Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

SESSION 4: Make it happen!
Group 1: Floods

Example of PREPAREDNESS
Experience from Germany

Meike Gierk
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
Germany

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

What do PREVENTION and PREPAREDNESS mean?

Prevention

- Structural and non-structural measures taken before an event in order to mitigate or avoid disasters and emergencies
  -> based on risk, hazard and vulnerability maps under different scenarios

Preparedness

- Measures taken before an event in order to minimize loss of life and damage, to organize the temporary removal of people and property from a threatened location and facilitate timely and effective rescue, relief and rehabilitation;
  -> based on risk maps under different scenarios

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

What do PREVENTION and PREPAREDNESS mean?

Prevention/Protection

Long-term development/strategy

- discharge reduction
- vulnerability reduction
- scenario modelling/analysis
- Flood risk mapping

- spatial-/land use planning
- potential retention areas
- polders
- reservoirs
- dykes
- awareness raising

Preparedness

Mostly only active at operational level

- early warning/forecast
- data survey/gathering
- scenario modelling/analysis
- emergency planning/crisis management

- potential retention areas
- polders
- reservoirs
- dykes
- awareness raising

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Example:

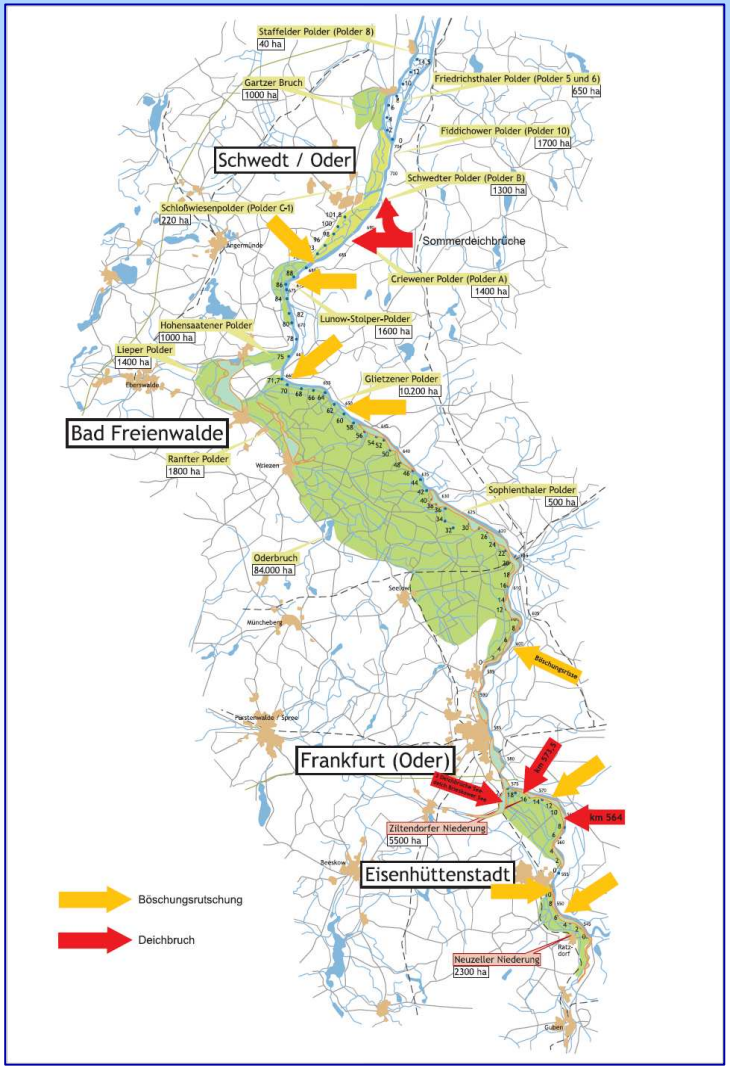
River Oder on the German-Polish border after flood in summer 1997

(Source: Brandenburg State Office for Environment)

