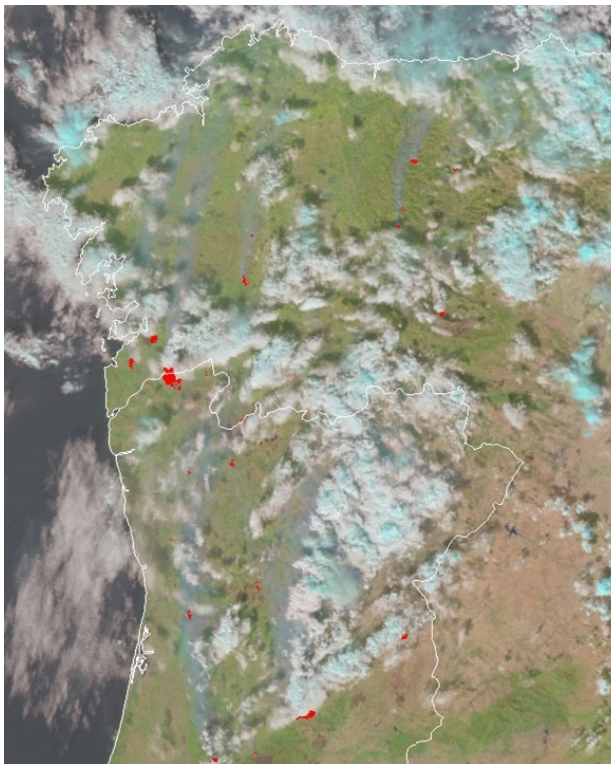




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## Earth Observation Products for Wildfires Monitoring and Forecast

18<sup>th</sup> to 20<sup>th</sup> October 2022



Copernicus  
Europe's eyes on Earth

**EUMETSAT**

**EUMETSAT  
AC SAF**  
ATMOSPHERIC COMPOSITION  
MONITORING

**EUMETSAT  
LSA SAF**  
LAND SURFACE ANALYSIS

**ECMWF**  
Atmosphere  
Monitoring Service  
atmosphere.copernicus.eu



# Fire Detection and Monitoring

HNMS, Ioannis Matsangouras



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Introduction



FD&M Product Validation



New App FD&M



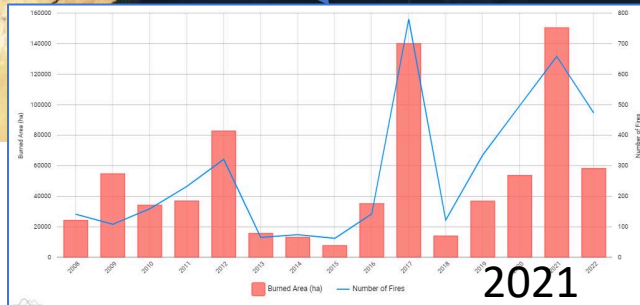
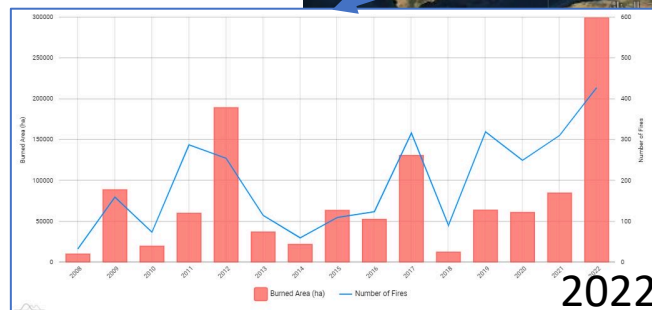
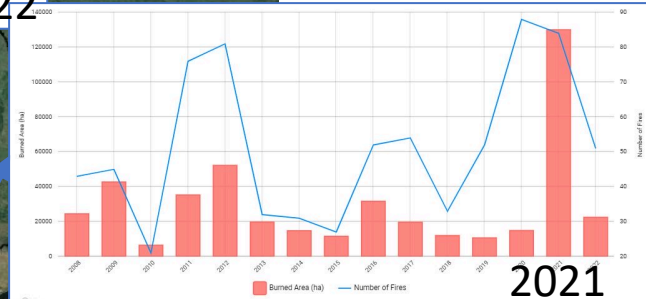
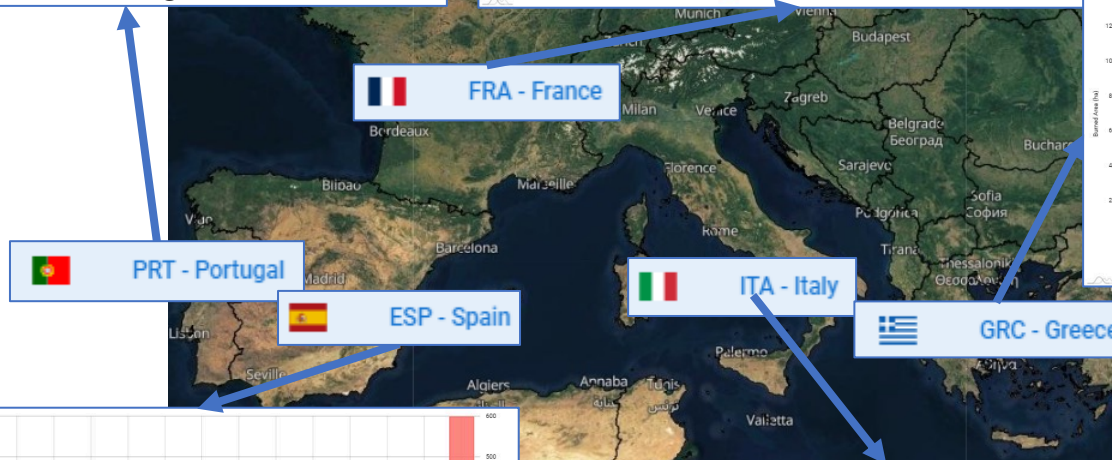
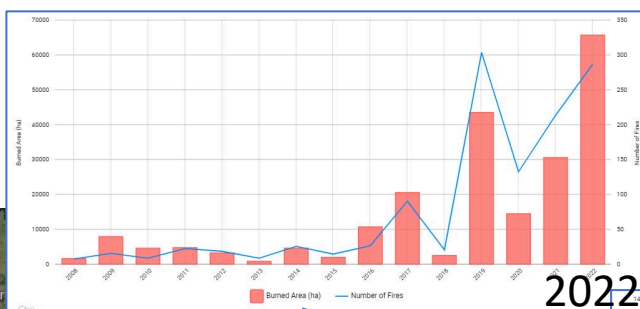
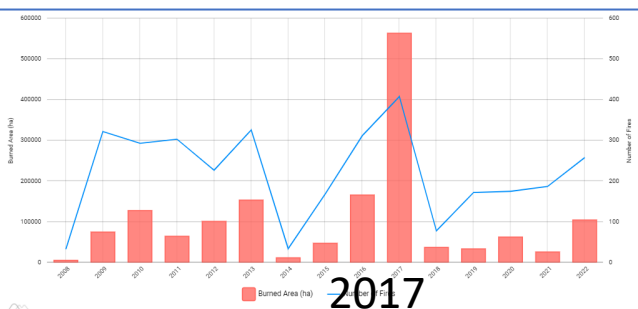
Future Work



