



FLOOD protection in Slovakia & The Slovak Water Management Enterprise, s.e.

The INBO 7th World General Assembly

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Debrecen, Hungary

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The Slovak Water Management Enterprise, s.e. Banská Štiavnica, Slovakia

Location of Banská Štiavnica in the heart of Europe





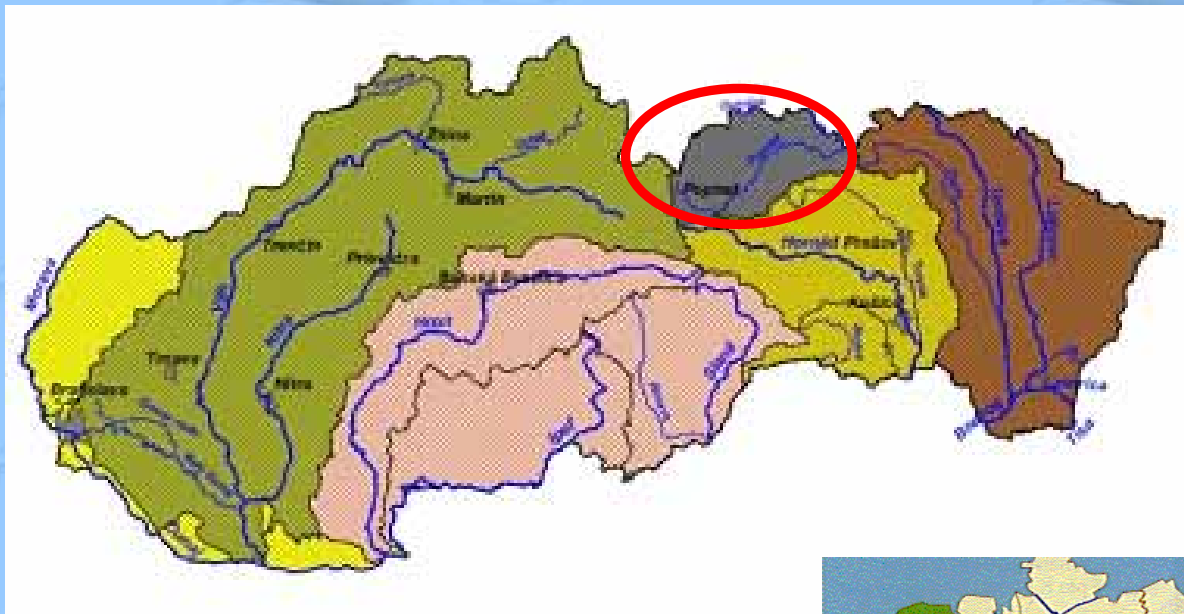
The headquarters of SWE, s. e. in Banská Štiavnica





Historical water reservoirs in the surrounding of Banská Štiavnica





96 % of Slovakia

- Danube River basin

4% of Slovakia

- Wistula River basin

Danube River (basin):

