EuroGEOSS

Protected Areas Pilot

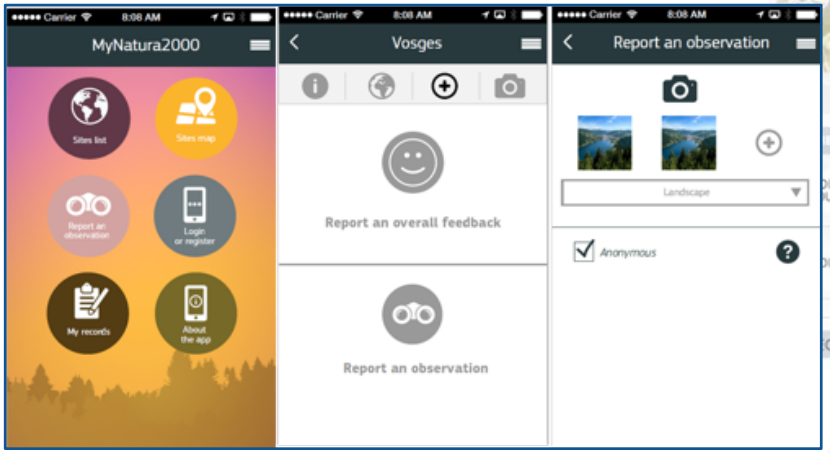
Max Craglia
European Commission
Joint Research Centre

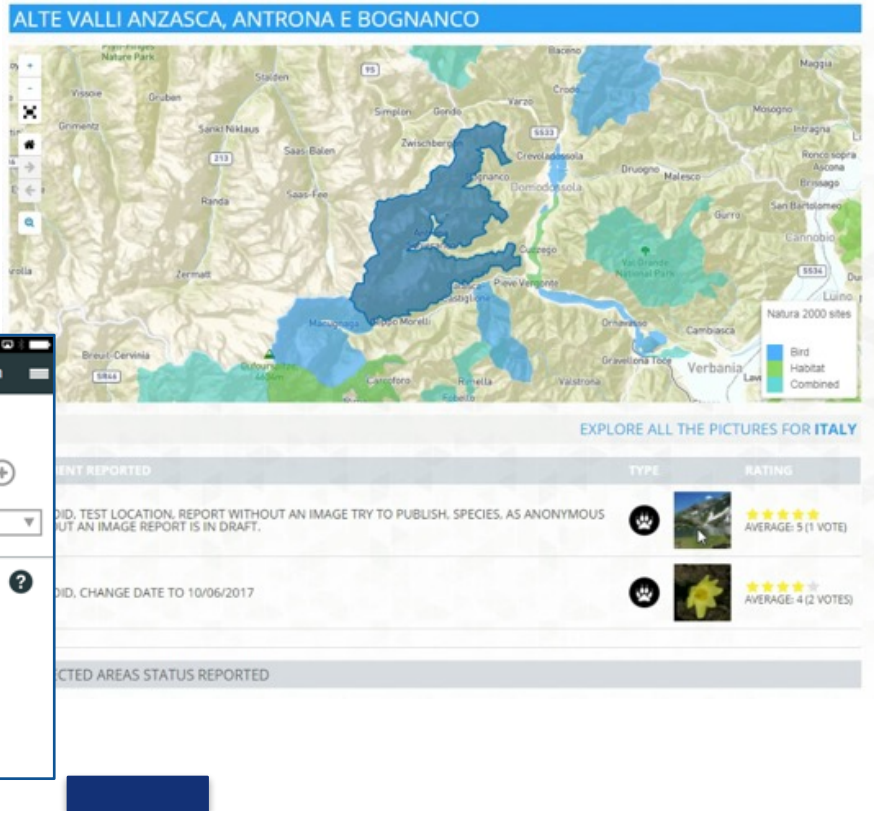
Part 1: the present

MyNatura2000 Mobile app.