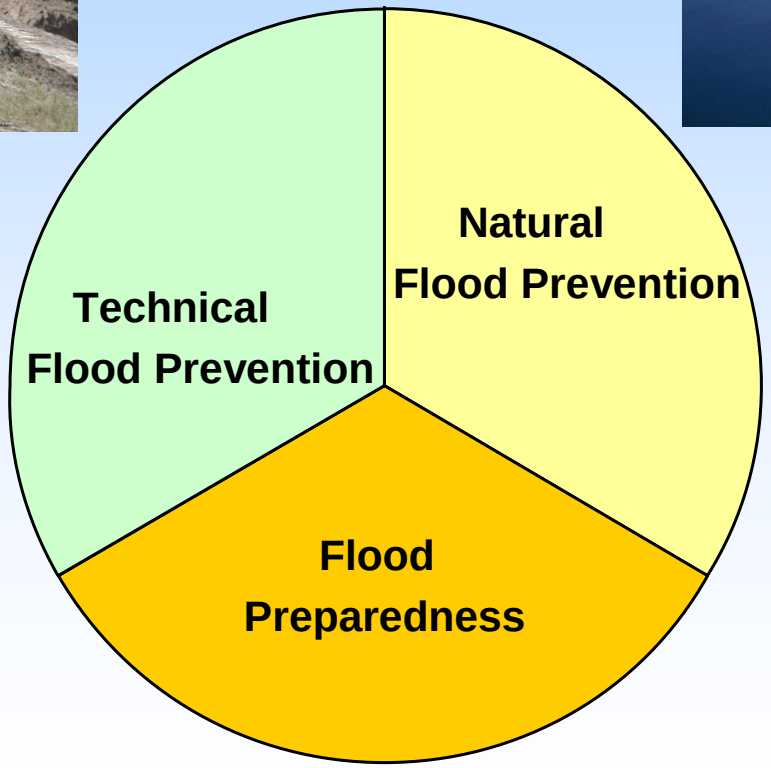
384,5 km dykes:

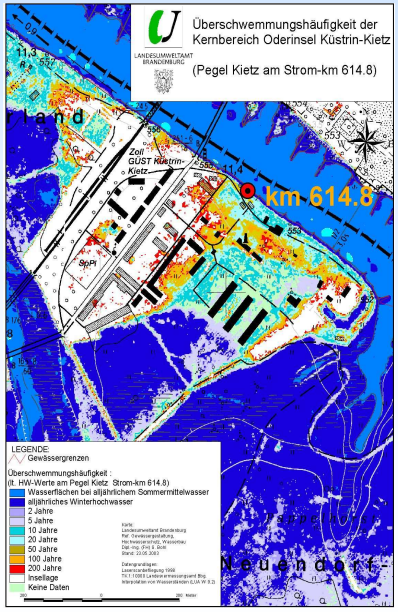
173,4 km main dykes
57,7 km rearward dykes
153,4 km dykes in polder areas

Damage (in Brandenburg):
331 M €
Damage on flood structures
152 M €



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety





Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

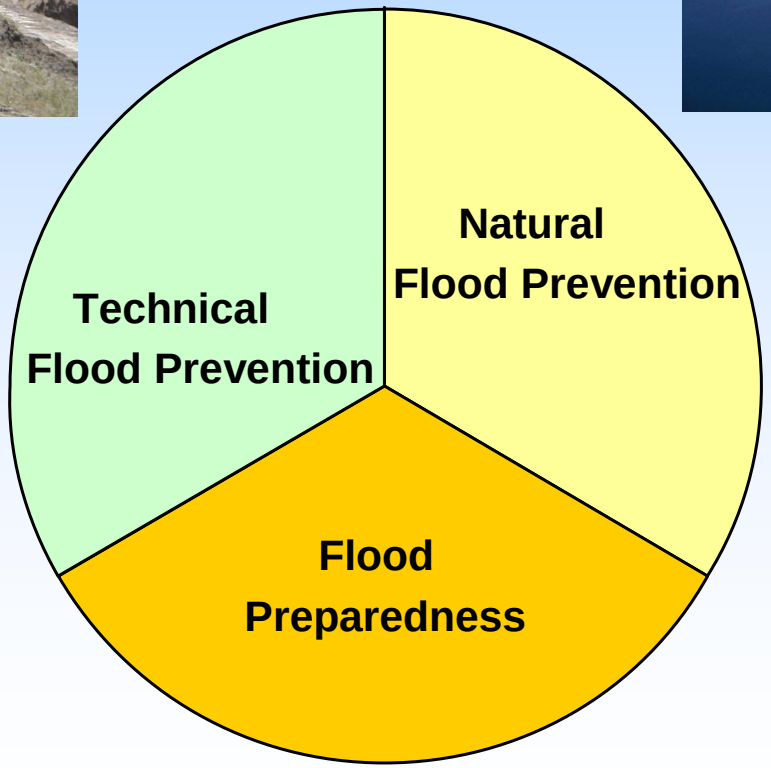
Technical Flood Prevention

Technological issues: can be solved!

