



European Flood Alert System (EFAS)

European Drought Observatory (EDO)

Update March 2010



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Juergen Vogt, Stefan Niemeyer
European Commission – Joint Research Centre
In collaboration with: ECMWF & GRDC



EDO
update

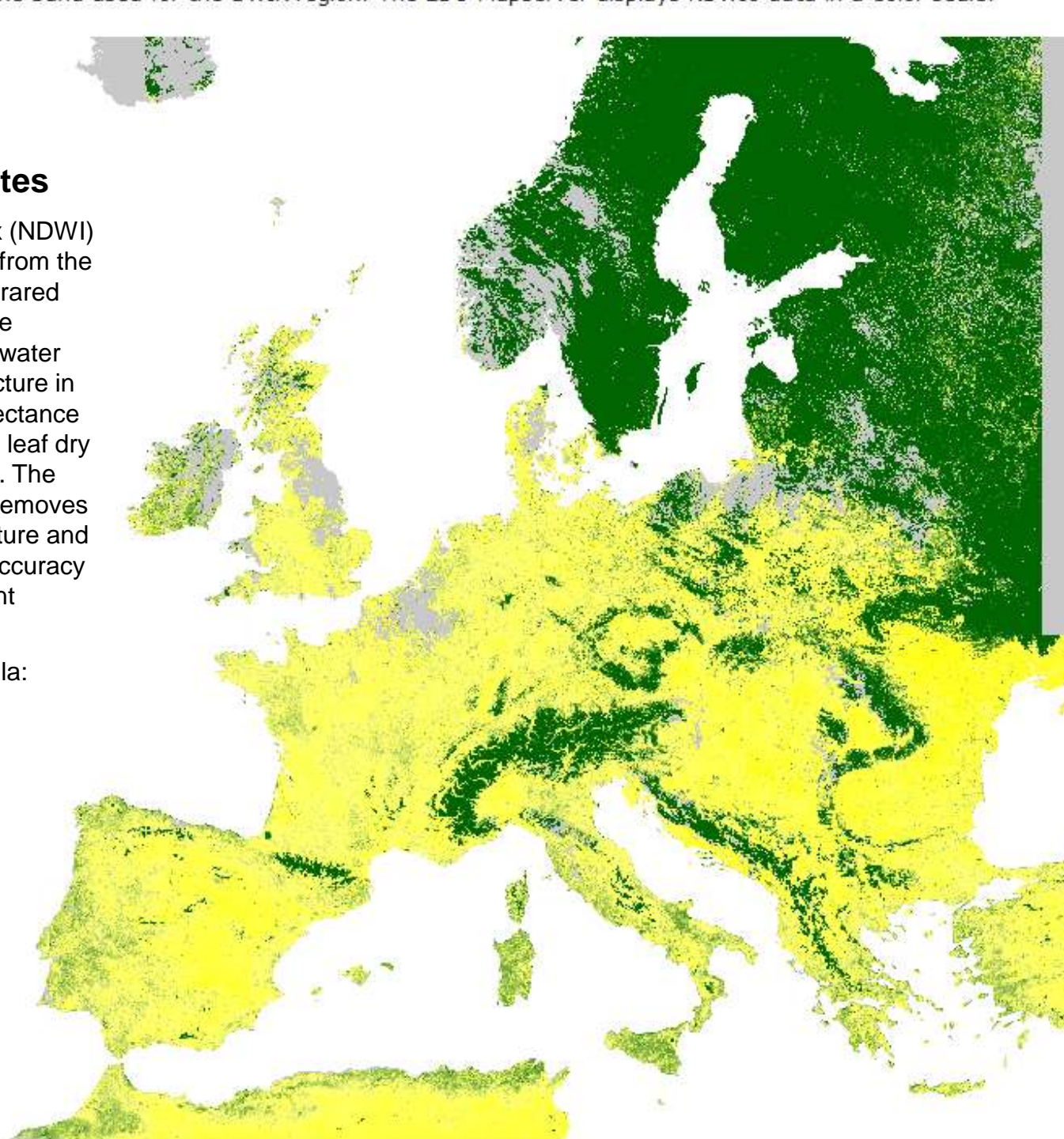
	TAPAR
	TEAM
	PUBLICATIONS
	LINKS

NDWI 10-day daily composites

The Normalized Difference Water Index (NDWI) (Gao, 1996) is a satellite-derived index from the Near-Infrared (NIR) and Short Wave Infrared (SWIR) channels. The SWIR reflectance reflects changes in both the vegetation water content and the spongy mesophyll structure in vegetation canopies, while the NIR reflectance is affected by leaf internal structure and leaf dry matter content but not by water content. The combination of the NIR with the SWIR removes variations induced by leaf internal structure and leaf dry matter content, improving the accuracy in retrieving the vegetation water content (Ceccato et al. 2001).

NDWI is expressed with a simple formula:

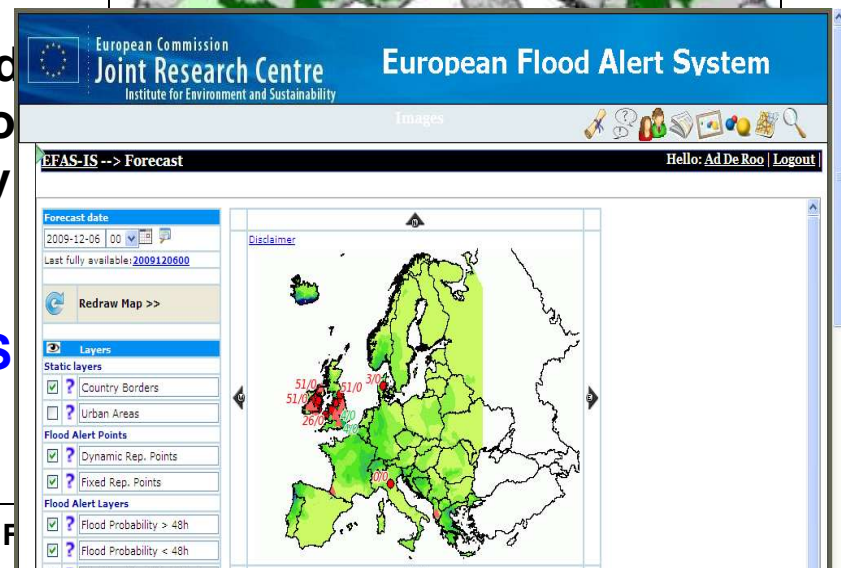
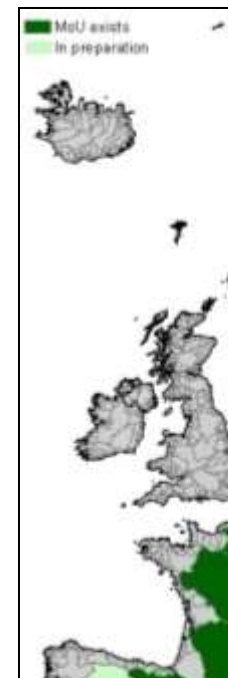
$$NDWI = \frac{(\rho_{NIR} - \rho_{SWIR})}{(\rho_{NIR} + \rho_{SWIR})}$$



EFAS
update

European Flood Alert System (EFAS)

- Run at EC-Joint Research Centre
- developed since 2002; **pre-operational** since 2005
- currently 25 partner water authorities in Europe
- **probabilistic flood alert system**, for **river basins larger than 4000km²**, with **extended lead time** up to 15 days (most success with 4-5 day leadtimes)
- Based on state of the art ensemble weather forecasts (120 forecasts used daily), satellite and ground observation
- **complementary system** to the already existing national systems
- **TWICE DAILY UPDATED**
- **ON-LINE ACCESS FOR AUTHORITIES**
- **EMAILS SENT WHEN FLOOD IS FORECASTED**





Images



EFAS-IS --> Forecast

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Forecast date

2009-12-06 00

Last fully available: [2009120600](#)



Redraw Map >>



Layers

Static layers

- ☒ ? Country Borders
- ☐ ? Urban Areas

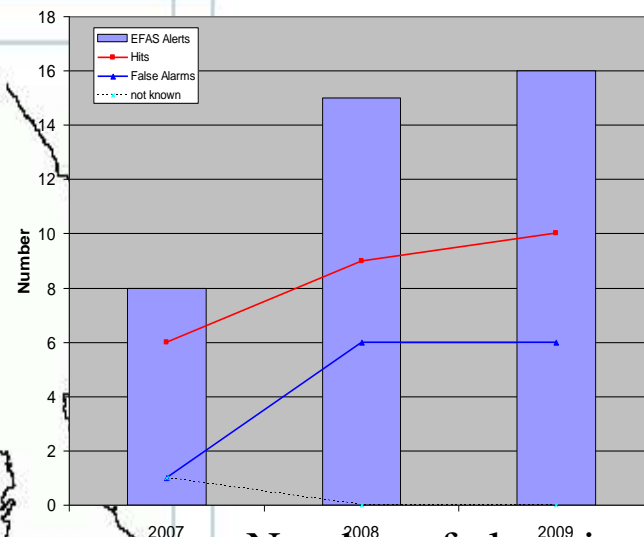
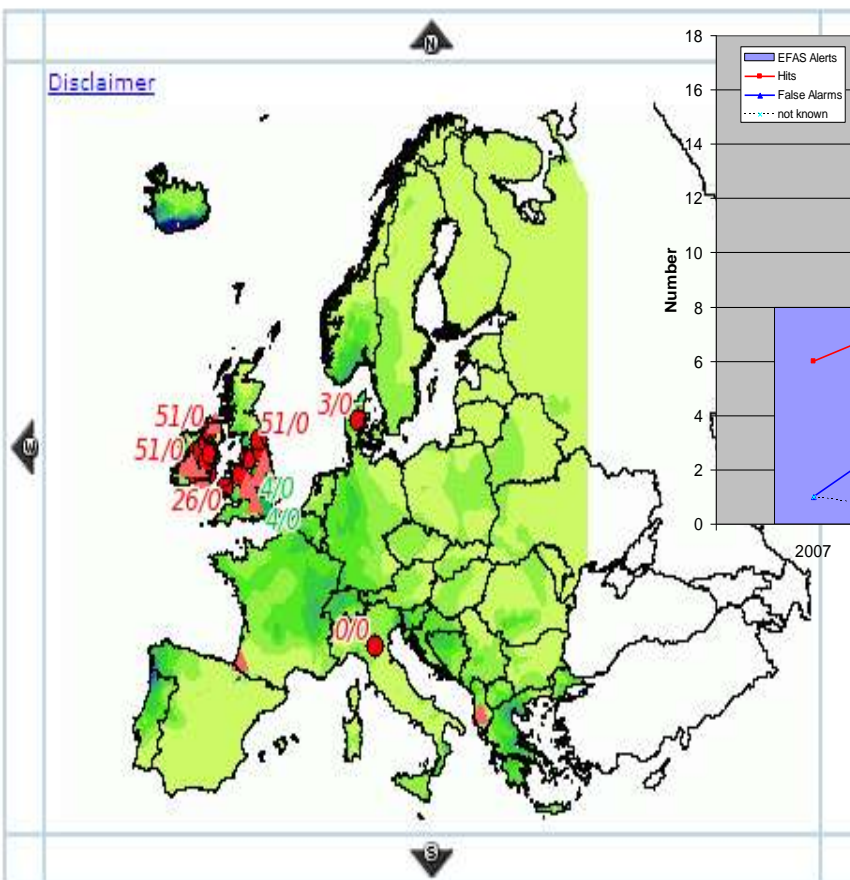
Flood Alert Points

