EU Strategy for the Danube Region (EUSDR)

Second Stakeholder Seminar of the Water Quality (PA4) and the Environmental Risks (PA5) Priority Areas

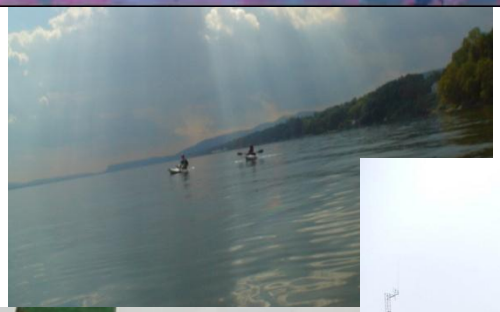
"*EUROPEAN FUNDING OPPORTUNITIES IN THE WATER SECTOR*"

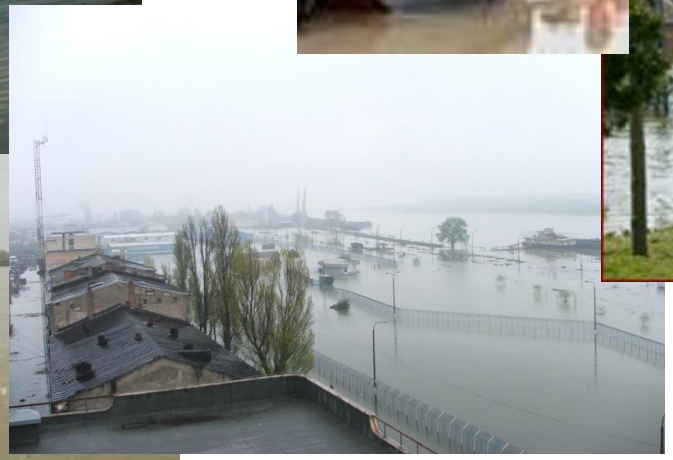
DANUBE FLOODRISK

Mary-Jeanne ADLER, PhD
Scientific Director

National Institute of Hydrology and Water Management

2006 flood aspects





Passau, GERMANIA, 3 June, 2010

Budapesta, UNGARIA, 7 June, 2010

Belgrad, SERBIA, 16 June, 2010

Ceatalchioi, ROMANIA, 7 July 2010

Context that generated the project idea

- At the end of 2007 was approved and published 2007/60/EC Directive on the assessment and management of floods.
- In accordance with the provisions of this Directive, Member States have the obligation to make preliminary assessment of flood risk until the end of 2011 and to achieve flood hazard and risk maps until the end of 2013.
- Floods occurred in the last 10 years along the Danube River have shown that these maps are needed to be made by trans-national river basin states, by linking existing information in order to be integrated into a common strategy of cooperation in flood risk assessment
- Achievement of these maps imply the allocation of large financial resources and activities.

Project goal:

- development of transnational cooperation and systems / tools to prevent flood risk.
- providing efficient risk maps of the Danube River floodplain, to present information needed for spatial planning and economic requirements.
- provide a basis for sustainable development along the river Danube.

Project facts: Danube FLOODRISK

- Duration: 36 luni (2009 – 2012)
- Budget: aprox. 6,5 milioane EURO – SEE grant
- 8 Countries involved
- 19 Partners Organisations involved and 5 Observer Partners
- thematic links with EU working groups (floods, spatial planning)
- close cooperation with the ICPDR

Project partners

MEF – Ministry of Environment and Forests (RO)
UBA-A – Federal Environment Agency Austria Ltd. (AT)
VD – via donau, Austrian Waterway Company (AT)
MOEW – Ministry of Environment and Water (BG)
VKKI – Central Directorate for Water & Environment (HU)
VITUKI – Environmental Protection and Water Management Research Institute (HU)
DEF – Danube Environmental Forum (HU)
ISPRA – Higher Institute for Environmental Protection and Research (IT)
TUCEB – Technical University of Civil Engineering of Bucharest (RO)
RWNA – "Romanian Water" National Administration (RO)
DDNI – "Danube Delta" National Institute for Research and Development (RO)
CESEP – Centre for Environmentally Sustainable Economic Policy (RO)
SWME – Slovak Water Management Enterprise, state enterprise (SK)
CroWa – Croatian Waters, Legal entity for water management (HR)
IJC – "Jaroslav Cerni" Institute for the Development of Water Resources (RS)
JVP SV – Public Water Company „Srbijavode" (RS)
JVP VV – Public Water Management Company "Vode Vojvodine" (RS)

MAFWM – Ministry of Agriculture, Forestry and Water Management (RS)
RHMSS – Republic Hydrometeorological Service of Serbia (RS)

Observers:

ICPDR – International Commission for the Protection of the Danube River (AT)
JRC – European Commission - DG Joint Research Center (IT)
BfG – Bundesanstalt für Gewässerkunde (DE)
LfU – Bavarian Environmental Agency (DE)
RPT BWL – Regional Council Tübingen (DE)

Contact

Lead partner
Ministry of Environment and Forests, Romania
12 Libertatii Blvd., Sector 5, 040129 Bucharest, Romania

Contact person
Mary-Jeanne Adler, Ph.D.