Awareness raising &
volunteered data collection.

Natura2000 covers 18% of
EU land area!

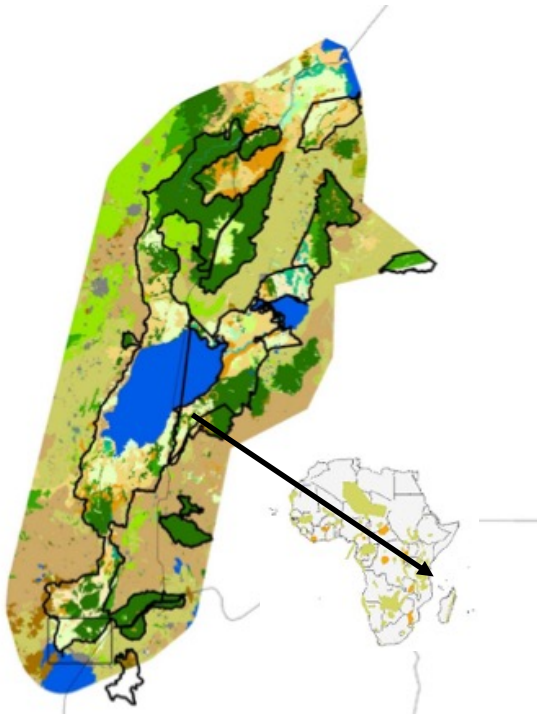




Copernicus Global Land High Resolution Hot Spot Monitoring

Land Monitoring

- Provides detailed land information on specific areas of interest globally by producing land cover and land cover change maps and related indicators using medium to high resolution satellite data (1-30 m)
- Answers to ad-hoc requests within the domain of the sustainable management of natural resources
- Supports EU funded projects or related policies with priority in biodiversity conservation and rural / social development sectors (B4Life)



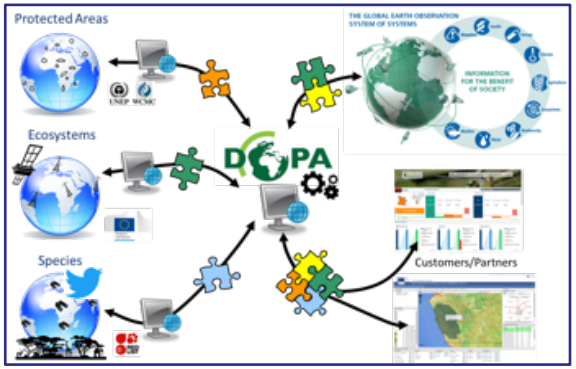
INSPIRE in situ data

Digital Observatory Protected Areas

DOPA is a set of web services and applications primarily designed to **globally assess**, monitor, report and possibly forecast the **state of and the pressure on protected areas.**

The data, indicators, maps and tools provided by the DOPA are used by a number of end-users including the UN Convention on Biological Diversity (**CBD**), policy makers, funding agencies, protected area agencies and managers and researchers.