- ☒ ? Dynamic Rep. Points
- ☒ ? Fixed Rep. Points

Flood Alert Layers

- ☒ ? Flood Probability > 48h
- ☒ ? Flood Probability < 48h
- ☐ ? Combined Det. High Alert
- ☐ ? Combined Det. Severe Alert

[Disclaimer](#)



Number of alerts is increasing

More hits than false alarms

Hit-rate: 60-70%



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- ▶ Ongoing floods
 - ▶ Global Ongoing Floods
 - ▶ Global Disaster Alert and Coordination System
- ▶ National flood information
- ▶ EFAS Flood forecasts
- ▶ Current news on floods
- ▶ Climate change impact assessment
- ▶ Flood risk
- ▶ Land use modeling and natural hazards

Information

- ▶ Flood research at JRC
- ▶ EFAS documents
- ▶ LISFLOOD Model
- ▶ Publications
- ▶ Team
- ▶ Job Opportunities
- ▶ Useful links

Select the ETNR data

- 2010
- 2009
- latest_output_etnr

Ongoing floods ▲

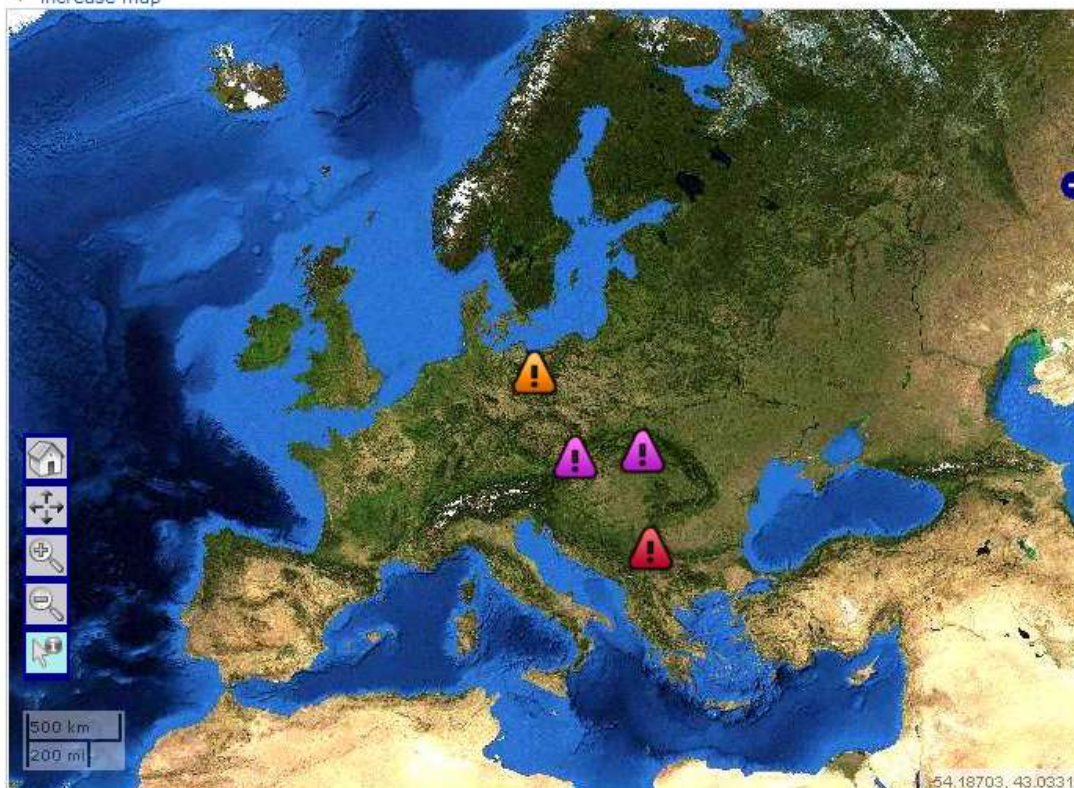
Based on a close collaboration with European Hydrological Services and the [Global Runoff Data Centre \(GRDC\)](#) in Koblenz, Germany, an overview of the current floods in Europe is made through the [European Terrestrial Network for River Discharge \(ETN-R\)](#).

The map is based on near-realtime river measurements, automatically transferred by the National Hydrological Centres, via the GRDC, to the JRC.

The map shows the locations, where river levels exceed critical thresholds.

Click on the following link/s representing the measurement hours on **Friday 26th of March 2010**: 06; 12; 00;

◀ increase map





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Friday 26th of March 2010

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Welcome to EFAS-IS Portal

The disastrous floods in the Elbe and Danube river basins in August 2002 were a wake up call for Europe that flood forecasting can not only be dealt with on regional and national level, but that efforts are needed to bridge communication between different authorities across the borders.

It was also recognised that trans-national floods may need longer warning times to be efficiently addressed.

The European Commission acted with the launch of the European Flood Alert System (COM(2002)-481), that is being developed at the Joint Research Centre in close collaboration with the National flood forecasting centres in the member states as well as several meteorological services.



Dresden
train station during the 2002
floods; photo with courtesy of U.
Höhne



The European Flood Alert System (EFAS) – increased preparedness for floods

- Flood warning information up to 10 days in advance. The information is designed to be complementary to national operational flood forecasting information and is distributed to the EFAS partner network twice a day through this password protected webpage
- European overview of ongoing and forecasted floods providing the European Commission with useful information for the preparation and management of aid during flood crises
- Application of state of the art weather forecasts and novel methods in probabilistic flood forecasting
- Research applied to practical operations

EFAS products are regularly reviewed by the EFAS partner network which currently consists of 24 National flood forecasting centres across Europe. EFAS is currently under development at the European Commission Joint Research Centre.

More detailed information on EFAS and the JRC activities on floods can be found on <http://natural-hazards.jrc.ec.europa.eu/> and <http://efas.jrc.ec.europa.eu/>

If you need more information contact [EFAS Team](#).