→ **BUT other circumstances have to be considered! These are almost more complicated/contradictionary and time consuming than finding technical solution.**

- **Financial issues (e.g. cost intensive investigations)**
- **Various land use interests and requirements**
- **Natural circumstances (special protected areas/FFH)**
- **Legal requirements (purchase of land)**
- **Explosive recovery (from World War II)**
- **Monument protection regulations**

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

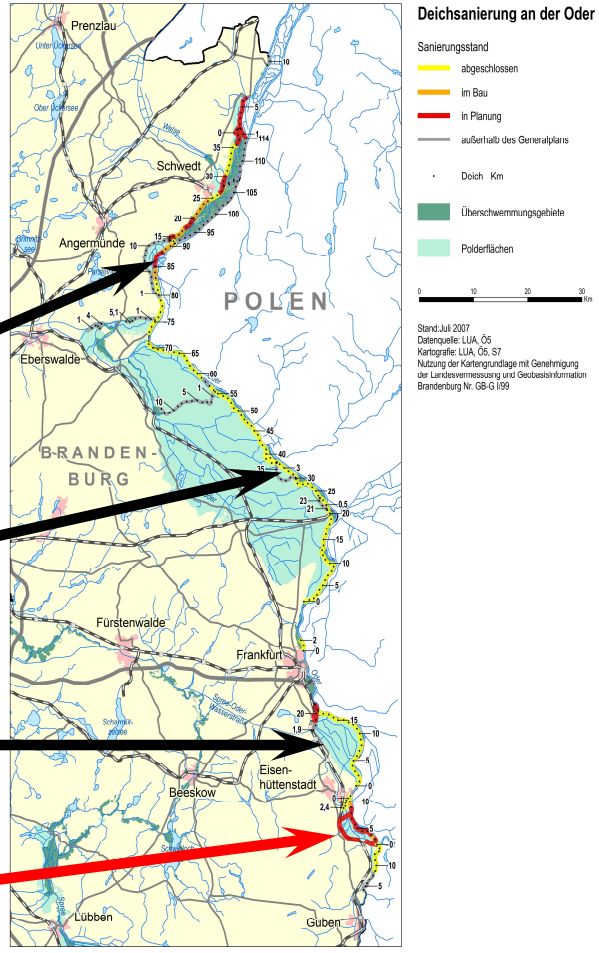
Natural Flood Prevention
- creation of retention areas -

Masterplan Oder 1999

Comprehensive investigation with regard to potential retention areas

Model calculations:

- **Lunow-Stolper-Polder 1.600 ha**
- **Sophienthaler Polder 500 ha**
- **Ziltendorfer Niederung 5.500 ha**
- **Neuzeller Niederung 2.300 ha**



