remote sensing

Supplementary Materials:

Exploitation of Sentinel-2 Time Series to Map Burned Areas at the National Level: A Case Study on the 2017 Italy Wildfires

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Table S1. Spectral characteristics of Sentinel-2 MSI sensor.

Spectral band	Band name	S2A Central wavelength (nm)	S2A Band width (nm)	S2B Central wavelength (nm)	S2B Band width (nm)	Reso lution (m)	Solar radiation fraction (ω_{bi})[1]
B1	Coastal aerosol	443.9	27	442.3	45	60	
B2	Blue	496.6	98	492.1	98	10	0.1324
B3	Green	560.0	45	559.0	46	10	0.1269
B4	Red	664.5	38	665.0	39	10	0.1051
B5	Red edge 1	703.9	19	703.8	20	20	0.0971
B6	Red edge 2	740.2	18	739.1	18	20	0.0890
B7	Red edge 3	782.5	28	779.7	28	20	0.0818
B8	Near infrared	835.1	145	833.0	133	10	0.0722
B8A	Near infrared narrow	864.8	33	864.0	32	20	
B9	Water vapor	945.0	26	943.2	27	60	
B10	SWIR Cirrus	1373.5	75	1376.9	76	60	
B11	Shortwave Infrared 1	1613.7	143	1610.4	141	20	0.0167
B12	Shortwave Infrared 2	2202.4	242	2185.7	238	20	0.0002

[1] From Vanino et al., 2018. ω_{bi} is the weighting coefficient representing the solar radiation fraction derived from the solar irradiance spectrum with spectral response curve of each Sentinel-2 band.

Table 2. Layers used to generate the raster mask.

Mask name	Source product	Layer name
Water mask	Sentinel-2 L2A (MUSCATE)	water_mask
Water pixel mask	Sentinel-2 BOA reflectances	Spectral bands expression [1]
Cloud reflectance mask	Sentinel-2 L2A (MUSCATE)	cloud_mask_refl
Cloud reflectance variance mask	Sentinel-2 L2A (MUSCATE)	cloud_mask_refl_var
Cloud shadow mask	Sentinel-2 L2A (MUSCATE)	cloud_mask_shadow
Cirrus mask	Sentinel-2 L2A (MUSCATE)	cloud_mask_cirrus
Snow mask	Sentinel-2 L2A (MUSCATE)	snow_mask
Edge mask	Sentinel-2 L2A (MUSCATE)	edge_mask
Topographical shadows mask	Sentinel-2 L2A (MUSCATE)	topographical_Shadows_mask
Low sun mask	Sentinel-2 L2A (MUSCATE)	sun_too_low_mask

[1] Spectral bands expression for water pixel calculation can be found in Filipponi, 2018.