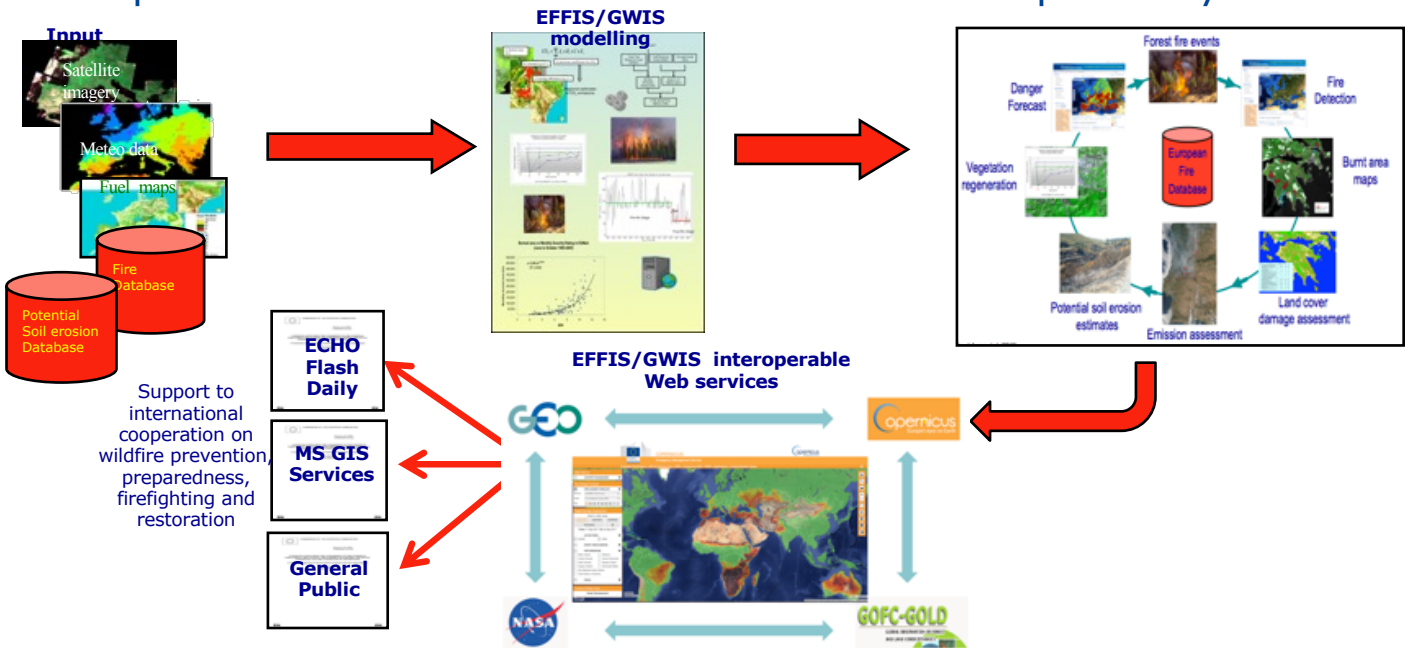
DOPA Indicators	Country	Ecoregions	Site Level (50km²)
Coverage statistics			*Not applicable*
Connectivity			*Not applicable*
Land cover & change			
Surface water & change		In devpt.	
Forest cover & change	In devpt.	In devpt.	In devpt.
Terrestrial habitat diversity/irreplaceability	*Not applicable*	*Not applicable*	
Marine habitat diversity/irreplaceability	*Not applicable*	*Not applicable*	
Species composition			
Species irreplaceability	*Not applicable*	*Not applicable*	
Agricultural pressure	*Not applicable*	*Not applicable*	
Population pressure	*Not applicable*	*Not applicable*	
Urbanisation pressure	*Not applicable*	*Not applicable*	In devpt.
Road pressure	*Not applicable*	*Not applicable*	
Monthly climate	*Not applicable*	*Not applicable*	
Conservation funds	In devpt.	In devpt.	In devpt.



http://dopa.jrc.ec.europa.eu/ @EU_DOPA

Forest Fires

The European Forest Fire Information System (EFFIS) and the Global Wildfire Information System (GWIS) provide web services supporting national and international administrations responsible for wildfire prevention, preparedness, firefighting and restoration and contribute to Copernicus and GEOSS initiatives on data interoperability