Danube FLOODRISK

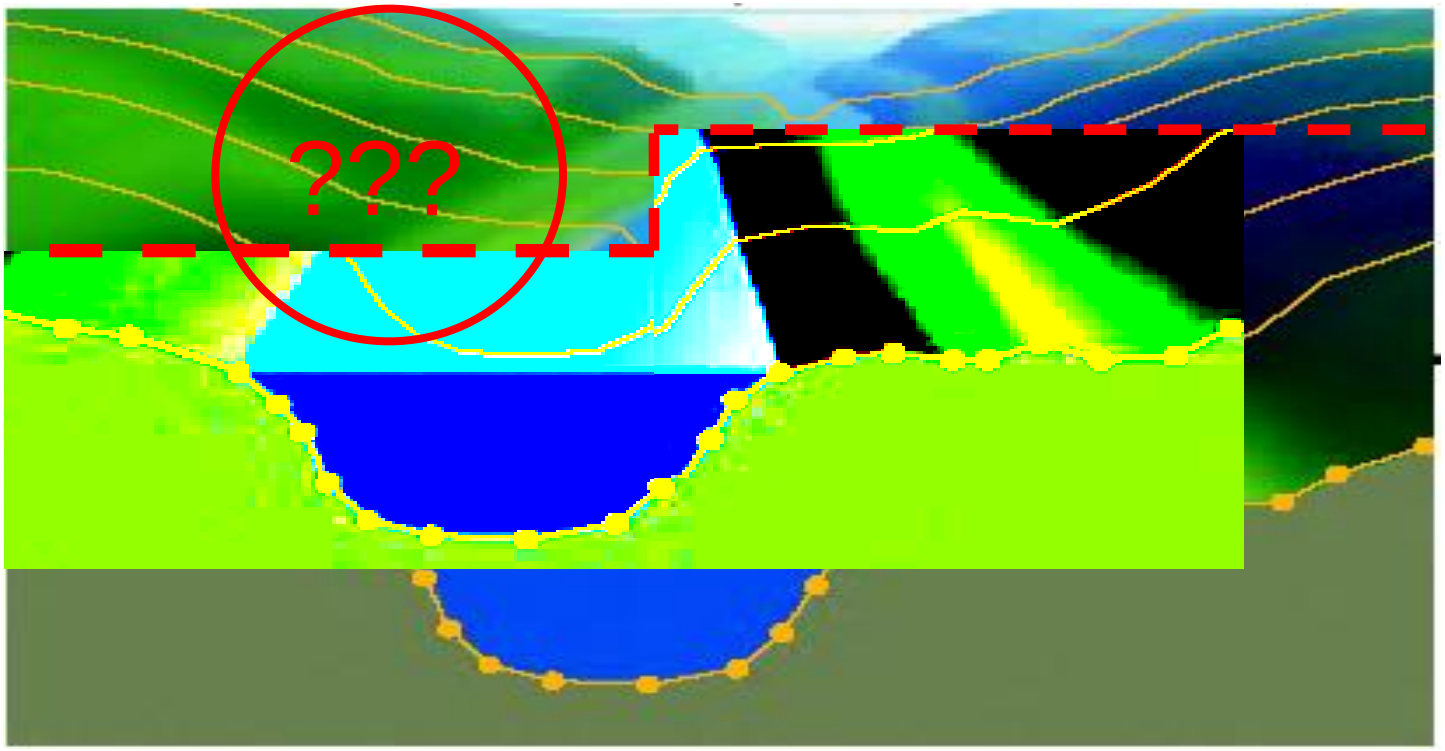
Specific objectives / Work packages

- WP1 - Project management
- WP2 - Communication and dissemination
- WP3 - Harmonization of data and methods
- WP4 - Stakeholder and end users involvment
- WP5 - Data collection and management
- WP6 – Production of maps (hazard, risk)
- WP7 - Integration of risk management methods + spatial planning + Pilot activities

Outcomes

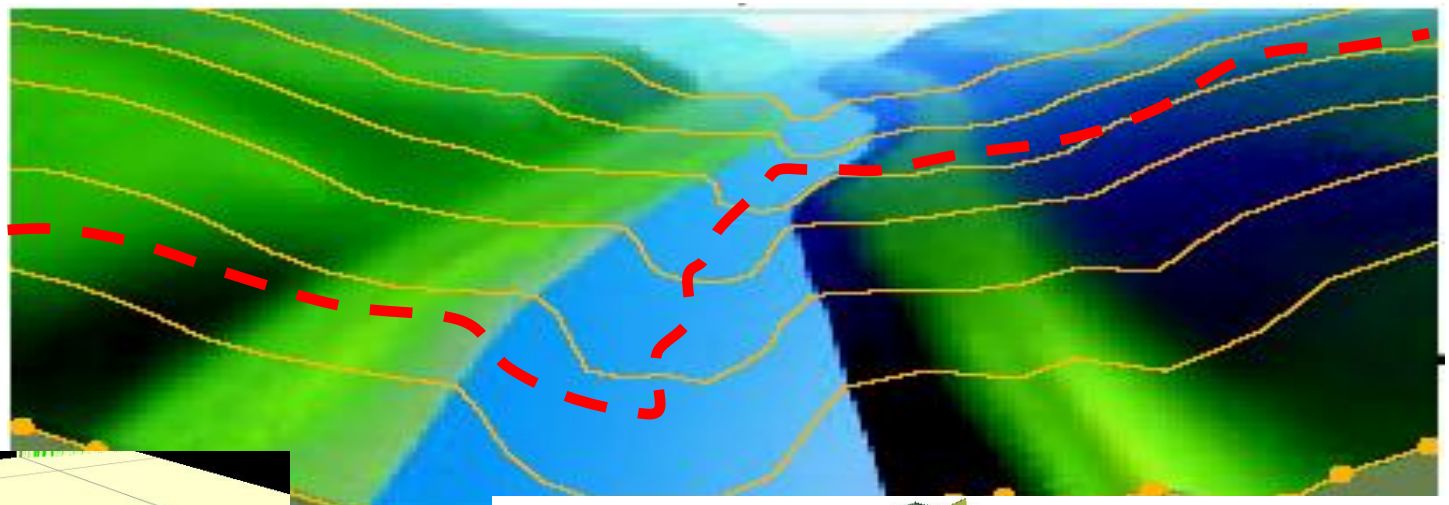
1. Harmonized methods and data (geographic data, hydraulic models, etc.)
2. Common catalogs for all actions on risk maps in Danube countries
3. Hazard and flood risk maps for the Danube Basin

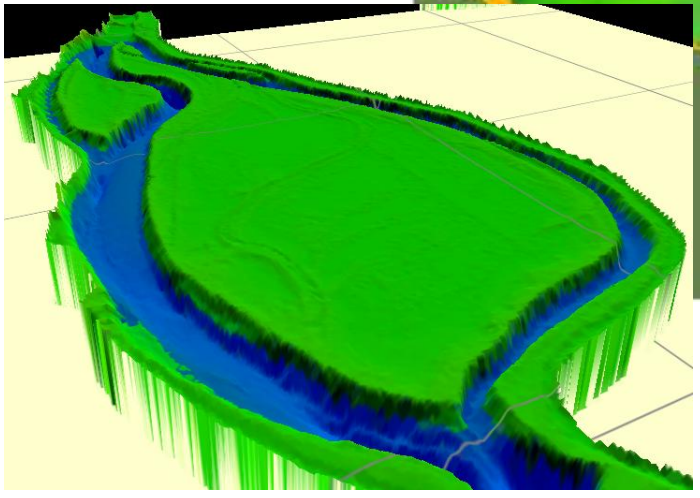
National Border

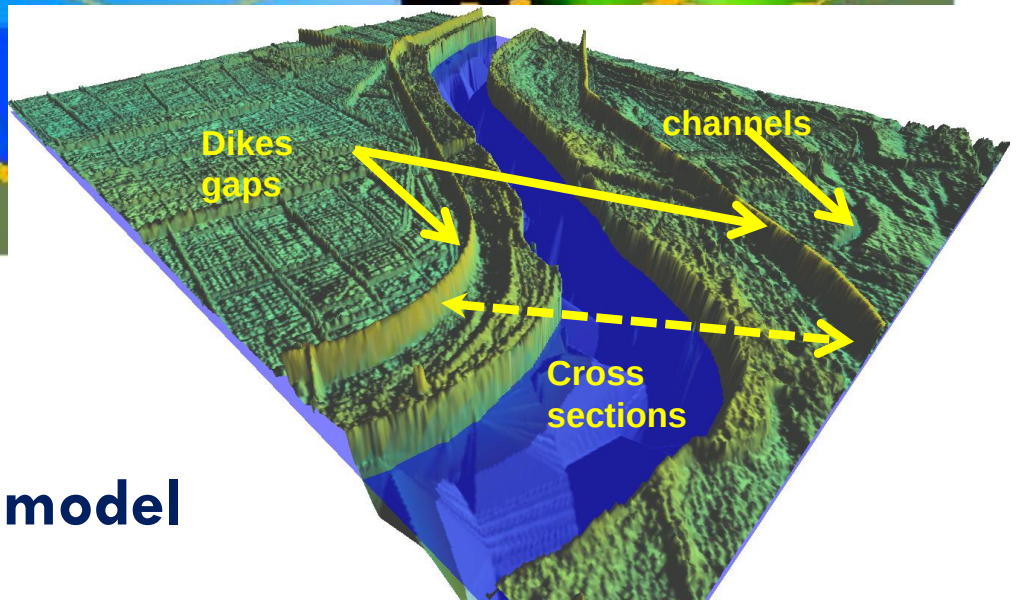


ONE system without national borders

National Border







Output: Joint digital elevation model

FLOOD HAZARD MAP

DIRECTIVE 2007/60/EC, CHAPTER III, Article 6:

3. Flood hazard maps shall cover the geographical areas which could be flooded according to the following scenarios:

(a) floods with a low probability, or extreme event scenarios;

(b) floods with a medium probability (likely return period ≥ 100 years);

(c) floods with a high probability, where appropriate.