Length (km): 2 960

Drainage Area (km²): 817 000

Discharge (m³/s): 6 500

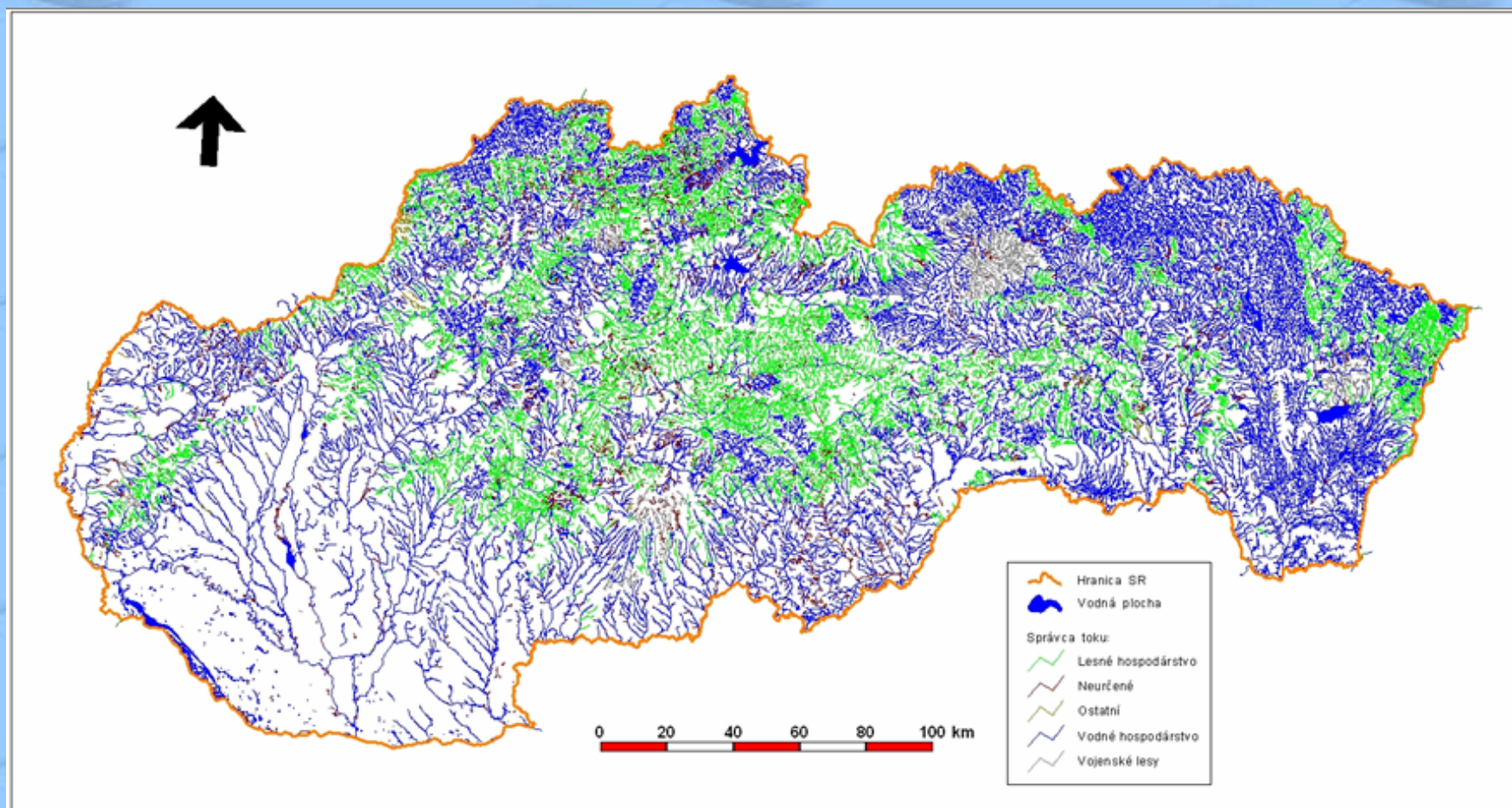
Countries: 17

Population: 80 000 000

Sea at Mouth: Black



The Rivers in Administration of SWE, s.e.



Surface of basins cca 49 015 km²

The Organizational Structure of the SWE, s.e.



Subject of activities

The main subjects of activities of the enterprise are administration and protection of surface and ground waters, complex hydrological activity within the river basin and to ensure other activities, especially:

- catering for **public utilities**
- **administration of the concerned water courses** and to ensure all their functions, implementation of the right to manage the water courses and water works built on them
- to ensure **effective protection of waters, water courses and water works**
- implementation of specific activities related to **administration of border water courses** and the following activities resulting from specific agreements related to border water courses
- to ensure **surface water supply** from water courses and reservoirs including its use for generating electric energy in the range determined by state water administration bodies
- to ensure **development, operation and maintenance of waterways**, to form conditions for utilization of water courses and reservoirs for navigation and other national economic use

• **implementation of safeguarding works** to prevent unfavourable affects of waters on water courses and water works, implementation of tasks resulting from flood plans and decisions of flood commissions during **flood activities**

- **implementation of building, assembling and maintenance works**, extraction of river materials, extraction and production of aggregate and cutting trees off forests
- **monitoring and evaluation of water quality** in water courses, taking of water and other handling with waters, collection of money according specific provisions
- operation of **fish farming** of the enterprise
- Implementation of **other tasks** resulting for the state enterprise from the act on waters and related legal rules including supervision activities in protected water management areas

State property administered by SWE, s. e.

