

## The European Flood Alert System EFAS

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The European Flood Alert System (EFAS) prototype is running pre-operationally for the whole Europe since 2005. EFAS is providing 3-10 day hydrological forecasts (deterministic and probabilistic) for 22 hydrological national services, covering most of the trans-national river basins in Europe. Interesting aspects of the system, forecasting results and verification approaches are presented in the following presentation.

After the potential advantages of such a system, the EFAS technical setup and the EFAS threshold approach are explained. Several EFAS forecasting products are presented: Hydrographs with alarm thresholds, spaghetti plots and historical diagrams (deterministic and probabilistic). The creation of the EFAS total probability maps are illustrated. These maps summarize most of the important information, including persistence, in just one hydrological forecast map.

Last but not least the EFAS interactive web-interface (password-protected and only for EFAS-partners) is introduced and the way forward shown.



### Potential advantages of EFAS

Joint Research Centre

**European Commission**

- assist aid management during a crisis
- comparable information across Europe

**National hydrological services**

- extend leadtime to medium-range (+ most services)
- flood information for entire river basin (+ most services)
- operationally applied research (++ all services)
- information exchange (++ all services)
- backup (+ most services)

**!! Aim: additional information *not* replace local expertise**



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### EFAS setup

Joint Research Centre

**EFAS hydrologic model : LISFLOOD**

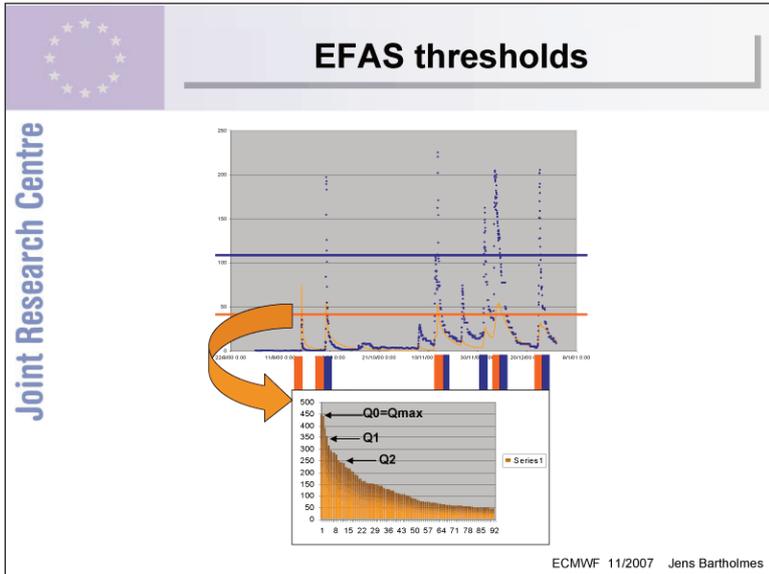
- Europe : 5 km grid
- 1, 6h or 24 h timesteps
- EFAS forecasts are based on 00 hrs & 12 hrs weather forecasts

**Meteo Input**

- 2x DWD, 7 days
- 2x ECMWF – Deterministic, 10 days
- 51x2 ECMWF EPS, 10 days
- observed meteo data (JRC-MARS)




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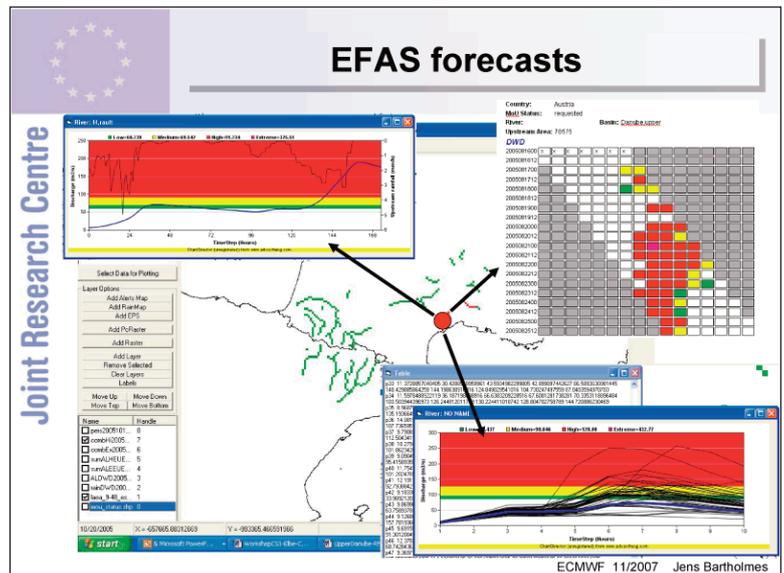