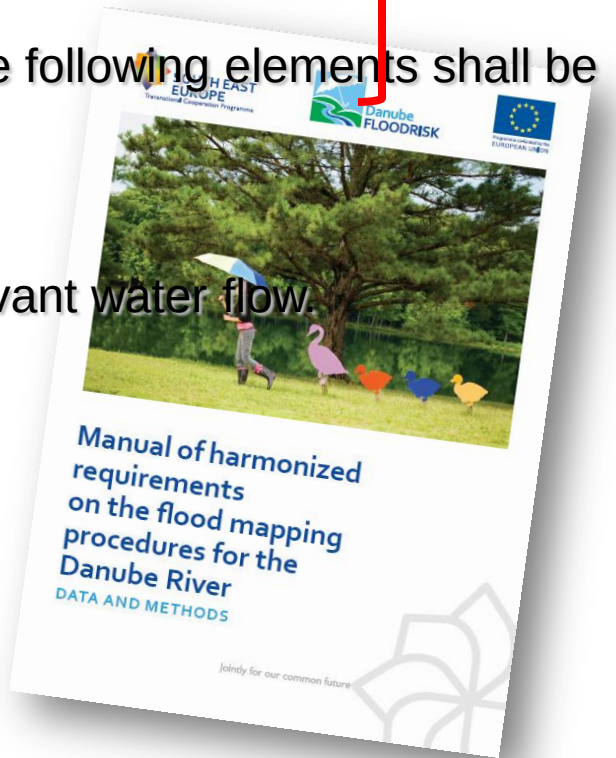
WP3 HARM outline

4. For each scenario referred to in paragraph 3 the following elements shall be shown:

(a) the flood extent;

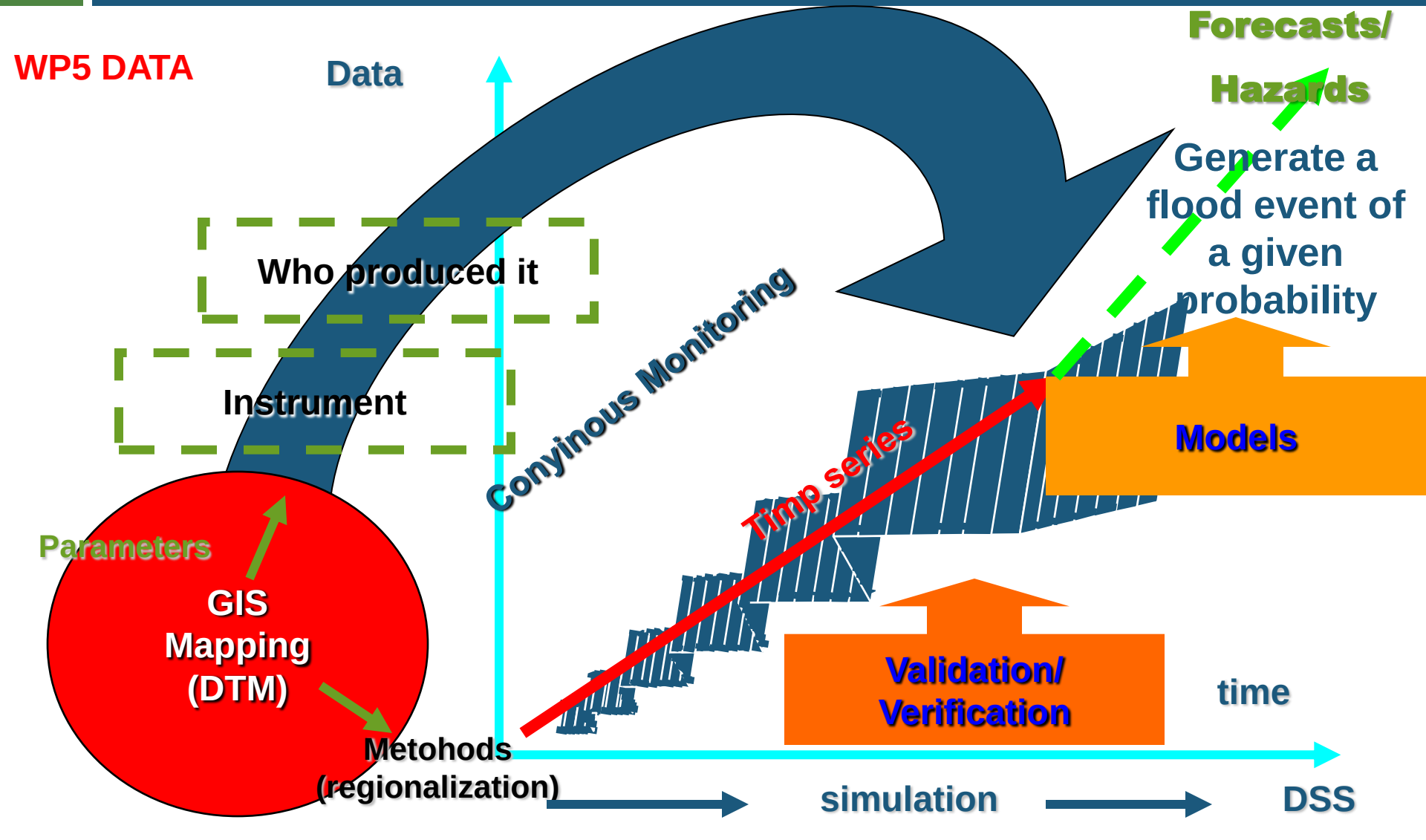
(b) water depths or water level, as appropriate;

(c) where appropriate, the flow velocity or the relevant water flow.

