European Drought Observatory

Progress on Drought Monitoring

Alfred de Jager – Diego Magni

European Commission
Joint Research Centre (JRC)
Disaster Risk Management Unit

Outline

1. **Introduction**
   - Philosophy
   - Hidden system interface
   - Web interface
2. **European Drought Observatory**
   - Monitoring
   - Forecast
   - Impact
   - Climate
   - Integration of your Maps/Data
3. **What do you want to change / add**
   - Current Droughts
   - Mapping
   - Analysis / Evolution
4. **How to change**

Philosophy

- Open System
  - Satellite Imagery
  - NetCDF
  - Weather Station data
  - WMS exchange
- Timely System
  - Daily and 10-day data
  - Forecasts
  - Large Archive

Hidden System Interface

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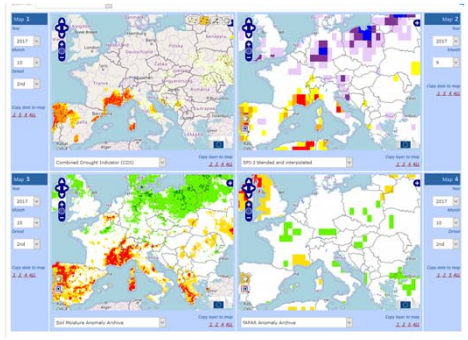
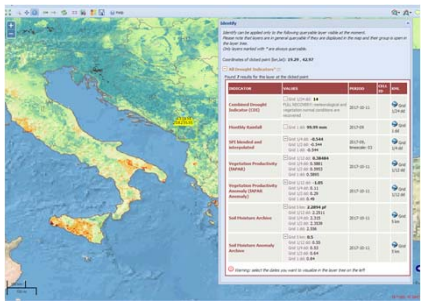


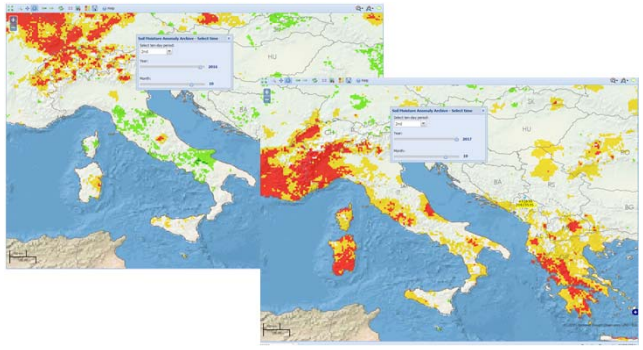
Side by Side Maps

- Checking up to 4 parameters varying in time on the same spot
- Rainfall, SPI, Soil moisture, fAPAR, CDI DM3
- Locking and unlocking maps to follow each other



Map Viewer Identify, integrating

- Get the numbers behind the map
- Compare the various parameters
- Analyze the effect of resolution / averaging



Go through time

- Step from month to month or year to year
- Compare various themes
- Export quickly a map for inclusion in a report
- Slider bar in ArcGIS for WMS themes