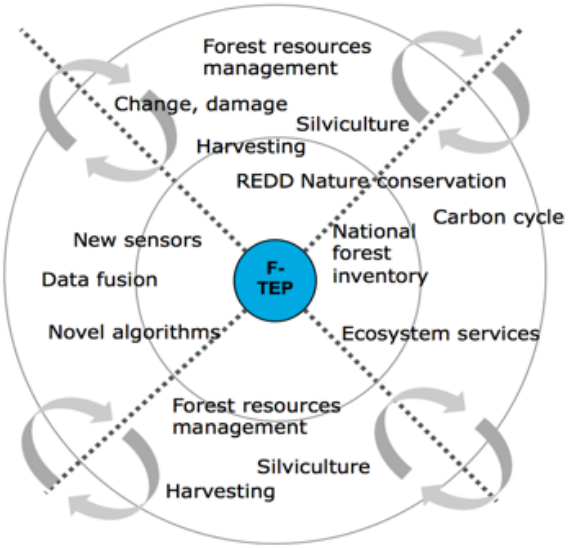


Forestry: Thematic Exploitation Platform

One-stop shop for forestry remote sensing services for the academic, public and commercial sectors

- Flipping the data access paradigm – from transferring Terabytes of raw data to moving Megabytes of results / products
- Moving away from model where each user works in their own 'silo'
- Community centric work environment
- Reduce the costs of data acquisition from miscellaneous sources with varying formats and processing levels
- Self-service environment with support

➔ ***https://forestry-tep.eo.esa.int/***



Satellite-based Wetland Observatory Service

SWOS monitoring methods and tools developed according to user requirements, in close collaboration with the ***Ramsar*** convention on wetlands and more than 20 user organizations working **from local to global level**

SWOS information for the preparation and monitoring of wetland conservation and restoration measures

SWOS assists wetland practitioners with wetland monitoring and reporting obligations for environmental policies at different scales

SWOS delivers

- standardized nomenclatures, mapping products and indicators
- tools for the production of maps / indicator
- Training capacity building

SWOS implementation via multi-level Service cases (global, national and about 40 local)

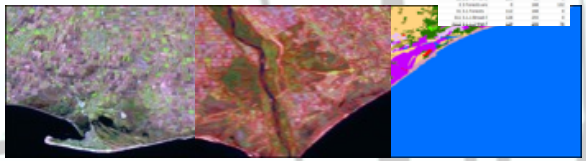
SWOS connects wetland information from different sources via the **SWOS (GEOwetlands) community portal**

SWOS is leading GEOwetlands

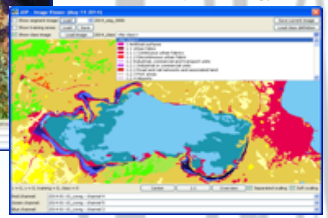
SWOS Portal =
GEOwetlands Community Por

Access to
- SWOS products
- global and European wetland related data sources
- Analysis functions

From satellite images to maps and indicators



GEO*classifier*
(Stand alone version, ArcGIS toolbox, Cloud processing)



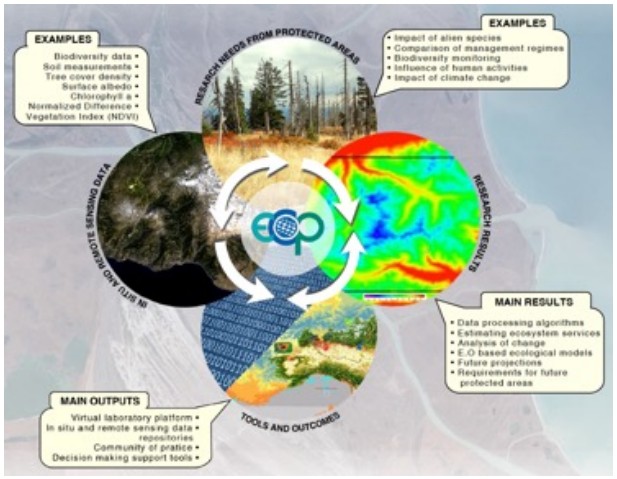
Free available toolbox for wetlands status and trends mapping and indicators calculation

ECOPOTENTIAL

Horizon 2020 research and innovation programme
grant agreement No 641762

- Develops a conceptual framework for the use of EO data in understanding ecosystem's structure
- Delivers EO data products to understand, model and monitor ecosystem changes and support the effective management of Protected Areas
- Contributes to the GCI through a Virtual Laboratory Platform

