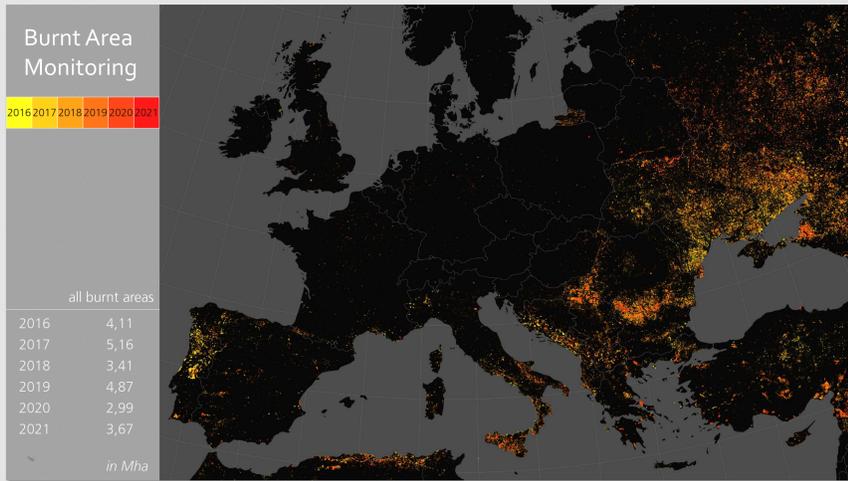


Assessment of recent trends of wildfire activity in Europe



Burnt Area monitoring results using all available Sentinel-3 OLCI data for 04/2016 - 12/2021, incl. agricultural areas



Burnt Areas affecting forests only

Assessment and monitoring of wildfires

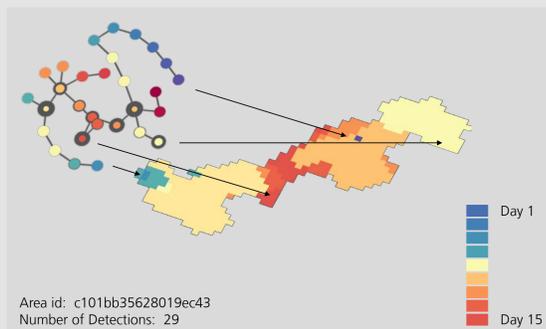
The presented burnt area dataset from DLR provides perimeters of burnt areas and fire severity information for entire Europe on a daily basis and already two hours after satellite sensing. The perimeters are incrementally updated as soon as new observations become available.

Besides providing results in near real-time, the complete Sentinel-3 OLCI time series has been processed to derive a consistent multi-year dataset, starting in April 2016 (see figures above).

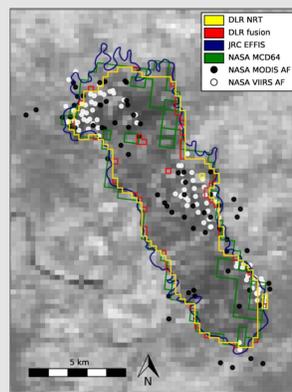
Method development and validation

The approach presented here works fully automatic. It uses the red and near-infrared bands of mid-resolution imagery to facilitate continental wide monitoring of recently occurred burnt areas. Several pre-burn scenes are combined to a cloud free mosaic and compared with at least one post-burn scene, incrementally updated over time as soon as more data becomes available. This process is repeated daily until the burn scar perimeter gets stable. In most cases this is the case after some days (max. 10 days).

To allow for a high detection capacity independent of the affected vegetation type, segmentation thresholds are derived dynamically from contextual information. This is done by using a Morphological Active Contour approach for perimeter determination.

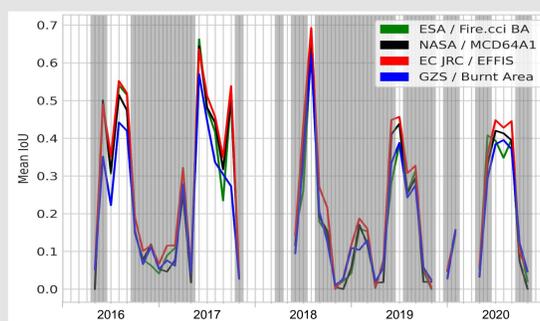


Correlation methodology: Areas are correlated spatially and temporally, and stored with a common ID