Forecast

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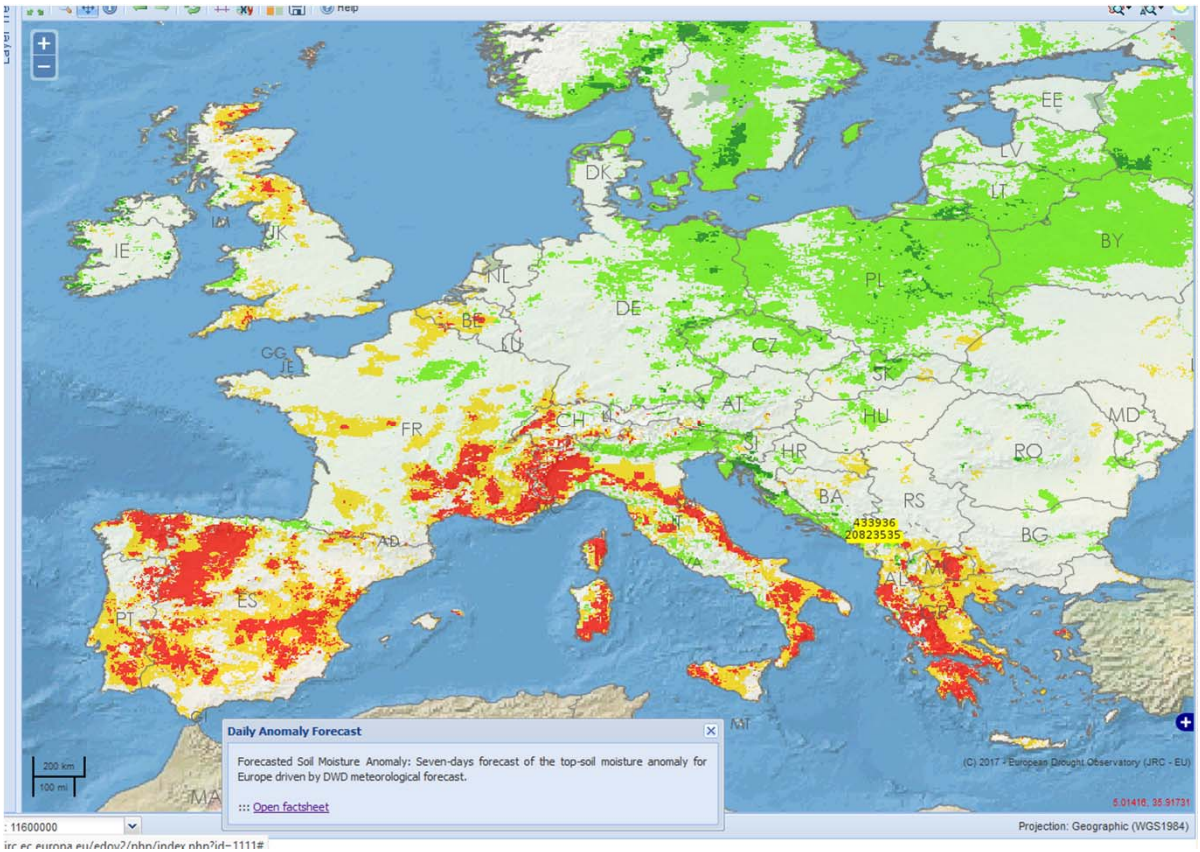
- ✓ **Soil moisture**
- ✓ **Model output**



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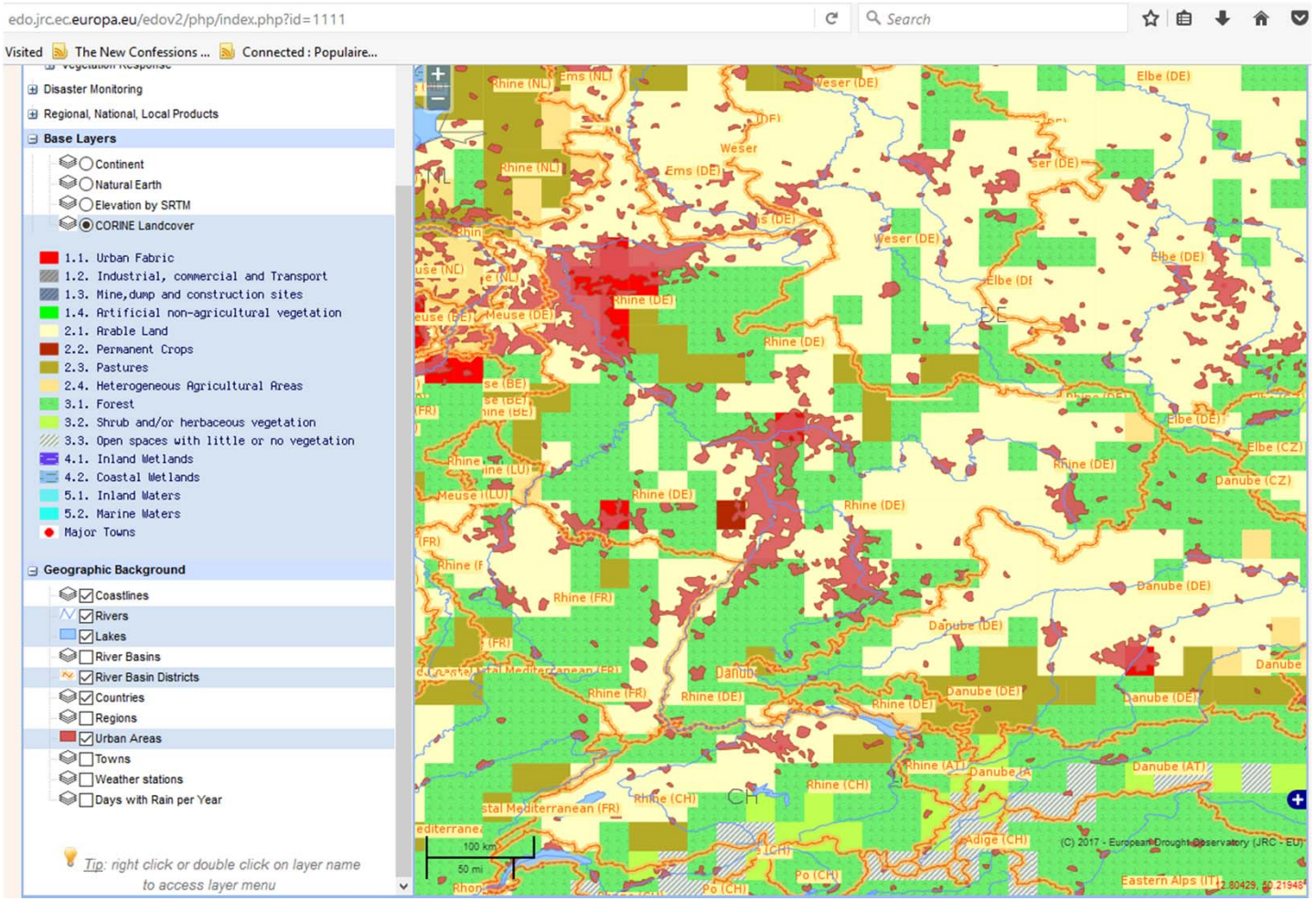
Integrate with Background Data