- Focus on 25 targeted set of Protected Areas in Europe and beyond
- Mountain, arid and semiarid, coastal and marine ecosystems
- Covering all the biogeographic regions of Europe



www.ecopotential-project.eu

Global Human Settlement Layer

Produces **new global spatial information** and knowledge describing the **human presence on the planet**

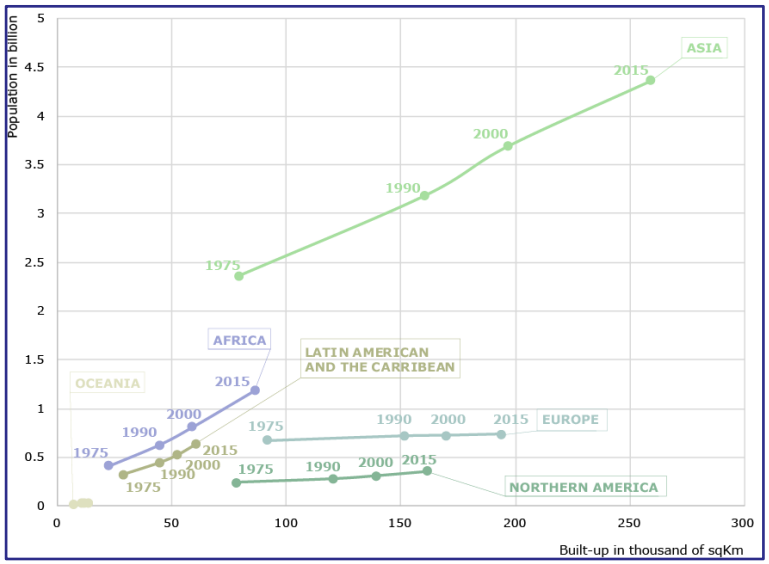
Operates with an **open and free** data, tools & methods policy

Supported by the European Commission (JRC & REGIO)

Core data set for the **GEO Human Planet Initiative** to map:

- **human exposure to disasters**
- **human impact on ecosystems**
- **human access to resources**

http://ghsl.jrc.ec.europa.eu



GHSL is supporting international frameworks:

- **Sustainable Development Goals**
- **Sendai Framework for Disaster Risk Reduction**
- **Paris Climate Change Agreements**
- **New Urban Agenda**

Part 2: the future

Density mapping of burnt areas

```
In [1]: map = Map()
        map
```


```
In [2]: %run DensityMappingOfBurntAreas.py
        densityMapOnYear(map)
```