## EFFIS Annual Statistics

Fires mapped in EFFIS of approx. 30 ha or larger.

2008-2022



Forest **fires** represent an extremely serious environmental issue in the **Mediterranean** region.

Earth Observation Products for Wildfires  
Monitoring and Forecast, Lisbon , 18-20 Oct 2022



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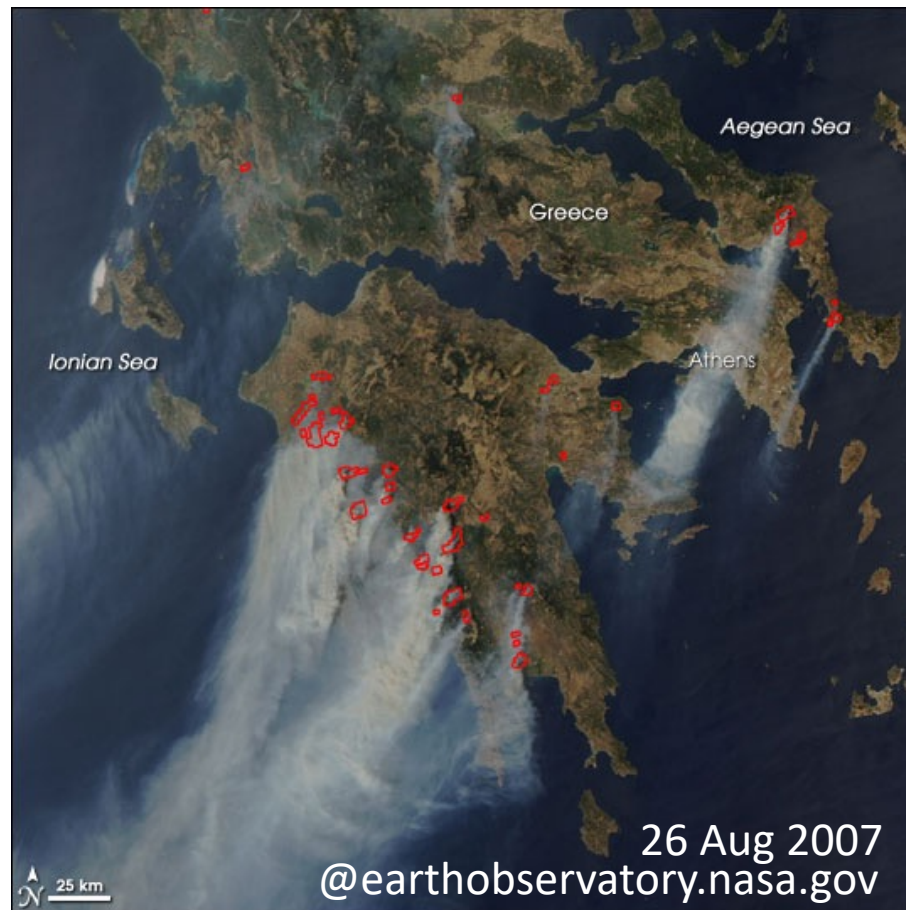
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*New App FD&M*