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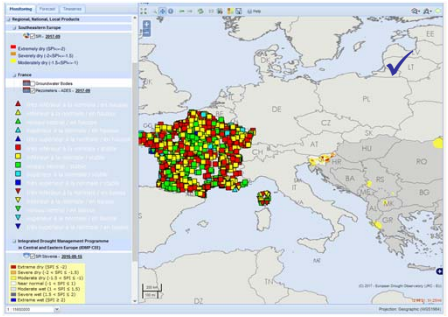
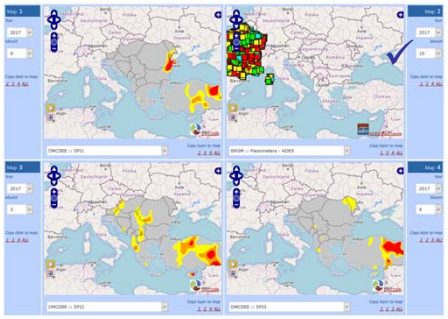
Integration platform of EDO: where your data / maps appear



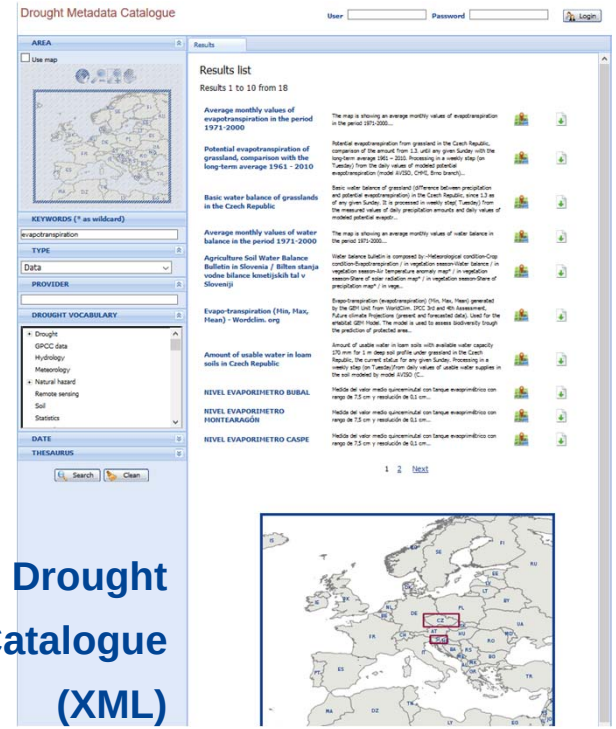
Interactive MapViewer

(WMS, links to WCS, WFS)



Side by Side Maps

(WMS)



✓ Drought Metadata Catalogue (XML)

Integration platform of EDO: steps to join EDO

1 **Resource preparation**

You can link to EDO any type of information concerning drought: papers, collection of data, indicators, maps, services (WMS, WCS, WFS, WPS).