Item	Unit	Amount
Total basin area	km ²	49 015
Water courses	km	29 917
... from that - trained water courses	km	8 189
Flood protection dikes	km	3 074
Drainage channels	km	1 602
Water reservoirs	number	285
Water reservoirs for drinking water	number	8
Volume of water reservoirs	mil.m ³	2 002
Retention Volume of water reservoirs	mil.m ³	249
Surface of water reservoirs	km ²	231
Weirs	number	216
Ship locks	number	12
Pumping stations for internal waters (flood protection)	number	70
Historical water management structures (water reservoirs)	number	23

... our dreams

...beautiful morning...

... holiday ...



Floods !



Natural phenomenon,
climate changes



2006

Districts in the Slovak Republic, where states of Emergency were raised in the period I. - VIII. 2006



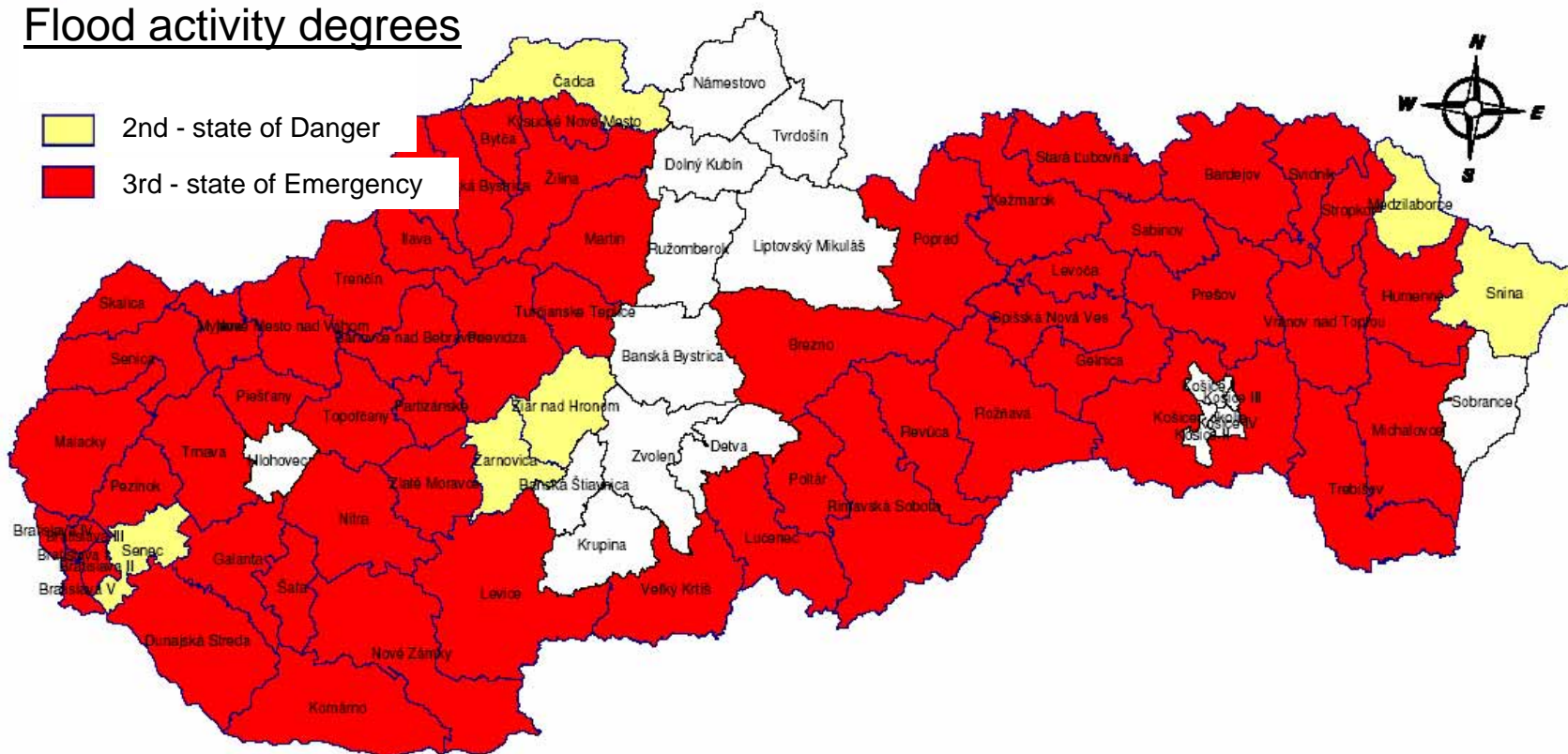
Flood activity degrees



2nd - state of Danger



3rd - state of Emergency



Floods ?????

What we can do ???

BEFORE

- IWRM, ... „INBO“
- River and basin cond.
- Rainfall - runoff models
- Flood risk maps
- Land-use r
- Forecast and Warning
- Flood protection inspections
- River trainings, construction reservoirs...

DURING

- Flood plans
- Security (safeguarding) activities (by water management sector)
Protection of dikes from surge, leakages, impact of erosion,epage and protection from overflow the top of the dike
- Emergency (rescue) activities (by interior sector)
on and evacuation of the on the threaten

AFTER

- data processing
- to know river basin
- models calibration
- ...

Floods ?????

We need to be prepared ???
We need to do our best „BEFORE“ ...

- Prevention flood protection measures:
 - Data, models, systems, IWRM management
 - Awareness, preparedness PEOPLE ...
 - Dikes, retention in country, ... sand bags

Legal basis:



- 1. The Water Framework Directive 2000/60/EC**
- 2. Directive of the European Parliament and of the Council on the assessment and management of flood risks (2007/??/EC)**
- 3. Bilateral agreements**



- 1. The Constitution of the Slovak Republic**
- 2. The Slovak Water Act (Nr. 364/2004)**
- 3. The Slovak Flood Protection Act (Nr. 666/2004)**

Directive of the European Parliament and of the Council on the assessment and management of flood risks (2007/??/EC)



