

Subsidy application and auxiliary information upload and pre-processing

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Sen4CAP hands-on training, 22-23 January 2020



sen4cap
common agricultural policy

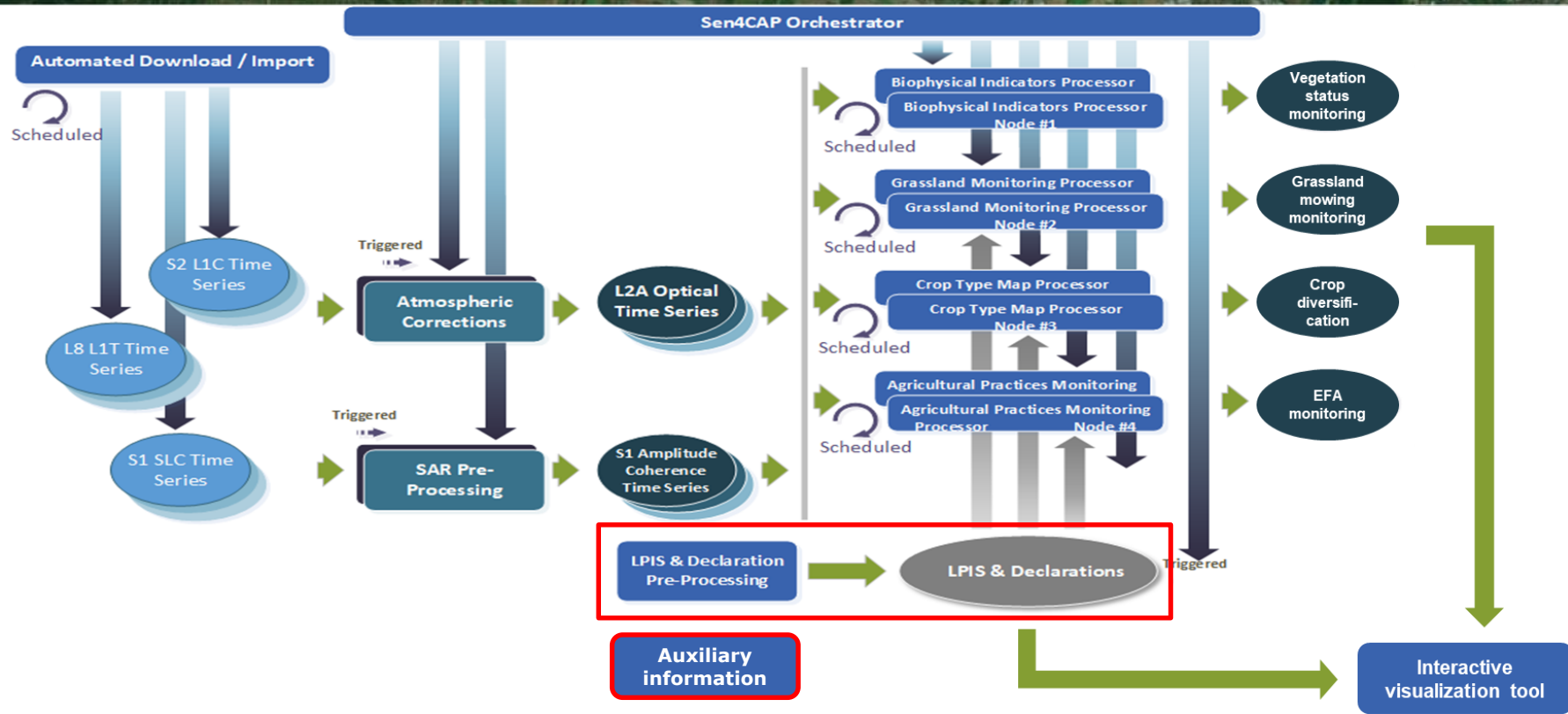
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Sen4CAP system overview



- Sen4CAP will interpret EO data into markers and products in an automated mode, with minimal intervention from users
- ... But input information required from YOU before getting any L4x product (crop type, grassland mowing, EFA monitoring)
 - 1) Subsidy application dataset
 - 2) Crop Code Look-Up-Table for L4A crop type mapping
 - 3) Configuration file for L4B Grassland mowing detection
 - 4) Configuration file for L4C EFA practices monitoring
 - 5) EFA practices Look-Up-Tables (catch crop, nitrogen fixing crops, land lying fallow, harvest) for L4C EFA practices monitoring