2 **Resource description**

Your resource will be registered into the Drought Metadata Catalogue by means of a set of mandatory INSPIRE metadata, possibly enriched by additional information.

3 **Service publication**

If your resource is a WMS service, it can be published into the Interactive MapViewer and/or the Side by Side Maps, after providing the necessary information to plug it to the EDO systems. WFS and WCS can also be linked to EDO.

4 **Maintenance**

WMS-delivered data must be provided/made available to EDO according to their production frequency. Layer names, descriptions and metadata must be up-to-date.

Combined Drought Indicator (CDI)

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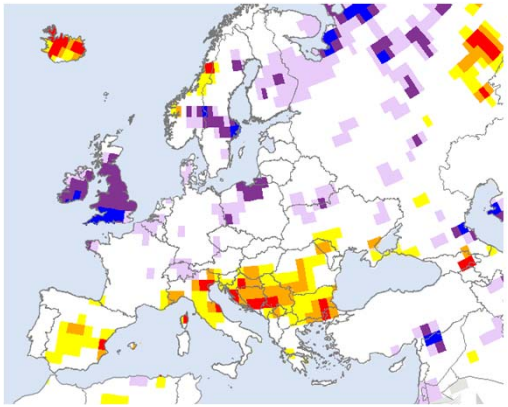
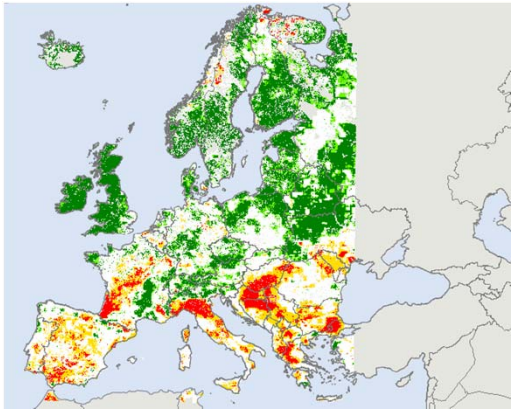
Precipitation Anomalies (SPI)



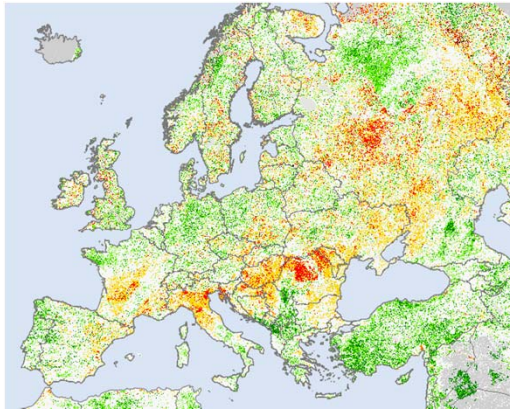
- reflects the statistically **expected frequency** (i.e. probability) of a given event
- is obtained **monthly** , calculated over **different rainfall accumulation periods**
- is obtained from the interpolation of observed **meteorological point data + Gridded GPCC data**
- **reference period**: 1981 - 2010

Soil Moisture Anomalies



- is obtained **daily** with the hydrological model LISFLOOD & aggregated to **10 days**.
- the meteorological input information is derived from observed **meteorological point data**
- is presented as **anomalies** (statistical deviation from the long-term mean)
- **reference period:** 1995-2016

fAPAR Anomalies



- is a **remote sensing derived** indicator available at intervals of **10 days**
- is presented as **anomalies** (statistical deviation from the long-term mean)
- the available **time-series** is still short (from 1997)
- the indicator is derived from SPOT-VEGETATION and MODIS (**reference period:** 2001-2016)

Combined Drought Indicator (CDI)

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Combined Drought Indicator (CDI)

