

Capturing the dynamics in the fragments of virgin forest of Carpathian region using dense satellite image time series

Workflow

• Define the Area of Interests (AOI)

• Find Footprints of Interest (FOI) for each AOI from WRS-2

• Parse the imagery archive offline according to FOI-s and additional criterias

• Order and download selected images with surface reflectance and masks from the agency

• Decompress downloaded files and check cloudmasks over the AOIs

• Calculate statistics for the AOIs availability on imagery with different mask cover categorys

• Create subset for AOIs from each image which have passed the criterias and apply cloud&shadow mask
• Additional filtering for topographic shadows

• Create virtual time stack from the masked subsets

After this step we assume that the imagery become noise free

• Create ellipsoid classes for each AOI subset

If the the STDEV on reference image is too high for the ellipsoid the AOI should be redefined

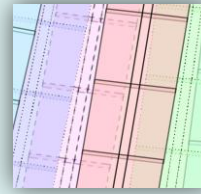
• Find pixels wich went out from the previous ellipsoid boundary and classify them as change area

• Create thematic maps from the change
• Create ellipse parameter trajectory for the time series

• Validate derived informations with more detailed field data

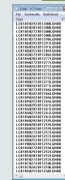
Feedback

Inputs

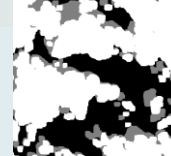


Archive of imagery metadata

Images to order



Cloud-Shadow masks

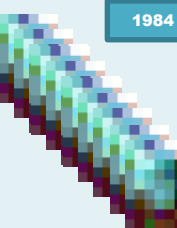


Primary&Secondary max mask cover



Single bands

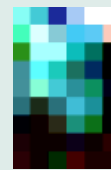
Mask cover stats table



1984

Masked image stack files

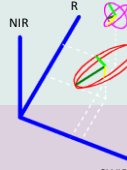
2016



Full time stack stack vrt



AOI database

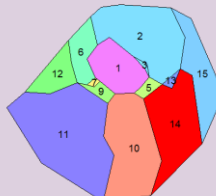


NIR

R

SWIR

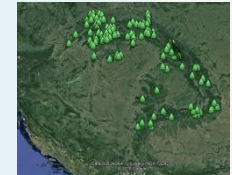
Classified changes



Thematic maps to validate

Outputs

AOI Polygons



List of assigned footprints to AOIs

AOI	Footprint	Area	Perimeter	Centroid
1	1	1000	1000	500,500
2	2	1000	1000	500,500
3	3	1000	1000	500,500
4	4	1000	1000	500,500
5	5	1000	1000	500,500
6	6	1000	1000	500,500
7	7	1000	1000	500,500
8	8	1000	1000	500,500
9	9	1000	1000	500,500
10	10	1000	1000	500,500
11	11	1000	1000	500,500
12	12	1000	1000	500,500
13	13	1000	1000	500,500
14	14	1000	1000	500,500
15	15	1000	1000	500,500
16	16	1000	1000	500,500
17	17	1000	1000	500,500
18	18	1000	1000	500,500
19	19	1000	1000	500,500
20	20	1000	1000	500,500

List of selected image IDs

Image ID	Year	Band	Mask
LT4186028199217200002	1992	1	0
LT4183027199216700002	1992	1	0
LT4184027199215800002	1992	1	0
LT4184026199215800002	1992	1	0
LT4186026199215600002	1992	1	0

Downloaded compressed images



Data table about the cloud mask cover above the AOIs

AOI	Mask	Area	Perimeter	Centroid
1	1	1000	1000	500,500
2	2	1000	1000	500,500
3	3	1000	1000	500,500
4	4	1000	1000	500,500
5	5	1000	1000	500,500
6	6	1000	1000	500,500
7	7	1000	1000	500,500
8	8	1000	1000	500,500
9	9	1000	1000	500,500
10	10	1000	1000	500,500
11	11	1000	1000	500,500
12	12	1000	1000	500,500
13	13	1000	1000	500,500
14	14	1000	1000	500,500
15	15	1000	1000	500,500
16	16	1000	1000	500,500
17	17	1000	1000	500,500
18	18	1000	1000	500,500
19	19	1000	1000	500,500
20	20	1000	1000	500,500

Mask cover statistics table

AOI	Mask	Area	Perimeter	Centroid			
153	2015	272	117	189	826	1	LE7189026201527200002
153	2015	297	117	189	826	1	LE7189026201529700002
154	1984	286	115	186	826	1	LT5186026198428600002
154	1984	254	115	186	826	1	LT5186026198425400002

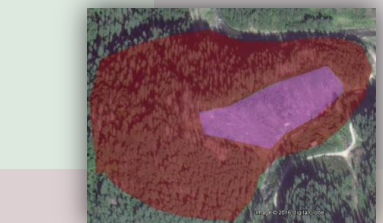
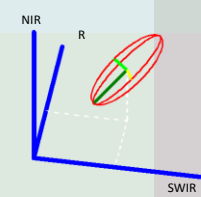
Masked image stack files



Full time stack stack vrt



Ellipsoid for the AOI polygon



Validated thematic time series

