



Integration of EFAS forecasts into the flood forecasting system of Brandenburg/Germany

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Flood warning center Brandenburg



Institution: Landesamt für Umwelt (Brandenburg State

Office of Environment)

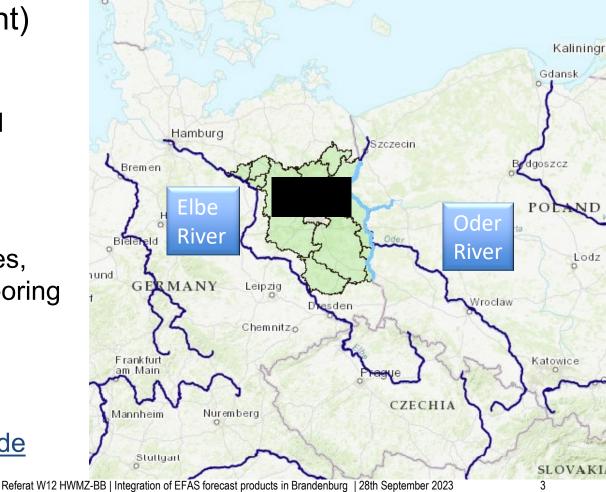
Tasks:

Official flood warnings and reports for federal state of Brandenburg

Collect and distribute hydrological data, own sites, federal waterways, neighboring states

Hydrological forecasts

Pegelportal.Brandenburg.de





Modular flood forecasting system



Models linked to our Delft-FEWS forecasting system









ARCEGMO

HYDROLOGISCHE MODELLIERUNGSSYSTEM

BAH

ArcEgmo **Schwarze Elster** RR





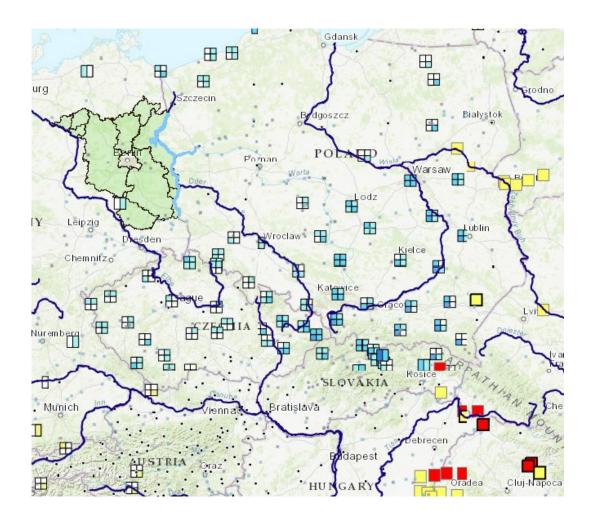


EFAS Data integration in FEWS



Integration of EFAS WMS layers in map view in FEWS

- > allows to visualize
 EFAS products
 (ECMWF
 exceedance, Synop,
 in own system)