Radius in Km.: 40

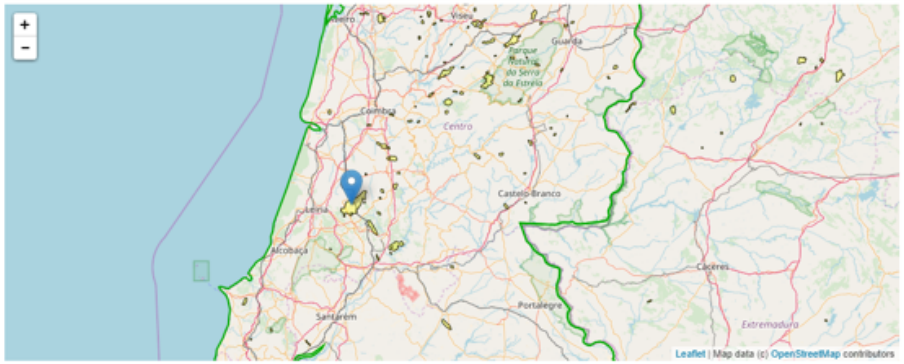
Select Year: 2001

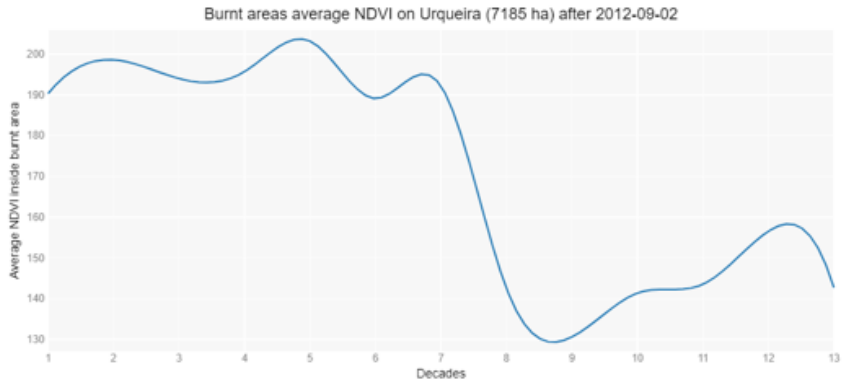
Impact on vegetation

NDVI change analysis on burnt areas around the fire date

```
In [1]: %run ChangeAnalysis.py

In [2]: map = Map(center=[40.5, -8], zoom=8)
        map
```

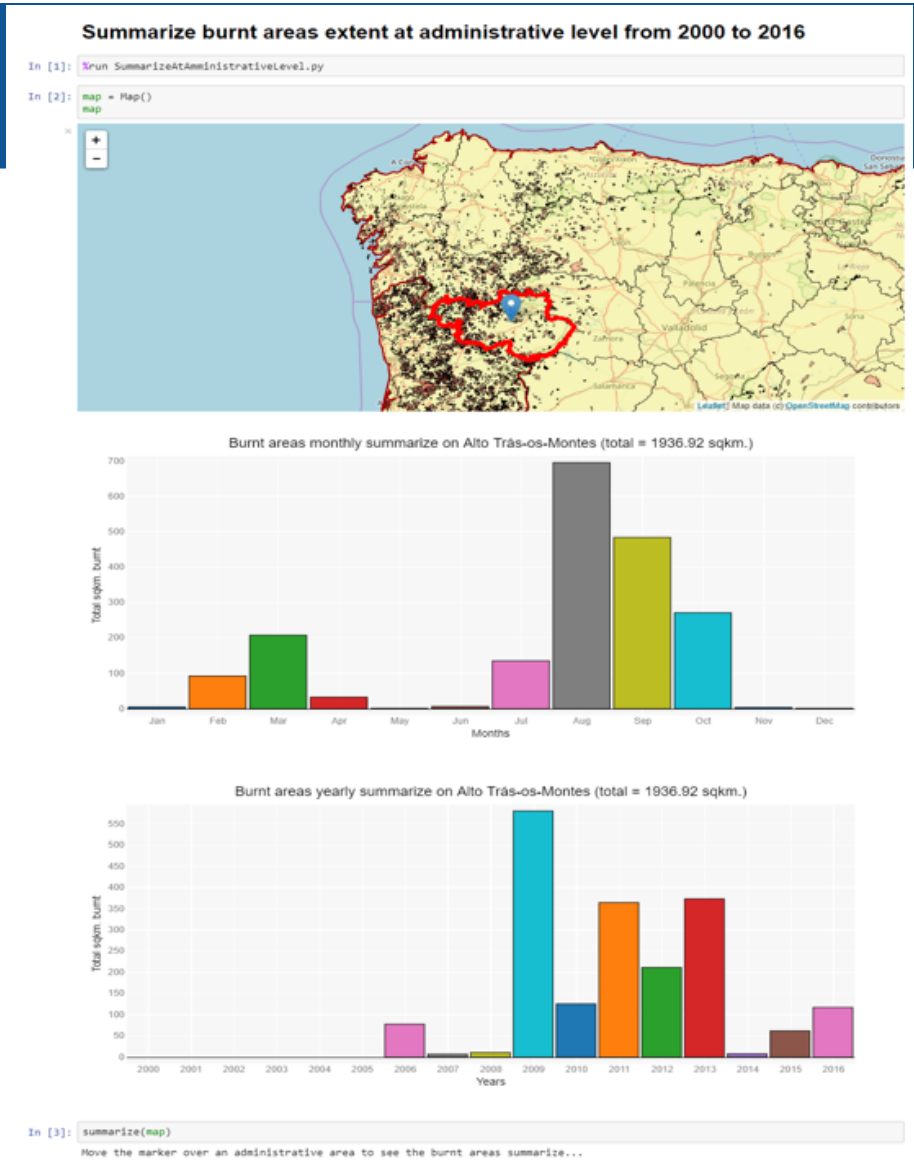





```
In [3]: changeAnalysis(map)
```