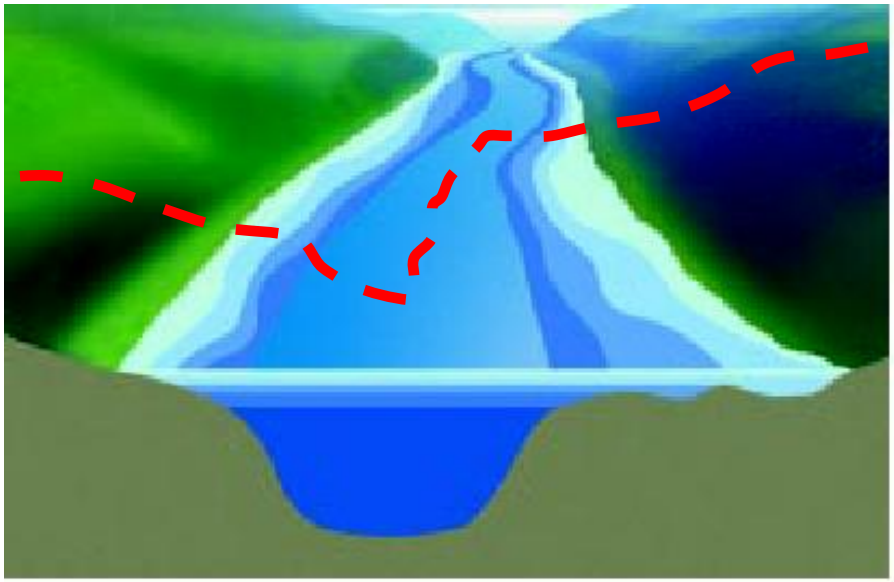


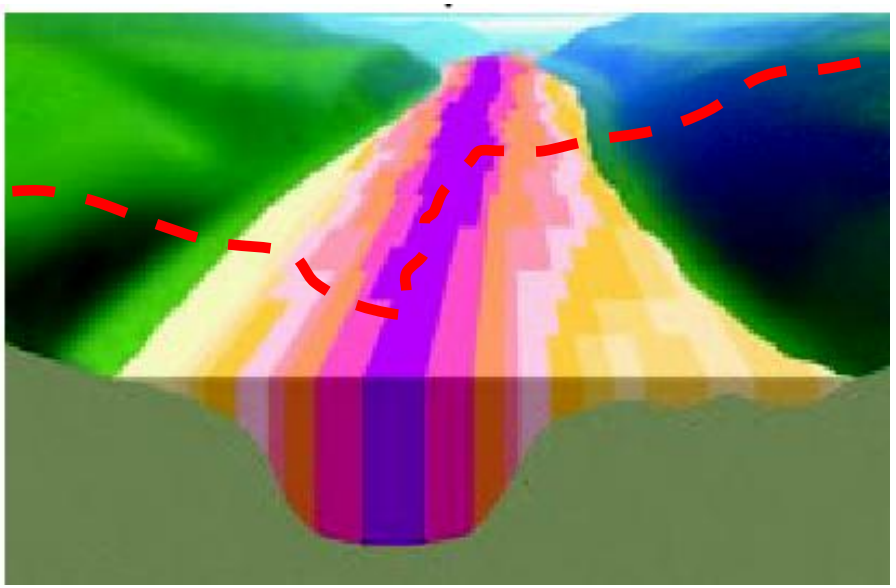
- **Hazard and risk mapping**
- **Damage and risk assessment**

How to calculate the inundation?



ONE system without national borders

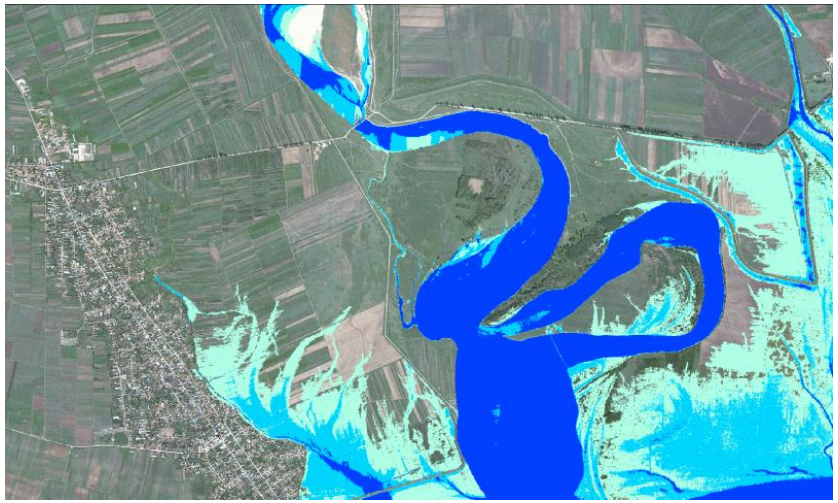




Water levels → flood zones → spatial planning

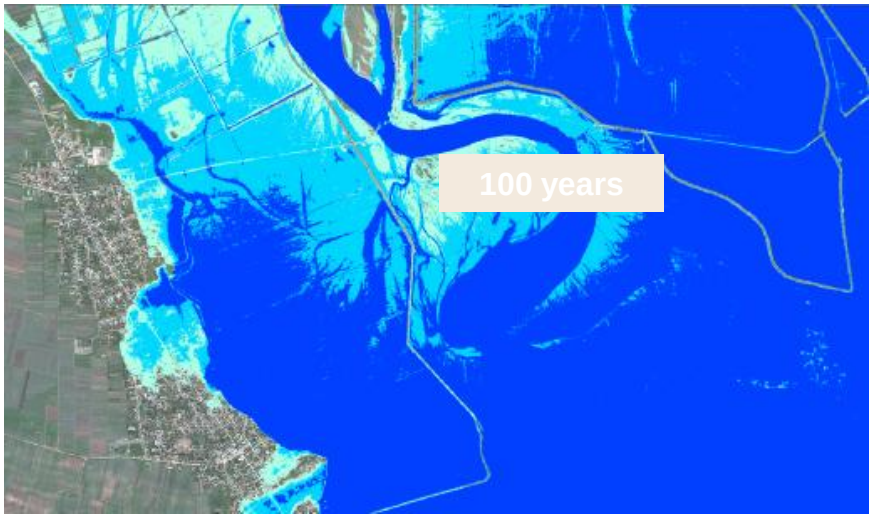
Output: Flood risk mapping for planning purpose

Hazard maps



33 years

100 years



1000 years

< 0.6 m
0.6 m - 1.5 m
> 1.5 m

Vulnerability - Damage assessment

Search of existing methods (assets and damage functions): **WP3 HARM**

- Atlases of Rhine, Elbe, Odra
- EU FP6/FP7-projects
- National methodologies/studies

Decision:

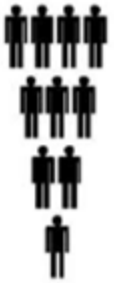
- **Usage of BEAM-methodology,** developed in FP7-project SAFER
- Methodology is a advancement of the existing atlases
- Synergies between projects as SAFER had test areas in Romania/Bulgaria
- **Use of existing damage functions, adaptations were necessary**

See Flood CBA Project Knowledge Platform

Additional risk information

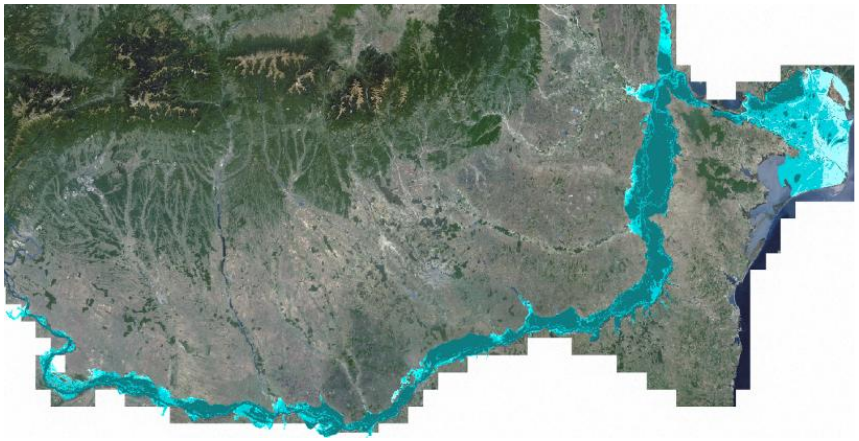
WP3 HARM-
WP6 MAPS

- Effected population (one symbol per NUTS 2 or 3 region)
- Elements at risk
- Dikes
- Natural reserve areas (if too large to be displayed by symbol)



Hospitals (human health)
Airport
Main train station
Cultural heritage or
Nature protection sites
Industrial sites and waste water treatment plant (IPPC)

Symbol	Class	r	g	b	C	M	Y	K
	dikes designed for floods < HQ_{100}	221	236	204	13	7	20	0
	main dikes designed for floods ≥ HQ_{100}	106	178	28	58	30	89	0



Weight_1 = f (water depth)
Weight_2 = f (water depth)
Weight_3 = f (water depth)