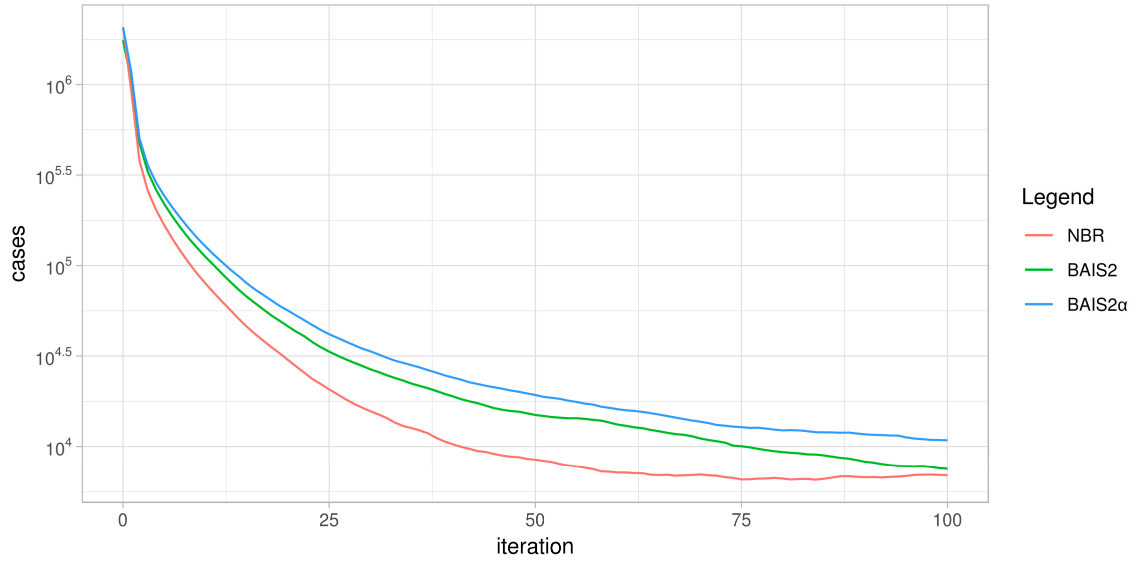

Figure 1. Sensitivity analysis for the maximum number of iterations used in the processing step C (growing region).