Last Updated on Wednesday, 17 March 2010 16:54



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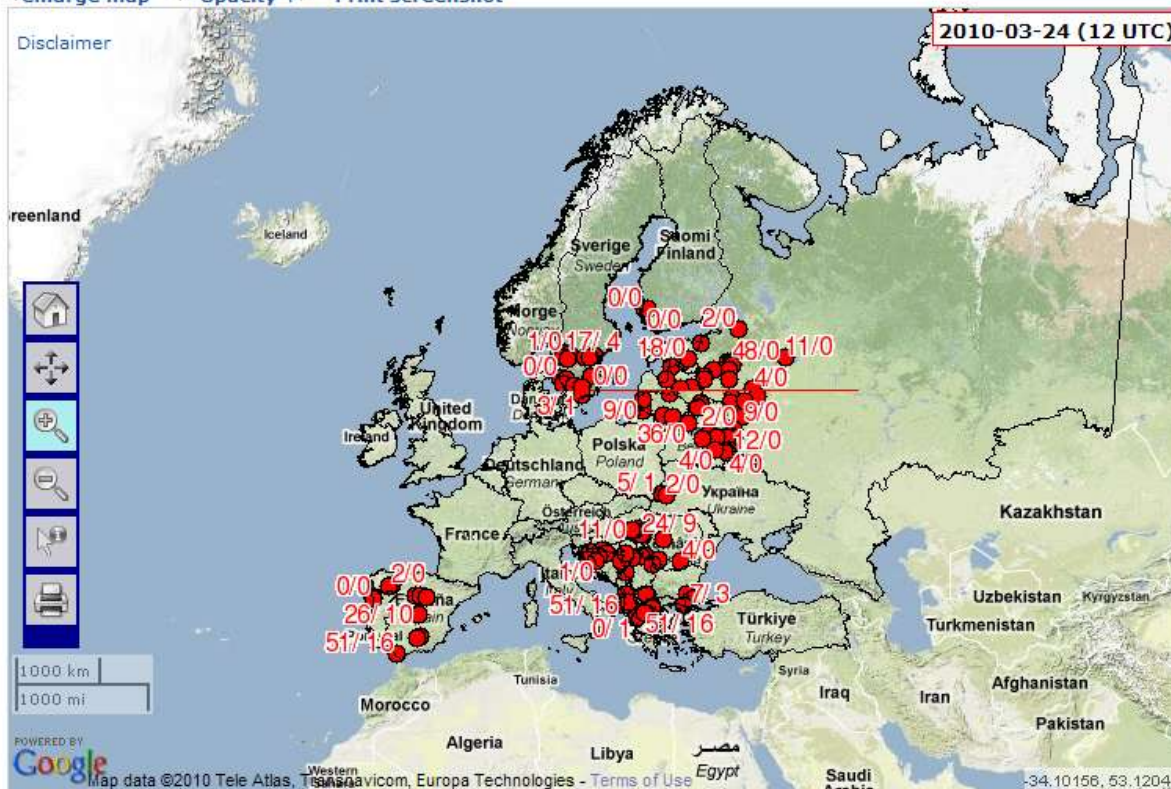
EFAS forecasting

EFAS forecasts available from **2010-03-07** to **2010-03-24**

◀ enlarge map ◀ - Opacity + ▶ Print screenshot

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2010-03-24 (12 UTC)



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 Select layers

Select the date

2010-03-24

12

Background layers

☒ Country Borders☐ Urban Areas☐ Major Rivers☒ Google background

General layers

☒ Reporting Points High

☐ Reporting Points Medium☒ Flood Probability > 48h

 Flood Probability < 48h

☐ Real-time hydrographs

 Expert layers

☐ 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☐ Acc. Precip. Det. ECMWF☐ Acc. Precip. Det. DWD



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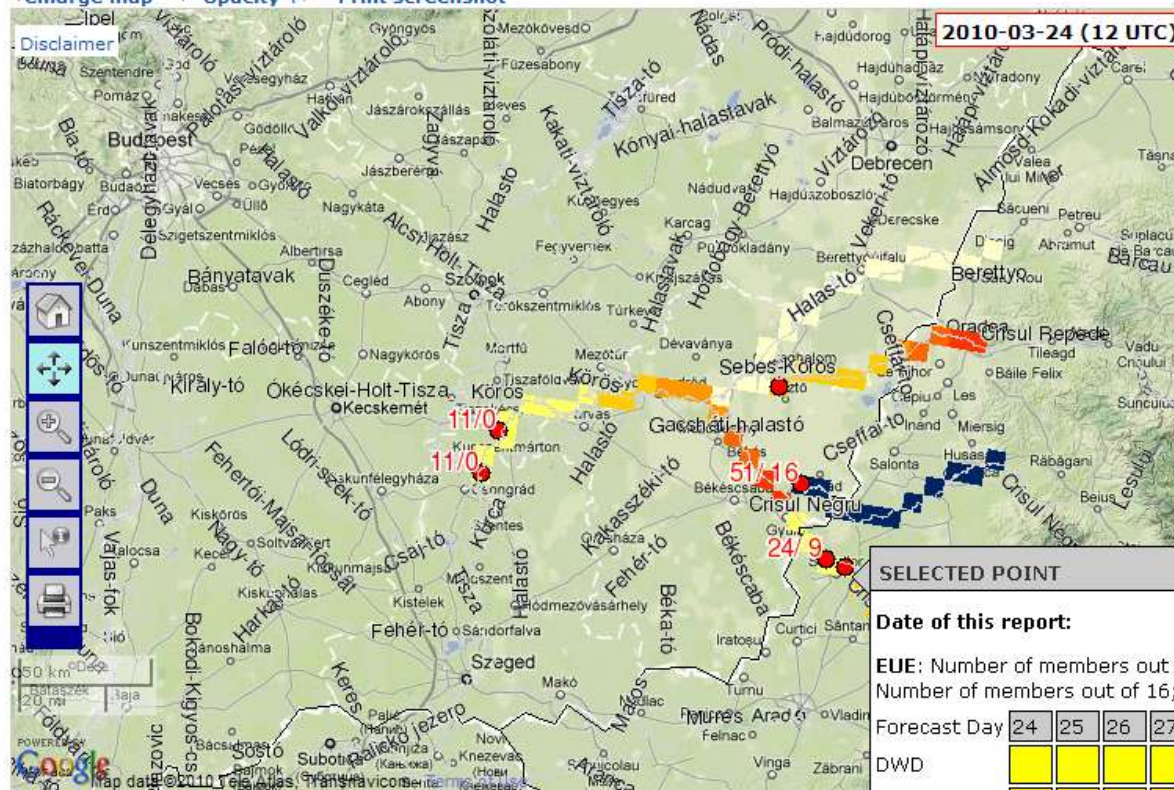
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EFAS forecasting

