Joint Research Centre

User perspectives:
European Commission - Joint Research Centre
Ad de Roo, Jutta Thielen

Floods and other Weather Driven Natural Hazards

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JRC as user

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- JRC started flood forecasting research activities as feasibility study EFFS within FP5

- operational tests were performed during Oder (almost) flood event in 2001 and during Elbe & Danube floods 2002
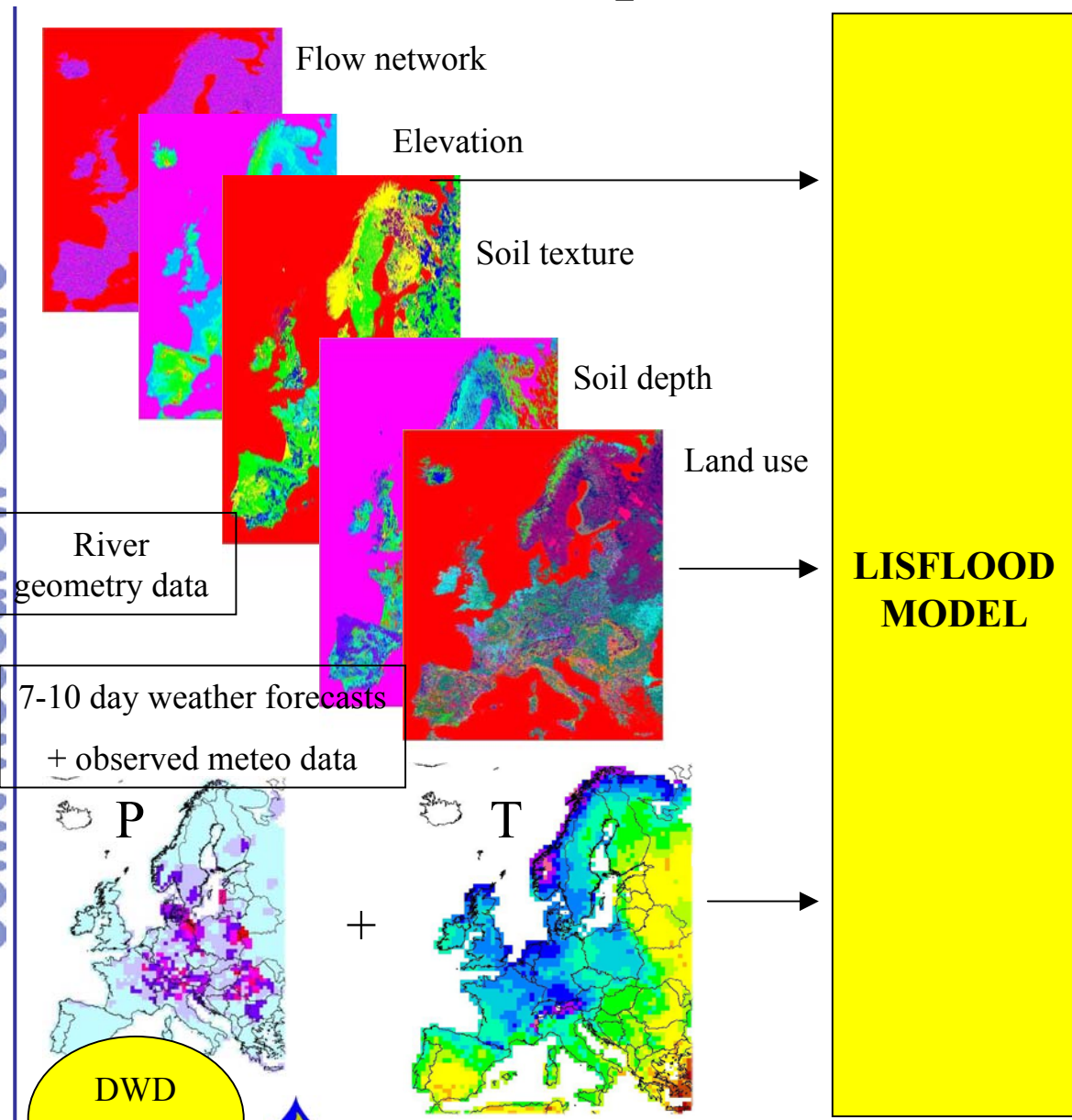
- This led to:

JRC Mandate

- Guidelines of the Secretariat- General (SEC(2002)907/2 and COM (2002)481 final):
  - Communication from the [European] Commission about 'The Community response to the flooding in Austria, Germany and several Applicant countries'
    - Support to development of a European Flood Alert System
    - Impact assessment studies on flood risk for transnational water basins

- Following this mandate:
  - JRC will develop and test EFAS to pre-operational stage by 2006
    - DG JRC resources
    - DG ENTR IDA resources (IDA= Interservice Data Access)
    - Special funds from the European Parliament through DG ENV
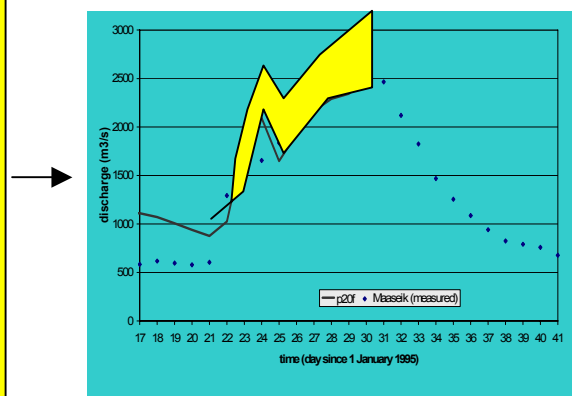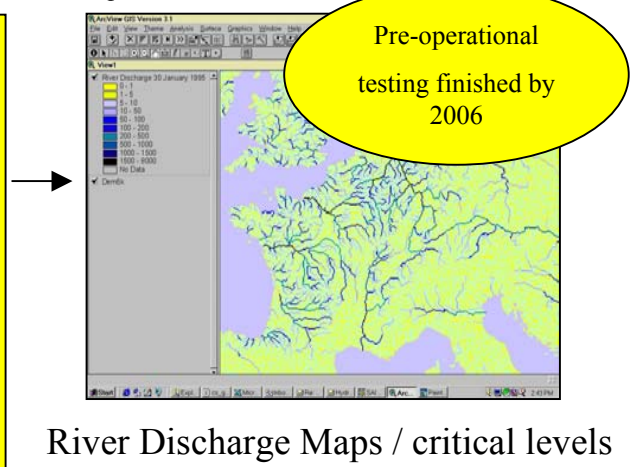 - After that, the Commission and its MS will discuss and decide the follow up

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European Flood Alert System (EFAS)

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Flow network

Elevation

Soil texture

Soil depth

Land use

River geometry data

7-10 day weather forecasts + observed meteo data

P + T

DWD ECMWF

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LISFLOOD MODEL

Pre-operational testing finished by 2006

River Discharge Maps / critical levels

Hydrographs for specific locations, incl uncertainty

EFAS flood alert to NWA

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The LISFLOOD model and EFAS

- **LISFLOOD is a hydrological modelling system to simulate medium and large river basins, while:**
  - Maintaining a high spatial resolution (EFAS1km grid & 5km for overview)
  - Maintaining as much as possible a physical basis for describing the hydrological processes (diffusion & kinematic wave equations, soil water transport equations)

- **LISFLOOD takes into account:**
  - Detailed river cross sections
  - Reservoirs
  - Lakes
  - Polders / flood retention areas

- **LISFLOOD is capable of using various data sources, such as:**
  - readily available European 1km datasets, such as DEM's, land use and soil data
  - Point data from gauging stations
  - new satellite derived products (Meteosat 2nd generation, Envisat)
  - numerical weather forecast data from NMS's and ECMWF
  - surface rainfall radar data
  - Realtime observed waterlevel & river discharge data for updating

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EFAS – setup

- **5km resolution European model:**
  - Deterministic forecasts:
    - DWD LM+GM
    - ECMWF
    - ++
  - Ensemble forecasts:
    - ECWMF EPS
- **1km models:**
  - Meuse, Oder, Elbe, Danube ++
  - Deterministic forecasts:
    - DWD LM+GM
    - ECMWF
    - ++
- **run twice daily**
- **near-realtime Synop station data used**
- **ongoing:**
  - test running with radar data
  - realtime H+Q data

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- Ensembles forecast, although not fully understood yet, proved to be a useful additional product, for which there is a operational need

- Main problems with ensembles from the view of end-users are:
  - translate the results into (easy) understandable products for the end-users;
  - Training of end-users to improve the understanding of probabilistic forecasts

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