Select year: 2012

Burnt area by NUTS3, 2000-16



Impact on protected areas

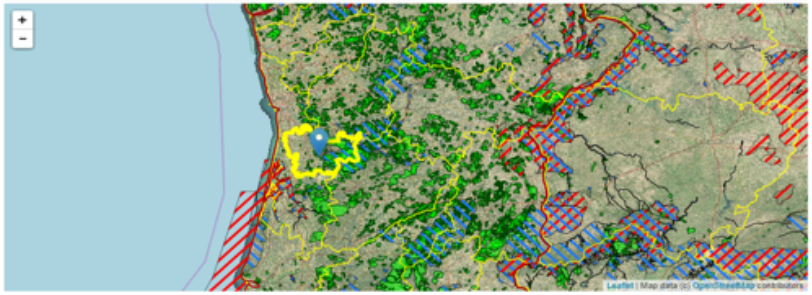
Impact of burnt areas from 2000 to 2016 on Natura2000 sites

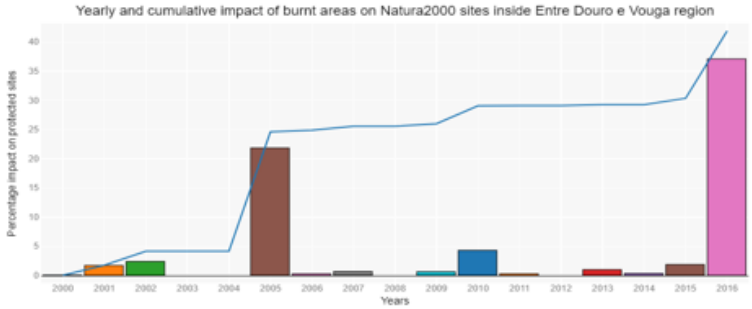
```
In [1]: %run ImpactOnNatura2000Sites.py
```

