road conditions and use	
78		NPA	Input		ZEC	2011	Mask of NPA
79		NPA			ZEPA	2011	Mask of NPA
80		NPA			ENP	2011	Mask of NPA
81		PLANT COMMUNITIES MAP			Mapa_series de vegetacion	2011	Mask of vegetation
82		VEGETATION POTENTIAL			Mapa_vegetación potencial	2011	Mask of vegetation
83		ECOSYSTEM MAP			Hábitats de interés comunitario HIC	2011	Mask of HIC
84		LULC		Input/Validation		Mapa cultivos y aprovechamientos	2012

ID	AOI acronym	Classification	Input / Validation / Output	Access level (open / restricted)	Name	Acquisition date	Notes
85		LULC	Input		Mapa cultivos y aprovechamientos cambios 1956/2008	2012	Divided in 7 regions
86		LULC			Mapa de pastos	2012	Mask of vegetation
87		AERIAL IMAGES			Photogrammetry dataset	1929-2017	Orto photo from years 1929, 1946, 1956, 1966, 1967, 1969, 1970,1971, 1982, 2003, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2017
88		AIRBORNE LIDAR			LIDAR	2011-2012	-
89		DIGITAL ELEVATION MODEL	Input / Validation		MDS	2012-2014	-
90		DIGITAL ELEVATION MODEL			MDT	2012-2014	-
91		DIGITAL ELEVATION MODEL			DTM slopes	2014	Produced from LiDAR data of 2011-2012
92		DIGITAL ELEVATION MODEL			DTM orientation	2014	Produced from LiDAR data of 2011-2012
93		GEODESIC POINTS	Input		Geodesic points network	2010	-
94		METEOROLOGICAL DATA			weather station	2010	Mask of water station localization
95		METEOROLOGICAL DATA			Meteorological Data	1974-2017	Meteorological network from Navarra
96		HYDROLOGY			Hydrographic network	2010	Mask of hydrographic network
97		HYDROLOGY			Hydrometric network	2010	Mask of hydrometric station localization
98		FOREST INVENTORY DATA	Input / Validation		Type of stand	2010	Map
99		FOREST INVENTORY DATA			Specie	2010	Map

ID	AOI acronym	Classification	Input / Validation / Output	Access level (open / restricted)	Name	Acquisition date	Notes
100		FOREST INVENTORY DATA			wood volume	2010	Map
101		FOREST INVENTORY DATA			CO2 stocks	2010	Map
102		FOREST INVENTORY DATA			fuel model	2010	Map
103		FOREST INVENTORY DATA			Nacional Forest Inventory (NFI)	2009	Public archives from the Ministry of environment of Spain
104		FOREST INVENTORY DATA			Forestry Damages Inventory (IDF)	Annually	Public archives from the Ministry of environment of Spain
105		SOIL MAP			Nacional soil erosion inventory (INES)	2016	Public archives from the Ministry of environment of Spain
108	MADERA+1	AOI	Input	Open	Northwestern Spain Plots	2018	38 circular sample plots (r = 14.1 m) located in northwestern Spain (Galicia)
110	FORESNA2	AOI	Input	Open	AOI_FORESNA_2_UTM_30N_ETRS89		Pyrenean AOI of Pinus Sylvestris
116	FOAL1	TOPOGRAPHIC	Input	Open	Geo-reference data set from National Land Services	since 2000	Various geographic datasets available from www.geoportal.it, including ortho photos (every 3-5 years), georeferenced background data (roads, waters, etc.)
121	FOAL2	TOPOGRAPHIC	Input	Open	Geo-reference data set from National Land Services	since 2000	Various geographic datasets available from www.geoportal.it, including ortho photos (every 3-5 years), georeferenced background data (roads, waters, etc.)
124	RAIZ4	AOI	Input	Open	RAIZ4_ZIF_APFC_Grid.shp	2018	
125	CFRI2	HR SATELLITE IMAGES	Input	Open	planet_order_112366	29/07/2017	

ANNEX B. REQUESTS OF FREE SATELLITE DATA

Table B-7 Requests of free satellite data

Acquisition code	AOI acronym	Optical / SAR	Sensor	Number of images	Total image surface (Km2)	Acquisition start date	Acquisition end date	Applicable services and products
CFRI1-20180727-0002	CFRI1	Optical	Sentinel2	2	276	20171224	20180705	S1 P1; S1 P4; S1 P7; S1 P8; S2 P1; S2 P2; S3 P1
CFRI1-20180727-0003		SAR	Sentinel1	2	276	20171226	20180708	S1 P5; S2 P1; S2 P2; S3 P1
CFRI1-20180727-0004		Optical	Landsat8	7	965	19840415	20030603	S1 P6
CFRI1-20180727-0005			Landsat5	2	276	20130729	20130830	
CFRI2-20180727-0007	CFRI2	Optical	Sentinel2	3	3,309	20180520	20180530	S1 P1; S1 P4; S1 P7; S1 P8; S2 P1; S2 P2; S3 P1
CFRI2-20180727-0008		SAR	Sentinel1	1	1,103	20180521	20180521	S1 P5; S2 P1; S2 P2; S3 P1
CFRI2-20180727-0009		Optical	Landsat8	9	9,927	19840620	20080622	S1 P6
CFRI2-20180727-0010			Landsat5	3	3,309	20130620	20131026	
FORESNA2-20180727-0012	FORESNA2	Optical	Sentinel2	2	1,901	20170310	20170822	S1 P5; S1 P9; S3 P1
FORESNA2-20180727-0013		SAR	Sentinel1	2	1,901	20170307	20170822	S1 P5; S2 P1; S2 P2; S3 P1
FORESNA2-20180727-0014		Optical	Landsat8	8	7,603	19840421	20080626	S1 P6
FORESNA2-20180727-0015			Landsat5	2	1,901	20080407	20080626	
RAIZ1-20181010-0022	RAIZ1	Optical	Sentinel2	2	20	20180321	20180902	S1 P1; S1 P4; S1 P7; S1 P8; S2 P1; S2 P2; S3 P1
RAIZ1-20181010-0022		SAR	Sentinel1	1	10	20180912	20180912	S1 P5; S2 P1; S2 P2; S3 P1
RAIZ1-20181010-0024		Optical	Landsat8	2	20	20130417	20130823	S1 P6
RAIZ1-20181010-0025			Landsat5	7	72	19840908	20080825	
RAIZ2-20181010-0026	RAIZ2	Optical	Sentinel2	2	1,220	20180321	20180902	S1 P5; S2 P1; S2 P2; S3 P1
RAIZ2-20181010-0027			Landsat8	2	1,220	20130417	20130604	S1 P6
RAIZ2-20181010-0028			Landsat5	7	4,270	19840417	20080809	
RAIZ3-4_20181010-0029	RAIZ3, RAIZ4	Optical	Sentinel2	2	538	20180326	20180912	S1 P1; S1 P4; S1 P7; S1 P8; S2 P1; S2 P2; S3 P1
RAIZ3-4-20181010-0030		SAR	Sentinel1	1	269	20180912	20180912	S1 P5; S2 P1; S2 P2; S3 P1