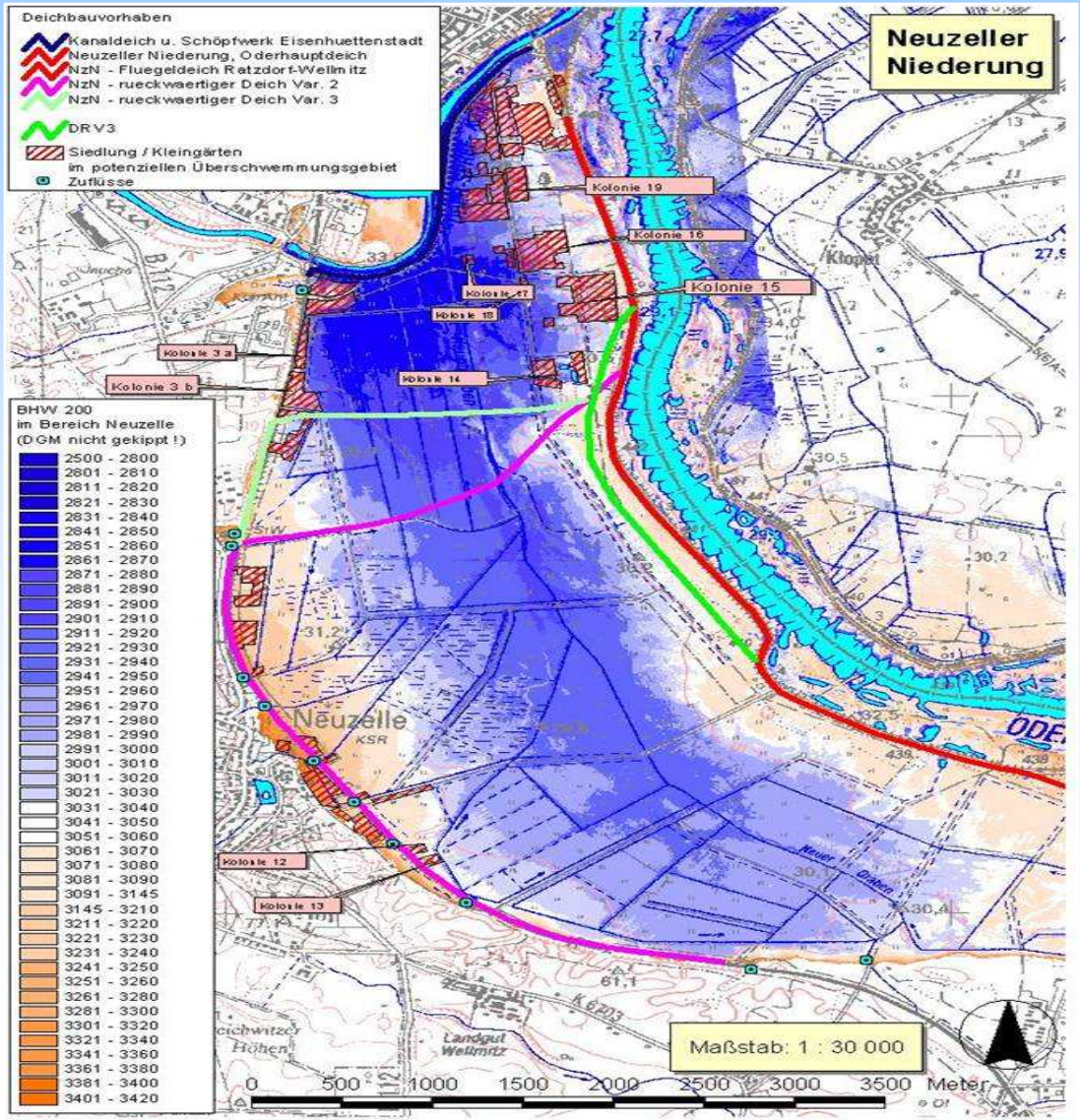
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Natural Flood Prevention

- creation of retention areas -

Example:
Neuzeller Niederung

- **Retention polder (peak cut) and with 2 explosion sites up to 1.900 ha**
- **2 dyke-shifts with 35 ha**
- **1 dyke-shift with 33 ha**