Vulnerability

Risk map

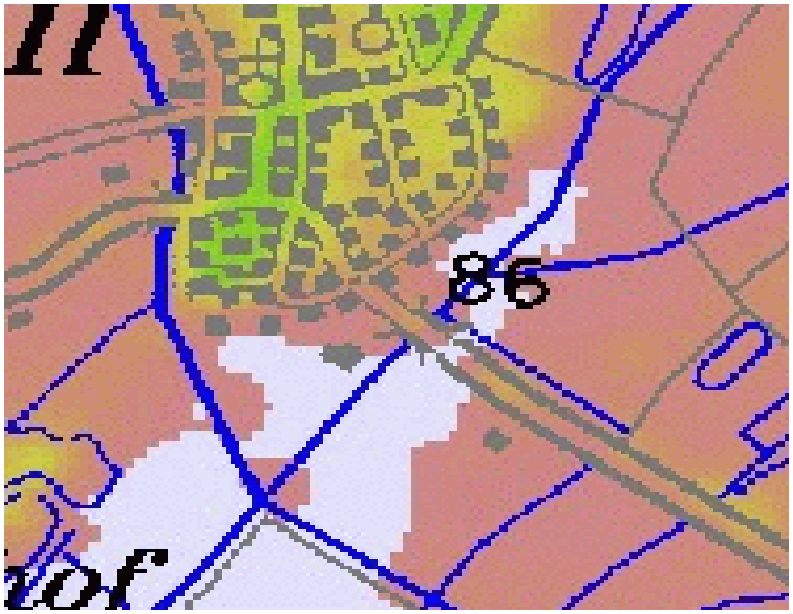
Output: Improvement of spatial planning and emergency management

WP4 STAKE

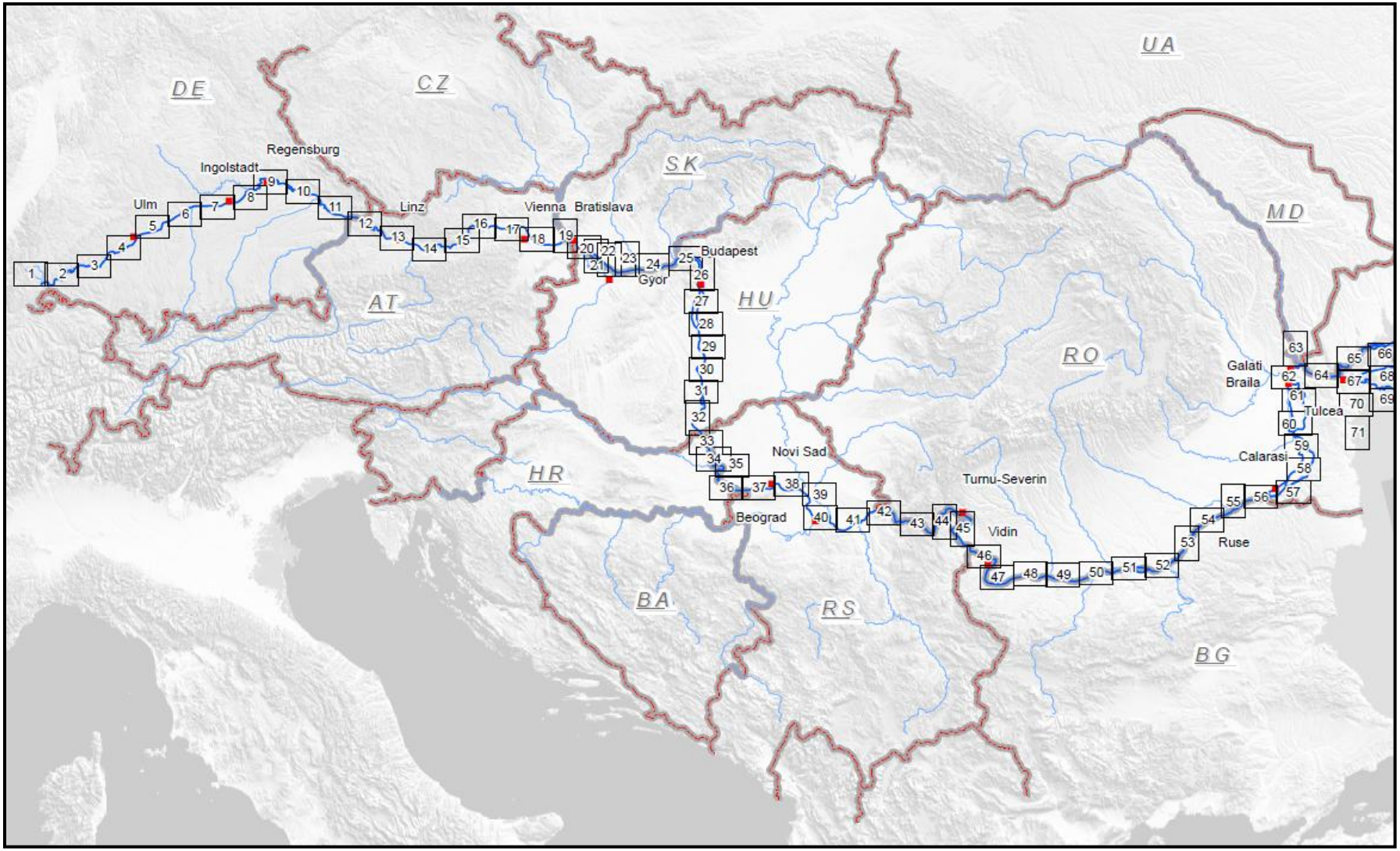
- Transfer of risk information into planning decisions
- Improvement of emergency management

WP7 PILOTS

WP6 MAPS



Atlas of hazard and risk maps production

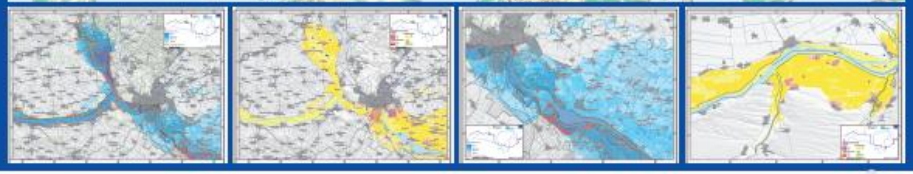


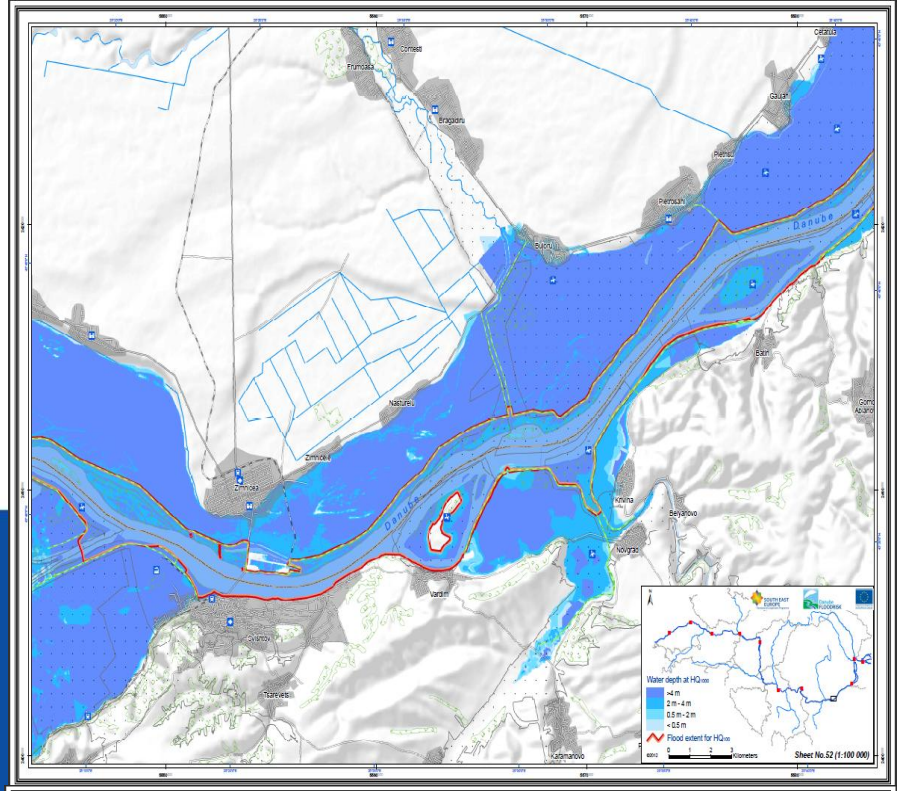
SOUTH EAST EUROPE
Transnational Cooperation Programme