I. Preliminary flood risk assessment by December 22, 2011

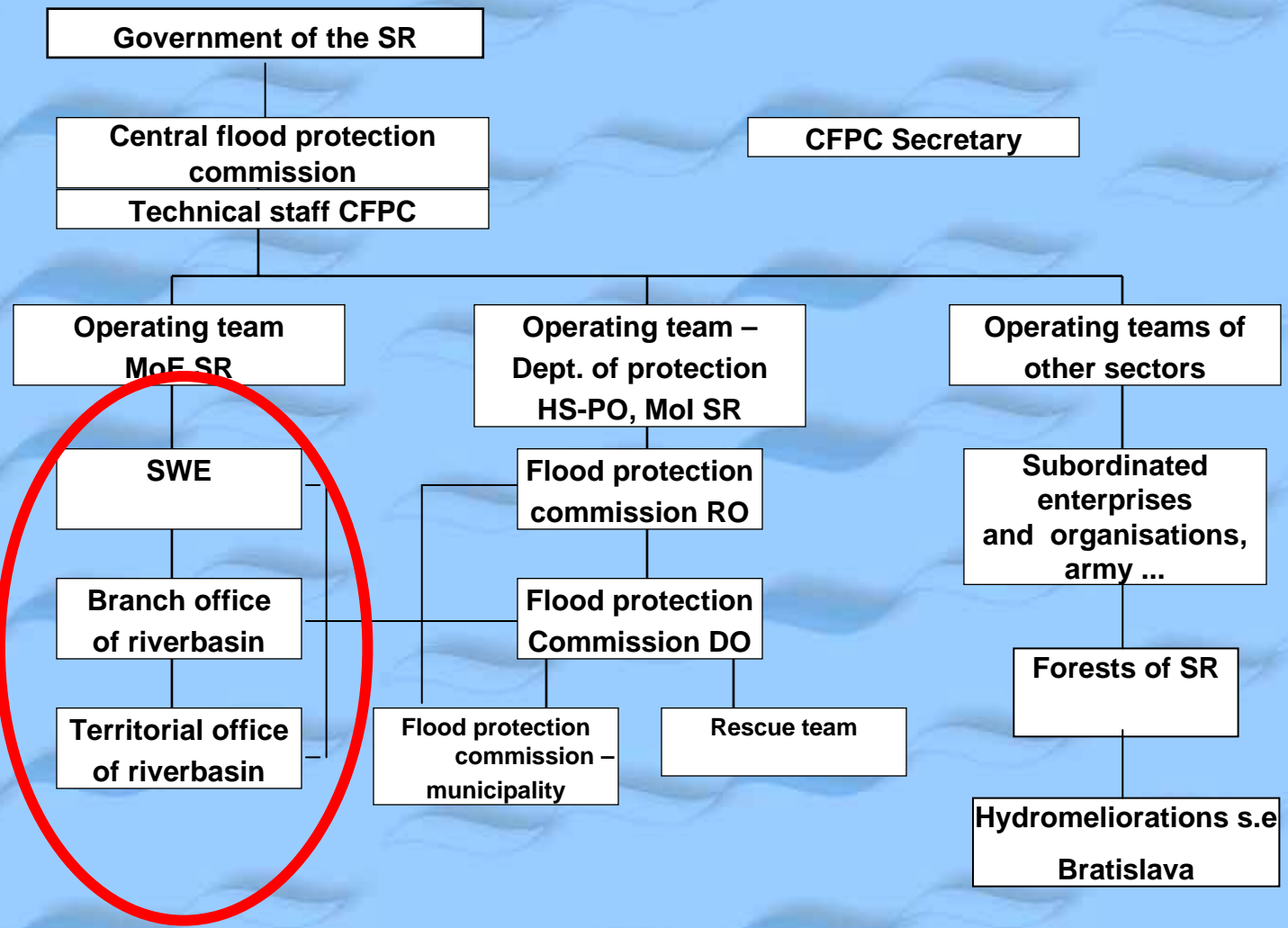
II. Flood hazard maps and flood risk maps by December 22, 2013

III. Flood risk management plans by December 22, 2015

- prevention
- protection
- preparedness

... repeated in a six-year cycle.

Organization of Flood Protection on the Territory of the SR



Information flow

data collection



SHMU
Slovak hydrometeorological
institute

Municipalities

Citizens

Media
TV, broadcast, newspapers

Flood Protection Commission
-Central Flood Protection Commission
-Flood Protection Commission PC
-Flood Protection Commission

Decisions

- **Security (safeguarding) activities** (by water management sector)
- **Emergency (rescue) activities** (by interior sector)

FLOOD PLANS

- Fixed phasing related to **flood activity degrees** (water levels, threat of exceptional snow melting, ice events)
 - 1st degree (state of Alert)
 - 2nd degree (state of Danger)
 - 3rd degree (state of Emergency)
- The plans are specific for different river basins
- They contain concrete actions with specific personnel attached
- There is specified the structure of flood authorities and flood protection system
- Format for situation reports is clearly specified
- Procedure for post-event evaluation



Security (safeguarding) activities

- Protection of dikes from surge, leakages, impact of erosion, seepage and protection from overflow the top of the dike
- Protection of water course channel and banks from violating and damaging
- Elimination of barriers disabling smooth water flow
- Striking ice blocks and obstructions
- Special operations on the water management systems
- Closing breaches on dikes
- Draining water from flooded territory
- Draining and pumping inner waters
- Building secondary flood protection lines
- Etc.