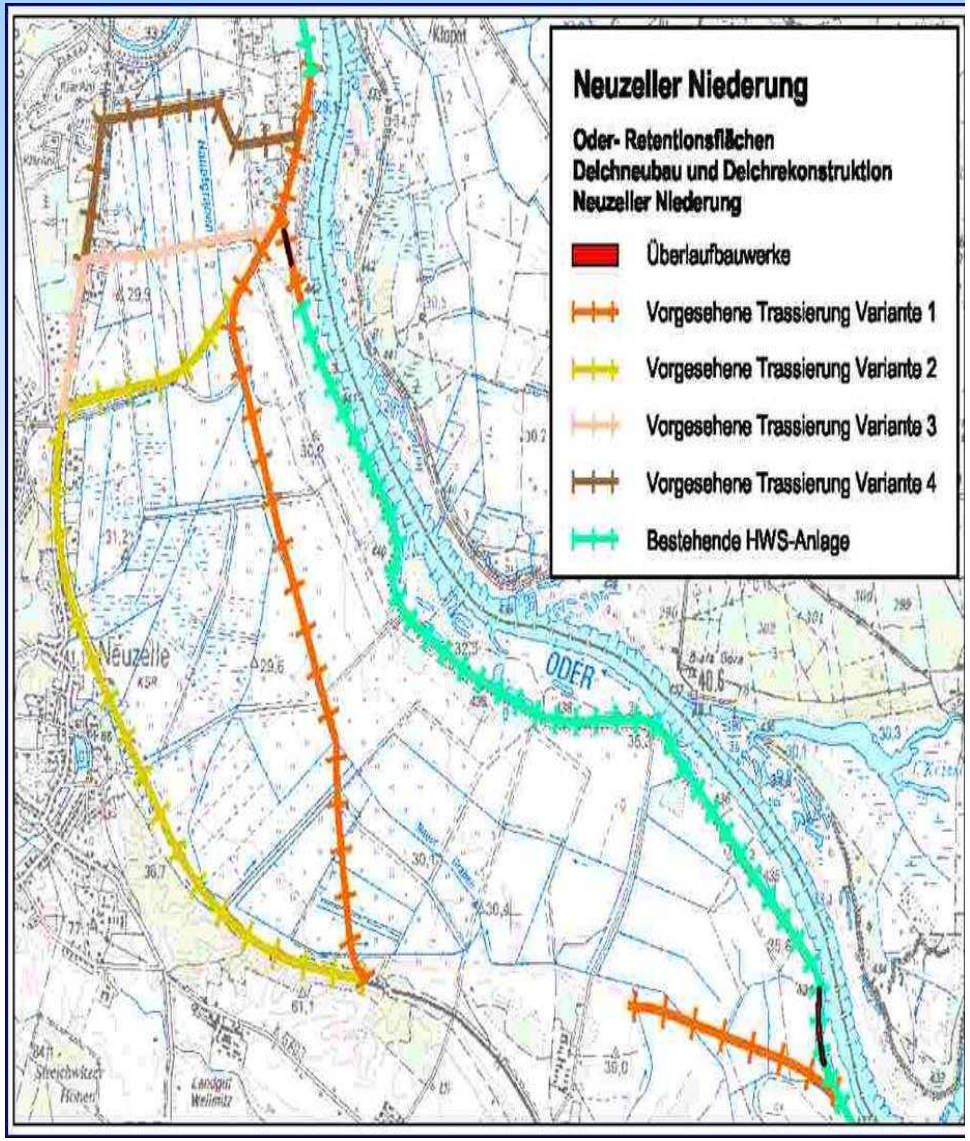


Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

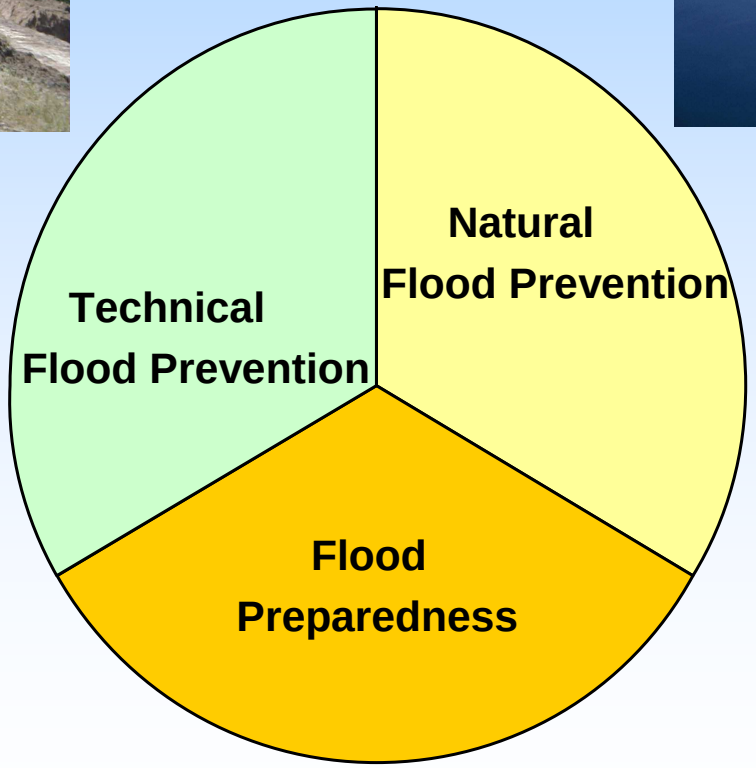
Natural Flood Prevention
- creation of retention areas -

