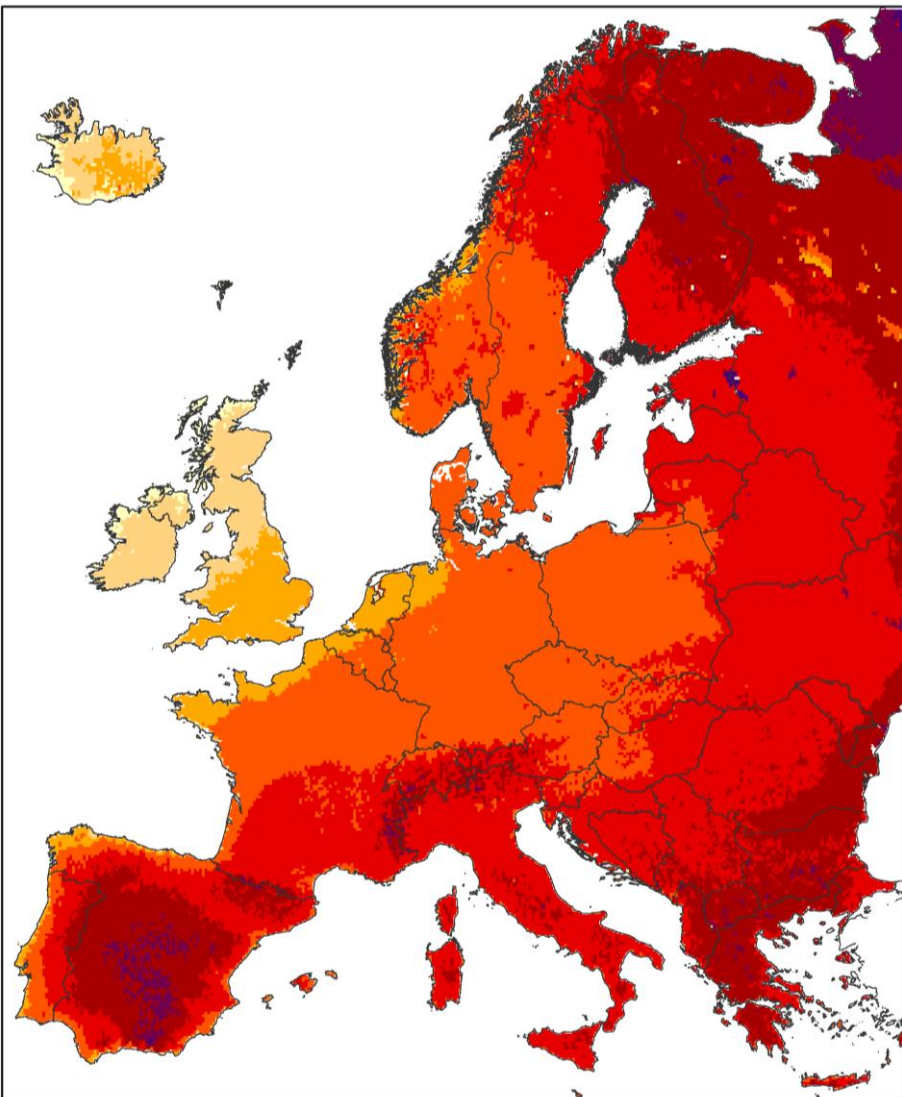




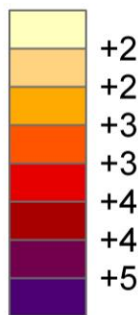
The European Flood Alert System (EFAS)



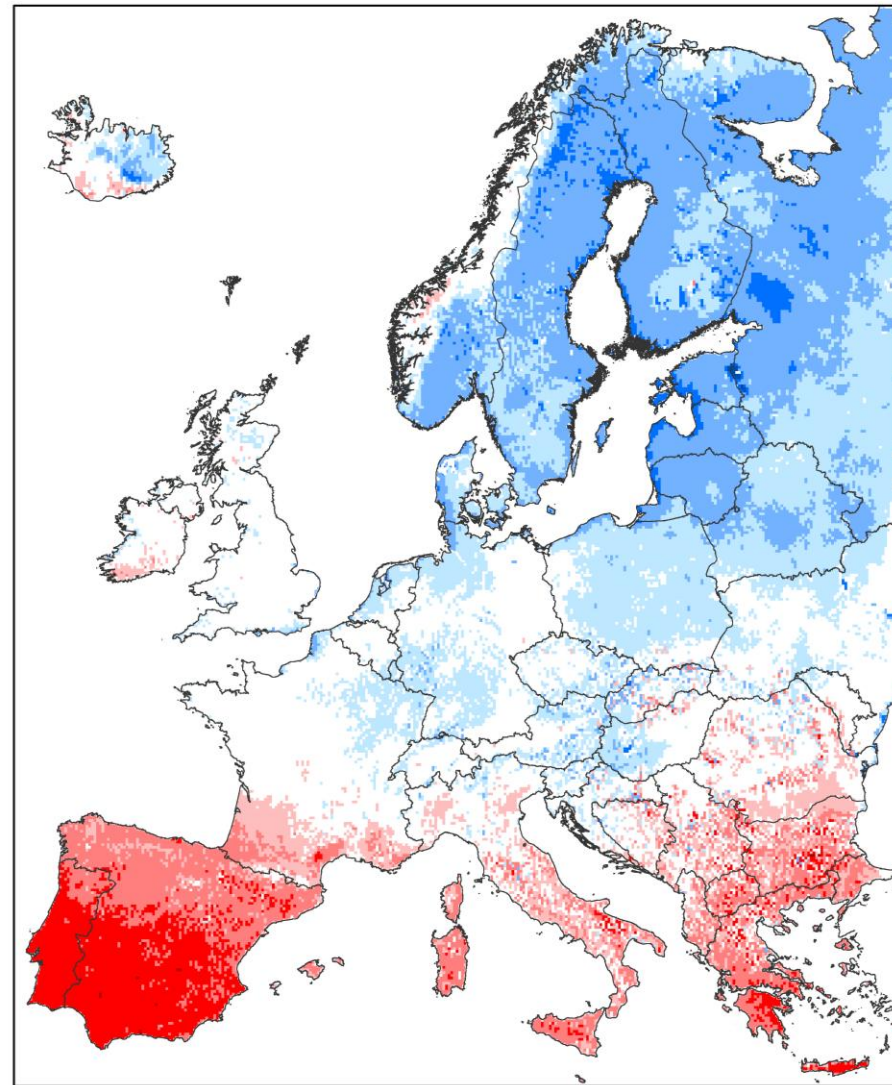
Temperature: change in mean annual temperature