EFAS forecasts available from **2010-03-07** to **2010-03-24**

[enlarge map](#) [Opacity +](#) [Print screenshot](#)



SELECTED POINT

Date of this report: 2010032412
DataSource: Test

EUE: Number of members out of 51; COS:
Number of members out of 16;

Forecast Day	24	25	26	27	28	29	30	31	1	2
DWD										
ECMWF										
EUE > HAL					4	24	23	17	14	11
EUE > SAL						1	3			1
COS > HAL					7					
COS > SAL										

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Select the date

2010-03-24 12

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- ☐ Combined Det. Severe Alert
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- ☐ No. EPS Above High
- ☐ No. COSMO Above Severe
- ☐ No. COSMO Above High
- ☐ Det. ECMWF
- ☐ Det. DWD
- ☐ Acc. Precip. Det. ECMWF
- ☐ Acc. Precip. Det. DWD



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- ☐ Acc. Precip. Det. DWD

DET. ECMWF

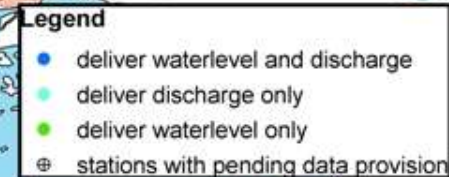
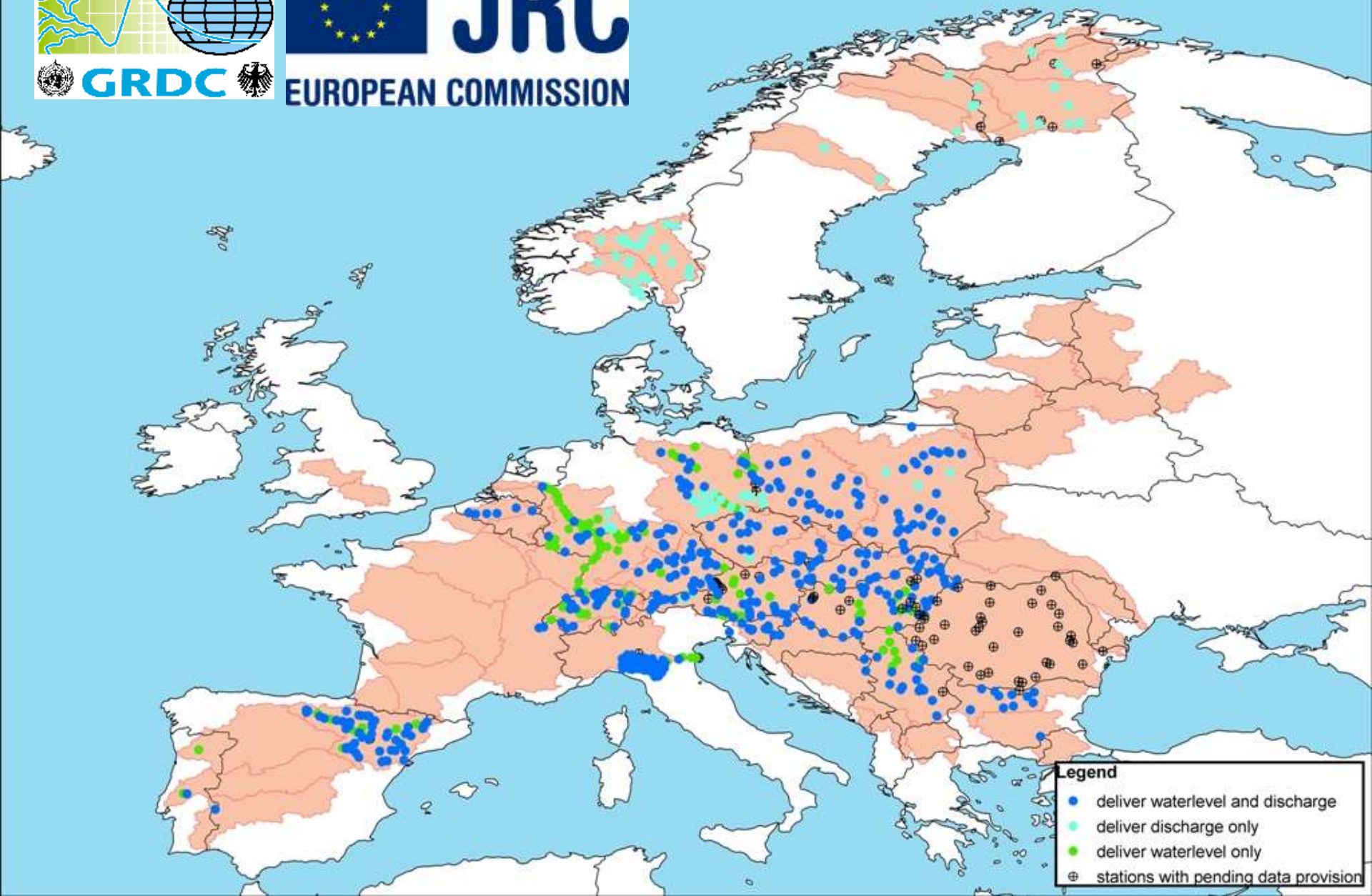
Legend