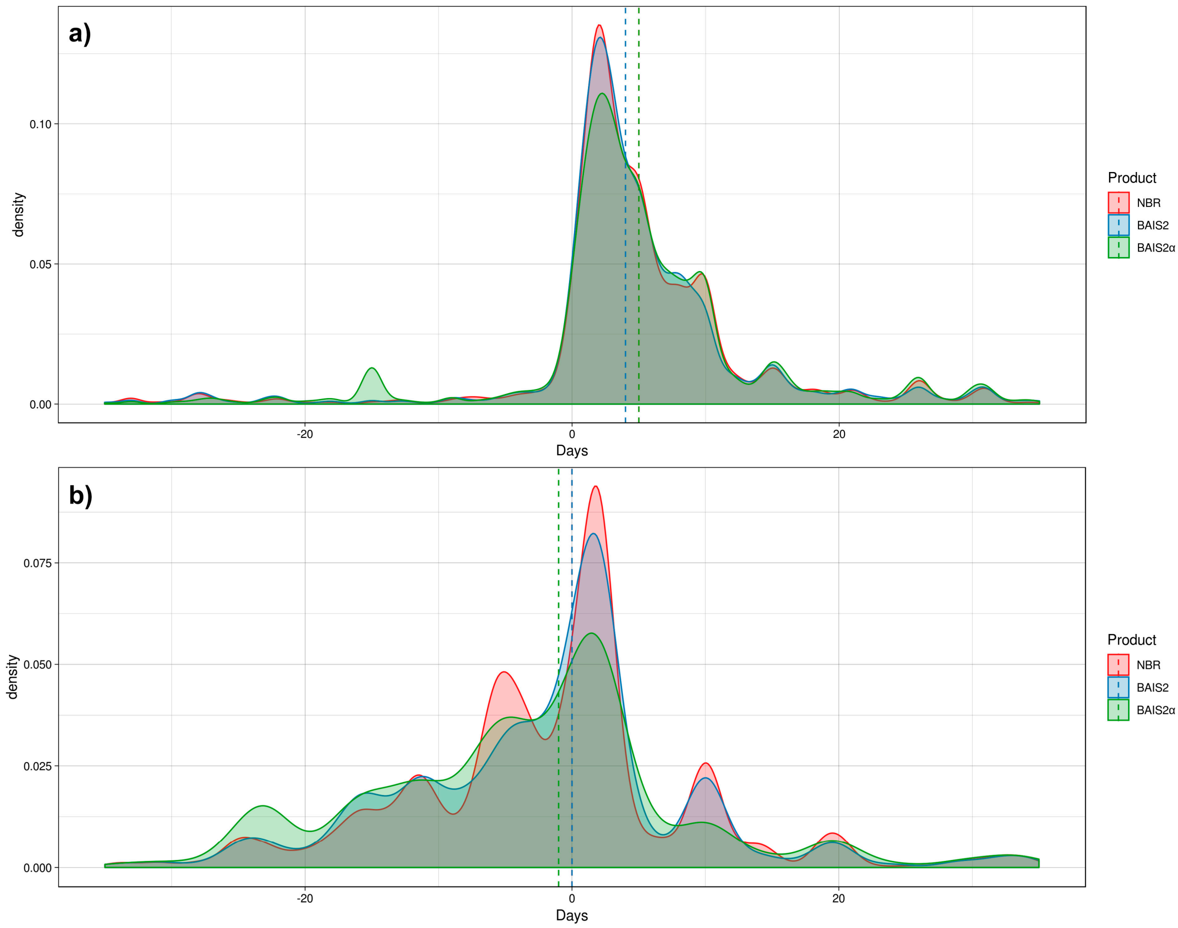

Figure 2. (**a**) Distribution of differences in days between the post-fire date identified from S2 observations and the fire date reported in the EFFIS 'MODIS burnt areas' product; (**b**) Distribution of differences in days between the post-fire date identified from S2 observations and the post-fire date used to produce the Copernicus EMS rapid mapping activations.