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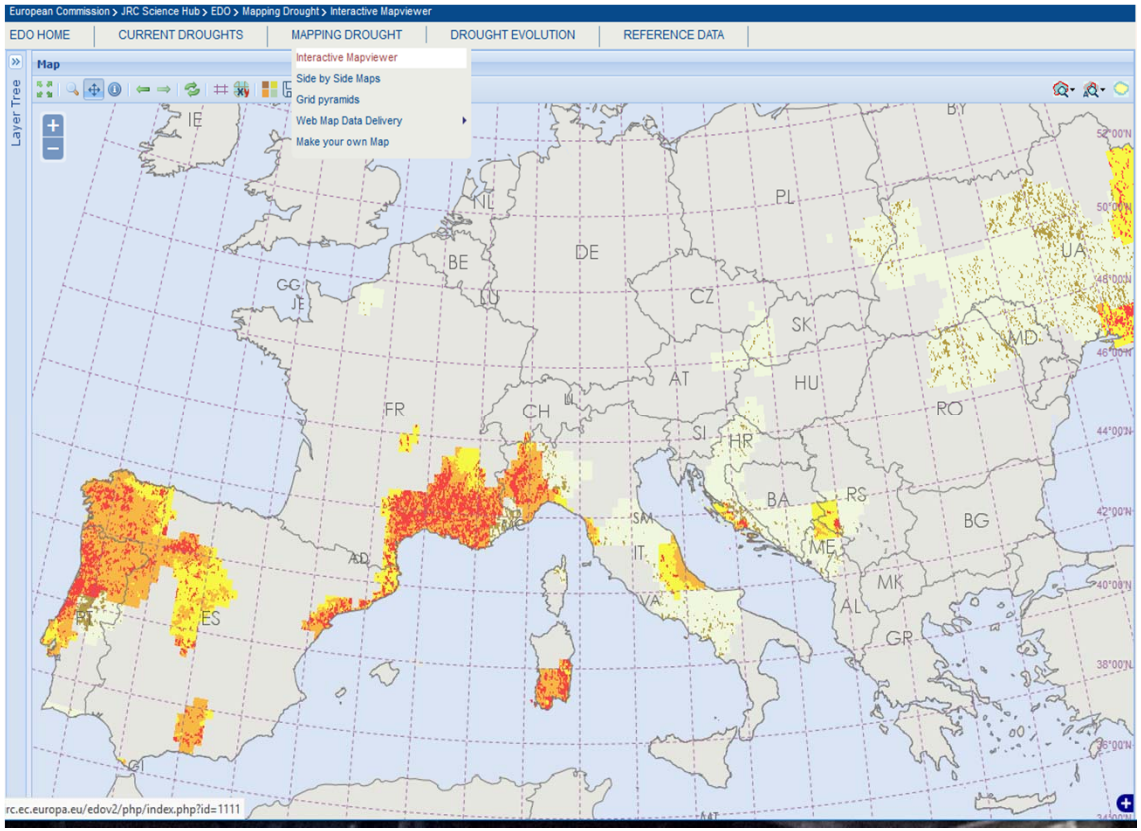
Impact	Level
Watch: rainfall deficit	1
	2
	3
Warning: soil moisture deficit	4
	5
	6
Alert: vegetation stress following rainfall/soil moisture deficit	7
	8
	9
	10

Increasing Dryness

Impact	Level
Partial Recovery of Vegetation: normal condition of rainfall still vegetation stress	11
	12
Full Recovery of Vegetation: normal condition of rainfall normal condition of vegetation productivity	13
	14