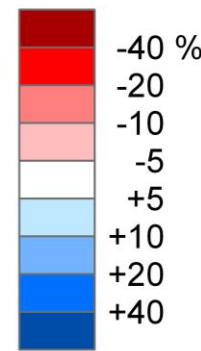
°C



Precipitation: change in annual amount



%

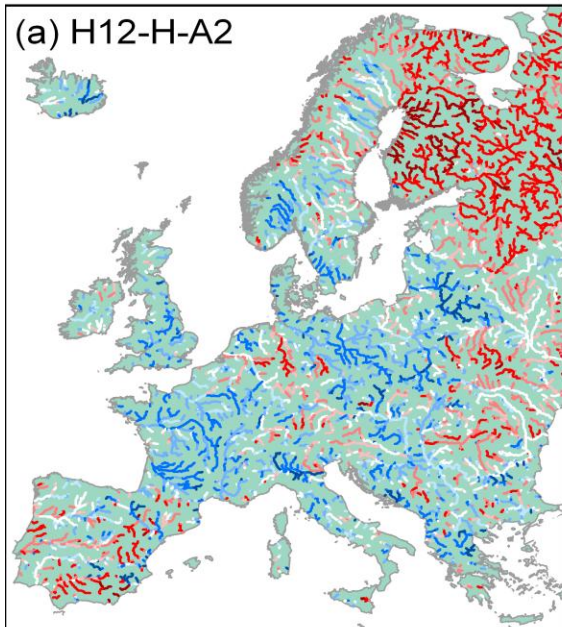


HadAM3H

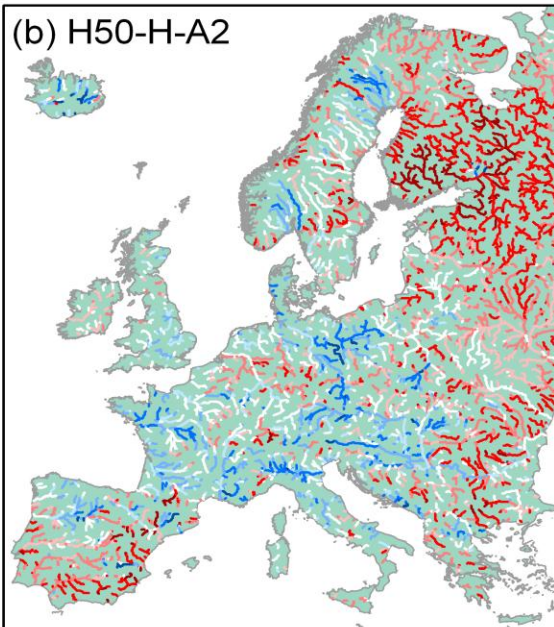
HadAM3H

ECHAM4/OPYC

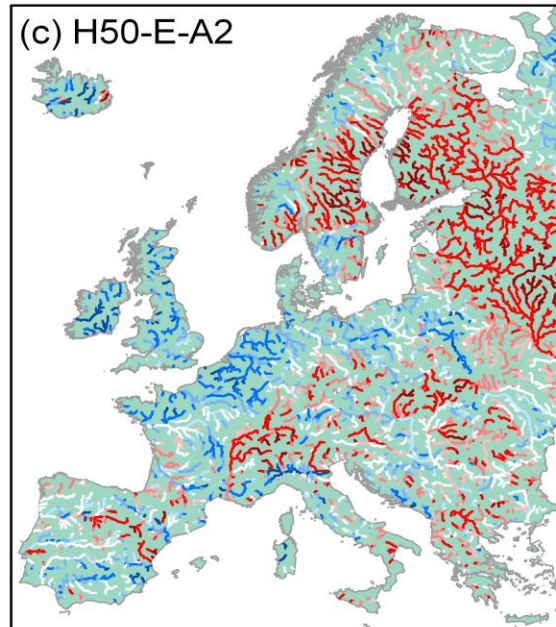
(a) H12-H-A2



(b) H50-H-A2

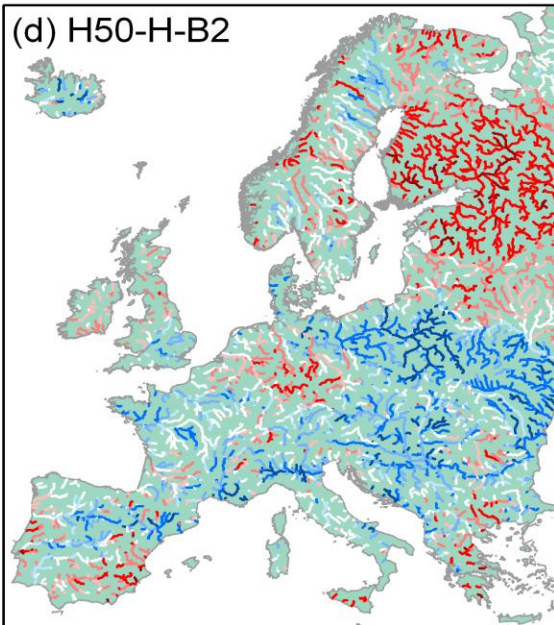


(c) H50-E-A2

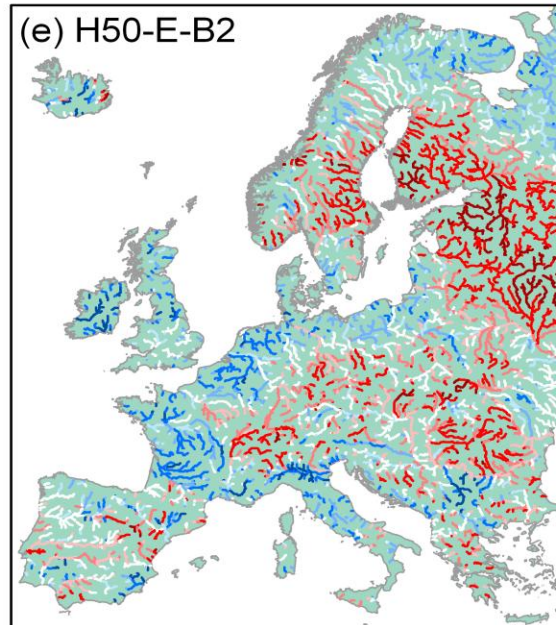


scenario A2

(d) H50-H-B2

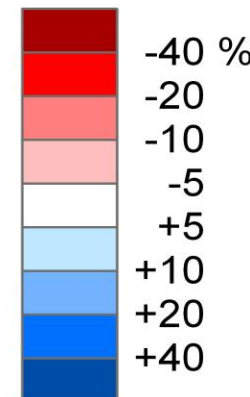


(e) H50-E-B2

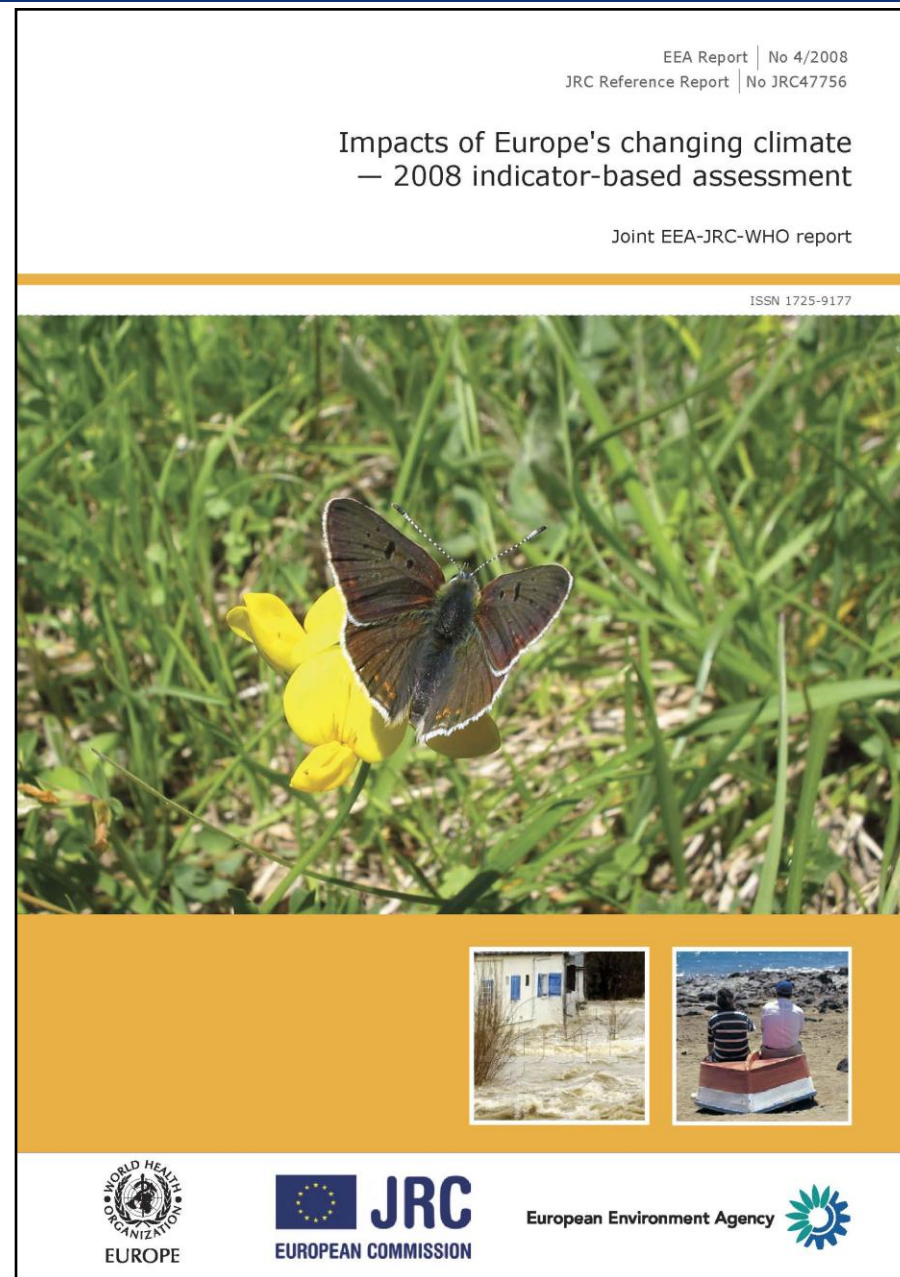


scenario B2

Estimated using
JRC
EFAS/LISFLOOD
model setup fed
with HIRHAM
scenarios



- Includes assessment of climate change effects on water resources (floods, low flows, average flows) in Europe



Hydro & Meteo Data

EU Flood GIS

Realtime H-Q data

Historical Data

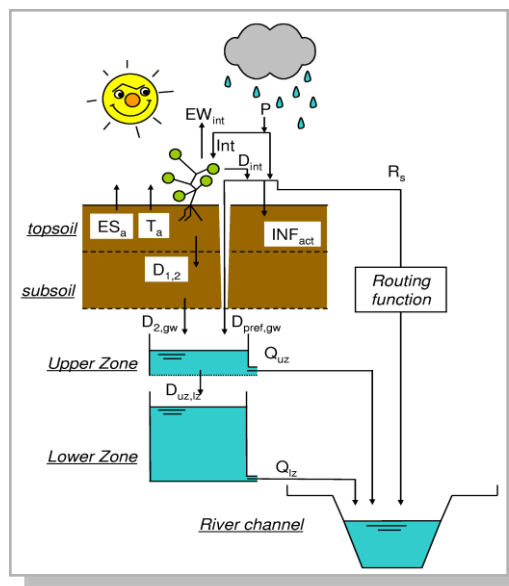
Static Data

Europ. Data Layers

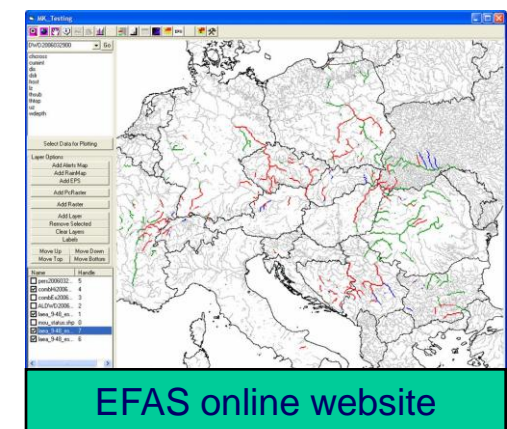
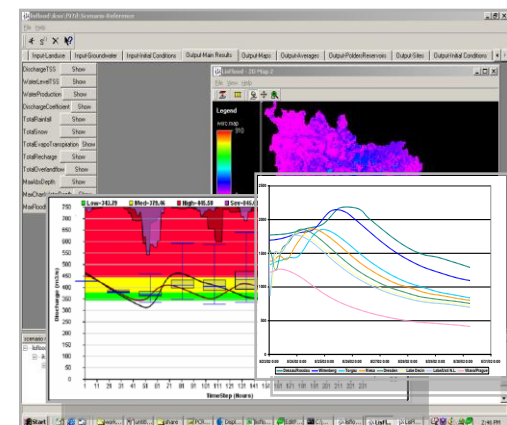
Meteo - Data