Security (safeguarding) activities



Protection of dikes from surge, leakages, impact of erosion, seepage and protection from overflow the top of the dike

Security (safeguarding) activities



Draining and pumping inner waters

Financial support of EU 2004 - 2006

- Preventive flood protection measures



Flood protection measures 2004 - 2006

Structural Funds

Approved 21 projects ... 6,681 mil. EUR

- ... projects of
- river trainings,
 - dikes reconstructions,
 - flood damages elimination,
 - ...

Structure of financing:

- ERDF 80 %
- State budget 15 %
- Own resources 5 %

Cohesion Fund

Bratislava (The Capital of SR) – Flood protection:

..... under construction

31,239 mil. EUR (eligible costs)

CF: 26,553 mil. EUR

State budget: 3,124 mil. EUR

Own resources: 1,562 mil. EUR

Structure of financing:

- CF 85 %
- State budget 10 %
- Own money 5 %





Community Initiatives

**INTERREG III B: GIS FORUM– PROJECT D4D,
DANewBE Data,
MOSES ...**



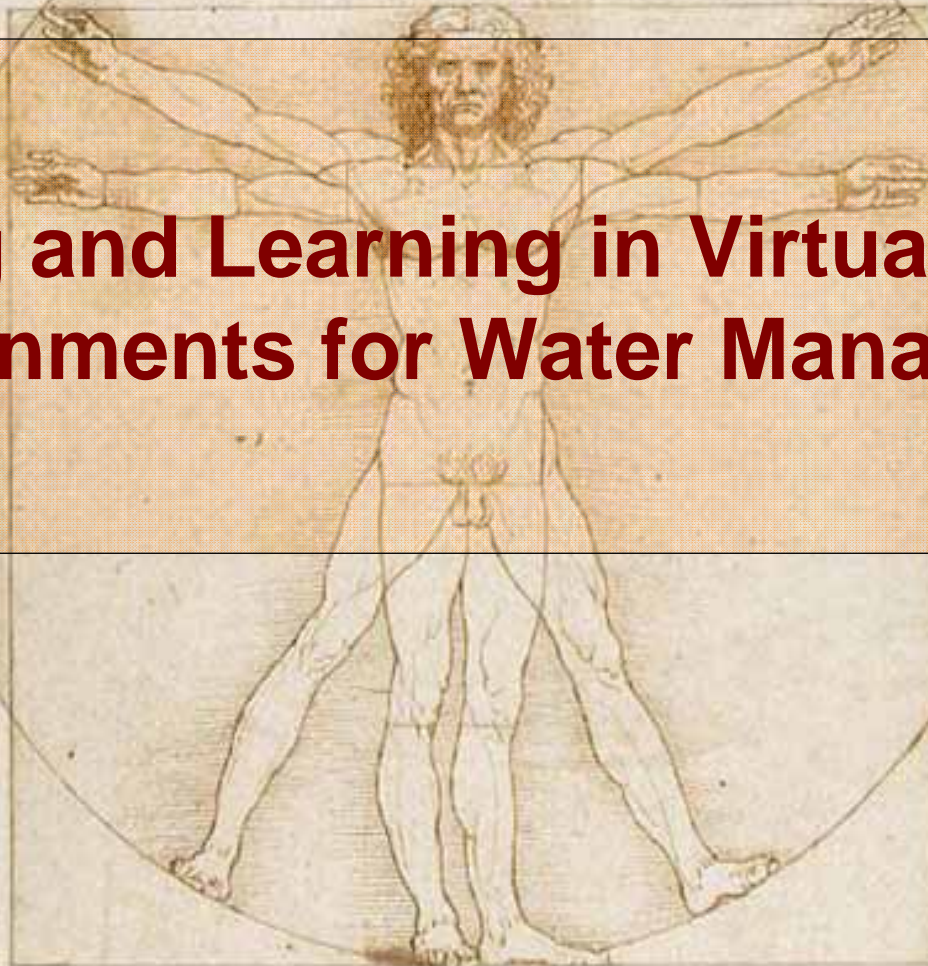
Community Action Programs

Socrates, Leonardo da Vinci, Life, Youth, Daphne,

Teaching and Learning in Virtual Learning Environments for Water Management

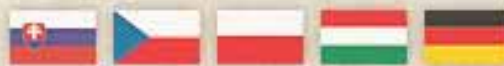
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Teaching and Learning in Virtual Learning Environments for Water Management