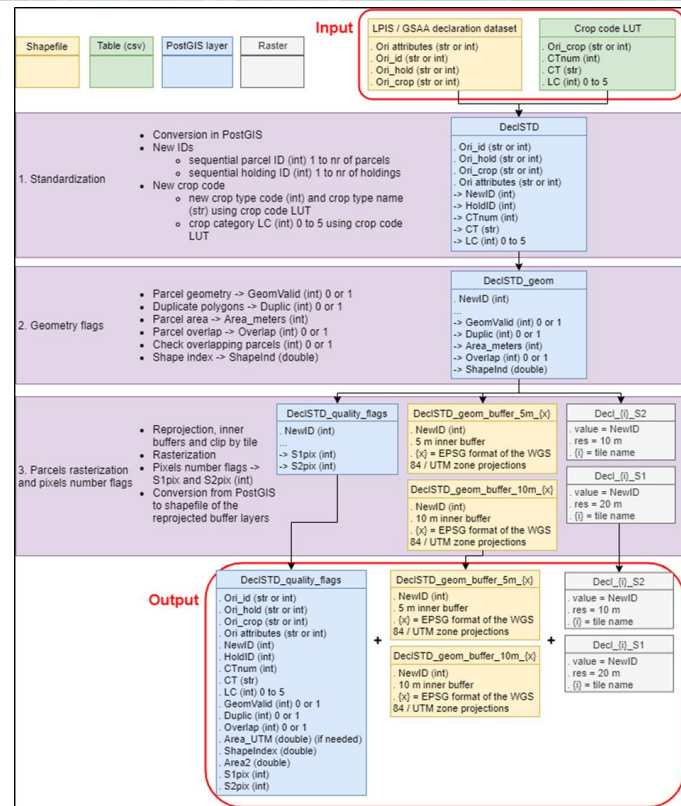
- The system can start working without this dataset, performing already the download / import, the S1 and S2 pre-processing and also creating the L3A Biophysical Products. But mandatory to get L4A, L4B and L4C products
- Upload your subsidy application as a shapefile
- You are required to identify the columns in the shapefile which correspond to:
 - ID of the parcel
 - ID of the holding
 - Code of the crop type declared by the farmer (numeric or integer format)
- Possibility to upload the applications several times during the season (as new ones or as updates)

Subsidy application « preparation » by the system



- Objectives:

- 1) As much as possible, **standardize** the dataset to be compatible with all processors
- 2) Add **quality flags** to the parcels
- 3) Create **intermediate products** to be used by the processors



Subsidy application « preparation » by the system



1) Standardization:

- New sequential parcel ID for internal use (NewID)
- New sequential holding ID for internal use (HoldID)

2) Geometric quality flags

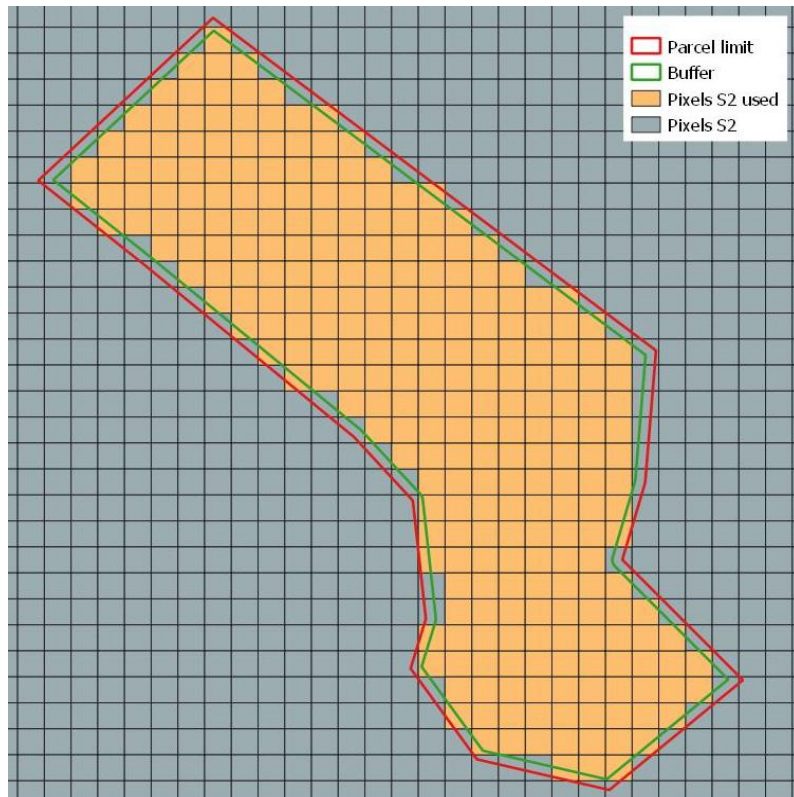
- GeomValid = validity of the parcel geometry
- Duplicate = duplicate parcels
- Overlap = overlap with other parcels (>15% of the area)
- Area_meters = measured area (m²)
- ShapeInd = circumference / area