Increasing Recovery



CDI, 11-21 October 2017

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CDI
Evolution 2017

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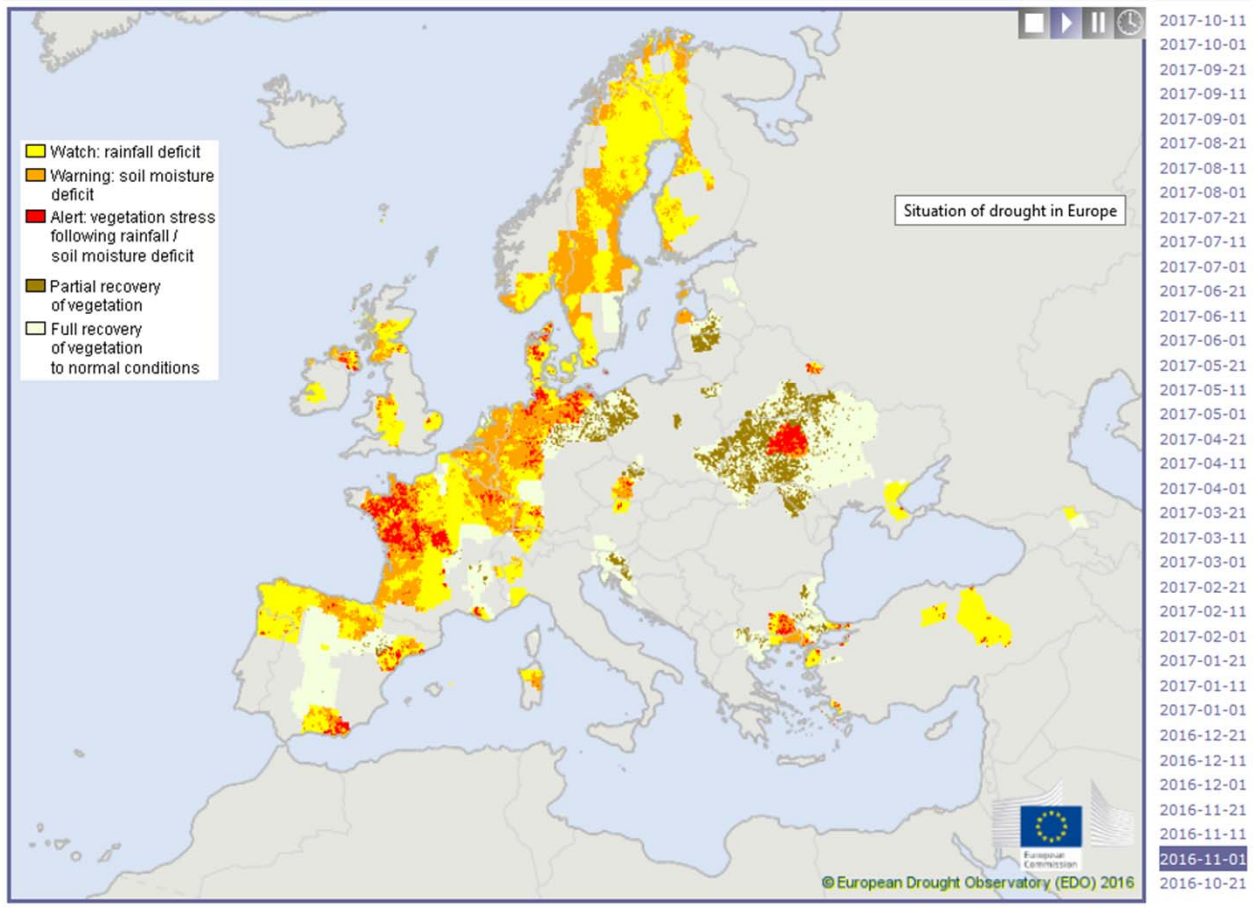
EDO HOME | CURRENT DROUGHTS | MAPPING DROUGHT | DROUGHT EVOLUTION | REFERENCE DATA

Animation of Combined Drought Indicator (CDI) maps during last year



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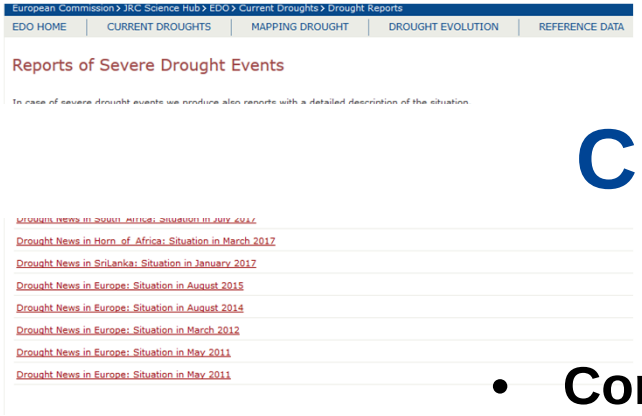
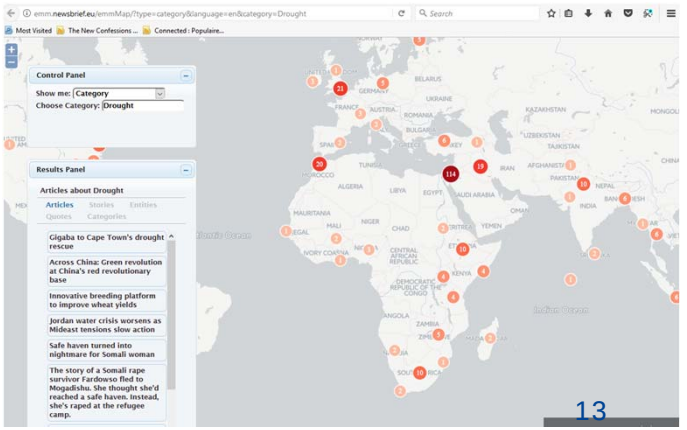