EFAS Data integration in FEWS

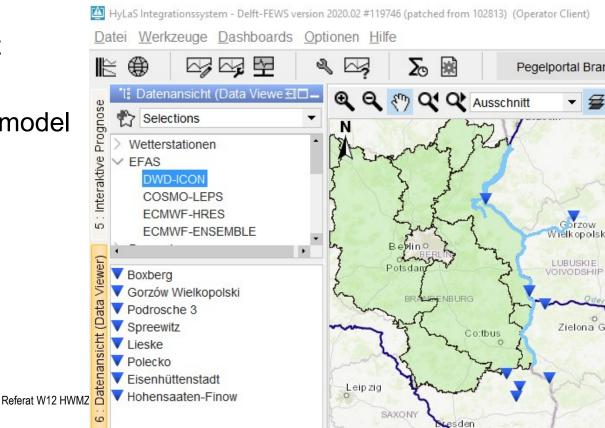


Integration of EFAS Sensor-Observation-Service (SOS 2.0) web-service

https://publicwiki.deltares.nl/display/FEWSDOC/EFAS+
 SOS

HyLaS Integrationssystem - Delft-FEWS version 2020.02 #119746

- Import EFAS forecast
- View & compare
- Use as input for own model





Flood forecasting Oder River





View on Frankfurt/Oder, Summer 2010, Photo: Patrick Pleul/ dpa



Flood forecasting model for Oder river for Brandenburg

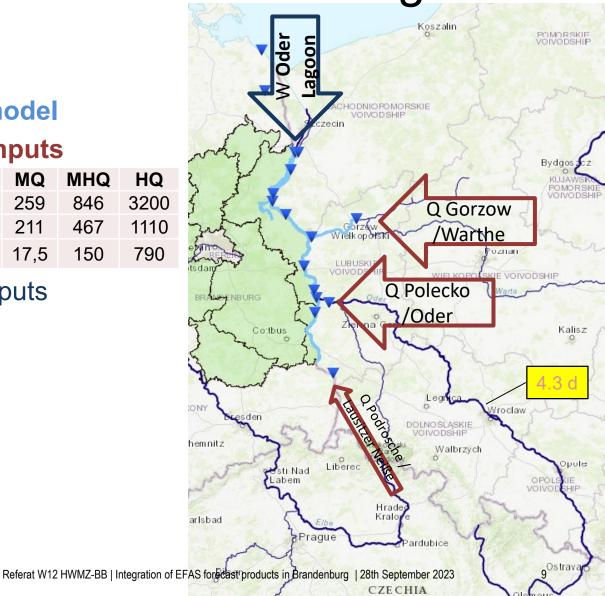


Model

- 1D hydrodynamic model
- 3 major discharge inputs

Gauge	River	Area	MQ	MHQ	HQ
Połęcko	Odra	47152	259	846	3200
Gorzów W.	Warthe	52404	211	467	1110
Podrosche	Laus. Neiße	2072	17,5	150	790

2 lower water level inputs

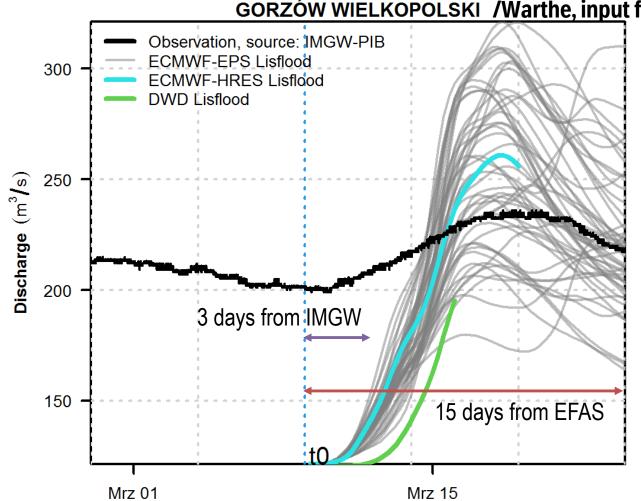




Extending our forecast horizon using EFAS



GORZÓW WIELKOPOLSKI /Warthe, input for hydrodynamic model



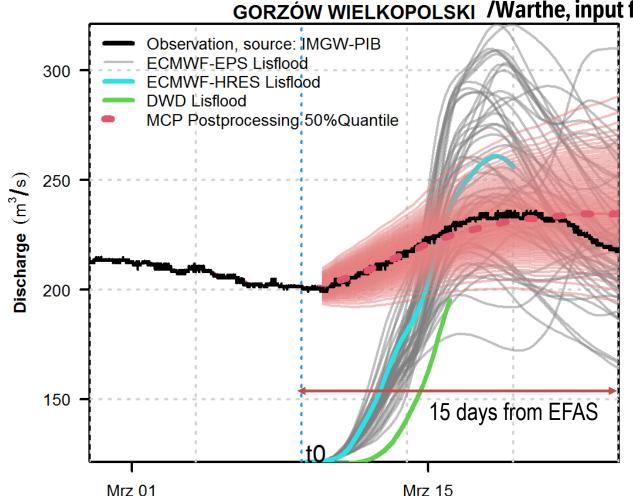
Caveat: Lisflood simulation and forecasts are not errorcorrected and can have substantial bias



Extending our forecast horizon using EFAS



GORZÓW WIELKOPOLSKI /Warthe, input for hydrodynamic model



Postprocessing product (mcp) partly available

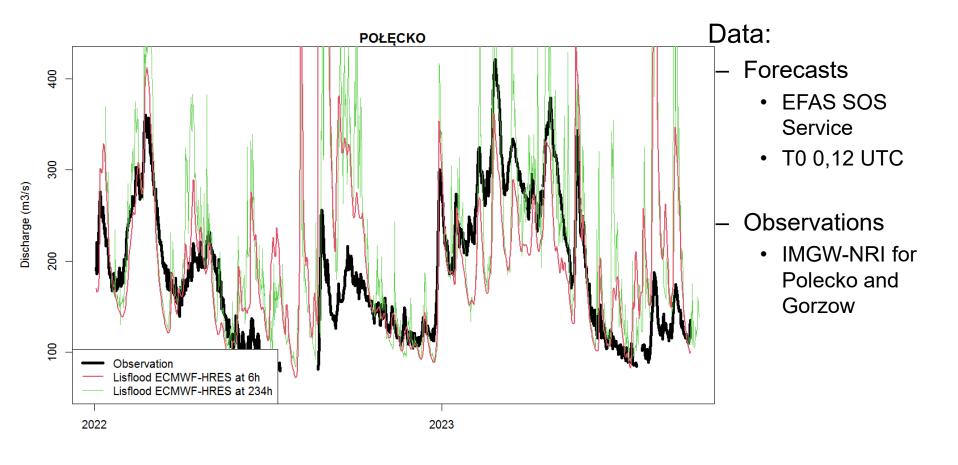
(not Polecko, Podrosche)

Caveat: Lisflood simulation and forecasts are not error-corrected and can have substantial bias