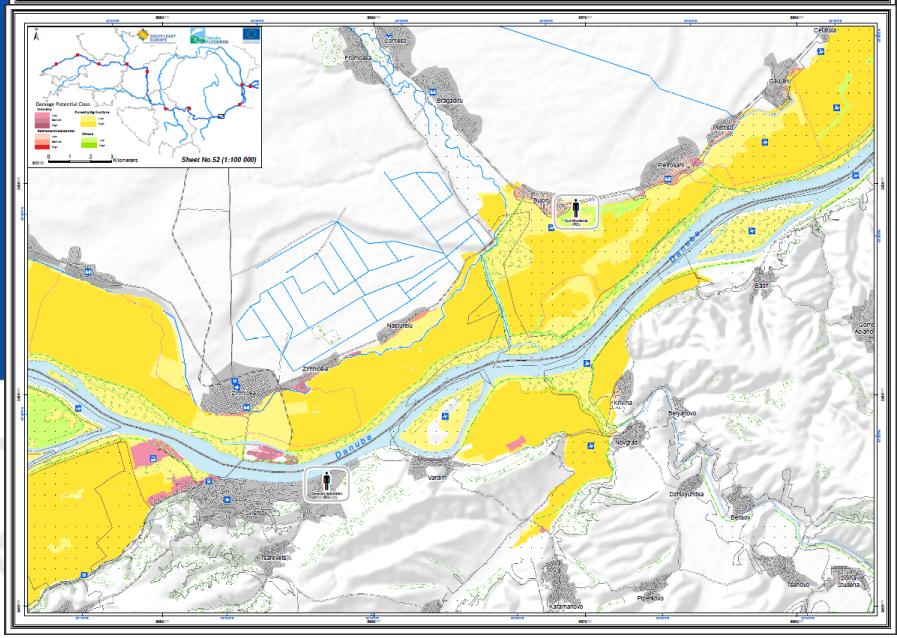
Danube FLOODRISK

Programme co-funded by the EUROPEAN UNION

DANUBE ATLAS
HAZARD AND RISK MAPS



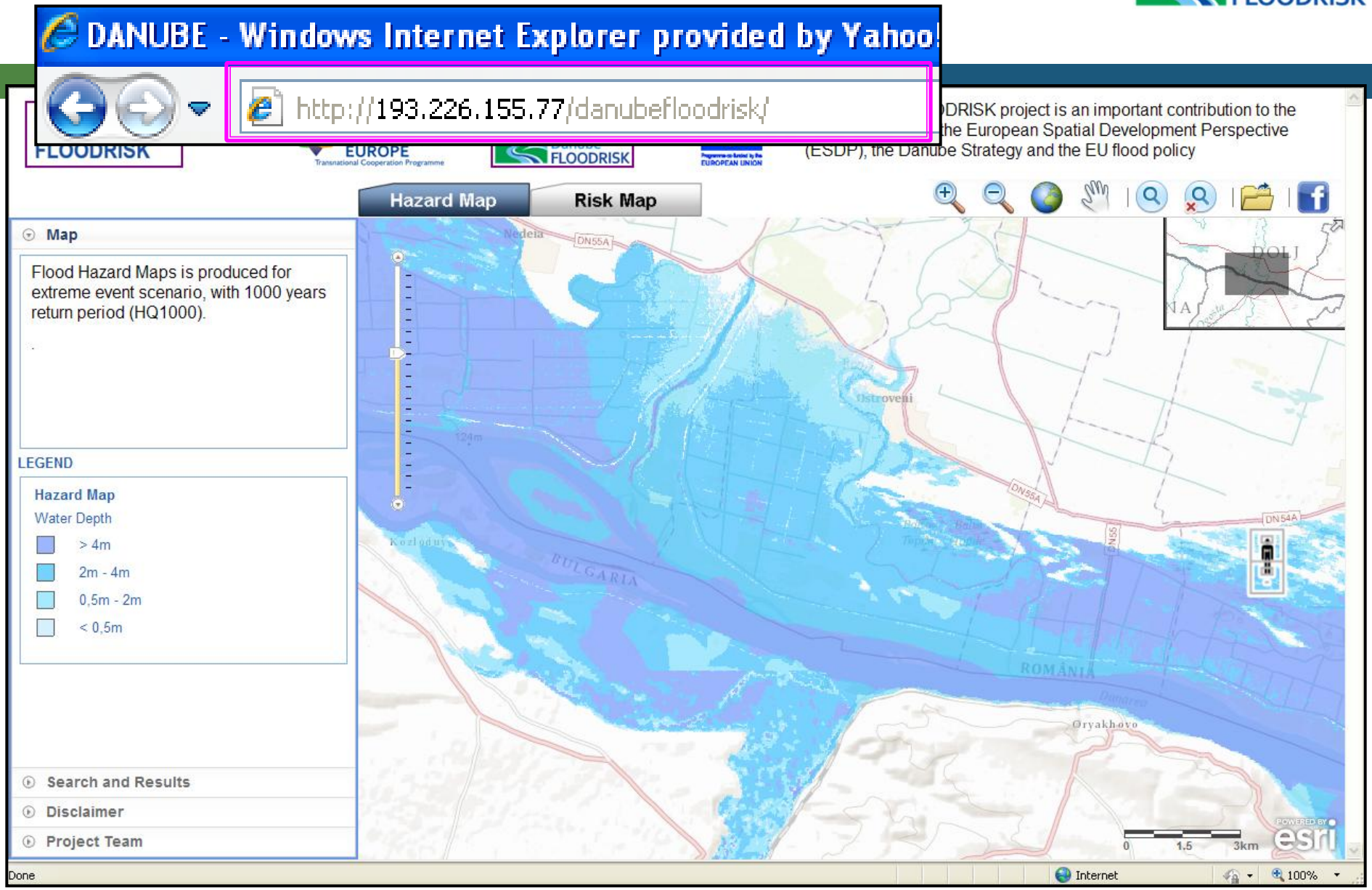




BUCHAREST / 2012

DANUBE REGION strategy

Jointly for our common future


DANUBE - Windows Internet Explorer provided by Yahoo!
http://193.226.155.77/danubefloodrisk/
DRISK project is an important contribution to the
he European Spatial Development Perspective
(ESDP), the Danube Strategy and the EU flood policy
Hazard Map
Risk Map
Map
Flood Hazard Maps is produced for extreme event scenario, with 1000 years return period (HQ1000).
LEGEND
Hazard Map
Water Depth
> 4m
2m - 4m
0,5m - 2m
< 0,5m
Search and Results
Disclaimer
Project Team
Nedeia
DN55A
Ostroveni
DN54A
BULGARIA
ROMÂNIA
Oryakhovo
DOLJ
0
1.5
3km
Done
Internet
100%

Output: Stakeholder involvement

What do you need?