Expert Knowledge of Member States

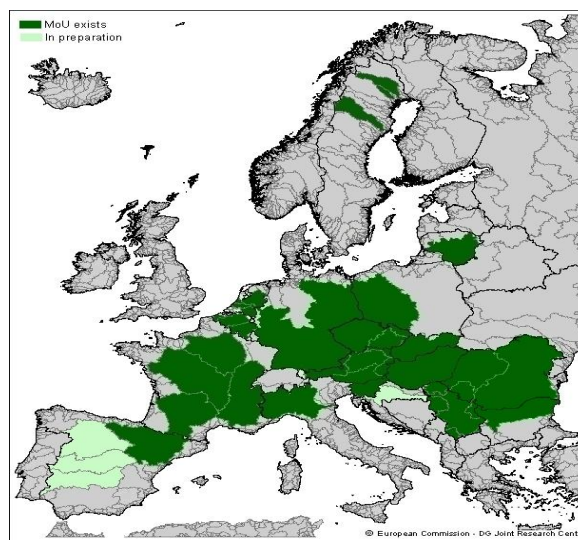
LISFLOOD hydrological model



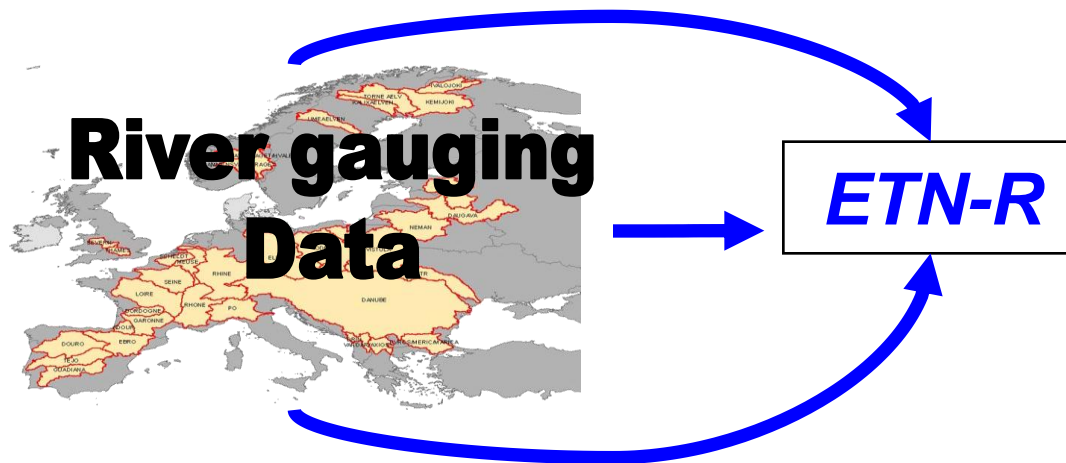
Flood Simulations



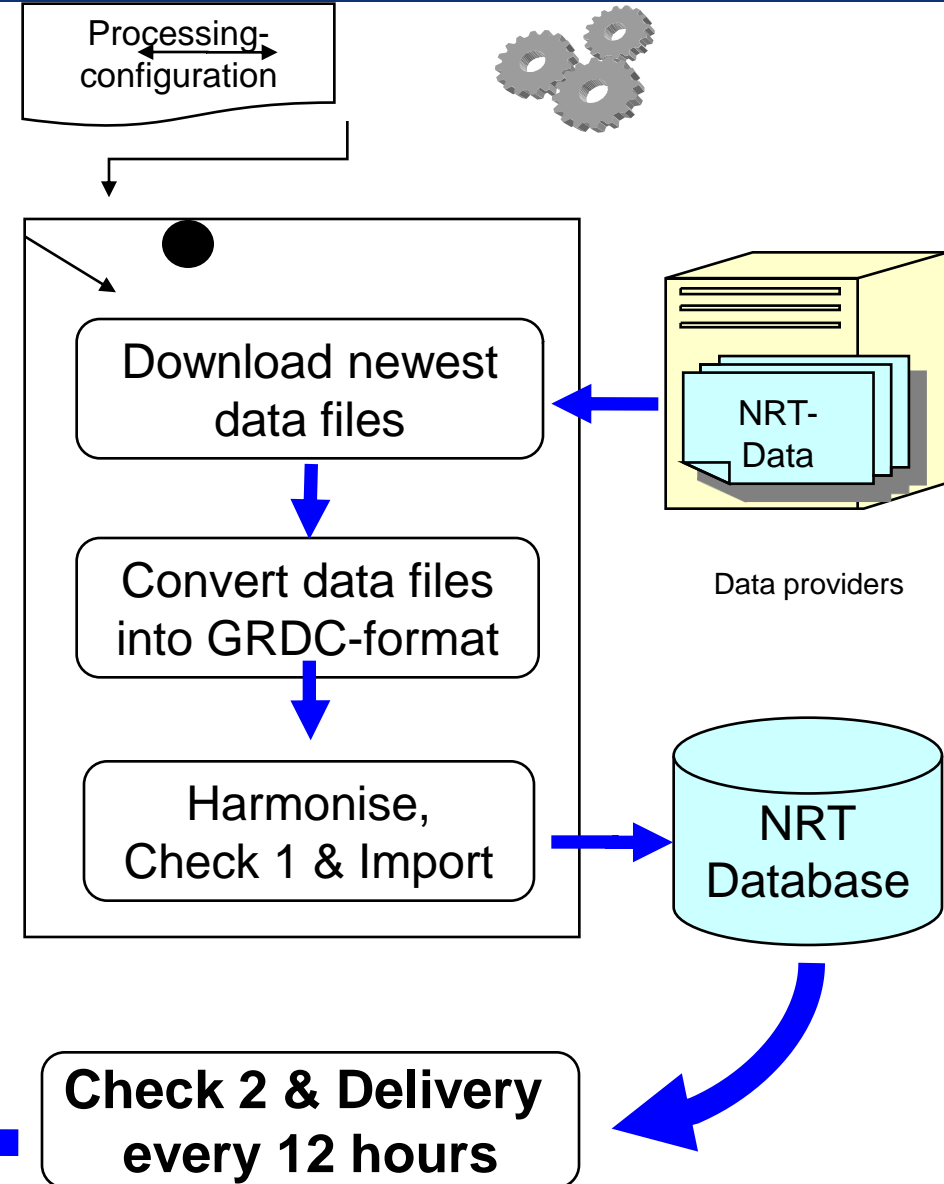
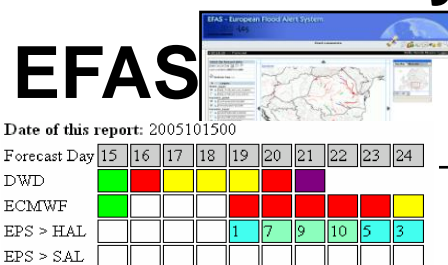
Currently
25 National
Organisations
informed

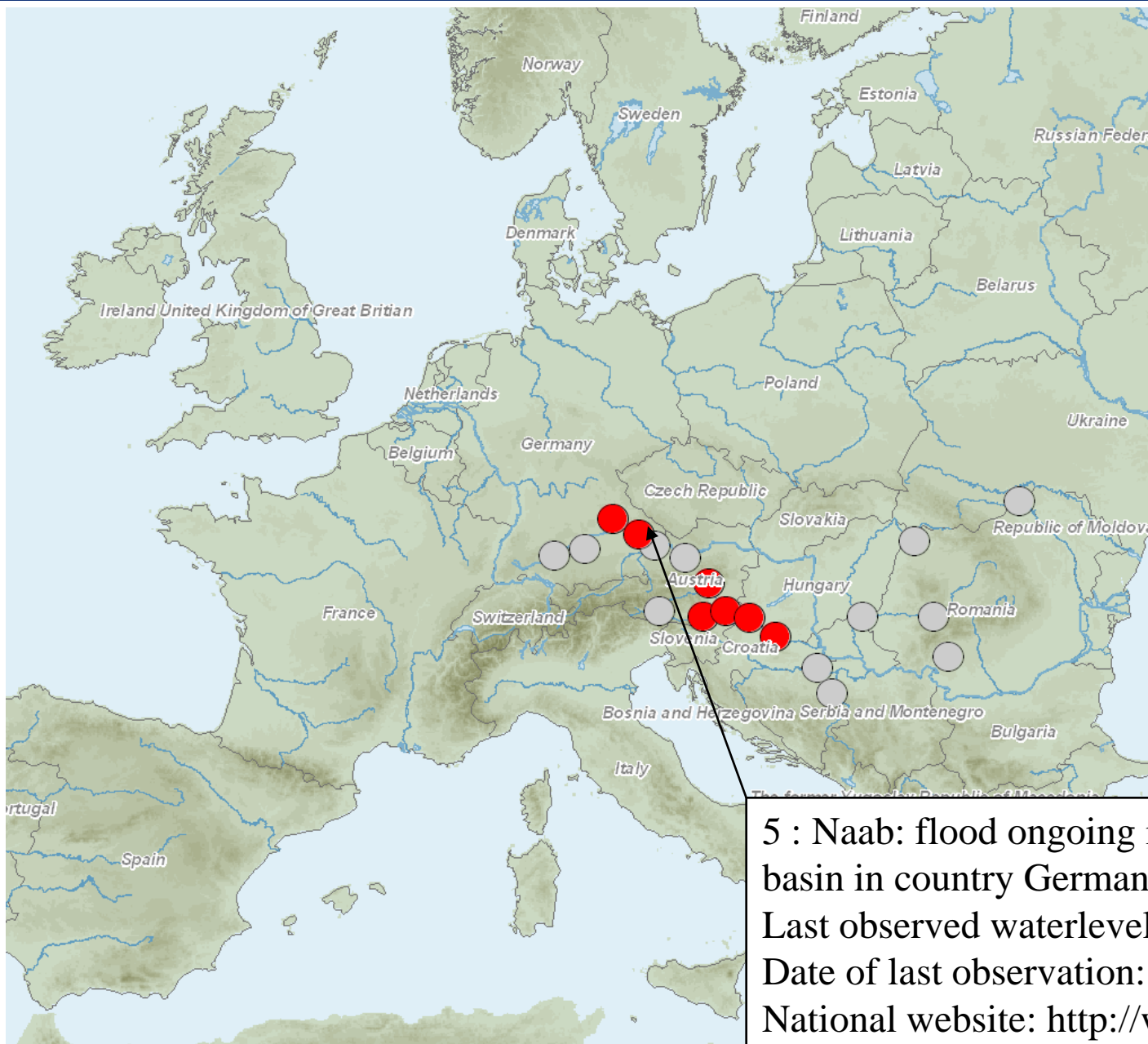


- **Romania/Moldavia/Ukraine**
 - End of July 2008
 - 2008-07-19/12 forecast Prut: 8 days before
 - Peak of the flood was 28-29 July in Prut
 - Warning sent on 21 July to Rumania, Moldavia, Hungary, Slovakia
 - Realtime satellite images provided to DG ENV MIC teams present in Moldavia/Ukraine
- **UK**
 - 2008-09-02/12 forecast for River Trent
 - 2008-09-03/12 also COSMO-LEPS now
 - Floods happened from the 5th onwards
 - No warning sent (no MoU)
- **Southern CH, northern IT**
 - 2008-09-03/12 Ticino forecast
 - Also with COSMO-LEPS forecasted for 6/7 Sep
 - No warning sent (very close to the event, COSMOLEPS recently over-predicting for the area)
 - Simplon, Nufuenen, Lukmanier passes closed 6/7 night for landslide risks
- **France**
 - Severe flash flooding occurred in Drome & Isere evening 4 Sep, night Sep
 - Scattered forecast: 2008-09-01/00
 - Also during next days
 - >> EFAS does not aim at flash flood forecasting (=National mandate)



- Operation in **near real-time**
- Automated **downloading**, **processing** and **harmonising**
- Basic **quality checking**
- Automated **delivery** to EFAS





Sources:

- Red dots (actual measurements):
 - ETN-R realtime river data (with GRDC, Koblenz)
 - **Webscraping (JRC)**
- Grey dots:
 - **EFAS estimations (JRC)**
- **Links to National Websites & Authorities will be provided**

5 : Naab: flood ongoing in river Naab, Danube, upper basin in country Germany.

Last observed waterlevel exceeds National Alert Level 2.

Date of last observation: 2008-10-08T09:00:00+01:00

National website: <http://www.nationalsite.de>

An on-line system that
gives an overview where
floods are predicted in the
next days.
Accessible 24/7

EFAS - European Flood Alert System



EFAS-IS --> Forecast

Select the forecast date:

2008-02-25 12
Last fully available: 2008022512

Redraw Map >>

Layers

Static_layer

- ☒ laea_9-48_esri_eu_country
- ☐ laea_9-48_esri_eu_urban

Dynamic_point

- ☒ DynPoints2008022512
- ☒ FixPoints2008022512

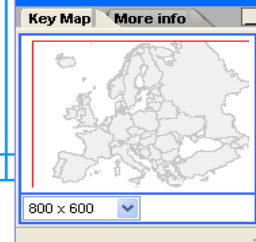
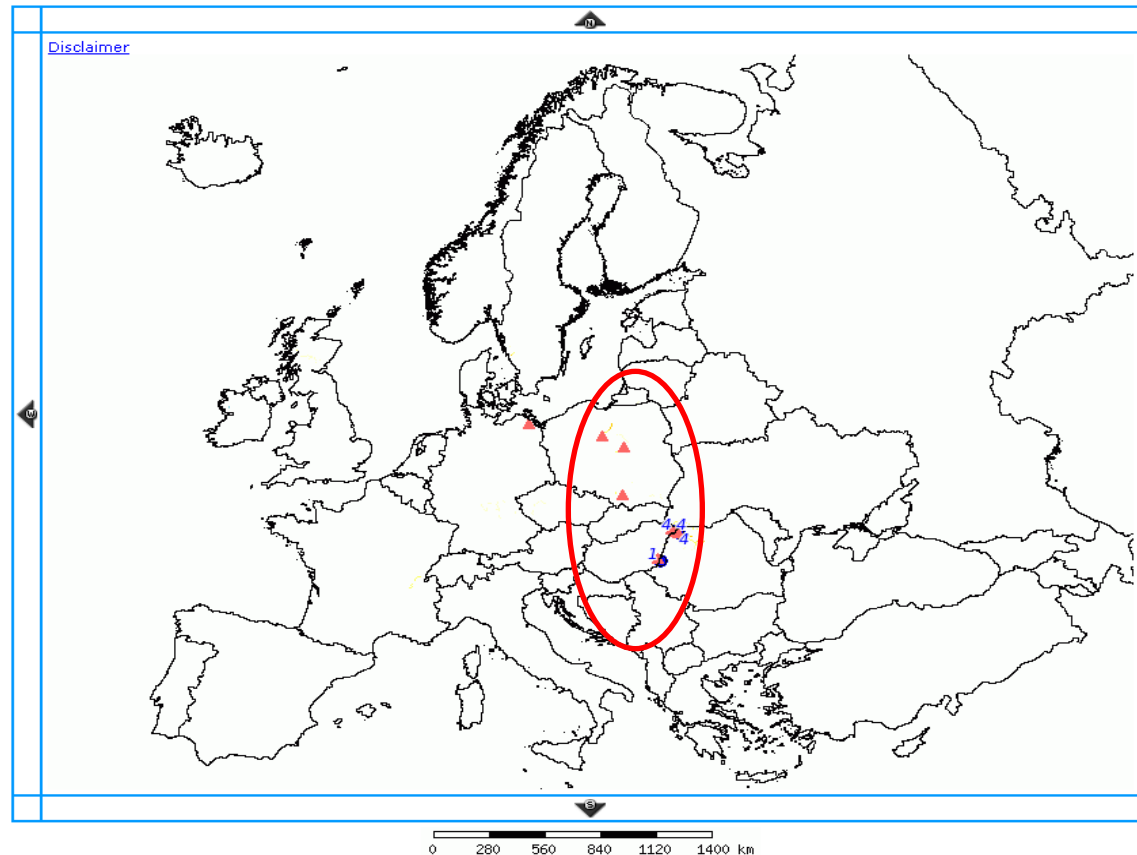
Dynamic_layer