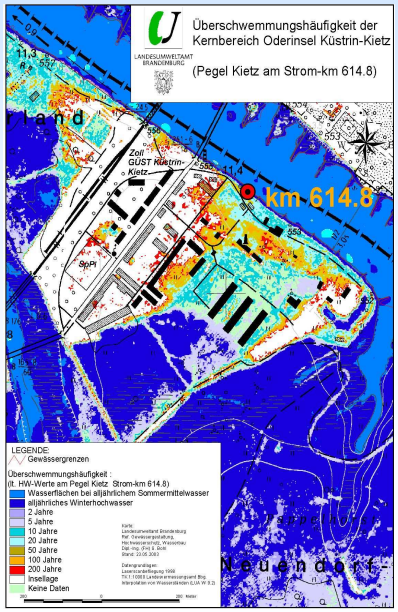
Calculation of potential water level decrease:

- 2 dyke-shifts (track correction) in the frame of dyke reconstruction
  - -> 8 cm directly in area
  - -> 2 cm in Ratzdorf (confluence of Oder and Neisse River)
- Dyke-shift in section downstream (section 4) currently under consideration
  - -> 12 cm (together with dyke-shifts mentioned above) directly in area and
  - -> 5 cm in Ratzdorf
- Inundation of the Neuzeller Niederung (Lowland) at flood peak through opening at dyke-km 8+000
  - -> 22 cm in Eisenhüttenstadt
- In case of flow through of the lowland (both explosion sites open)
  - -> 19 cm in area



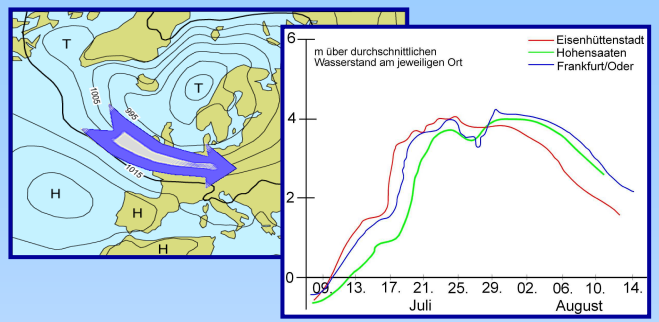
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety





Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Flood Preparedness



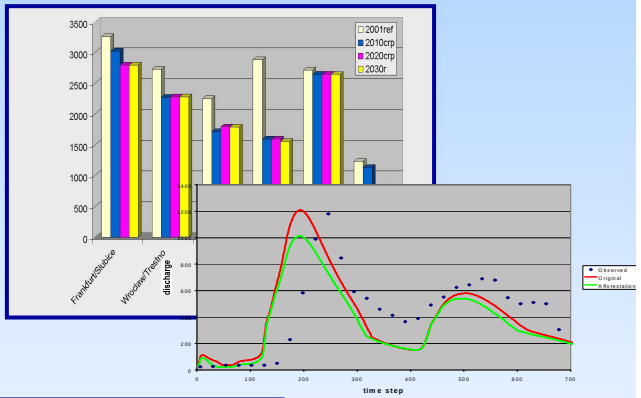
Improvment of hydrological forecasts (Model: WVM Oder)

Improvment of data situation for Topography and Hydrology (Laserscanning)

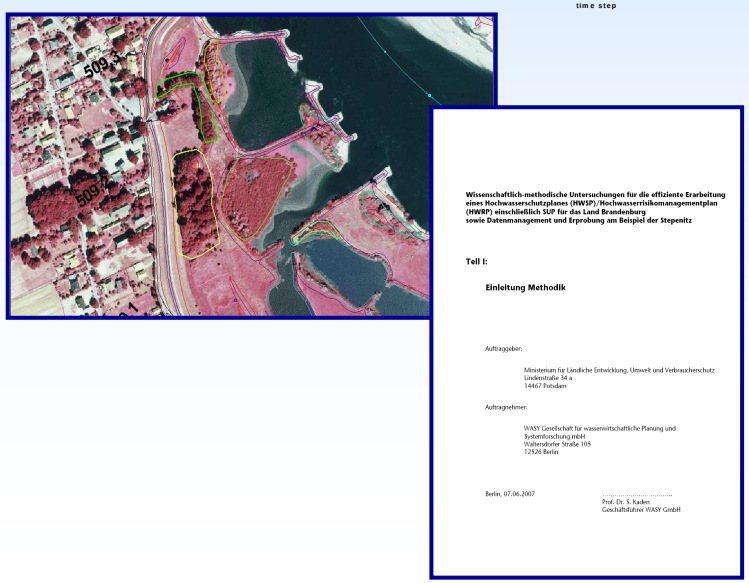
Scenario analysis for polder filling (regulated and unregulated; single and combined; different combined scenarios):