*Future Work*



Wild fires over Greece have a significant impact

*Earth Observation Products for Wildfires  
Monitoring and Forecast, Lisbon , 18-20 Oct 2022*





Study the performance of *Fire Detection and Monitoring (FD&M)* LSAF product during 2020-2021 fire season over Greece.

### ***What we are looking for?***

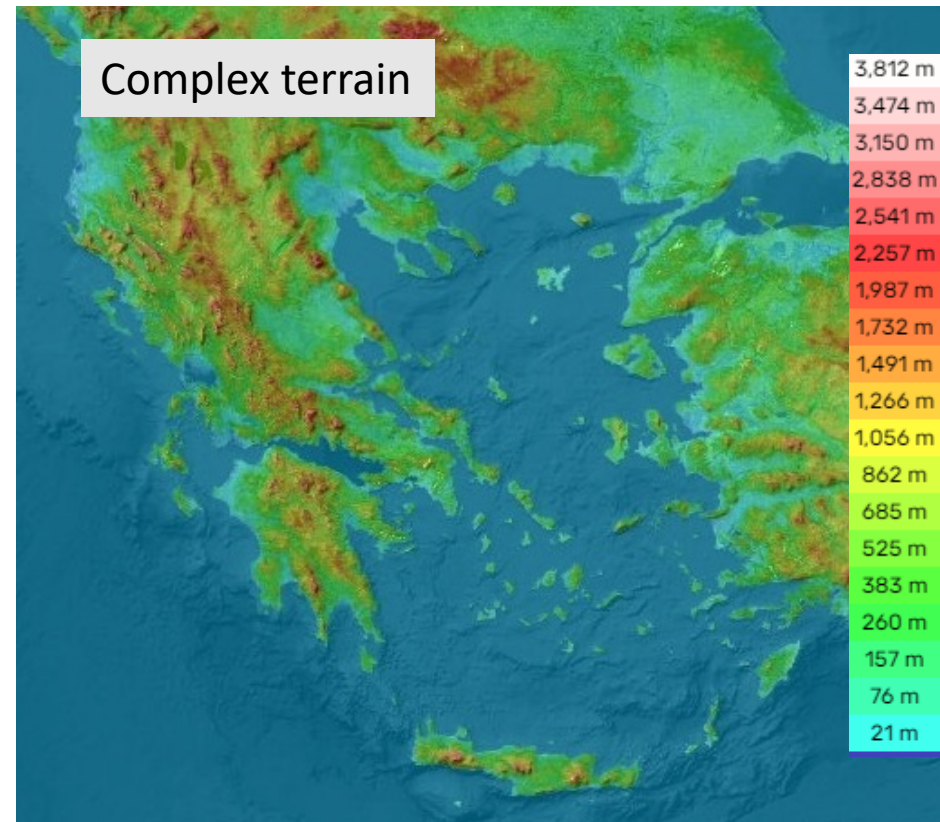
Looking for the average time of timeliness of FD&M product in terms of fire events and fuels (forests, low vegetation areas, etc)

Example: A fire event over a wild forest at 1000 UTC (time of fire initiation) is expected to be detected by FDEM product after 45 min