Current Droughts

- **Combined Drought Index Maps**
- **Comprehensive Reports**
- **EMM Drought News**



Drought Mapping

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- **Map viewer**
- **Side by Side Maps**
- **WMS access**
- **Make your own Map**

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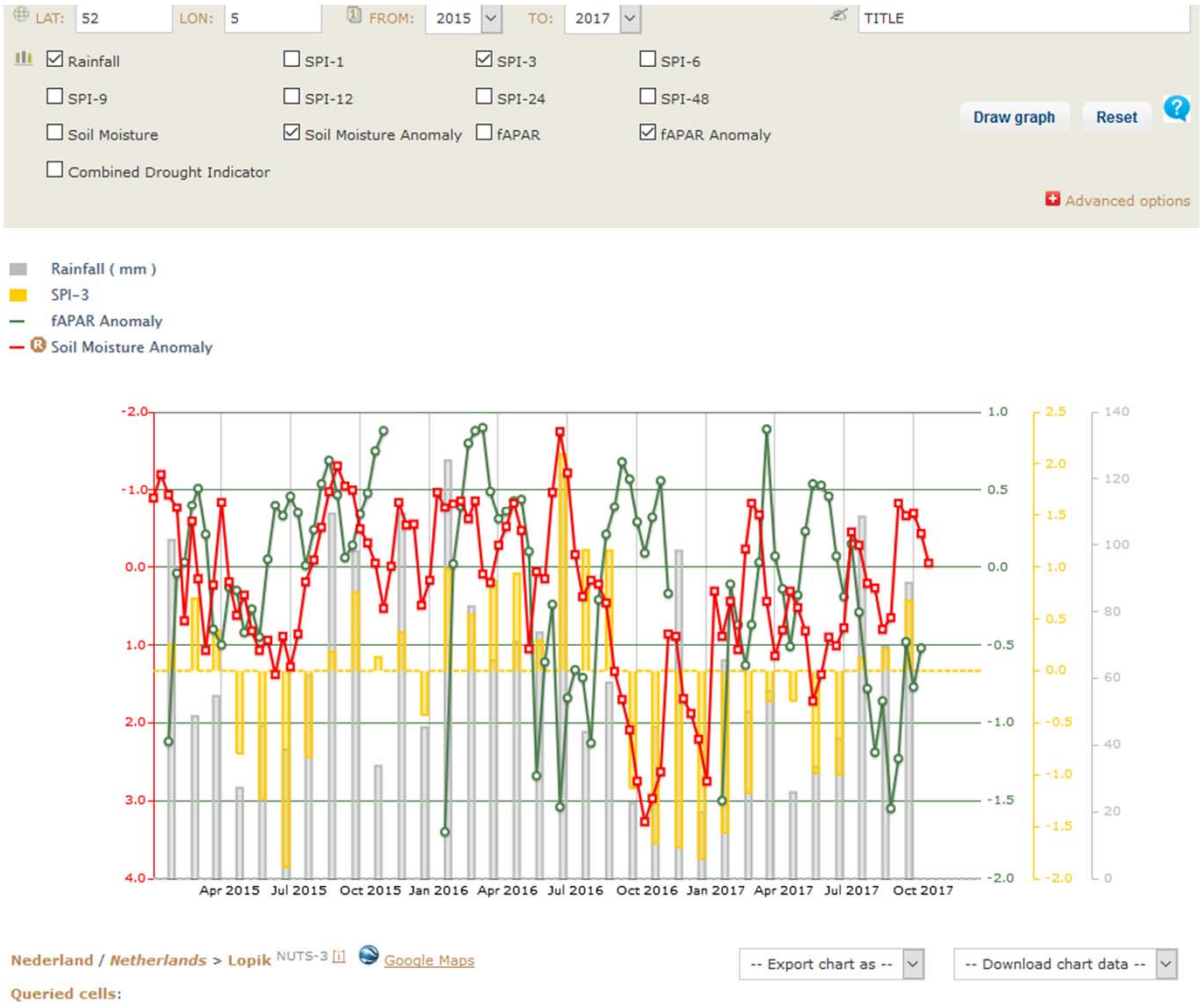
Analysis / Evolution



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

Alfred de Jager – Diego Magni

alfred.de-jager@ec.europa.eu diego.magni@ext.ec.europa.eu

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