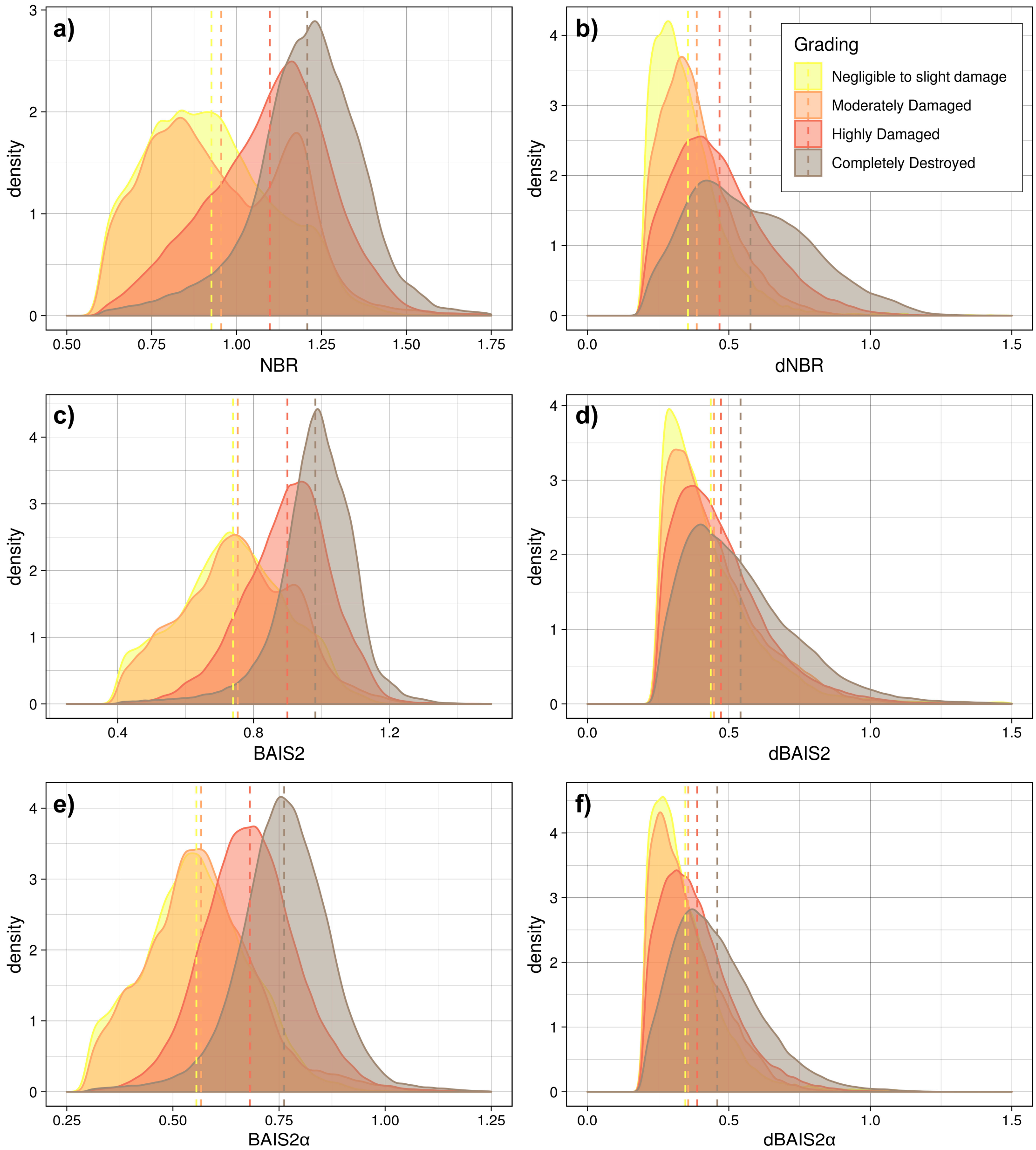

Figure 3. (**a**) Distribution of NBR index values in the identified burned areas with respect to the Copernicus EMS fire grading classes; (**b**) Distribution of dNBR index values in the identified burned areas with respect to the Copernicus EMS fire grading classes; (**c**) Distribution of BAIS2 index values in the identified burned areas with respect to the Copernicus EMS fire grading classes; (**d**) Distribution of dBAIS2 index values in the identified burned areas with respect to the Copernicus EMS fire grading classes; (**e**) Distribution of BAIS2α index values in the identified burned areas with respect to the Copernicus EMS fire grading classes; (**f**) Distribution of dBAIS2α index values in the identified burned areas with respect to the Copernicus EMS fire grading classes.

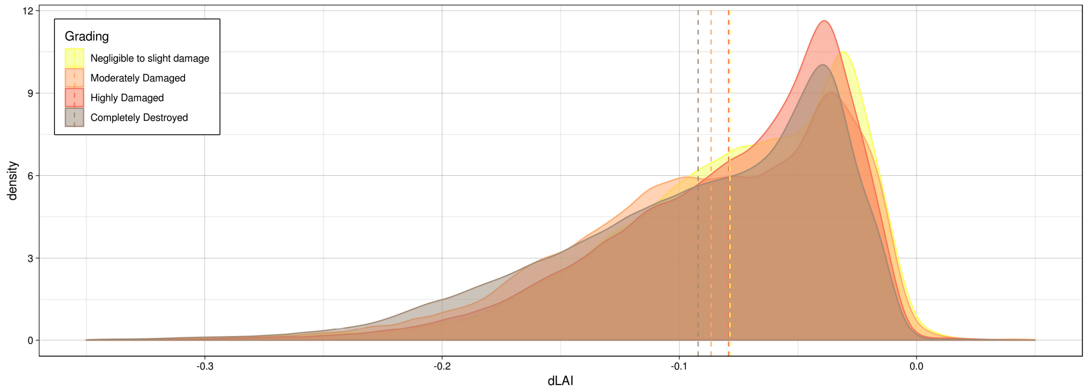

Figure 4. Distribution of dLAI values in the identified burned areas with respect to the Copernicus EMS fire grading classes.

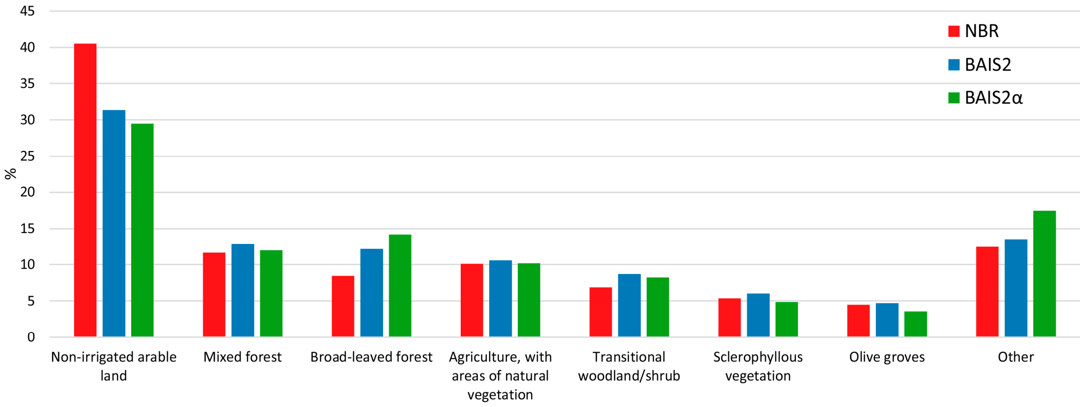

Figure 5. Distribution of misclassified burned area pixels with respect to the Corine Land Cover classes (source: CLC 2012).