### ***Why?***

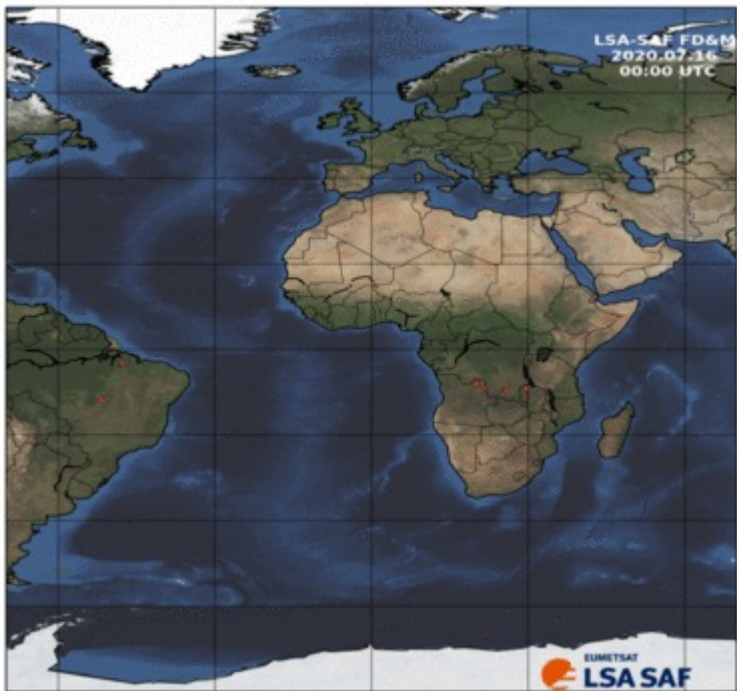
Provide an additional info to operational department to be prepared to provide weather consultancy, assessment of the overall fire activity

***Limitations:*** SEVIRI spatio-temporal resolution, use of land, biodiversity, time of fire event, complex terrain, etc





**Fire Detection and Monitoring (FD&M)** explores the capability of SEVIRI/MSG to detect and monitor active fires, particularly over Africa and Europe.



FD&M is based on the algorithm FIDALGO (Fire Detection Algorithm) developed within the LSA SAF (Amraoui et al., 2010) to identify SEVIRI/Meteosat pixels potentially contaminated by fires.

### Algorithm Description

Depending on whether they are smouldering or flaming, most wild fires burn at temperatures between 500 and 1200 K. Higher temperatures may even be reached in some forested areas. At these temperatures, and according to the Planck law, there is a very strong emission in the middle-infrared, at wavelengths between 3 and 5  $\mu\text{m}$ . The signature of fires, even with scales considerably smaller than one pixel, is then captured by SEVIRI channel centred at 3.9  $\mu\text{m}$ . A fire event is then identified within a given pixel, when the contrast between that pixel and its surroundings is high enough.

### Data Characteristics

The FD&M product is derived every 15 min at the native SEVIRI pixel resolution.



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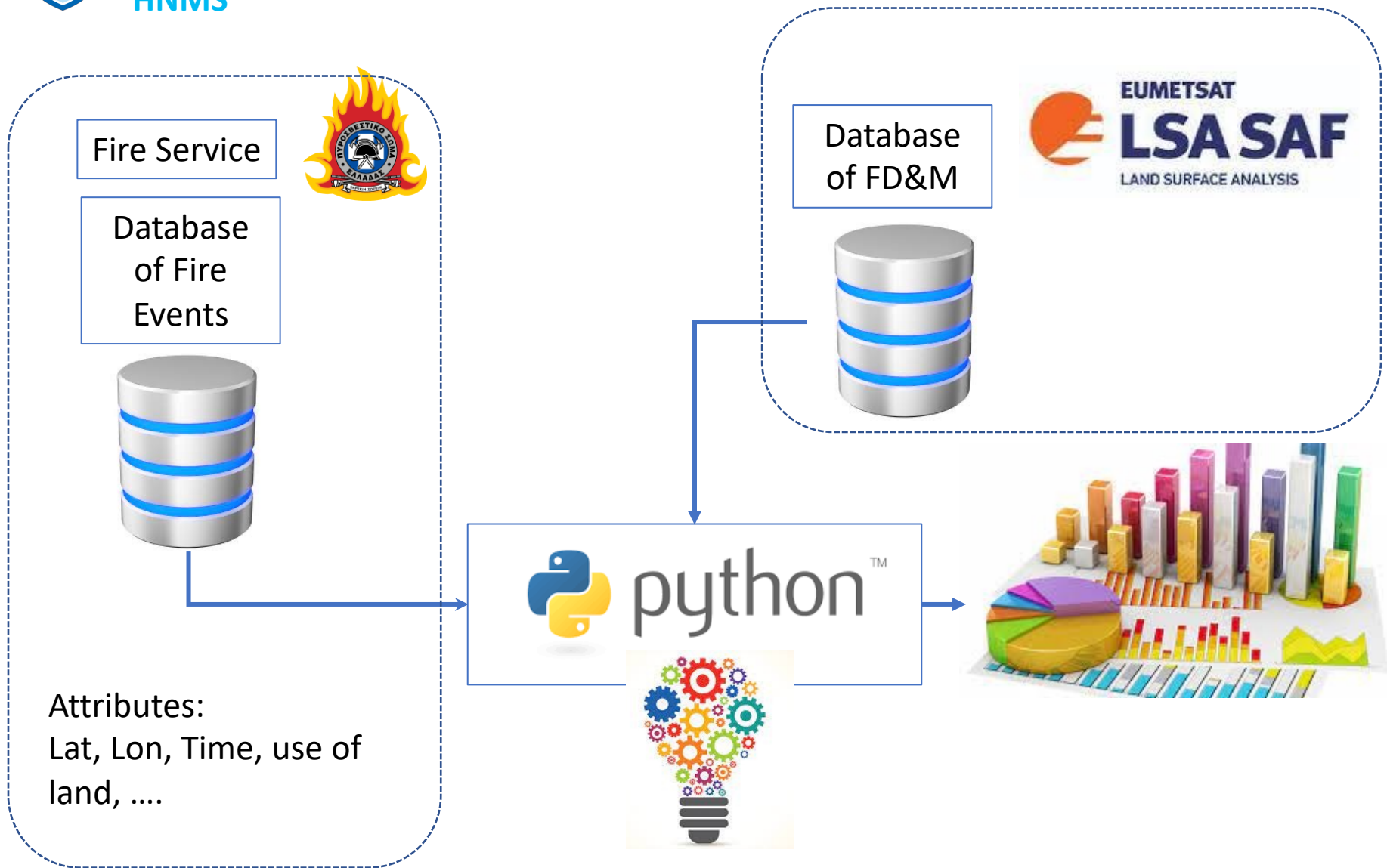
FD&M Product Validation