- Severe
- High
- Medium

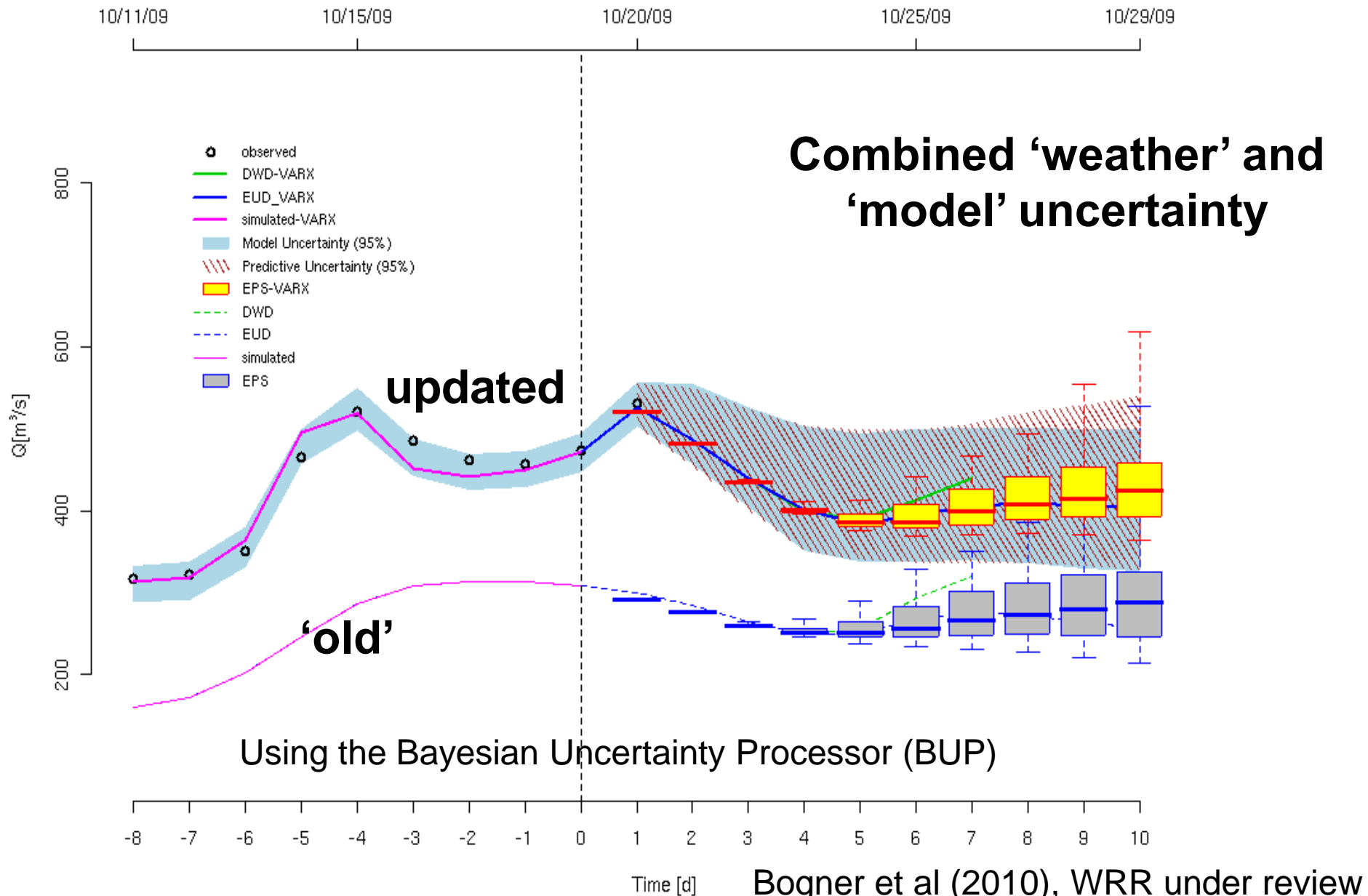
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EFAS discharge forecast error correction in near-real time with observed river discharges