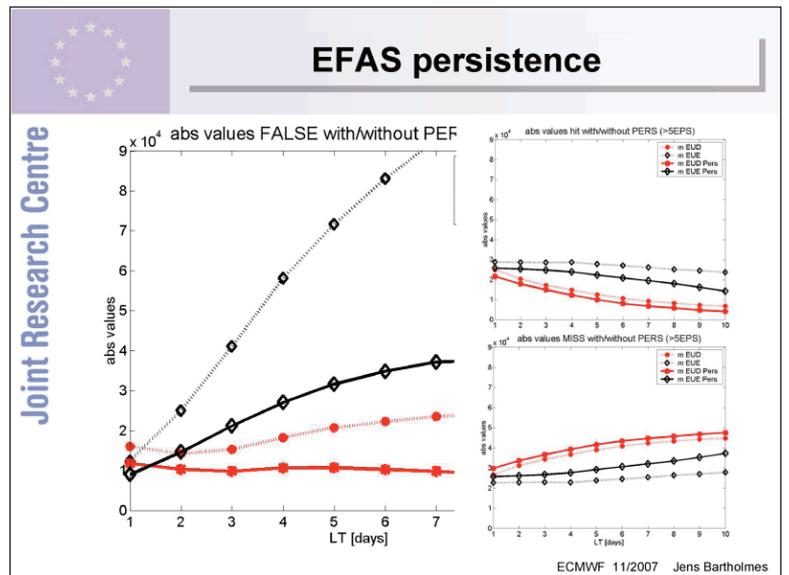
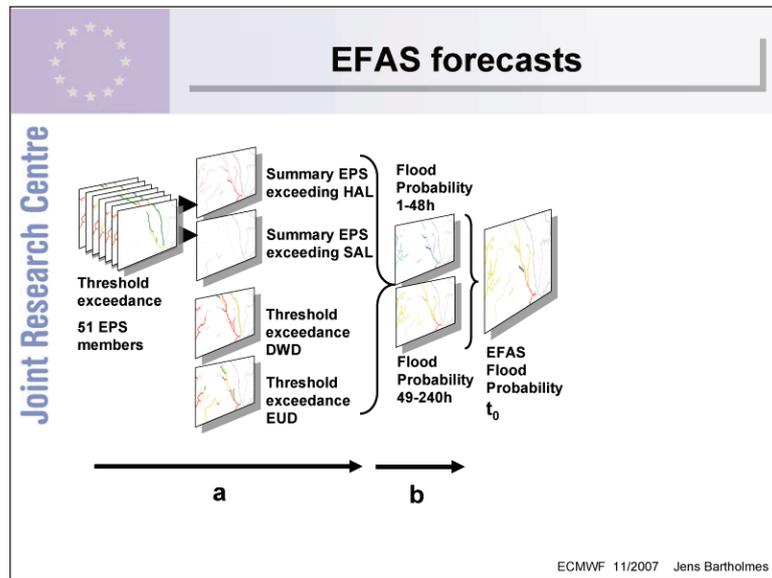
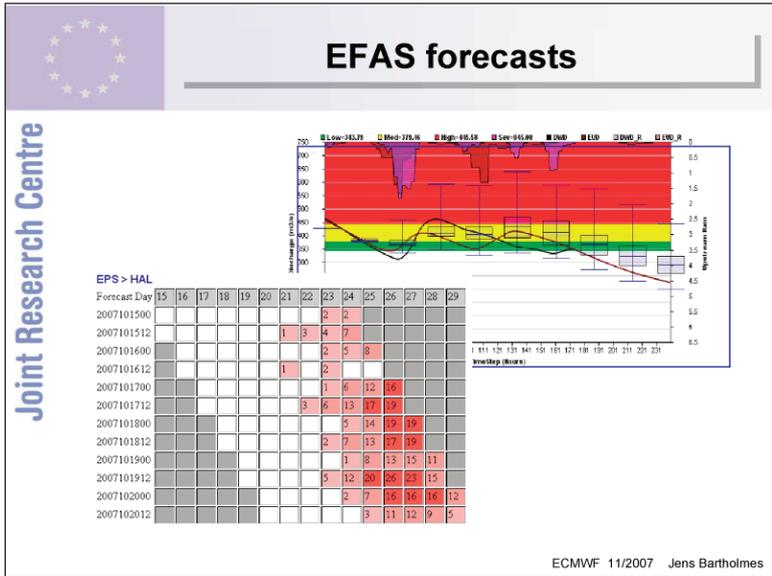
## Advantage of EFAS thresholds

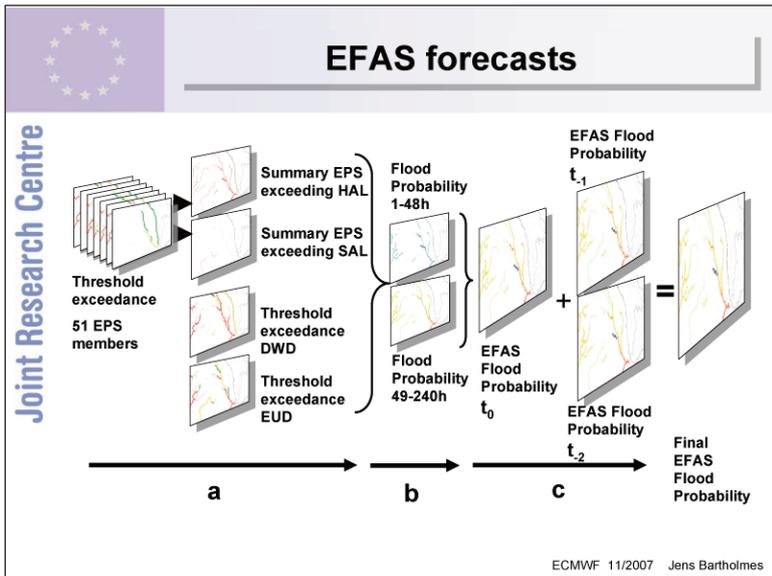
- systematic over- under predictions are compensated for
- EFAS alarm thresholds are available for every pixel
- easy to understand / display