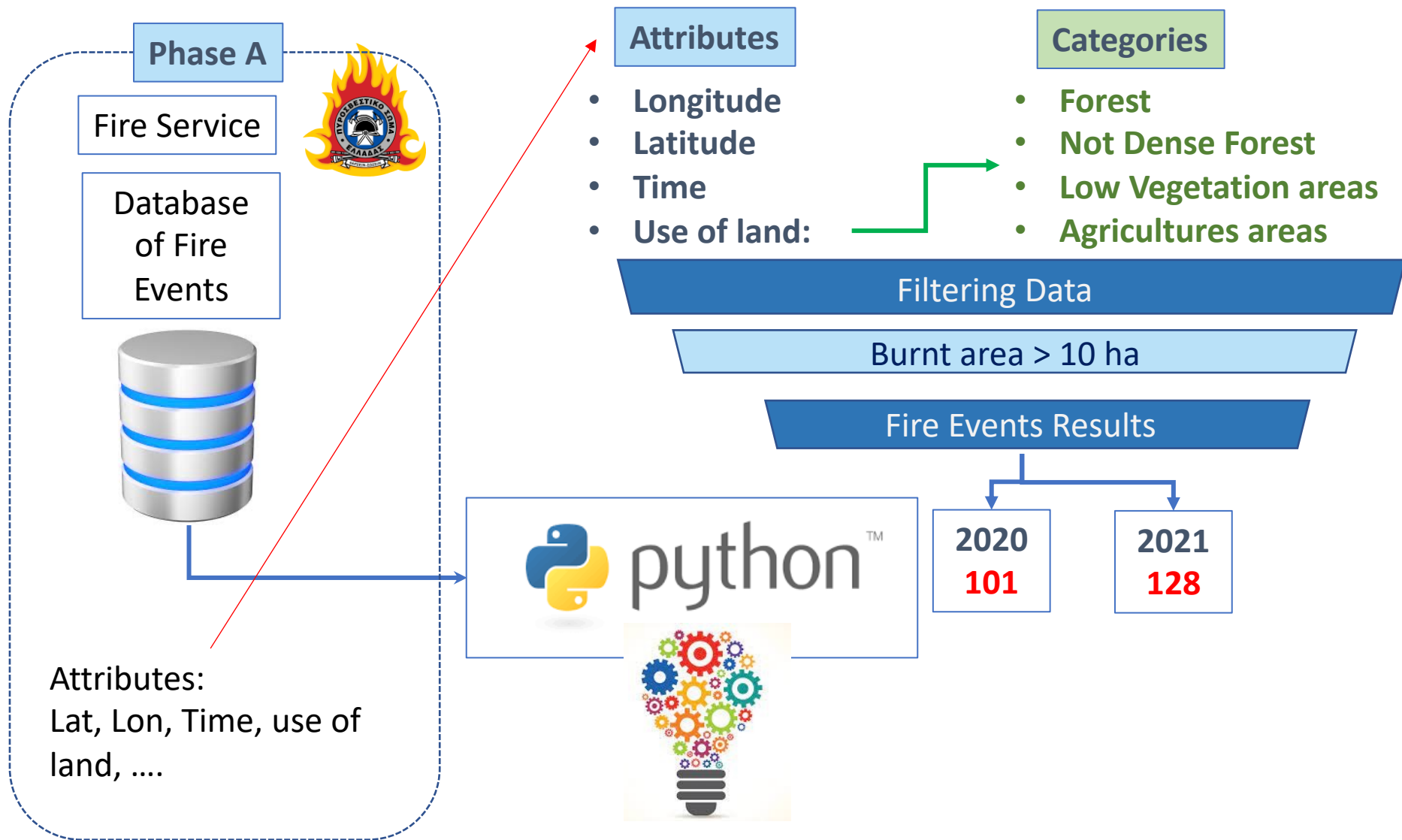


New App FD&M



Future Work







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