- ☒ probGT48h2008022512
- ☒ probLT48h2008022512
- ☐ combHi2008022512
- ☐ combEx2008022512
- ☐ sumALEEUE2008022512
- ☐ sumALHEUE2008022512
- ☐ alEUD2008022512
- ☐ alDWD2008022512
- ☐ rainEUD2008022512
- ☐ rainDWD2008022512

Background_layer

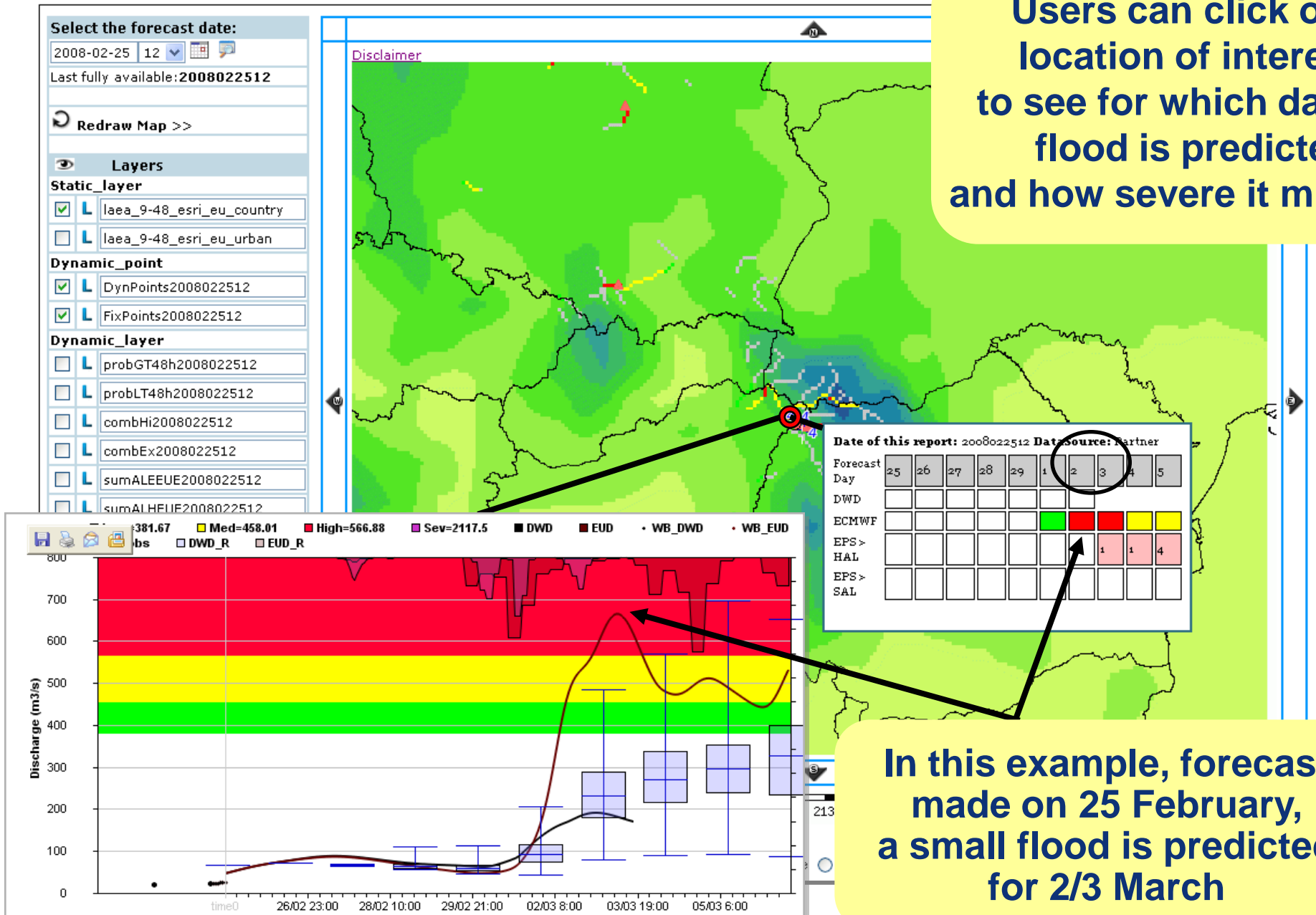
- ☐ laea_9-48_esri_eu_water
- ☐ Topography

Java Mode Disabled
Click to Enable

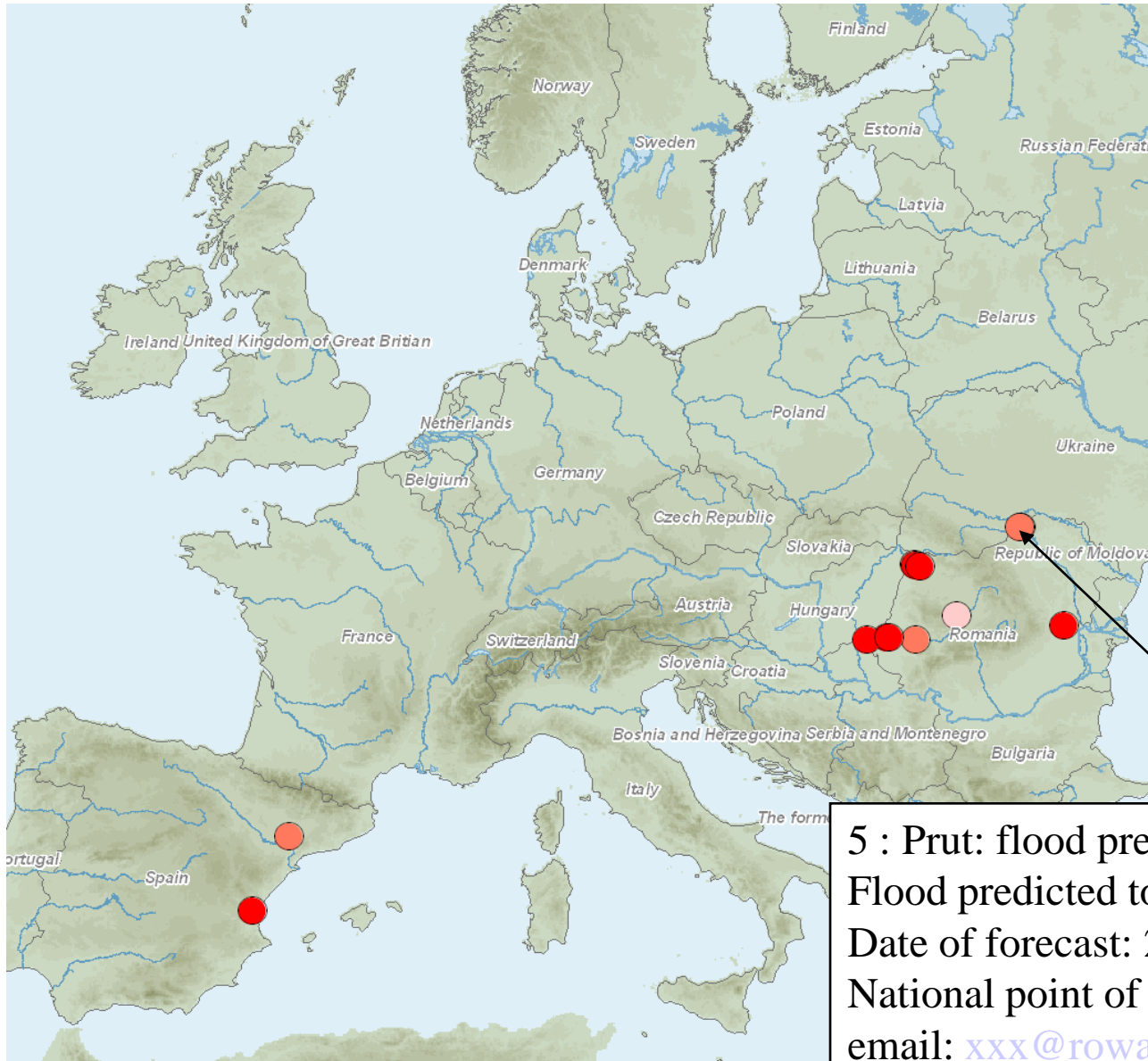


Zoom In Zoom Out Full View Recentre Query
Print 2 Zoom Factor

Users can click on a location of interest, to see for which day the flood is predicted and how severe it might be



In this example, forecast made on 25 February, a small flood is predicted for 2/3 March

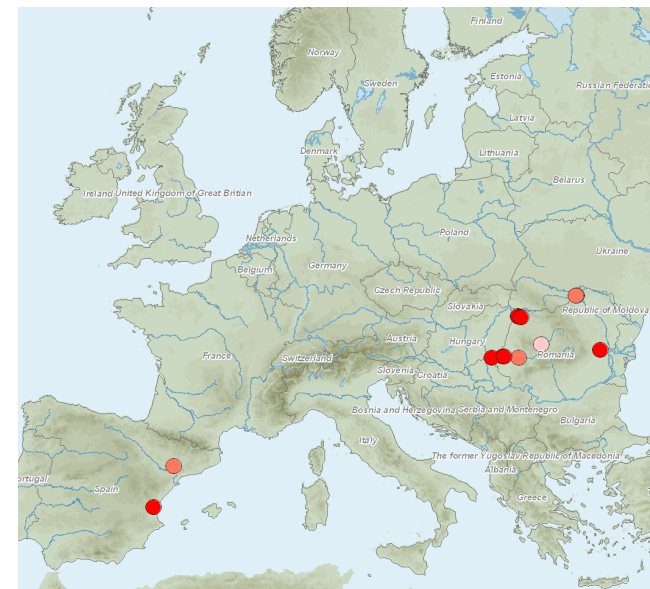


- **Dark red dots:**
 - Flood forecasted for 3-5 days from now
- **Light red dots:**
 - Flood forecasted for 6-8 days from now
- **Grey dots:**
 - Flood forecasted for 9+ days from now
- **Links to National Websites & Authorities will be provided**

5 : Prut: flood predicted for the river Prut in country Romania. Flood predicted to start D+6: 2008-10-01.
Date of forecast: 2008-09-25 00:00
National point of contact: Mr/Mrs XXX
email: xxx@rowater.ro <http://www.rowater.ro>