- Municipalities
- Spatial planning
- Rescue services
- Emergency management
- Insurances
- NGOs
- …

→ Demands on map content!

→ Action Plan

Case Study - Galati

Galati was identifyed as high risk area

Pilot area GALA TI

Water level at Galati Gauging Station

26 April 2006	7.00 m
5 July 2010	7.18 m
Q 1%	7.22 m

Flooding scenario- Galati 5 July 2010

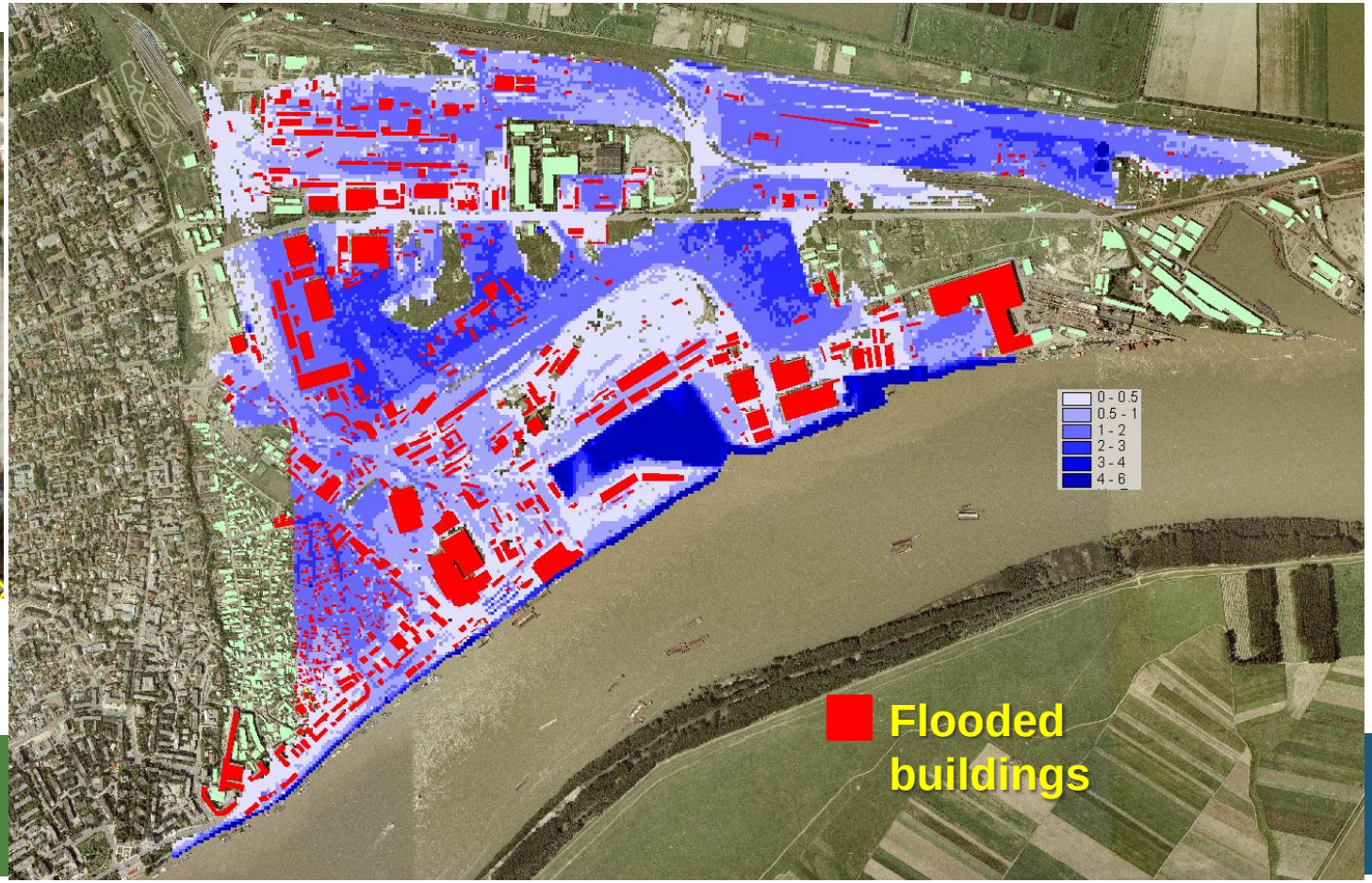
Dyke breche with discharge of 50cm/s

L_bresa =100m, H over 25 cm H 2010

Scenario- Galati 5 July 2010

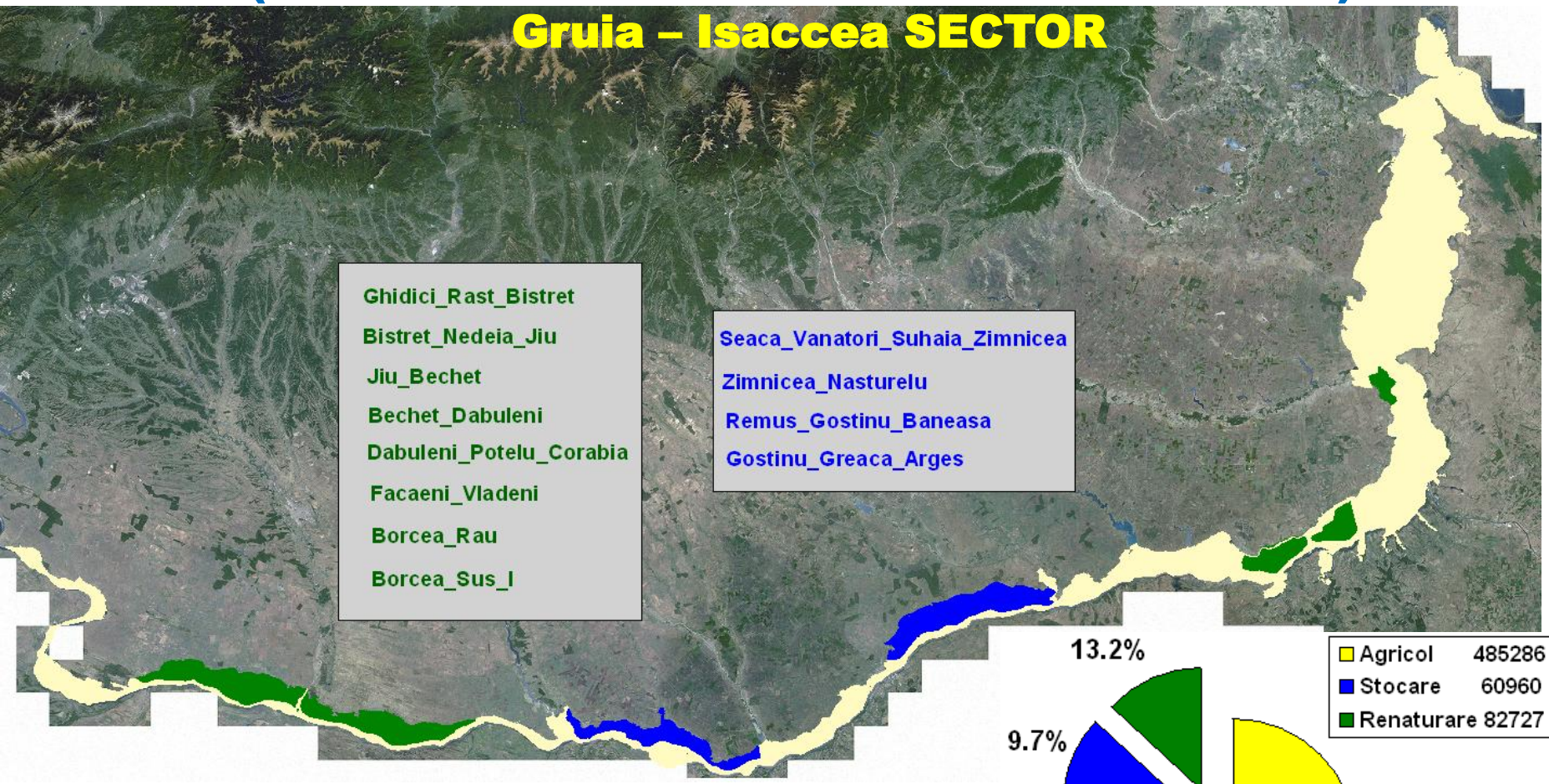
Flooded area in 24 h = 333 ha
No of buildings= 706
Flooded surface= 54 ha