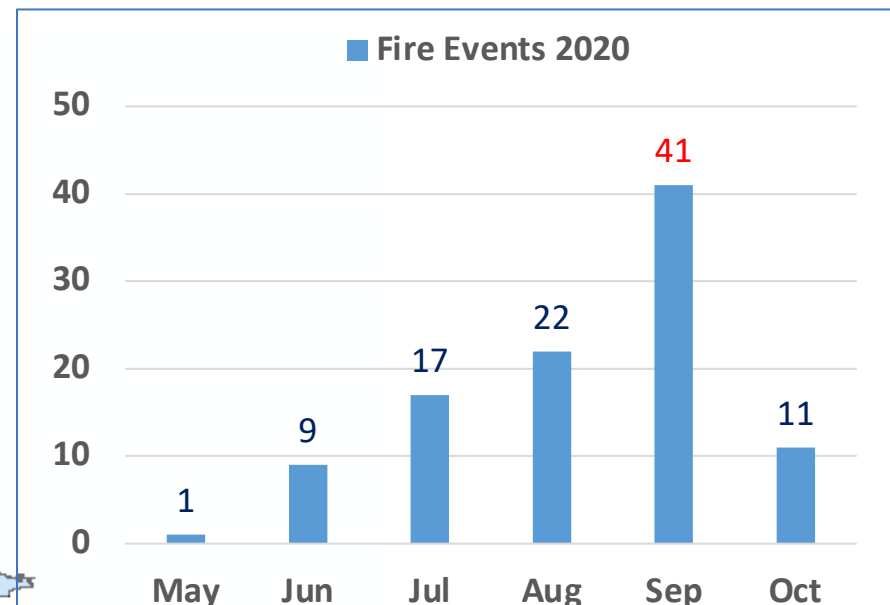
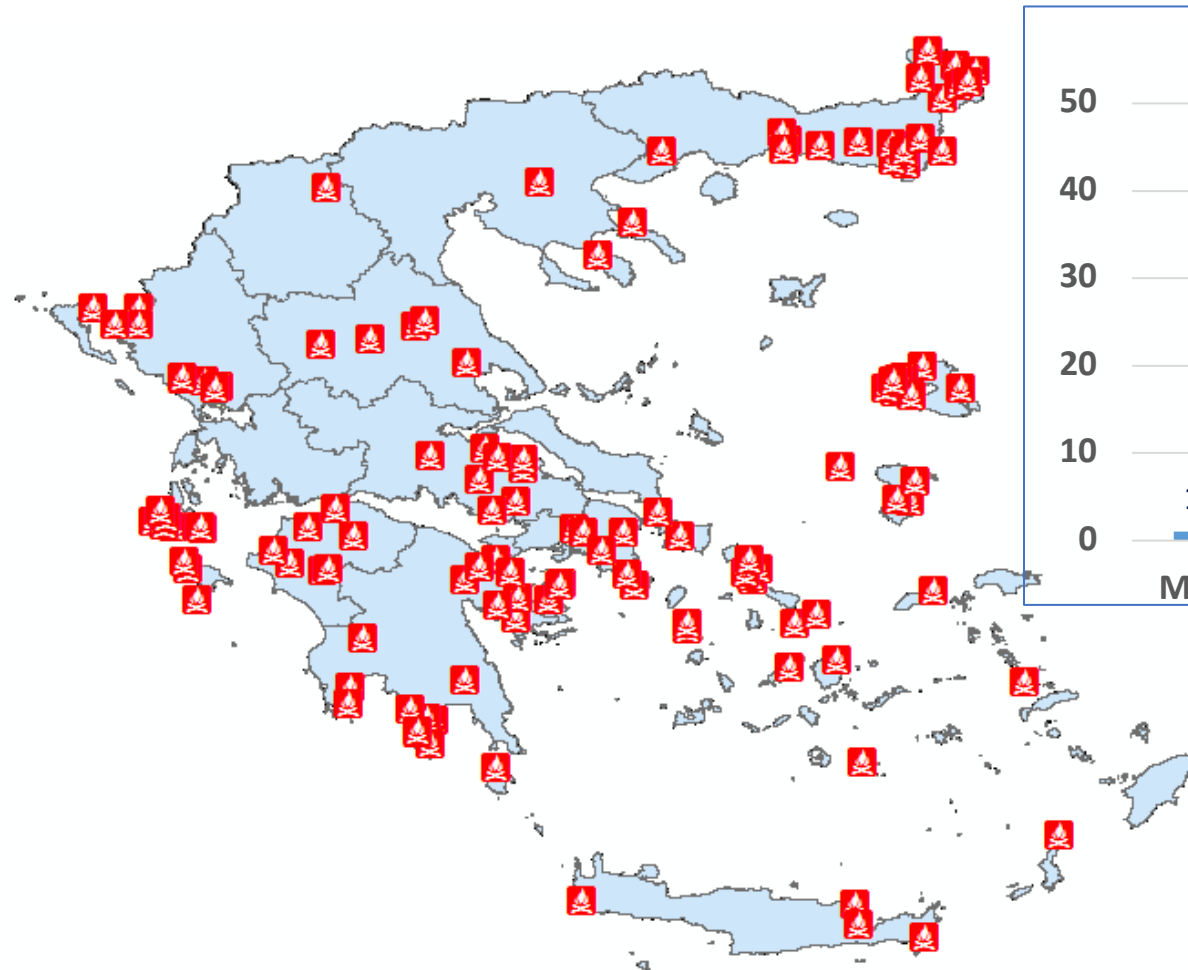
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Future Work