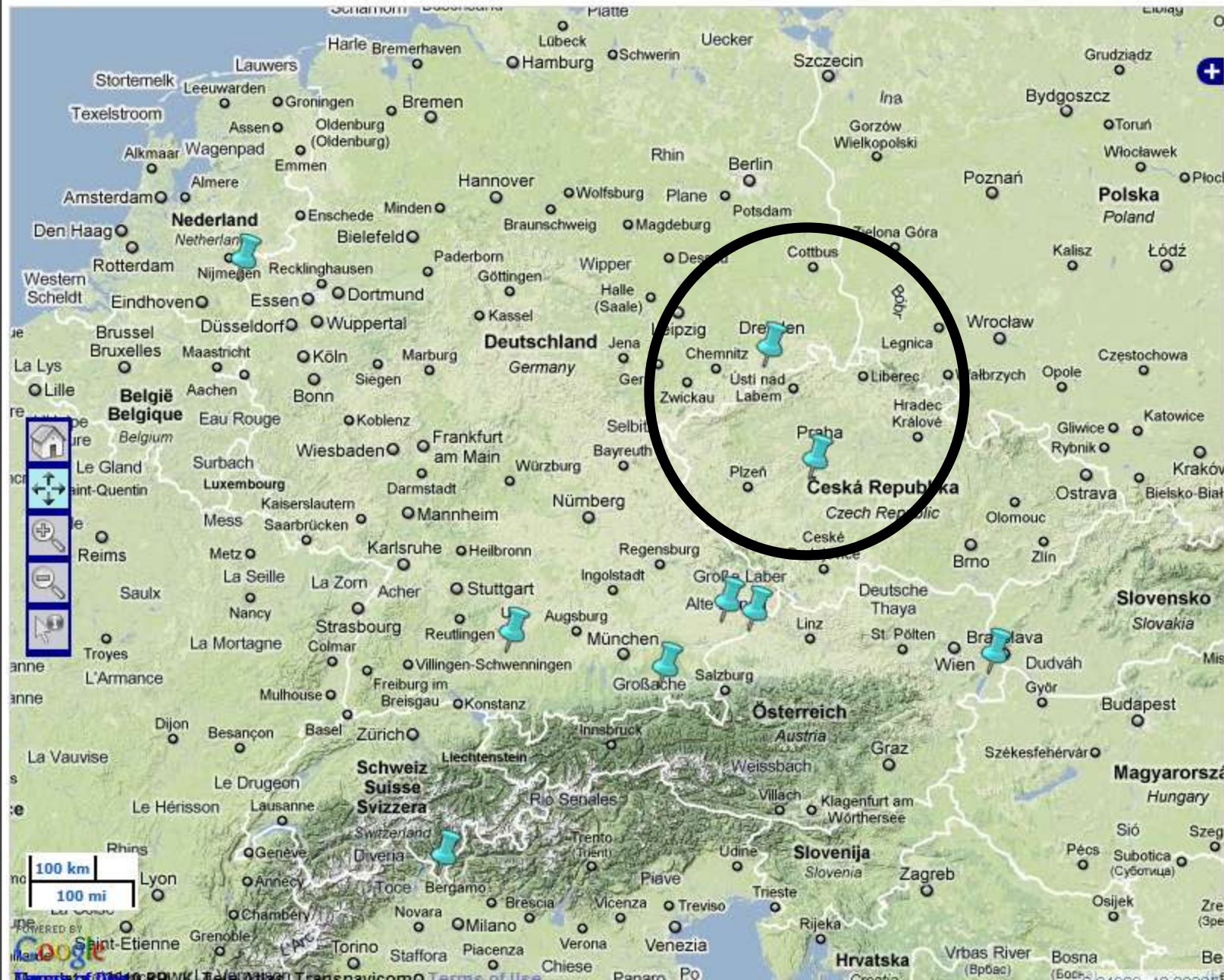
EFAS-IS --> Hydrographs

Using realtime discharge to 'correct' EFAS forecasts

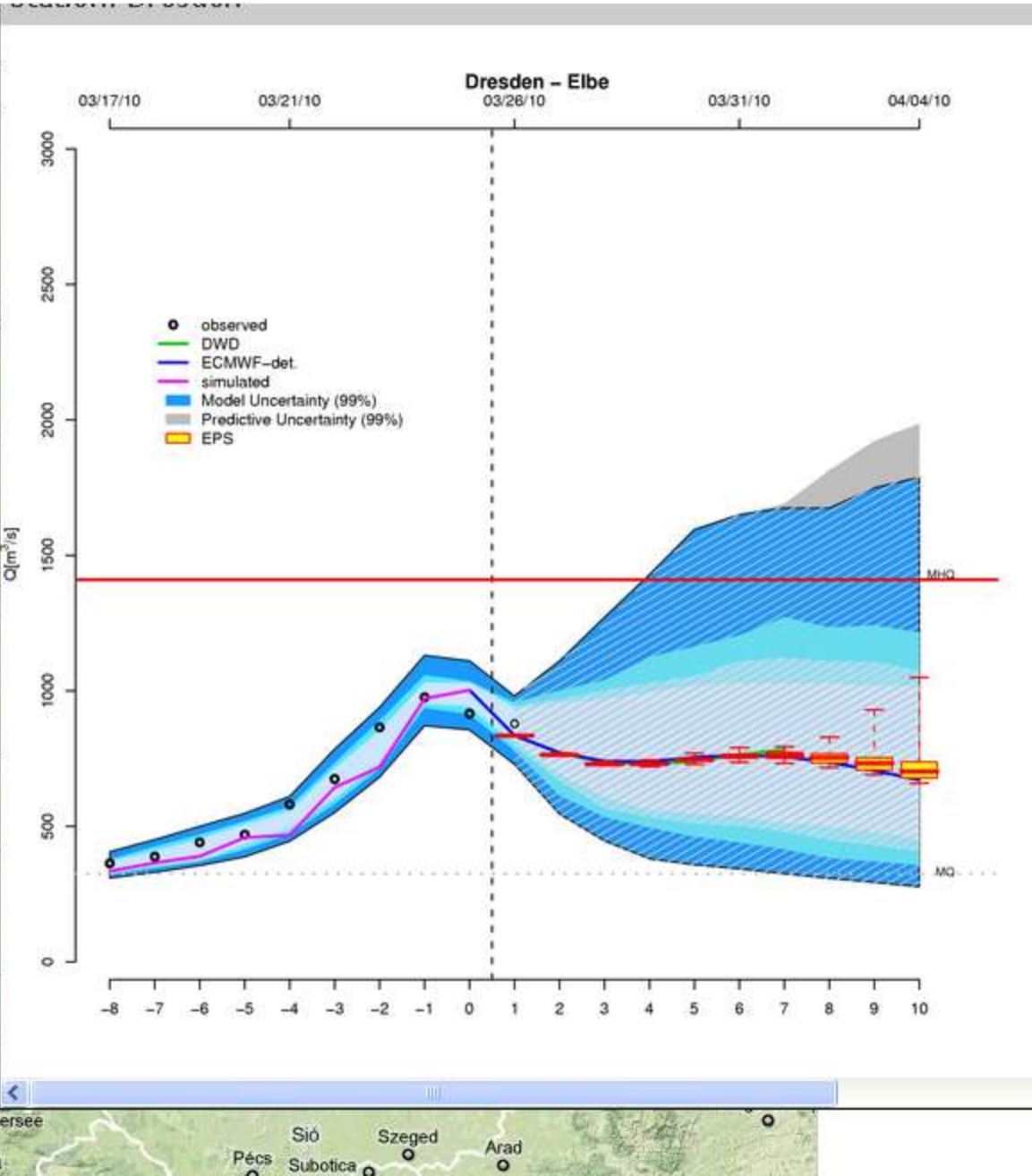
Description ▾



Description ▾



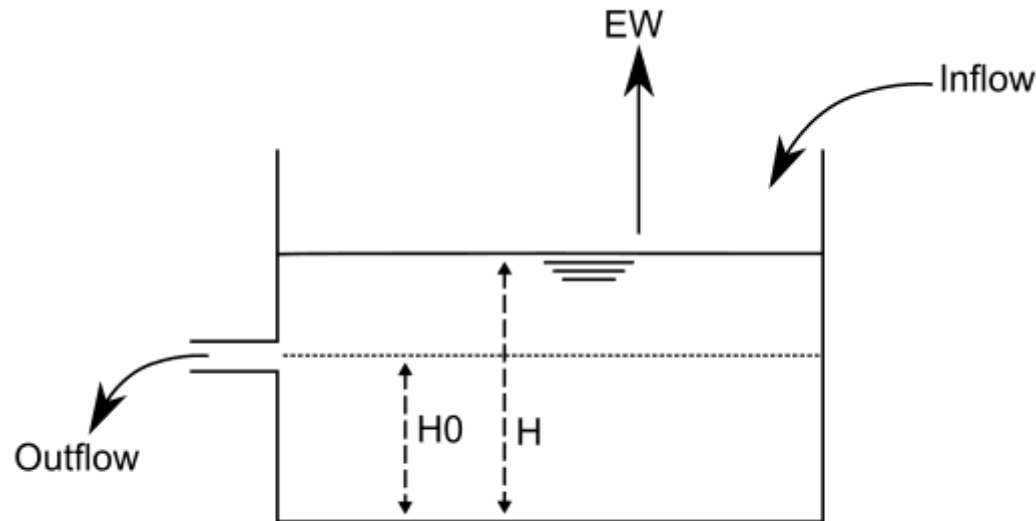
Description



Manmade influences: Simulation of lakes, reservoirs, weirs

6 lakes included:

Maggiore, Como, Geneva, Constance, Vättern, Vänern



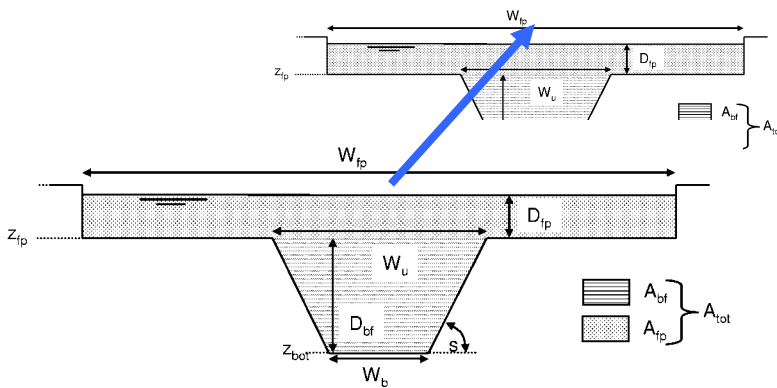
Schematic overview of the simulation of lakes. H_0 is the water level at which the outflow is zero; H is the water level in the lake and EW is the evaporation from the lake