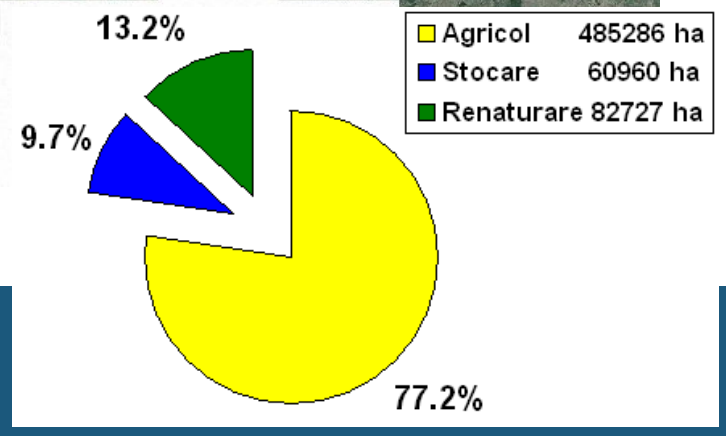
Adancimea apei (m)	S(ha)
0 - 0.5 m	32
0.5 - 1 m	12
1 - 1.5 m	8
1.5 - 2 m	2
2 - 3.5 m	1

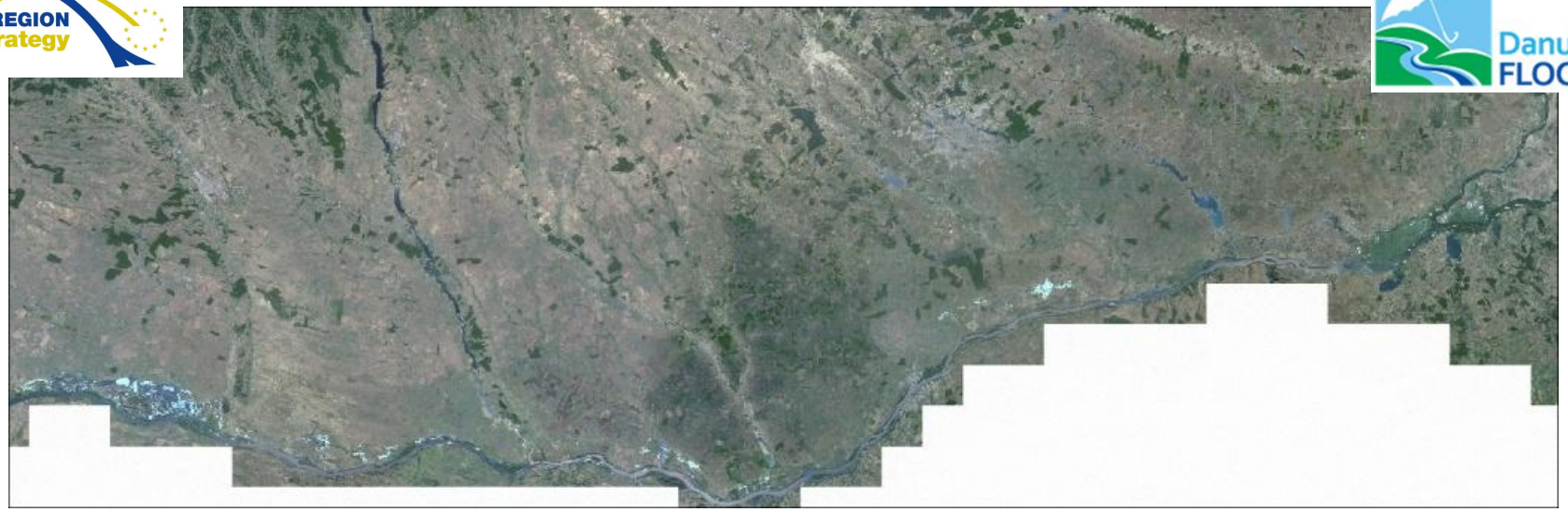


INTEGRATED SOLUTIONS ALONG THE DANUBE (RENATURATION AND TEMPORAL STORAGE)

Gruia – Isaccea SECTOR



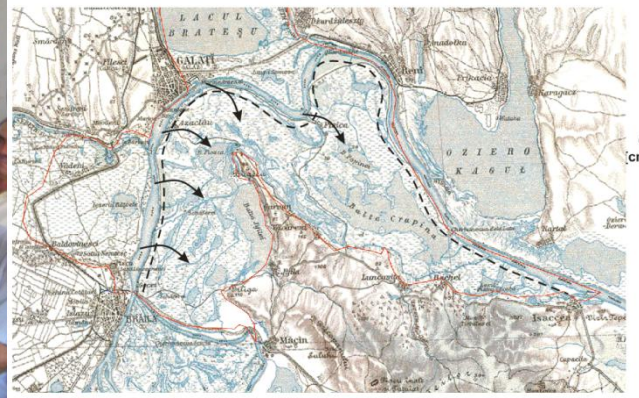


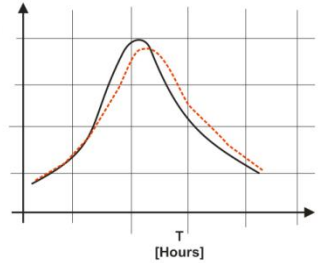


Water level decrease in proposed scenario

Danube Floodrisk experience capitalization

	Scenariu_Q100	Scenariu_Q200
	SC1	SC2
Gruia	-0.37	0.09
Calafat	-0.75	-0.34
Bistret	-1.24	-0.93
Bechet	-0.79	-0.44
Corabia	-0.26	0.12
Tr.Magurele	-0.42	-0.07
Zimnicea	-0.36	0.11
Giurgiu	-0.38	0.03
Oltenita	-0.47	-0.17
Chiciu	-0.49	-0.26
Calarasi	-0.49	-0.25
Cernavoda	-0.47	-0.16
Harsova	-0.43	-0.13
Vadu Oii	-0.40	-0.12
Braila	-0.41	-0.12
Galati	-0.40	-0.12
Isaccea	-0.26	-0.08





More Room for the Water in the Cat's Bend Area

1. Sketch match — Process
2. Hydraulic modelling / 3D GIS — Effects
3. Romanian REELD study — Basis
4. Dutch 'Room for the river' approach — Principle

Innovative Character of the project idea

- ***For DANUBE RIVER BASIN***
  - Cooperation of all Danube countries in joint implementation of risk management

- ***For SOUTH EAST EUROPE***
  - Pilot project approach due to same issues in other river basins

- ***For risk management in EUROPE***
  - Integration of relevant stakeholders
  - Development of standards for flood risk mapping
  - Practice and user orientated development
  - Test of EU Driectives on early stage

Thank you

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