Bringing together pan-European information on:

- Ongoing floods
 - Through ETN-R data and web scraping
- Active national flood warnings
 - Through Meteoalarm (weblink)
- Early flood warnings (3 days and beyond)
 - Simplified warnings: restricted dissemination CP
 - Detailed EFAS info: restricted dissemination NHS
 - Archived forecasts: open access
- Maps of flood extent during disasters
 - Sources: Dartmouth, JRC, other
- Flood news/press items
 - Using JRC EMM tool, via EFAS
- Flood risk maps
 - Links to MS map sites, JRC
- Floods & climate change
 - Pan-European maps



Latest on-line news articles on flooding in Europe

Date published	Flood date	River	Country	Language	Title	Entered by
06-OCT-08	05-OCT-08 to 05-OCT-08	Severn	United Kingdom	English	Rivers burst banks after torrential rainfall	McCormick Niall
06-OCT-08	05-OCT-08 to 05-OCT-08	unspecified	United Kingdom	English	Heavy rain to raise flood fears	McCormick Niall
06-OCT-08	04-OCT-08 to 06-OCT-08	Prut	Romania	English	Rain and cold grip the nation	McCormick Niall
06-OCT-08	04-OCT-08 to 06-OCT-08	Prut	Romania	Rumanian	Code yellow alert for floods in 25 counties	McCormick Niall
30-SEP-08	29-SEP-08 to 29-SEP-08	unspecified	Spain	Spanish	Storm floods in Lucena: Another strong storm causes damage in the built-up area	McCormick Niall
30-SEP-08	28-SEP-08 to 29-SEP-08	unspecified	Portugal	Portuguese	District of Faro with Yellow warning: Floods in Quarteira and Albufeira	McCormick Niall
30-SEP-08	28-SEP-08 to 29-SEP-08	unspecified	Portugal	English	Flooding in Algarve	McCormick Niall
30-SEP-08	22-SEP-08 to 25-SEP-08	unspecified	Spain	Spanish	The Levant is suffering the worst floods in the past 20 years	McCormick Niall
30-SEP-08	22-SEP-08 to 25-SEP-08	unspecified	Spain	Spanish	Heavy rains cause destruction in the Levant and thunderstorms are expected for today	McCormick Niall



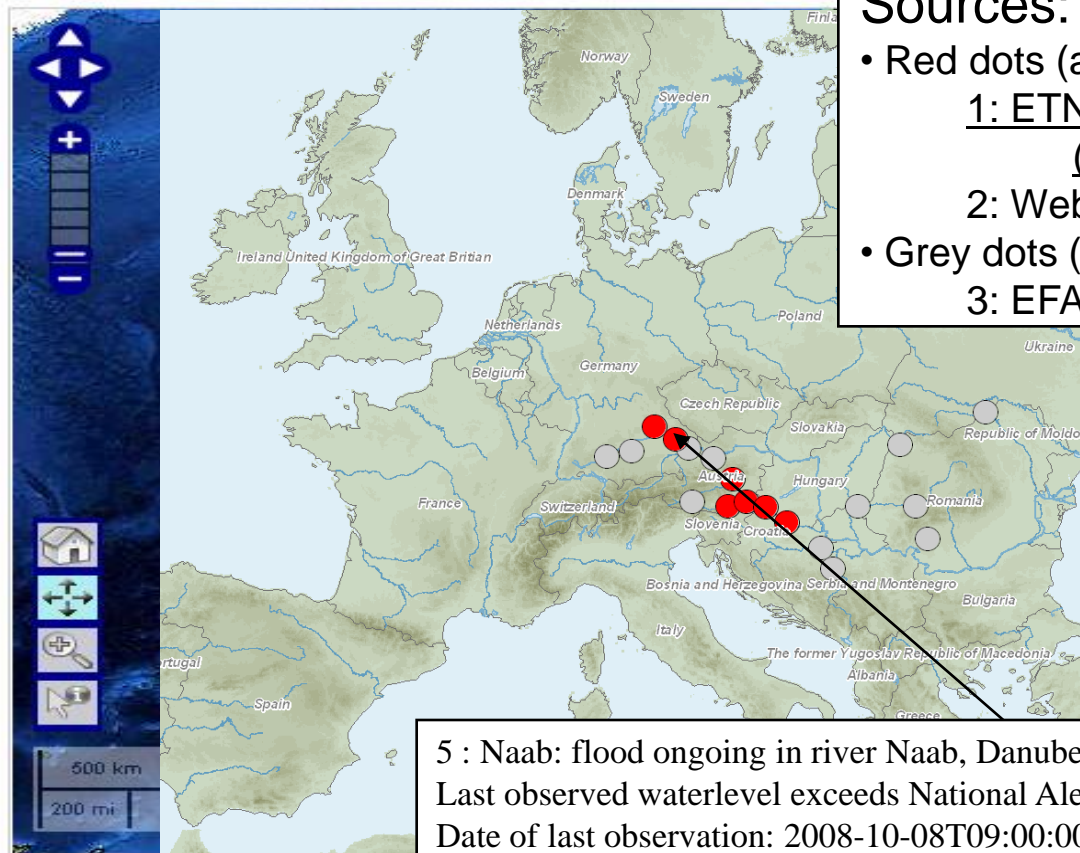
Floods

- **Current situation**
- National flood alerts
- EFAS early warnings
- Current news on floods
- Flood risk maps
- Floods and climate change
- Floods and land use change
- Flood research at JRC
- Publications
- Staff
- What's new

Burnt Area Query

Country:
Province:

Floods > Current situation



Sources:

- Red dots (actual measurements):
 - 1: ETN-R realtime river data (with GRDC, Koblenz)
 - 2: Webscraping (JRC)
- Grey dots (estimations):
 - 3: EFAS estimations (JRC)

5 : Naab: flood ongoing in river Naab, Danube, upper basin in country Germany.
Last observed waterlevel exceeds National Alert Level 2.
Date of last observation: 2008-10-08T09:00:00+01:00
National website: <http://www.national-site.de>

☒ Fire Danger Forecast

Today

Tomorrow

30/10

☐ Daily Modis

☐ Hot Spots (Last Update: 28/10 : 11:10)

☐ Burnt Areas (Last Update: 28/10 : 13:10)

Latest

Last 7 Days

All season

Last 7 Days

Last 30 Days

All season

Medium Risk

High Risk

Very High Risk

layer information

The EFAS Floods Portal brings together information on river floods and flood risk in Europe, resulting from ongoing research within the "Floods" Action at the Joint Research Centre of the European Commission, as well as from public available information from EU countries.



Floods

- Current situation
- **National flood alerts**
- EFAS early warnings
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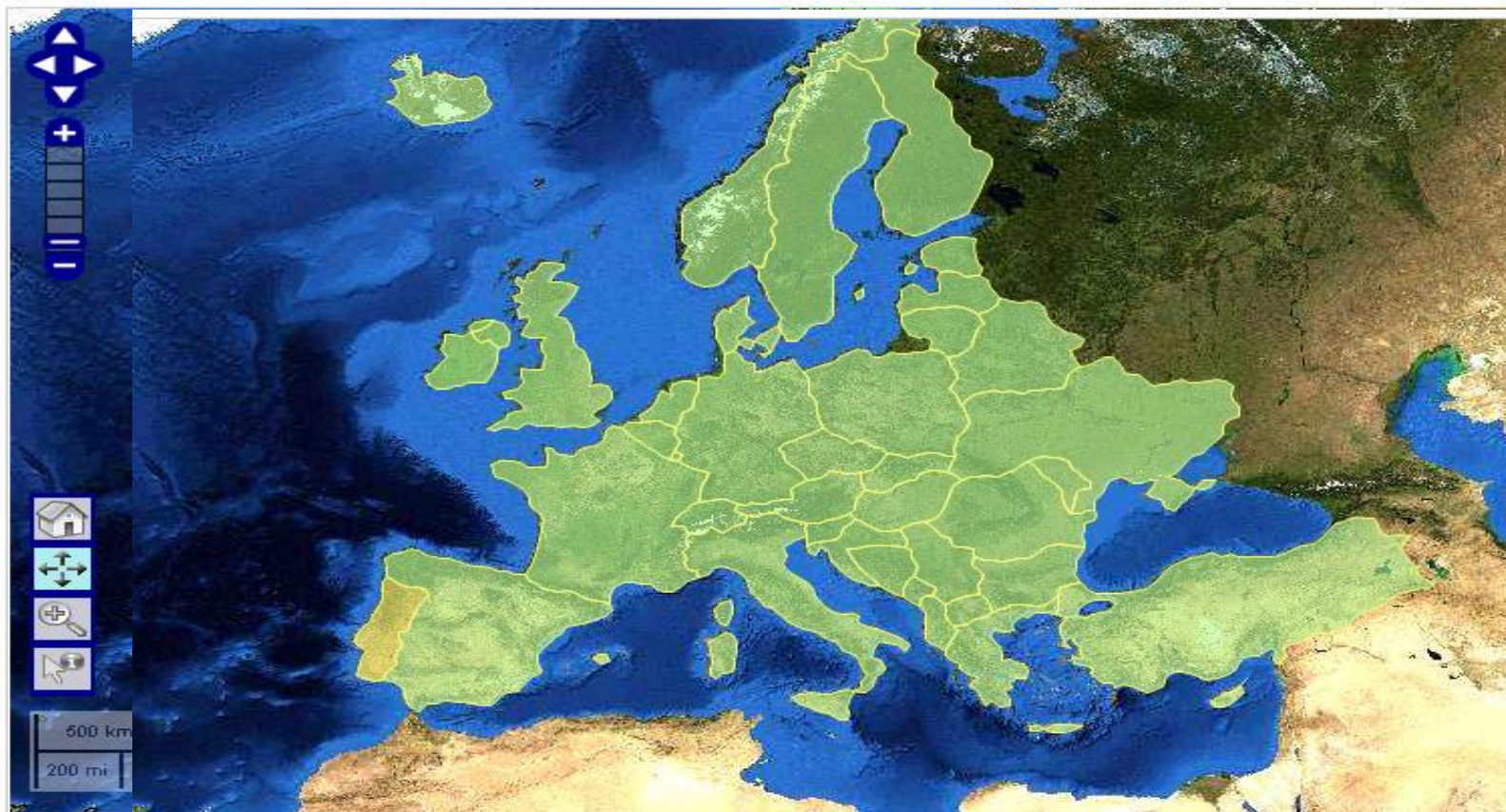
Burnt Area Query

Country:

Province:

Floods > National flood alerts

Tuesday 28th of October 2008



Upon click,
goto national/regional websites

Link to Meteoalarm
website

The EFAS Floods Portal brings together information on river floods and flood risk in Europe, resulting from ongoing research within the "Floods" Action at the Joint Research Centre of the European Commission, as well as from public available information from EU countries.