Education and Culture

Leonardo da Vinci
Pilot projects

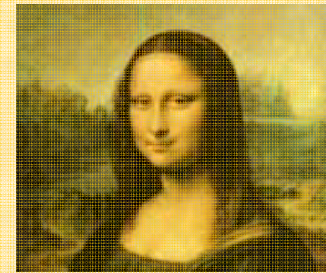


"Teaching and Learning in Virtual Learning Environments for Water Management"

Main goal

Online education system

- in the area of flood protection and renewal of a country's retention ability.



"Teaching and Learning in Virtual Learning Environments for Water Management"

Project partners

The Slovak Republic:

The Slovak Agricultural University Nitra,
The Slovak University of Technology Bratislava,
The Slovak Water Management Enterprise Banská Štiavnica

The Czech Republic:

Mendel Agricultural and Forestry University Brno,
Labe River Basin Management Enterprise, Hradec Králové,

Germany:

Osteuropazentrum Universität Hohenheim Stuttgart,
Ingenieurbüro Winkler und Partner GmbH Stuttgart,

Poland:

Szkola Główna Gospodarstwa Wiejskiego w Warszawie,
Instytut Badawczy Lesnictwa w Warszawie,

Hungary:

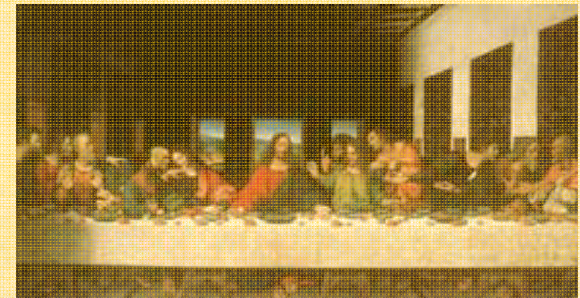
University of Debrecén,
Vituki Consult Rt Budapest.



"Teaching and Learning in Virtual Learning Environments for Water Management"

The expected specific results:

- Rework of the **LMS** (Learning Management System)
- Creation of **6 modules** system for training of the target group
 - Module 1** Hydrology and applied hydrology of water resources
 - Module 2** Water resources use and protection
 - Module 3** Integrated Water Resources Management
 - Module 4** Habitats of water courses and their dynamics, revitalization of water courses
 - Module 5** Flood prevention measures in the country and settlements, reduction of disasters
 - Module 6** Natural and human-made wetland ecosystems and their sustainable use
- Combined models of education (eLearning, establishment of transnational virtual study groups...)
- The development of a pilot course for the target group,
- Etc.



"Teaching and Learning in Virtual Learning Environments for Water Management"

Products:

- self-contained online education system
 - CD ROM,
 - Online course (The Internet),
 - Text materials

www.fem.uniag.sk/water_management/

- Leaflets, posters ...
- Publication in press and specialized magazines
- Participation in conferences ...