101 fire events

Spatial and monthly distribution of fire events during 2020 fire season (May-Oct)





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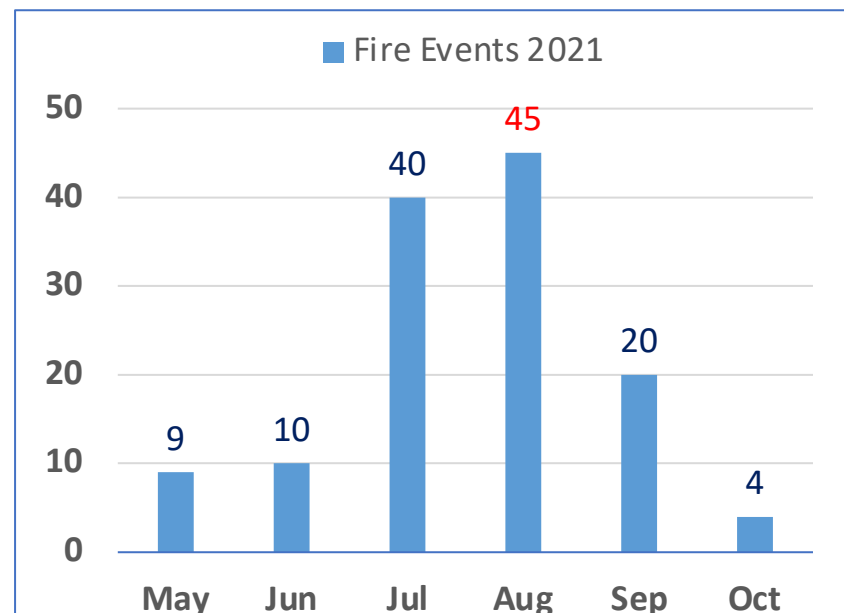
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128 fire events

Spatial and monthly distribution of fire events during 2021 fire season (May-Oct)