Africa: irrigation, water use, river transmission losses

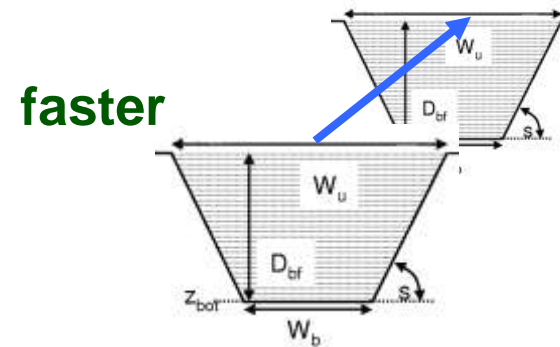
Changes in 2010

- improved routing (kinematic wave)

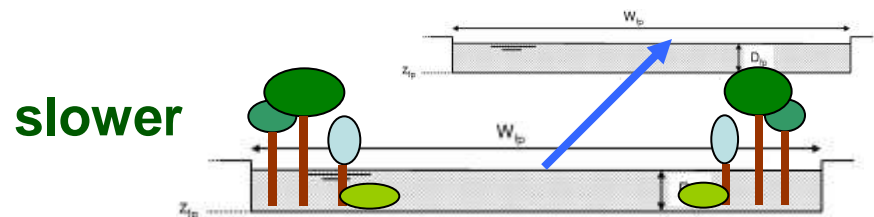
Current routing:



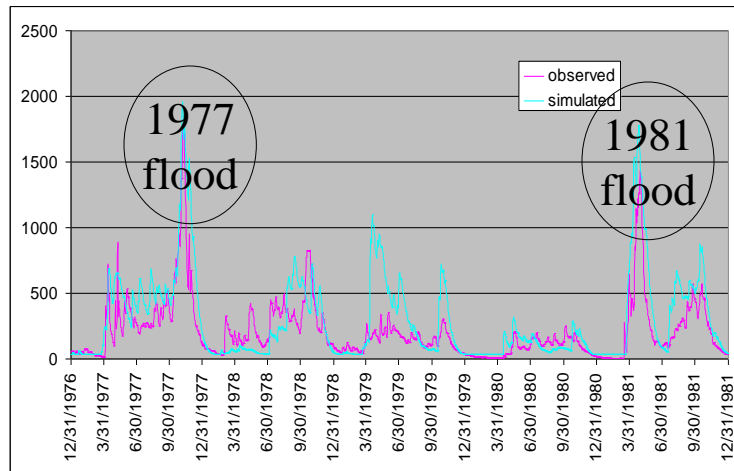
Channel gets split up in a bankful routing



and an over bankful flood routing



Pilot test in East Africa: Juba & Shabelle



Two pilot studies:

Juba/Shabelle river basins Somalia - Ethiopia)

Zambesi river basin (Southern Africa)