Floods

Floods > EFAS early warnings

Tuesday 28th of October 2008

- Current situation
- National flood alerts
- **EFAS early warnings**
- Current news on floods
- Flood risk maps
- Floods and climate change
- Floods and land use change
- Flood research at JRC
- Publications
- Staff
- What's new

Burnt Area Query

Country:

Province:

EFAS-IS --> Forecast

Forecast date
2008-10-28 00
Last fully available: 2008102800

Redraw Map >>

Layers

Static layers

☒ ? Country Borders

☐ ? Urban Areas

Flood Alert Points

☒ ? Dynamic Rep. Points

☒ ? Fixed Rep. Points

Flood Alert Layers

☒ ? Flood Probability > 48h

☒ ? Flood Probability < 48h

☐ ? Combined Det. High Alert

☐ ? Combined Det. Severe Alert

☐ ? No. EPS Above Severe

☐ ? No. EPS Above High

☐ ? No. COSMO Above Severe

☐ ? No. COSMO Above High

☐ ? Det. ECMWF

☐ ? Det. DWD

Meteorological Layers

☐ ? Acc. Precip. Det. ECMWF

☐ ? Acc. Precip. Det. DWD

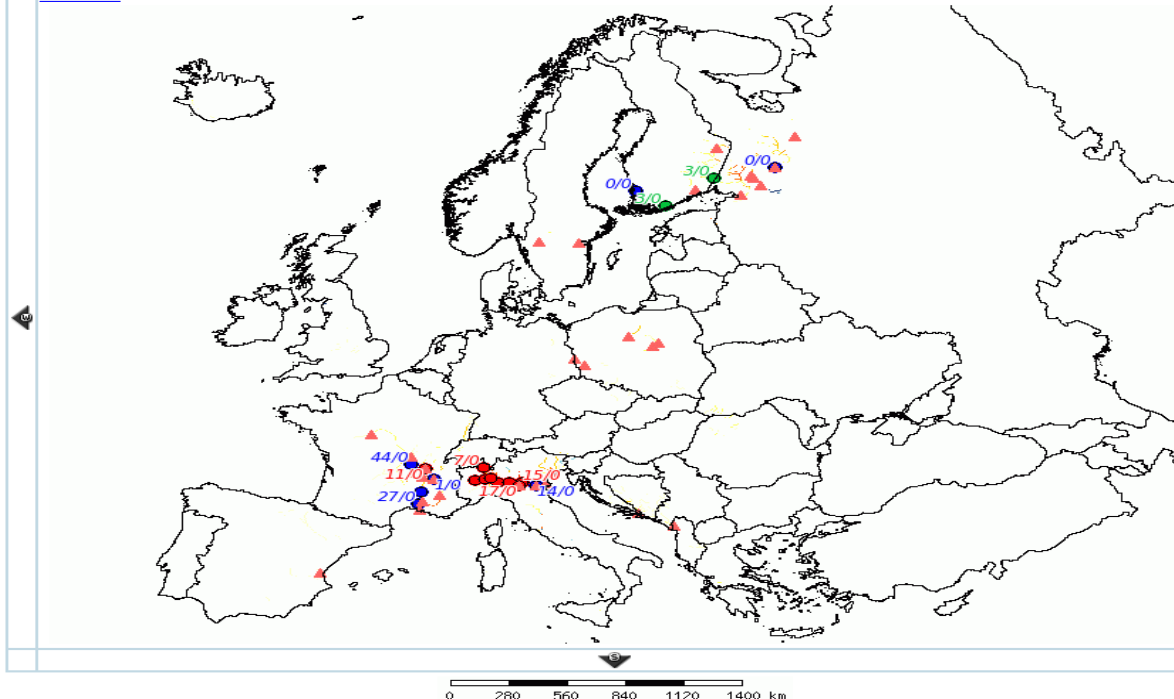
Background layers

☐ ? Major Rivers

☐ ? Topography

Java Mode Disabled
Click to Enable

[Disclaimer](#)



Zoom In Zoom Out Full View Recentre Query


Note:

EFAS active early warnings
are accessible only for EFAS members
(national and regional hydrological services).
They will take appropriate action
in each individual EU country

Public access is granted to archived flood warnings,
older than 2 weeks

EFAS Login:
Username:
Password:

The EFAS Floods Portal brings together information on river floods and flood risk in Europe, resulting from ongoing research within the "Floods" Action at the Joint Research Centre of the European Commission, as well as from public available information from EU countries.

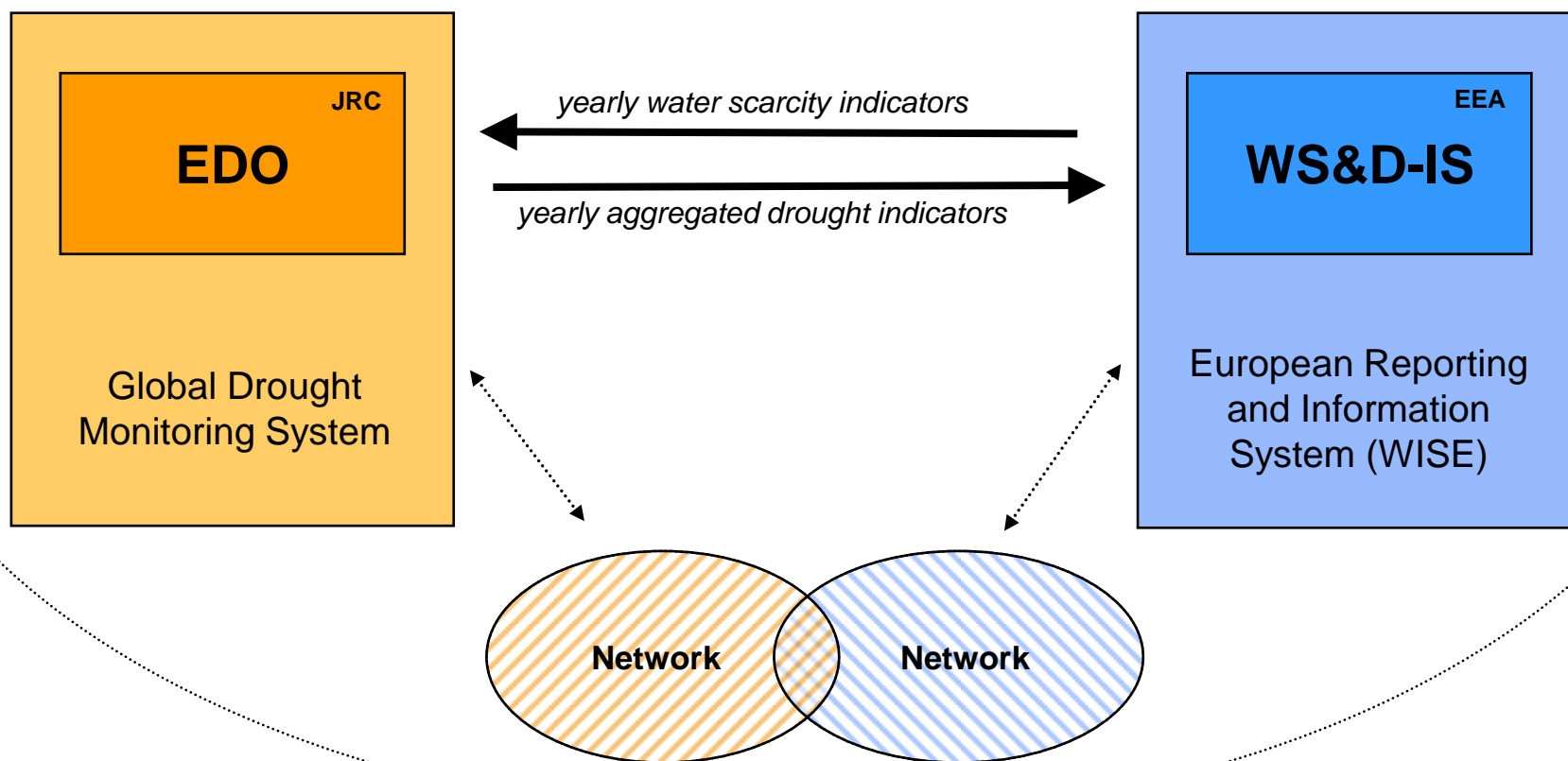
- Today EFAS is in a research pre-operational phase.
It is planned to be officially operational by ~2011 (GMES, DG ENV, JRC?)
 - Currently, a number of countries have shown interest in running an operational EFAS:
 - SMHI (SE)
 - SMHU (SK)
 - Waterdienst (RIZA) (NL)
 - APAT (IT)
 - ECMWF
 - JRC
 - EFAS will be run at the Joint Research Centre (JRC) until then; JRC has also interest in running it operationally itself
 - EFAS is already part of the ICPDR Danube Flood Action Plan, as one of the measures implemented; also linked to the Elbe-IKSE Action Plan
 - EFAS might be part of other Flood Action Plans, made in the framework of the EU Flood Directive
- 
- EFAS info will be a part of a Floods portal with all sorts of flood info collected at one place

EDO

European Drought Observatory

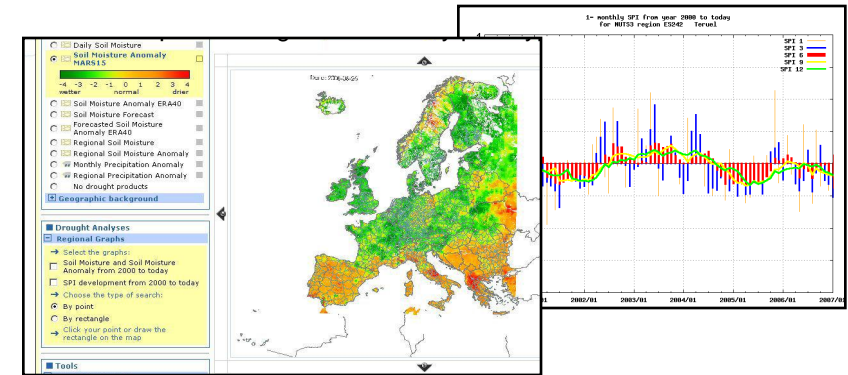
- **WWW-based platform** for drought monitoring, detection, and forecasting
- **Multi-scale approach**, integrating continental (EU), national (MS), regional, and river basin scale information
- **Real-time** monitoring and **forecasting** products for preparedness and early warning
- **Commonly agreed** set of **products** that are produced routinely on all spatial scales e.g. SPI, Q95, soil moisture anomaly, ...
- **Decentral data** holding and management, but **direct linking and exchange** between different levels by common standards & formats
 - **Allows for seamless up- and downscaling, comparison, analysis, and validation**
 - **Implementation based on INSPIRE principles**
- A **knowledge-based platform** for discussion and exchange
 - **Regular feedback process between all levels for comparison and improvement**
 - **Annual user community workshops**

Communication on Water Scarcity and Drought



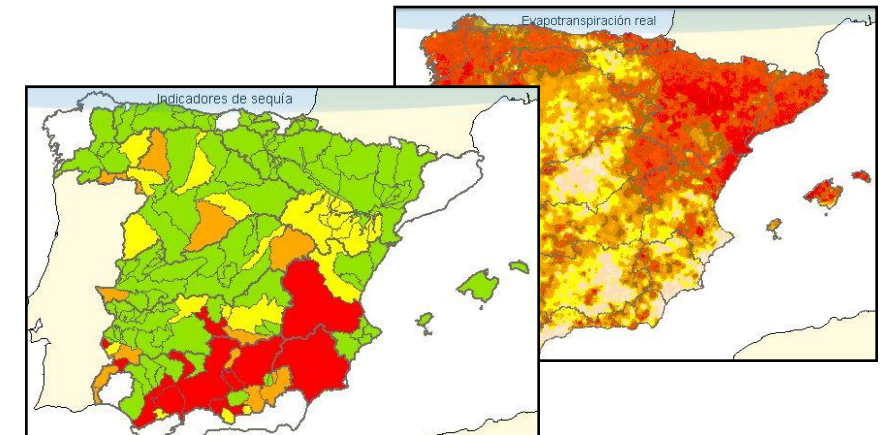
Joint Research Centre

- Drought Monitoring and Forecasting
- SPI monitoring
- fAPAR anomaly
- Soil Moisture anomaly and forecasting



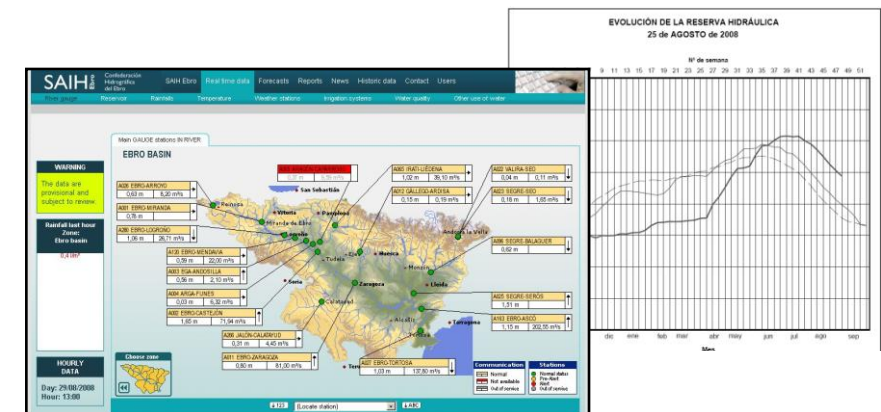
Ministerio de Medio Ambiente (MARM)

- Observatorio Nacional de la Sequía
- Sistema Integrado de Información del Agua (SIA)
- e.g. drought indicator, actual ET, ...