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Future Work



FD&M h5  
data



Filtering Data

Greece col/line

Dataset

Phase B

Database  
of FD&M



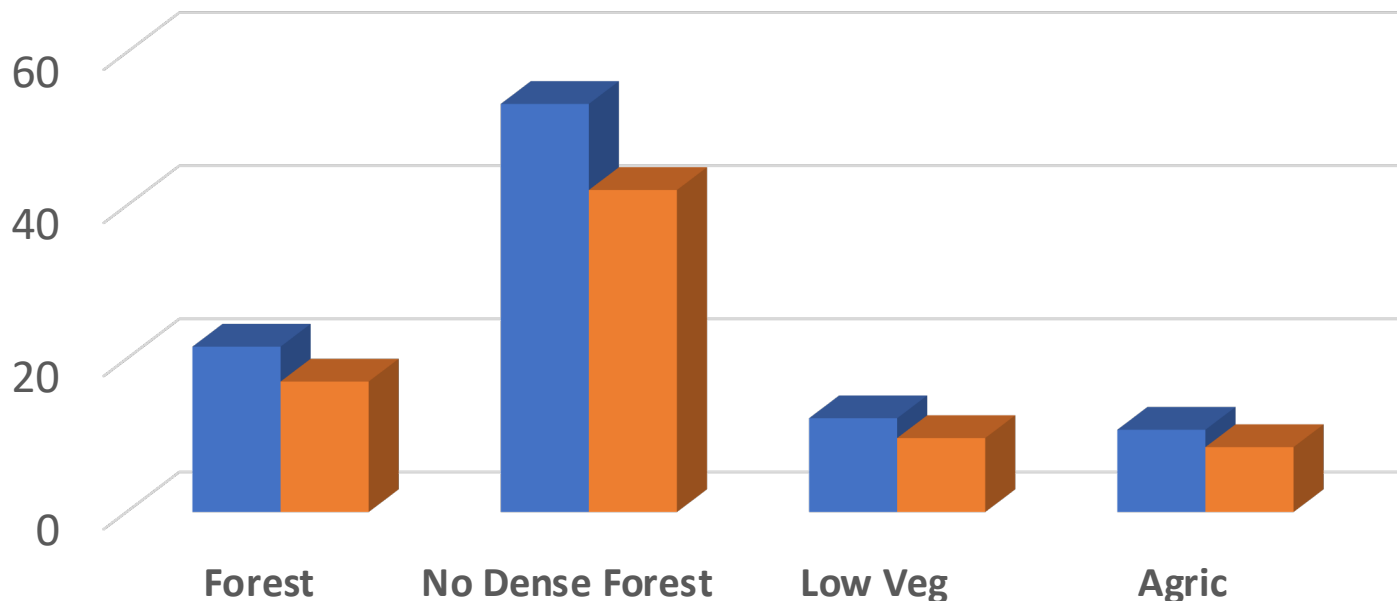
 python™





Total 229 fire events -> 182 FD&M (79,4%)

## 2020-2021



- 38 • **Forest** 4,4 scan
- 95 • **Not Dense Forest** 6,2 scan
- 31 • **Low Vegetation areas** 9,6 scan
- 18 • **Agricultures areas** 7,2 scan



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Future Work



**EUMETCast**



**Processing**

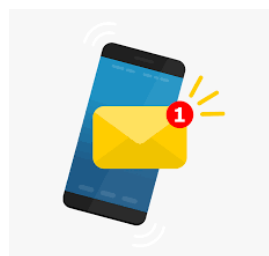


Filtering **FD&M** Data  
Greece col/line

**False**

**True**

**Email Alert Generation**



**Operational Centers**



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## Automatic Fire Detection & Monitoring Email Alert

Date: 08 Oct 2022

Time: 1518 UTC

### Summary:

Based on **081020221015** LAF FD&M data **3 Fire Events**  
were detected.

### Details:

#### Fire Event 1

Lon: 38,2641

Lat: 23,4668

#### Fire Event 2

Lon: 31,7442

Lat: 21,6870

#### Fire Event 2

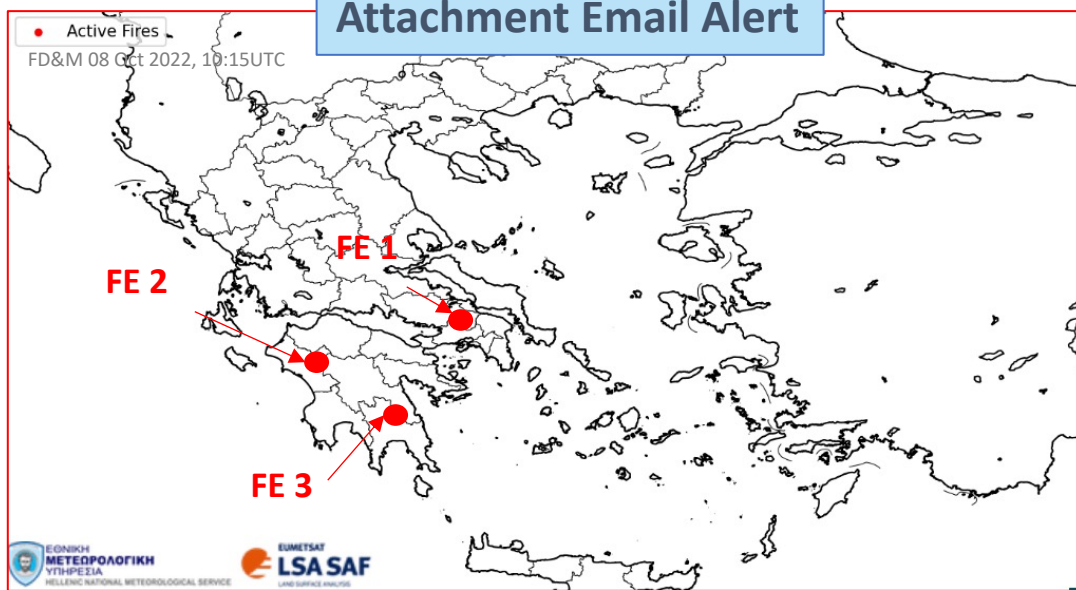
Lon: 36,8746

Lat: 22,8625

Contact:

\*\*\*\*\*

### Attachment Email Alert





## Future Works:

- Expand the study period (2012-2022)
- Include additional filters (e.g. Quality)
- Enhance Email Alert product with additional info and/or LSA product
- Tailored products for Fire Service Geoserver



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Future Work



***Thank you for your attention!***