Subsidy application « preparation » by the system



3) Intermediate products and area flags:

- 5-meter (Sentinel-2) and 10-meter (Sentinel-1) inner buffers
- Rasterization to S2 resolution (with 5m inner buffer) and to S1 resolution (with 10m inner buffer)
- S2 and S1 pixels counting by parcel



Subsidy application « preparation » by the system



- Outputs:

- Subsidy applications with flags and indicators
- 5-m and 10-m inner buffers
- Rasterization of the parcels at S2 and S1 resolution



FRA_AIN_2019_DeclSTD_quality_indic :: Features Total: 86378, Filtered: 86378, Selected: 0

NewID	HoldID	CTnum	CT	LC	GeomValid	Duplic	Overlap	Area_meter	Shapelnd	S1pix	S2pix	is_deleted	inserted_t	updated_t	geom_chg
56572	52138	1667	256	Triticale d'hiver	1	1	0	15478.60	1.20	23	127	0	2019/11/05 14:4...		
56573	52139	1667	203	Prairie permanent...	3	1	0	14712.40	1.28	26	119	0	2019/11/05 14:4...		
56574	52140	1667	203	Prairie permanent...	3	1	0	8776.27	1.30	11	71	0	2019/11/05 14:4...		
56575	52141	1667	203	Prairie permanent...	3	1	0	33531.60	2.04	98	523	0	2019/11/05 14:4...		
56576	63234	1962	65	Chou	1	1	0	9321.35	1.14	16	75	0	2019/11/05 14:4...		
56577	63236	1962	65	Chou	1	1	0	12228.30	1.18	19	101	0	2019/11/05 14:4...		
56578	63213	1961	203	Prairie permanent...	3	1	0	41124.50	2.31	64	328	0	2019/11/05 14:4...		

Crop Code Look-Up-Table



- The system can start working without this dataset, performing already the download / import, the S1 and S2 pre-processing and also creating the L3A Biophysical Products. But mandatory to get **L4A, L4B and L4C products**
- Upload your Look-Up-Table (LUT) as a .csv file
- To be uploaded at the same time than subsidy application dataset
- LUT content:
 - Define high-level land cover categories (L4A, L4B and L4C products)
 - List of all possible crop types declared by the farmer (L4A)
 - Information for crop diversification use case (L4A)

1) High-level land cover categories: for each crop code, define if they belong to:

1. Annual crop
2. Permanent crop
3. Grassland
4. Fallow land
5. Greenhouse and nursery
0. Other natural areas

} Never be monitored

By default:

L4A: will monitor all parcels belonging to categories 1 to 4

L4B: will monitor all parcels belonging to category 3

L4C: will monitor all parcels belonging to category 1

2) List of all possible crop codes declared by the farmers

- One field (Ori_Crop) linking with the crop code column of the subsidy application data uploaded before
- For each crop:
 - ❖ Sequential ID for the crops (CTnum) + English translation (CT)
 - ❖ Crop Code used for the classification, with possible grouping (CTnumL4A) + name (CTL4A)

3) Information for crop diversification use case

- Specific crop code + crop name for the crop diversification assessment (CTnumDIV & CTDIV) – possible specific grouping
- Binary flags specifying, for each crop code, if it is or not:
 - ❖ Eligible Agricultural Area
 - ❖ Arable Land
 - ❖ Permanent Grassland
 - ❖ Temporary Grassland
 - ❖ Fallow Land
 - ❖ Crop under Water

Configuration file for Grassland mowing detection



- The system can start working without this dataset, performing already the download / import, the S1 and S2 pre-processing and also creating the L3A Biophysical Products. But mandatory to get **L4B Grassland Mowing products**