Forecast verification 2022-01 – 2023-09

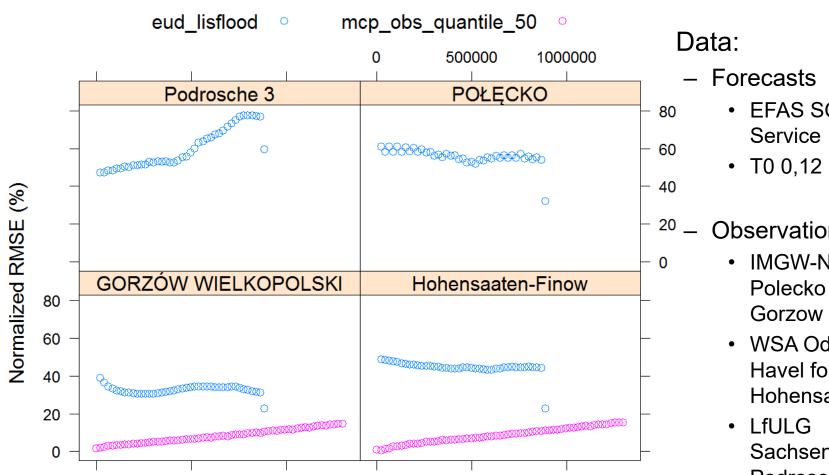






Forecast verification 2022-01 - 2023-09





- **EFAS SOS**
- T0 0,12 UTC
- Observations
 - IMGW-NRI for Polecko and
 - WSA Oder-Havel for Hohensaaten
 - Sachsen for **Podrosche**

1000000

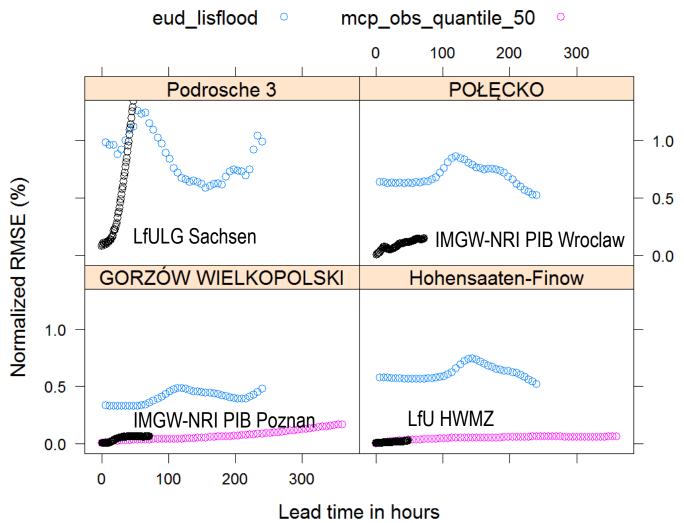
500000

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Forecast verification 2023-08-27 — 2023-09-25





Data:

- Forecasts
 - EFAS SOS Service
 - T0 0,12 UTC
- Observations and Forecasts in our System
 - IMGW-NRI for Polecko and Gorzow
 - WSA Oder-Havel for Hohensaaten
 - LfULG Sachsen for Podrosche



To be solved

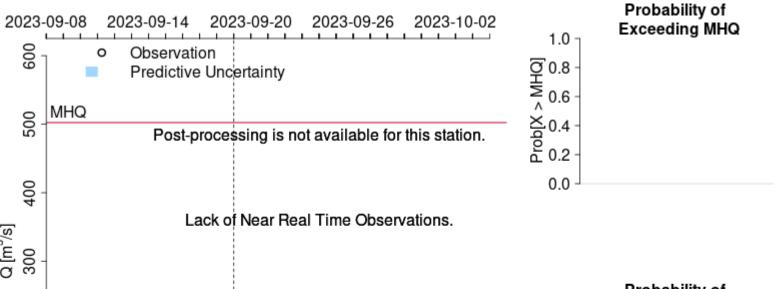


EFAS ensemble forecasts not corrected with observations

large offset in input

Solution 1: EFAS MCP Postprocessing Product

- Postprocessing Quantile Forecast Product (mcp)
- But: some stations have a "Lack of Near Real Time Observations"
- ... FEWS Adapter must be updated





To be solved



EFAS ensemble forecasts not corrected with observations

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Solution 1: EFAS MCP Postprocessing Product

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Solution 2: Regional center performs error-correction

- e.g. by ARMA method (Broersen and Weerts 2005)
- requires Lisflood Simulation data, ! in EFAS-SOS

Solution 3: Data assimilation into EFAS forecasts to correct hydrological states in upstream areas



Conclusions



EFAS forecast products

- Useful for regional forecasting / warning centers
- Especially at larger, international rivers
- Extent forecast range
- Availability: Sensor-Observation-Service / Copernicus Climate
 Data Store

To be useful

- Import tools are necessary, NEW adapter for Delft-FEWS
- Error-correction / Postprocessing must be improved
- Powerful webservers and data sharing technologies