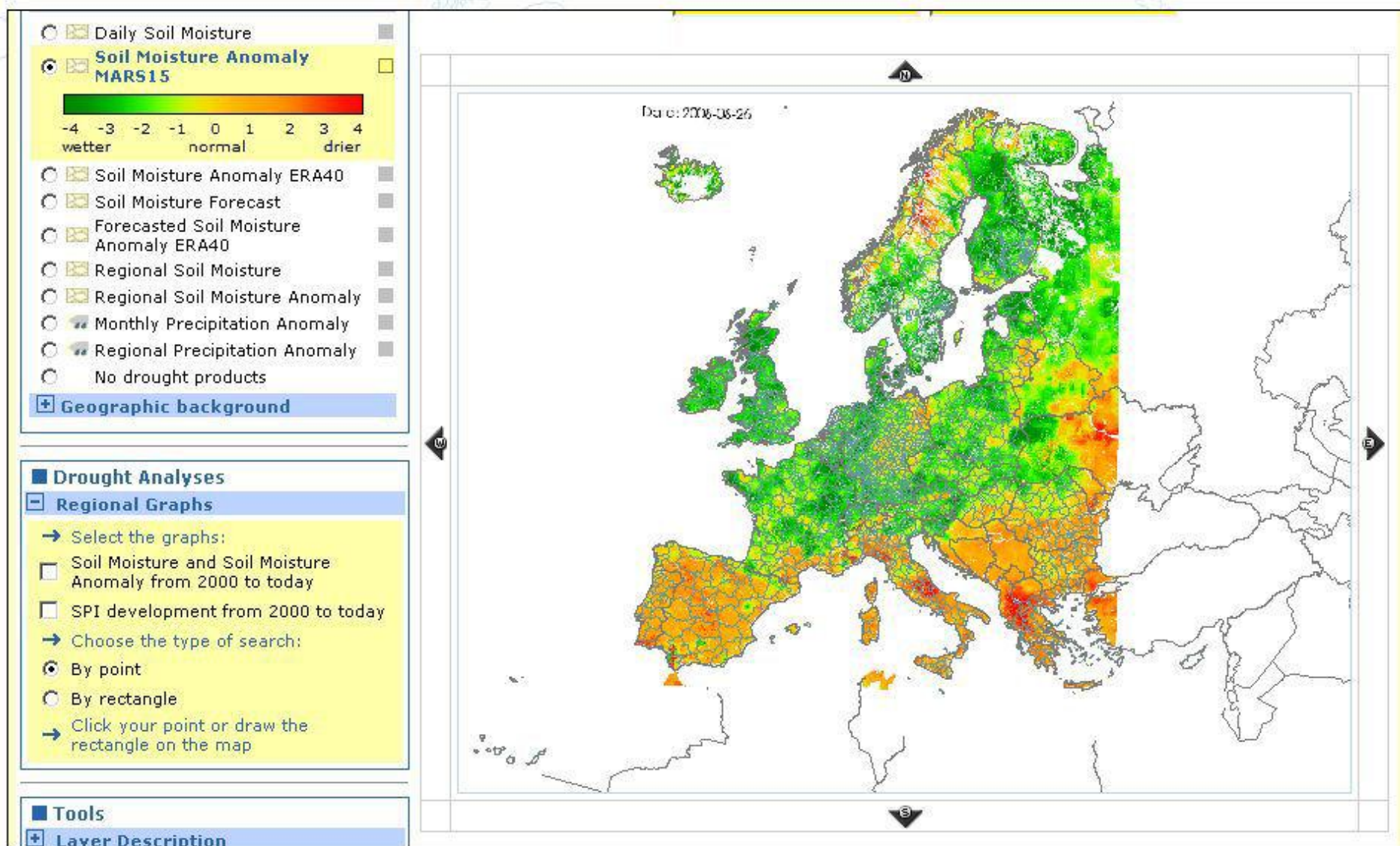
Confederación Hidrográfica del Ebro

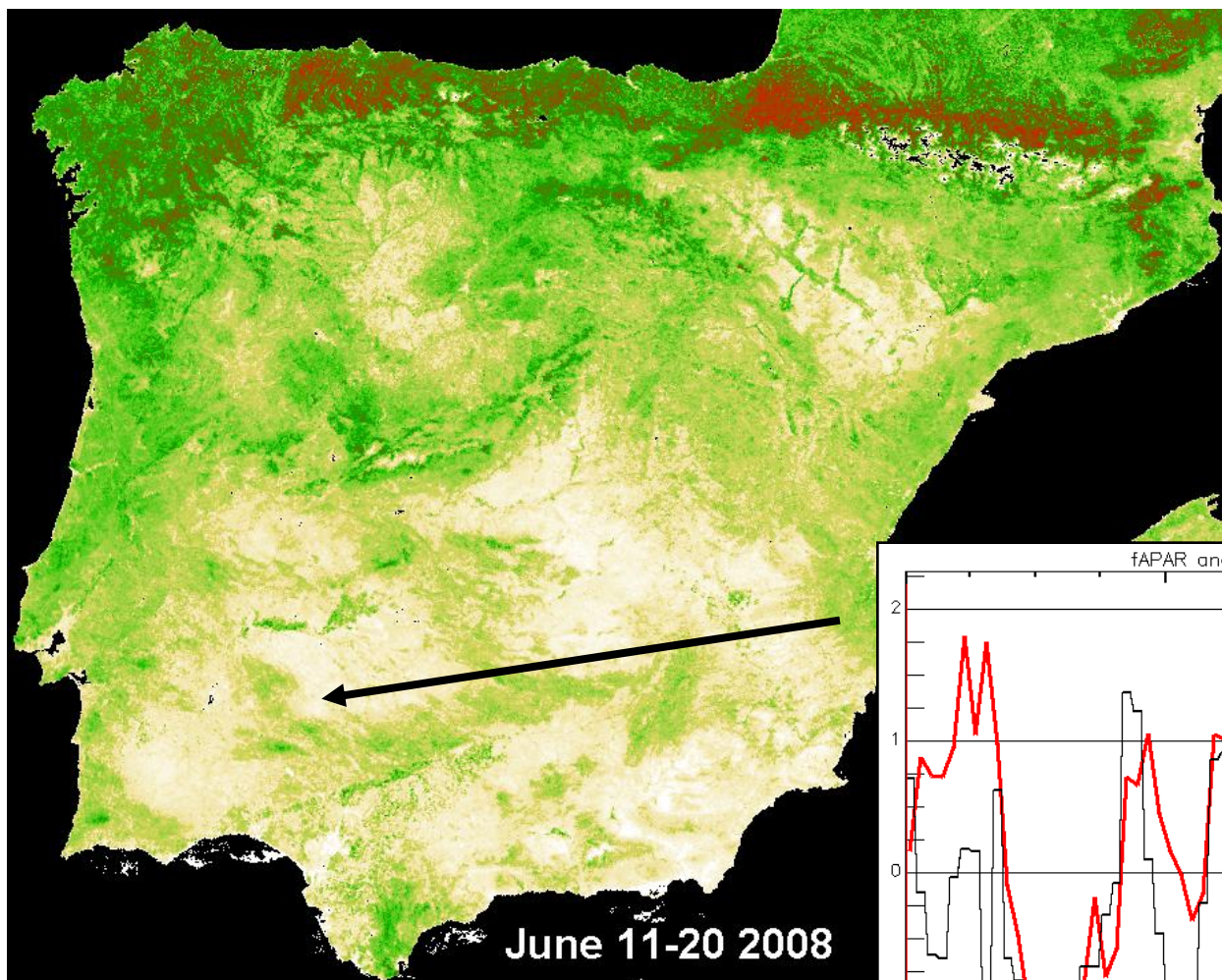
- SAIH Ebro, SITEbro
- Evolución de la reserva hidráulica



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

...coming soon!