**Thank you for your
attention !**



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Banská Štiavnica,
Slovakia, Europe

Floods in Slovakia



Bratislava – flood situation on the Danube river quay in summer 2002

Floods in Slovakia



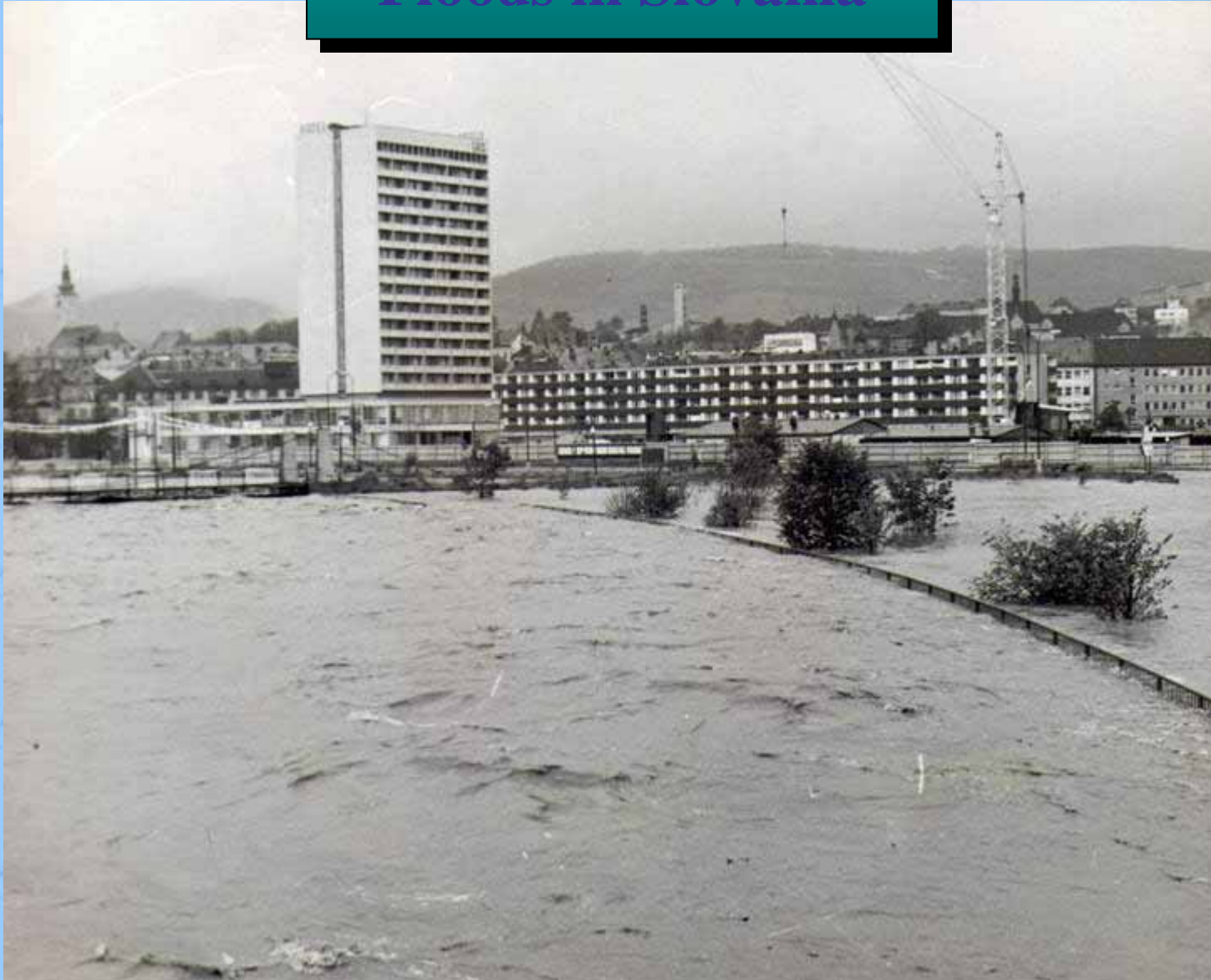
The **Ondava River** - flood protection dike failure in 2004

Floods in Slovakia



The Danube river in 1965

Floods in Slovakia



The Hron river in 1974

Floods in Slovakia



Šahy in 1999

Flood prevention



The **Beša polder** in 1999

Floods in Slovakia



Tichý potok (Silent Creek) in 1997

Flood prevention



The **Morava river** in 1997

Floods in Slovakia



Devínska Nová Ves in summer 2002