EFAS Level		Description
<b>S (Severe)</b>	<span style="color: magenta;">■</span>	very high possibility of flooding, potentially severe
<b>H (High)</b>	<span style="color: red;">■</span>	seriously increased river discharges with high possibility of flooding (likely exceeding bankful conditions)
<b>M (Medium)</b>	<span style="color: yellow;">■</span>	significantly increased river discharges, no flooding expected
<b>L (Low)</b>	<span style="color: green;">■</span>	river discharges increased, no flooding expected

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## EFAS-IS

- Password protected web interface EFAS-IS for EFAS Partner organizations was launched in October 2007

The screenshot shows the EFAS-IS web interface. It includes a navigation menu with "Home page", "On line press articles", and "EFAS forecasting". A "Network reliability" section contains a disclaimer. The main content area features a "Forecast" section with a "Select the forecast date:" dropdown set to "2007-10-20 10:00" and a "Go to date:" field. Below this is a "Layers" panel with several checked options, including "EFAS\_48h\_EPS\_HAL\_20070929", "EFAS\_48h\_EPS\_SAL\_20070929", "EFAS\_240h\_EPS\_49-240h\_20071020", and "EFAS\_240h\_EPS\_49-240h\_20071020". A map of Europe is displayed on the right, showing forecasted flood areas in red. The browser's address bar shows "http://www.ecmwf.int/efas-is/".

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## EFAS-IS

This view shows a detailed map of Europe with a "Disclaimer" box at the top left. The map displays flood forecast areas in red. A scale bar at the bottom indicates distances from 0 to 2800 km. Below the map are several interactive controls:

- Zoom In, Zoom Out, Full View, and Recentre buttons.
- Print and Query buttons.
- A "Zoom Factor" input field set to "2".

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**EFAS-IS**

**Country:** Romania  
[MoU Status](#) MoU\_Status  
**River:** Siret **Basin:** Danube/Siret  
**Upstream Area:** 36025  
**Probability Tendency:**   
**Probability value:** 83.720  
**PointID:** 1011 **Lat:** 45.5 **Long:** 27.5

Forecast Day	23	24	25	26	27	28	29	30	31	32
DWD										
ECMWF										
EPS > HAL			31	37	19	5	3	2	2	3
EPS > SAL										

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**EFAS-IS**

- Real time access to EFAS forecasts 24/7
- Built up experience on a day to day basis
- EMM floods DB

Flood date	River	Country	Language	Title	Date inserted article	Entered by
23-OCT-07 to 26-OCT-07	Trotus	Romania	English	<a href="#">Waters withdraw, weather improves</a>	26-OCT-07	McCormick Niall
23-OCT-07 to 26-OCT-07	Trotus	Romania	English	<a href="#">Flood warning for 10 Romanian counties</a>	26-OCT-07	McCormick Niall
23-OCT-07 to 26-OCT-07	Trotus	Romania	English	<a href="#">Thousands of Romanians isolated by floods</a>	26-OCT-07	McCormick Niall
18-SEP-07 to 18-SEP-07	Sava, above Kupa	Slovenia	English	<a href="#">Šelenci a week after the storm</a>	05-OCT-07	McCormick Niall
18-SEP-07 to 18-SEP-07	Sava, above Kupa	Slovenia	English	<a href="#">Floodline in Slovenia leaves six dead</a>	05-OCT-07	McCormick Niall
07-SEP-07 to 08-SEP-07	Danube	Germany	German	<a href="#">Hochwasser in Südbayern - Donau in Passau stark ansteigend</a>	18-OCT-07	McCormick Niall
06-SEP-07 to 09-SEP-07	Danube	Austria	German	<a href="#">20-stündliches Hochwasser für Donau in Neusiedler</a>	22-OCT-07	McCormick Niall
06-SEP-07 to 09-SEP-07	Danube	Austria	German	<a href="#">Hochwasser: Situation entspannt sich</a>	16-OCT-07	McCormick Niall
06-SEP-07 to 09-SEP-07	Danube	Austria	German	<a href="#">Angepannte Hochwasserlage an der Donau</a>	09-OCT-07	McCormick Niall

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**Conclusions and Way Forward**

- EFAS is now available online to EFAS partners 24/7
- EFAS is producing medium-range probabilistic flood forecasts with leadtimes up to 10 days
- Feedback is positive and products are used by partners
- Try Var-EPS
- Include forecasts of other weather forecasting services

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