Legend

- Habitats Directive Sites (pSCI, SCI or SAC)
- Birds Directive Sites (SPA)

```
In [4]: map = Map(center=[40.5, -8], zoom=8)
        map
```






```
Region total sqkm.: 1509.75
Natura2000 total sqkm. inside the region:  625.50 (41.43% of the region)
Impacted Natura2000 total sqkm. in 2000:    0.25 ( 0.04% of the protected sites, cumulative impact: 0.04%)
Impacted Natura2000 total sqkm. in 2001:   10.75 ( 1.72% of the protected sites, cumulative impact: 1.76%)
Impacted Natura2000 total sqkm. in 2002:   15.00 ( 2.40% of the protected sites, cumulative impact: 4.16%)
Impacted Natura2000 total sqkm. in 2003:    0.00 ( 0.00% of the protected sites, cumulative impact: 4.16%)
Impacted Natura2000 total sqkm. in 2004:    0.00 ( 0.00% of the protected sites, cumulative impact: 4.16%)
Impacted Natura2000 total sqkm. in 2005:  136.75 (21.86% of the protected sites, cumulative impact:24.62%)
Impacted Natura2000 total sqkm. in 2006:    1.75 ( 0.28% of the protected sites, cumulative impact:24.90%)
Impacted Natura2000 total sqkm. in 2007:    4.25 ( 0.68% of the protected sites, cumulative impact:25.58%)
Impacted Natura2000 total sqkm. in 2008:    0.00 ( 0.00% of the protected sites, cumulative impact:25.58%)
Impacted Natura2000 total sqkm. in 2009:    4.00 ( 0.64% of the protected sites, cumulative impact:26.02%)
Impacted Natura2000 total sqkm. in 2010:   27.00 ( 4.32% of the protected sites, cumulative impact:29.10%)
Impacted Natura2000 total sqkm. in 2011:    1.75 ( 0.28% of the protected sites, cumulative impact:29.14%)
Impacted Natura2000 total sqkm. in 2012:    0.00 ( 0.00% of the protected sites, cumulative impact:29.14%)
Impacted Natura2000 total sqkm. in 2013:    6.25 ( 1.00% of the protected sites, cumulative impact:29.30%)
Impacted Natura2000 total sqkm. in 2014:    2.25 ( 0.36% of the protected sites, cumulative impact:29.30%)
Impacted Natura2000 total sqkm. in 2015:   11.75 ( 1.88% of the protected sites, cumulative impact:30.38%)
Impacted Natura2000 total sqkm. in 2016:  232.25 (37.13% of the protected sites, cumulative impact:41.93%)
```

```
In [5]: impact(map)
```

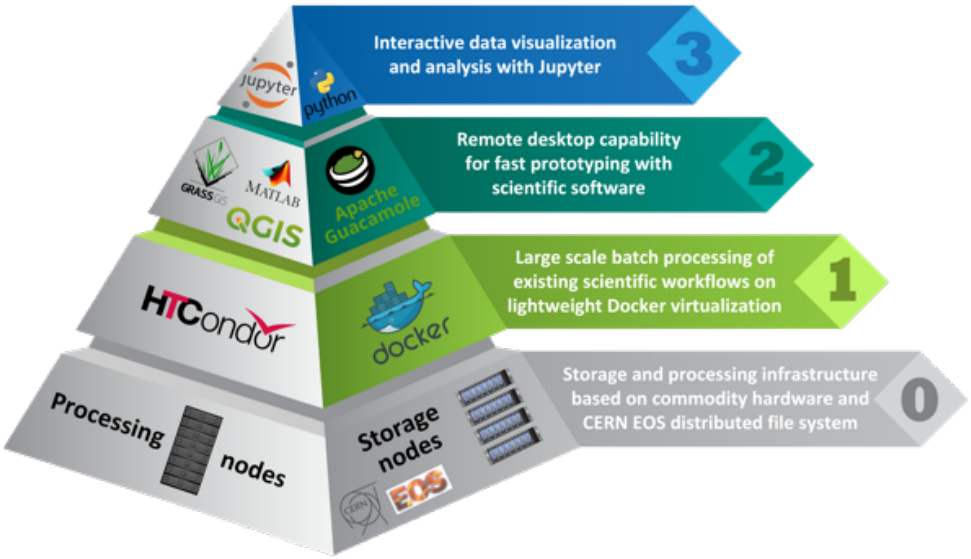
```
Move the marker over an administrative area to see the burnt areas impact on Natura2000 sites...
```

Future steps

- Now that we the framework in place we can add all the relevant data from the other projects (INSPIRE, GHSL, Surface water, ECOPOTENIAL, DOPA, SWOS, etc…)
- Great opportunity to increase depth of analysis and recommend policy options
- A shared European framework is good but we also need an infrastructure to underpin it …

EuroGEOSS infrastructure(s)

- For this demonstrator we have used the JRC EO Data processing platform
- Many others will be available soon (DIAS, European OpenScience Cloud, ……)
- Crucial that they are interoperable and do not end up in more silos.



Thank you for your attention!