-> for whole River (ICPOR/IKS- EC JRC: 1998-2000)

-> for German-Polish section seperately in addition with higher resolution (2D, partly 3D)



Determination of flood plains until 2010/2012 (legal binding)



Identification of flood hazard areas

Development of Flood Protection Plans until 2009

(Application of Act to Improve Preventive Flood Control – into force May 2005)

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Summary

Prevention/Protection

Long-term development/strategic

- discharge reduction
- vulnerability reduction
- scenario modelling/analysis
- flood risk mapping

- ➢ spatial-/land use planning
- ➢ potential retention areas
- ➢ polders
- ➢ reservoirs
- ➢ dykes
- ➢ awareness raising

Preparedness

Mostly only active at operational level

- early warning/forecast (WVM)
- data survey/gathering
- scenario modelling/analysis
- emergency planning

- ➢ potential retention areas
- ➢ polders
- ➢ reservoirs
- ➢ dykes
- ➢ awareness raising

✓Transboundary discussions (border commission and international river commission (IKSO/MKOO/ICPOR)

✓Vulnerability reduction

✓No climate multiplier yet

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Conclusion

River basin level/border section

- agreement on return period
- agreement on designed flood
- agreement on model application (river basin level)
- agreement on scenario modelling (river basin level)
- qualitative improvement of forecast
- prolonging forecast time period
- data (resolution, time scale, format, coordinate system position/altitude)
- …

Long-term aspects

- **Timing**
- **Costing**
- Staff
- …

Thank you for your attention!

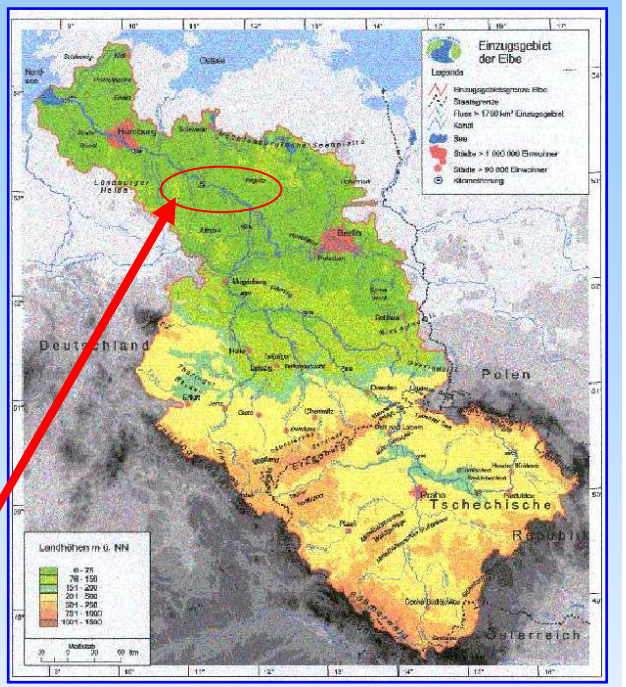
meike.gierk@bmu.bund.de

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Example: dyke-shift on Elbe

Lenzen

- new dyke track 6.110 m
- old dyke track 7.189 m
- retention area 420 ha
- dyke- height 5,7-6,3 m above bottom level
- 6 inundation slits
- expected water level reduction of max. 30 cm
- nature protection project (alluvial forest)



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Additional remarks

- **Transnational** discussion/understanding in International River Commission (IKSO/MKOO/ICPOR)
  - Trilaterally, supported by EC
  - INTERREG IVB -> preparation to fulfil requirements of the FD
- **Transboundary** discussion in Border Commissions
  - bilaterally