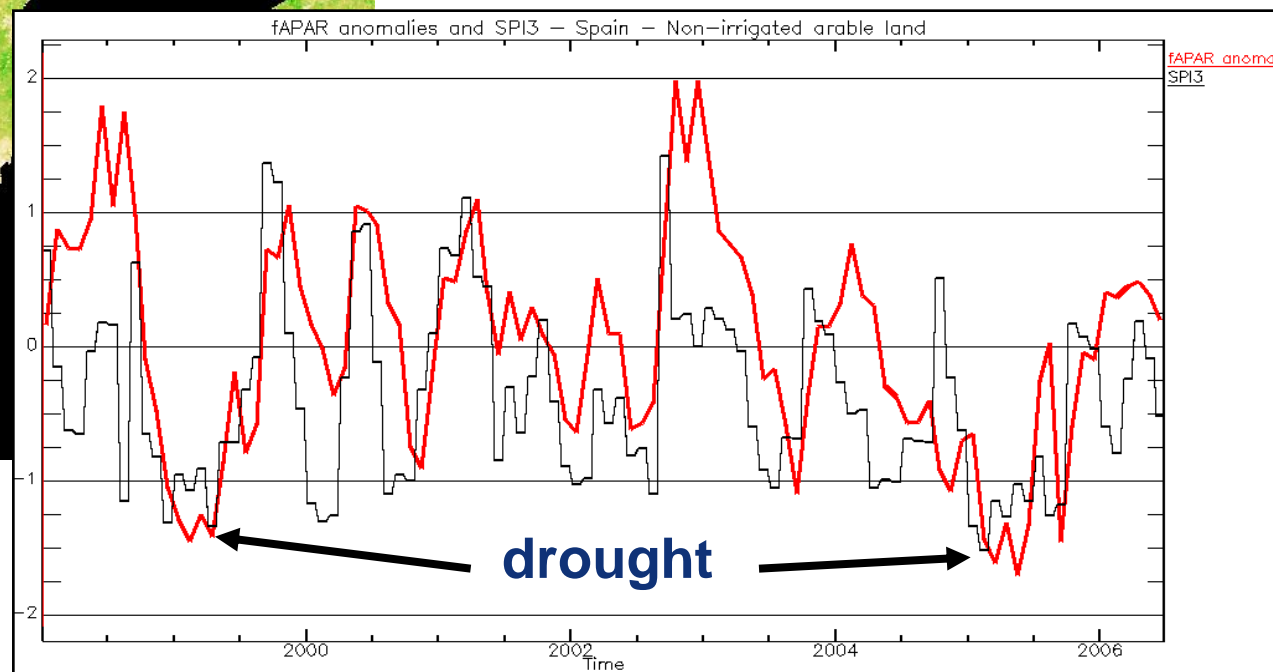


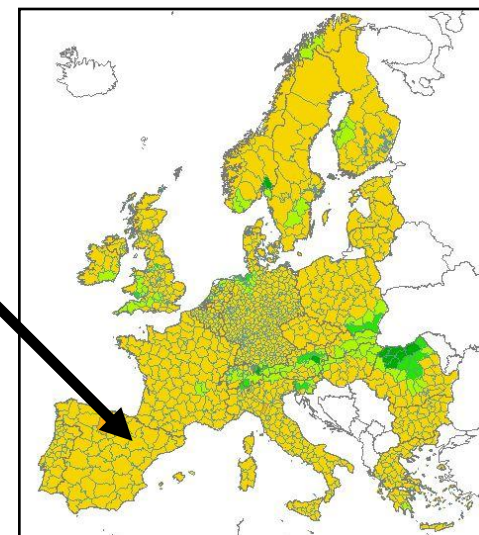
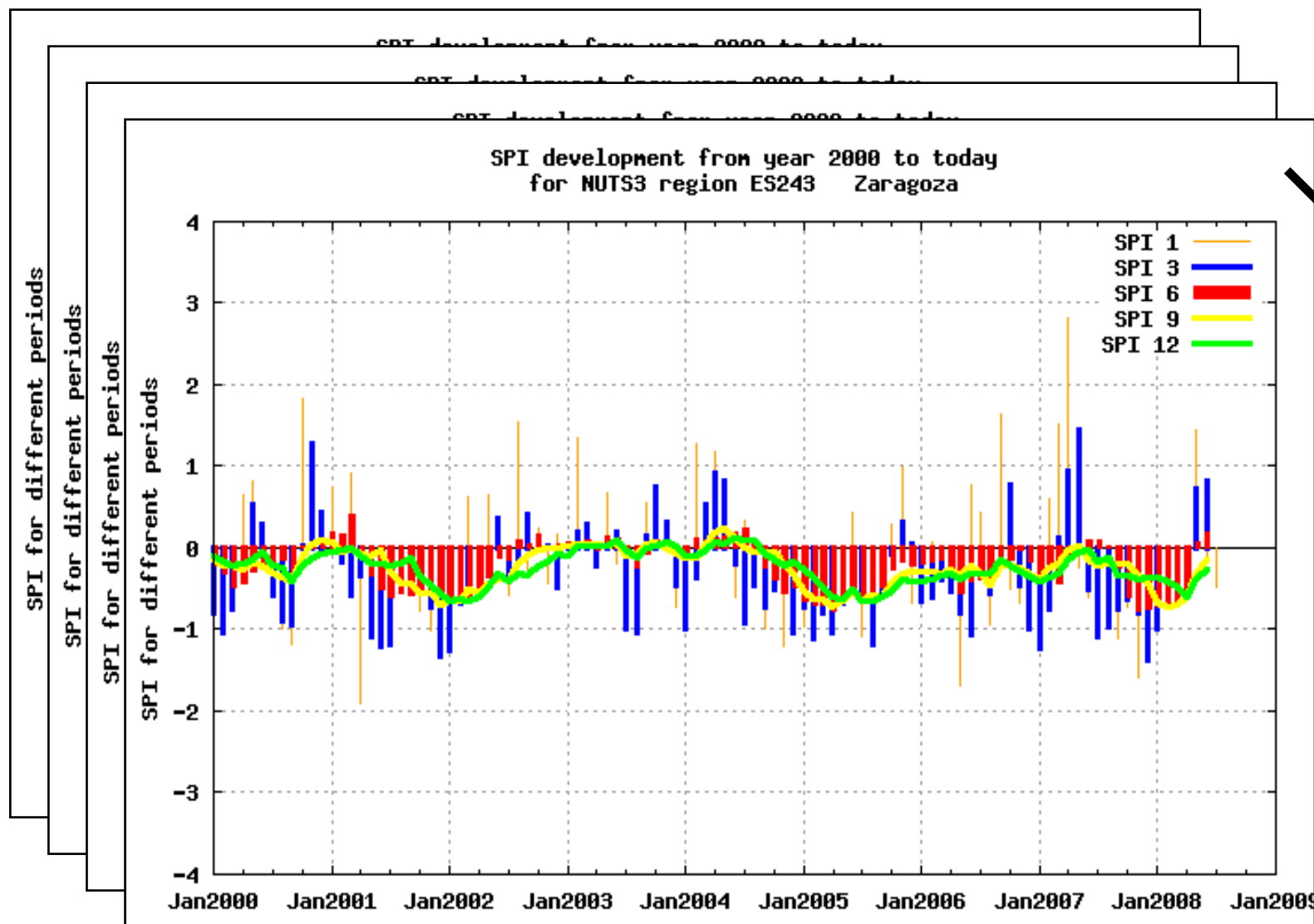


**fAPAR Anomaly 1999-2006
compared to SPI-3**

**fAPAR for Spain derived
from ESA ENVISAT/MERIS**

**June-August 2008
(10-day periods)**



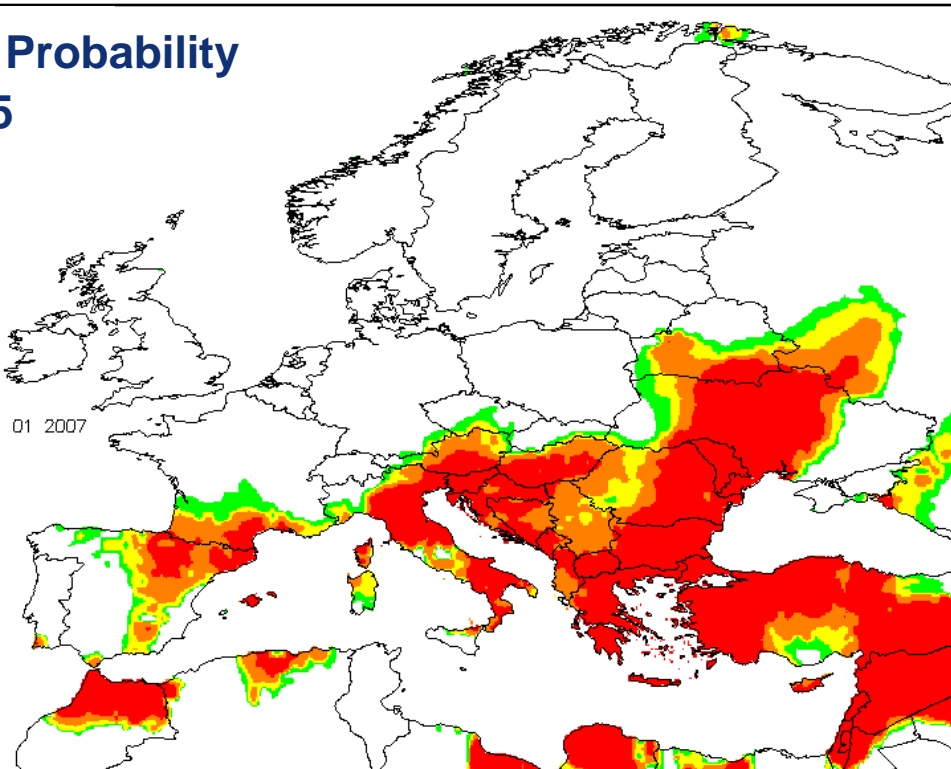


*Time series are
calculated for all
NUTS3 regions.*

Forecasted Probability for SPI < -1.5

03 month(s) forecasted SPI: 01 2007

- 1) 0%–20%
- 2) 21%–40%
- 3) 41%–60%
- 4) 61%–80%
- 5) 81%–100%



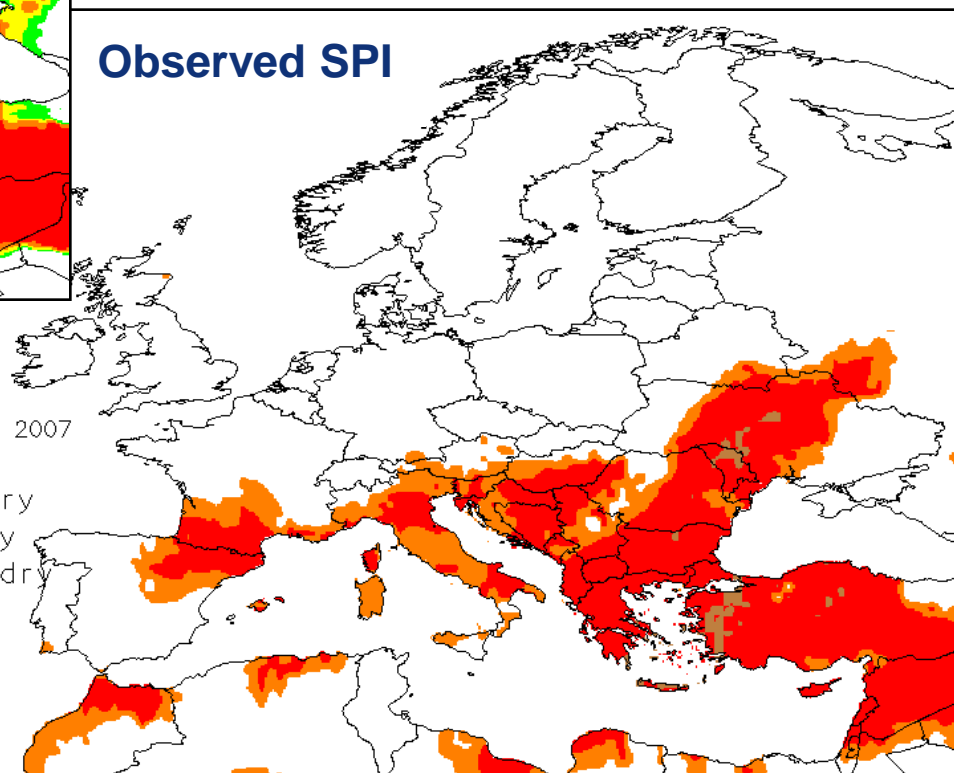
1-month Probabilistic Forecast of SPI-3

January 2007

Observed SPI

03 month(s) SPI: 01 2007

- 1) extreme dry
- 2) severe dry
- 3) moderate dry
- 4) normal



**Probability that SPI-3 for the next
month is “severe dry” or worse**

... still experimental!

Portal for **European Drought Observatory to be released** in autumn 2008
(<http://edo.jrc.ec.europa.eu>)

System Development

- Start-up with the pilot version of EDO
- European overview level
- Stepwise integration of drought information from pilot MS
- Bottom-up approach, increasing level of complexity

Research and Development

- Drought indices (development, testing, validation)
- Drought forecasting (monthly forecast products)
- Data exchange, standards and protocols (EUROGEOSS project)

Networking

- EEA: exchange of data and indicators,
- EU scientific community (e.g., XEROCHORE, EUROGEOSS, ...)
- Global exchange and networking (e.g., US NDMC, UNCCD, GEO, SWALIM, ...)
- Regular consultation with national and regional stakeholders

Thank you !



For further Information on EFAS:

<http://natural-hazards.jrc.it>

<http://efas.jrc.it>

ad.de-roo@jrc.it