- Upload your Configuration File as a .cfg file
- By-default file provided; to be updated
- Content:

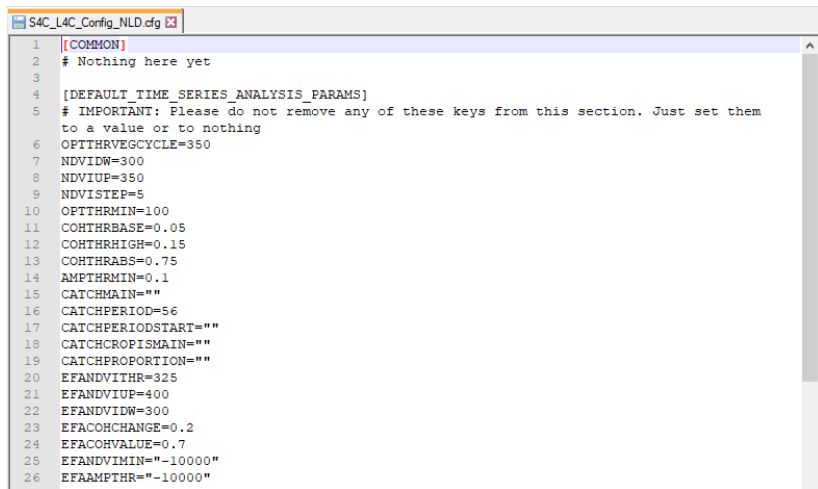
- Additional information by crop code
- Algorithms parameters

Presented in detail tomorrow AM

```
S4C_L4B_Default_Config.cfg
1 [GENERAL_CONFIG]
2 CTNUM_FILTER = 77
3
4 ; The following section is temporarily kept only for processor code evolution reasons
5 ; but should not be used anymore and will be removed.
6
7 [S1_input_data]
8 re_compile =
9 (SEN4CAP_L2A_(S[0-9]{1,2})_V[0-9]{8})T[0-9]{6})_([0-9]{8})T[0-9]{6})_([VH]{2})_([0-9]
10 {3})_([A-Z]{3,4})\.)
11
12 ; The following section is temporarily kept only for processor code evolution reasons
13 ; but should not be used anymore and will be removed.
14
15 [S2_input_data]
16 re_compile = (S2AGRI_L3B_([A-Z]{5,11})_A([0-9]{8})T[0-9]{6})_T[0-9]{2}[A-Z]{3})\.)
17
18 [S1_constants]
19 ; for all countries
20 S1_time_interval = 6
21 SAR_spacing = 20
22 ; meters
23 cohe_ENL = 100
24 ; 20*5
25 min_cohe_var = 0.024
26 ; ML=2*8; sl_res=3.0*22.; sl_smp=2.3*17.4; cohe_var.cohe_var(0.2,
27 ML*sl_smp/sl_res)
28 locAcqTimeASC = 18:00:00
29 locAcqTimeDESC = 06:00:00
30
31 [S2_constants]
32 ; for all countries
33 S2_time_interval = 5
34 ; meters
```

- Additional information by crop code
- Algorithms parameters

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- ## Define the practices to be followed:

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- The system can start working without this dataset, performing already the download / import, the S1 and S2 pre-processing and also creating the L3A Biophysical Products. But mandatory to get **L4C EFA Monitoring products**
- Upload your LUT as a .csv file
- LUT content:
 - List of parcels to be monitored and associated practices
 - For each practice, period of monitoring (start and end)

FIELD_ID	MAIN_CROP	VEG_START	H_START	H_END	PRACTICE	P_TYPE	P_START	P_END
31.0000003730124.001	1933	20-05-19	03-06-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003487830.001	242	20-05-19	03-06-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000004049812.001	3506	20-05-19	03-06-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003758331.001	233	20-05-19	15-07-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003832018.001	233	20-05-19	15-07-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003465920.001	233	20-05-19	15-07-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003525102.001	233	20-05-19	15-07-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003870820.002	233	20-05-19	15-07-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003456194.001	1932	20-05-19	03-06-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000003525217.001	233	20-05-19	15-07-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA
31.0000004201395.001	1933	20-05-19	03-06-19	15-10-19	CatchCrop	CatchCrop_1	15-10-19	NA