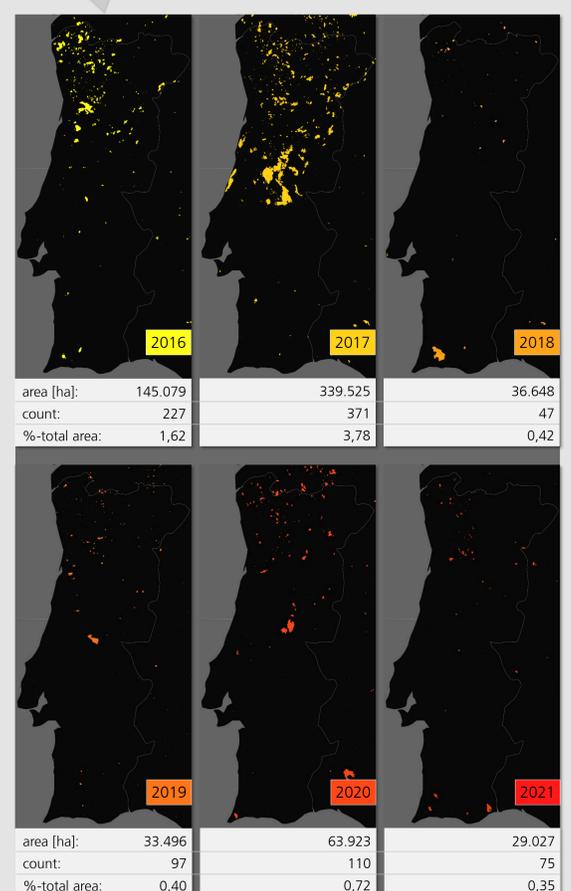


A day to day inter-comparison has been performed regarding the development of one specific burnt area, with daily JRC EFFIS burnt area data as a reference. The respective fire occurred in the community of Catalonia, south of the city of Lleida/Spain, at the end of June 2019. It was one of the largest burnt areas throughout Europe during the year of 2019.

To gain insights on a larger temporal and spatial scale, an inter-comparison has been performed with reference data produced by ESA (Fire.CCI), NASA (MCD64A1) and JRC (Copernicus EFFIS). This comparison was conducted over the entire area of the five most affected European countries, namely Spain, Portugal, Italy, Greece and France.



Cross-comparison: Intersect over Union for each of the four datasets



Literature

Nolde, Michael; Plank, Simon; Riedlinger, Torsten (2020): **An Adaptive and Extensible System for Satellite-Based, Large Scale Burnt Area Monitoring in Near-Real Time.** - Remote Sensing 2020, 12, 2162. <https://doi.org/10.3390/rs12132162>

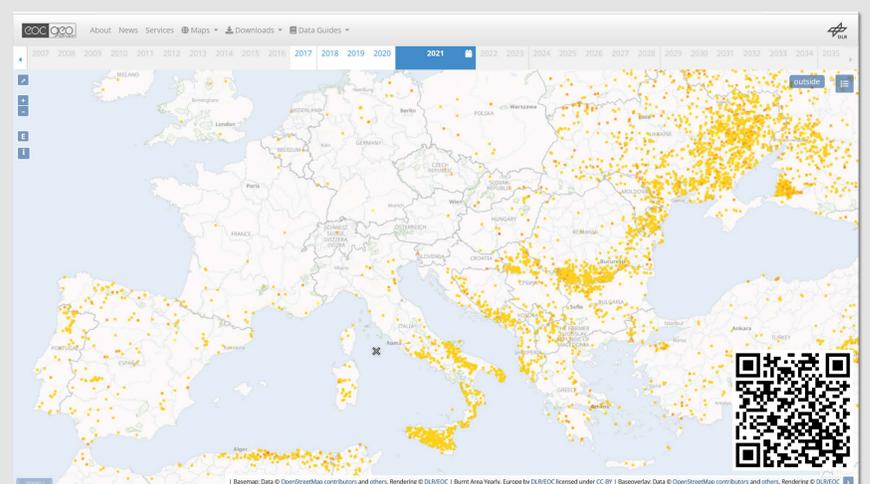
Data availability

The daily NRT results as well as the monthly and yearly composites are automatically published on DLRs Geoservice, provided by the Earth Observation Center:

Daily NRT - <https://geoservice.dlr.de/web/maps/eoc:burntarea:efr:daily>
Monthly - <https://geoservice.dlr.de/web/maps/eoc:burntarea:efr:monthly>
Yearly - <https://geoservice.dlr.de/web/maps/eoc:burntarea:efr:yearly>



Example from central Portugal showing heterogeneity of burn severity / unburnt areas (taken on Sept 28, 2016)



DLR burnt area data sets published on EOC Geoservice