Acquisition code	AOI acronym	Optical / SAR	Sensor	Number of images	Total image surface (Km2)	Acquisition start date	Acquisition end date	Applicable services and products
RAIZ3-4-20181010-0031		Optical	Landsat8	2	538	20130417	20130706	S1 P6
RAIZ3-4-20181010-0032			Landsat5	2	538	19840807	20080809	
FORESNA1-20181010-0033	FORESNA1	Optical	Sentinel2	8	65,166	20170310	20170718	S1 P1; S1 P4; S1 P5; S1 P6; S1 P7; S1 P8; S2 P1; S2 P2; S3 P1
FORESNA1-20181010-0034			Landsat5	7	57,020	19840807	20110907	

ANNEX C. GENERATED PRODUCTS IN DMP (V1)

Table C-8 Generated products in DMP (v1)

AOI acronym	Product code	Product name	Reference date	Main EO source data
FOESNA1	S1 P1	FOREST MASK	2017	Sentinel2
FOESNA1	S1 P1	FOREST MASK	2017	LIDAR
FOESNA1	S1 P1	FOREST MASK	2011	Landsat5
FOESNA1	S1 P4	MAIN FOREST TYPES	2017	Sentinel2
FOESNA1	S1 P4	MAIN FOREST TYPES	2011	Landsat5
FOESNA1	S1 P6	FOREST AGE	2017	Sentinel2, Landsat8, Landsat5
FOESNA1	S1 P7	BURNT SCARS	2011 - 2017	Sentinel2, Landsat5
FOESNA1	S1 P8	CLEAR-CUTS	2011 - 2017	Sentinel2, Landsat5
FOESNA1	S1 P9	DEM Elevation	2017	LIDAR
FOESNA1	S1 P10	DEM Slope	2017	LIDAR
FOESNA1	S1 P11	DEM Aspect	2017	LIDAR
FOESNA2	S1 P1	FOREST MASK	2018	Sentinel2
FOESNA2	S1 P4	MAIN FOREST TYPES	2018	Sentinel2
FOESNA2	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5
FOESNA2	S5 P1	WATERSHED DELINEATION	2018	
FOESNA2	S5 P2	STREAM NETWORK DELINEATION	2018	
FOESNA2	S5 P4	HABITAT FRAGMENTATION INDICATOR	2018	
CFRI1	S1 P1	FOREST MASK	2018	Sentinel2
CFRI1	S1 P4	MAIN FOREST TYPES	2018	Sentinel2
CFRI1	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5
CFRI1	S5 P1	WATERSHED DELINEATION	2018	
CFRI1	S5 P2	STREAM NETWORK DELINEATION	2018	
CFRI1	S5 P4	HABITAT FRAGMENTATION INDICATOR	2018	
CFRI2	S1 P1	FOREST MASK	2018	Sentinel2
CFRI2	S1 P4	MAIN FOREST TYPES	2018	Sentinel2
CFRI2	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5
CFRI2	S5 P1	WATERSHED DELINEATION	2018	
CFRI2	S5 P2	STREAM NETWORK DELINEATION	2018	
CFRI2	S5 P4	HABITAT FRAGMENTATION INDICATOR	2018	
RAIZ1	S1 P1	FOREST MASK	2018	Sentinel2
RAIZ1	S1 P4	MAIN FOREST TYPES	2018	Sentinel2
RAIZ1	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5
RAIZ1	S5 P4	HABITAT FRAGMENTATION INDICATOR	2018	
RAIZ2	S1 P1	FOREST MASK	2018	Sentinel2
RAIZ2	S1 P4	MAIN FOREST TYPES	2018	Sentinel2

AOI acronym	Product code	Product name	Reference date	Main EO source data
RAI22	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5
RAI22	S5 P4	HABITAT FRAGMENTATION INDICATOR	2018	
RAI23	S1 P1	FOREST MASK	2018	Sentinel2
RAI23	S1 P4	MAIN FOREST TYPES	2018	Sentinel2
RAI23	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5
RAI24	S1 P1	FOREST MASK	2018	Sentinel2
RAI24	S1 P4	MAIN FOREST TYPES	2018	Sentinel2
RAI24	S1 P6	FOREST AGE	2018	Sentinel2, Landsat8, Landsat5



Earth observation services for silviculture

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