



Chair and Institute of Hydraulic and Environmental Engineering



www.grf.bg.ac.yu

Prof. Marko Ivetic
Head of the Chair

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Director of the Institute



Academic Studies

□ Curricula

First Degree – 4 years

Theory of structures 1
Soil mechanics
Transportation infrastructure systems
Hydrology
Legislative in civil engineering
Engineering economy

Concrete structures
Water quality
Hydraulics 1
Metal and timber structures
Foundation

Hydraulics 2
Municipal hydraulic engineering 1

Drainage system
Hydraulic structures 1
Engineering hydrology

Construction management and technology
Irrigation
Waterways and ports
Municipal hydraulic engineering 1
Groundwater use and control
Hydropower engineering

River engineering
Water resources systems
Measurements in hydraulic engineering
Synthesis project



Academic Studies, cont.

□ Curricula

Second Degree

Hydraulic structures 2

Numerical methods in hydraulic engineering

Elective course 1

Elective course 2

Elective course 3

Elective course 4

Diploma project

Number of students:
30 on average

Elective courses 1, 2, 3 and 4

Construction of hydraulic engineering infrastructure

Flood control

Transport processes in hydraulic and environmental engineering

Risk and reliability analysis in civil engineering

Solid waste management

Stochastic hydrology

Hydroinformatics

Integrated urban water management

Object oriented programming

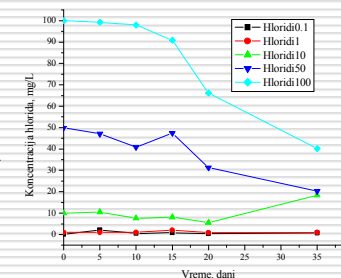
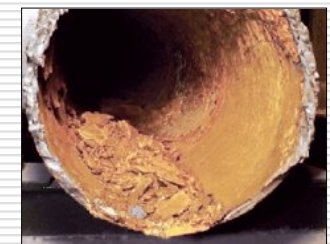
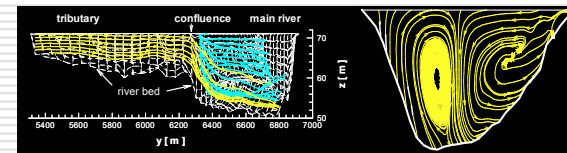
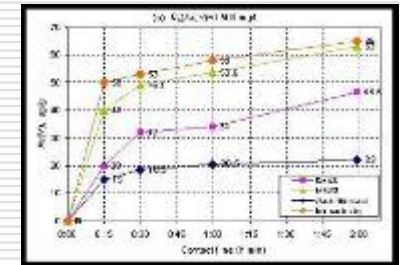
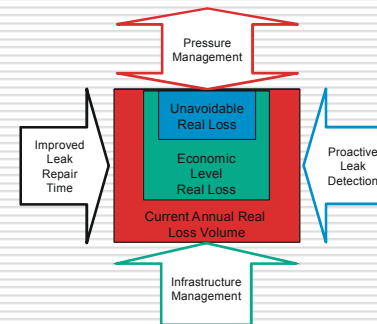
System optimization



Academic Studies, cont.

□ PhD Candidates/Thesis

- Branislav Babic
Enhanced methodology for assessment and improvement of Water Supply System performance
- Branislava Jovanovic
Development of Water Treatment Techniques for Arsenic Removal
- Dejana Djordjevic
Numerical study of river confluence hydrodynamics
- Vladana Rajakovic Ognjanovic
The effect of water quality on steel corrosion
- Dragutin Pavlovic
Dynamic Monitoring of Distribution Networks Leakage Detection
- Vladimir Hristodulu
Analysis of system operation in critical situation in water supply systems
- Olivera Doklesic
Performance Indicator improvements of Water Supply Systems with large seasonal consumption variations





Academic Studies, cont.

□ Laboratories

■ LABORATORY FOR SANITARY ENGINEERING



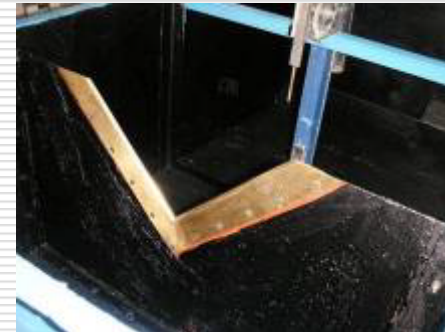
■ LABORATORY FOR FLUID MECHANICS AND FLUID VOLUME MEASUREMENT



■ LABORATORY FOR HYDROMETRY AND HYDROLOGY

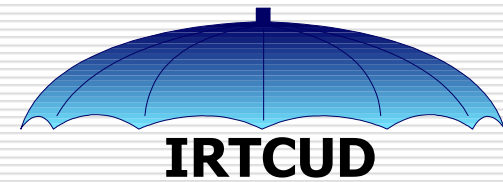


■ LABORATORY FOR HYDRAULICS AND WATERWAY REGULATION





Research



- ❑ Resolution on the 24th UNESCO General Conference, Paris, October 1987
- ❑ Participation in & contribution to the IHP programme
- ❑ Cooperation with:
 - UNESCO and UN organisations (UNEP, UNDP, UNIDO)
 - professional institutions (IAHR, IAWPRC, IAHS)
 - World Meteorological Organization (WMO)
 - governmental institutions and NGOs
 - universities and research institutions



IRTCUD Network:

- IRTCUD Belgrade
- CC – Cold Climate IRTCUD, Trondheim
- HT – Humid Tropic IRTCUD, Porto Alegre
- ASA – Arid & Semi Arid IRTCUD

CUW Network:

- CUW – UK, London
- IRTC UW – BG, Sofia
- CUW – BL, Banja Luka
- Regional CUWM, Tehran

SEE Network:



Research, cont.

- EDUCATE project – Postgraduate Studies in Water Resources and Environmental Management

Partners:

- National Technical University of Athens, Greece
- University of Ljubljana, Slovenia
- Technical University of Civil Engineering Bucharest, Romania
- University of Belgrade, Faculty of Civil Engineering, Serbia

Duration: 2 years

Organization: e-learning + lecturing

Curriculum: 4 Thematic areas / 12 Modules

Theses: focus on integrated management of transboundary water resources



Research, cont.

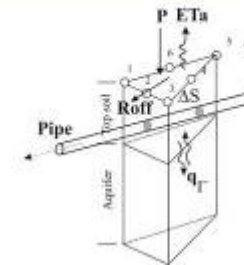
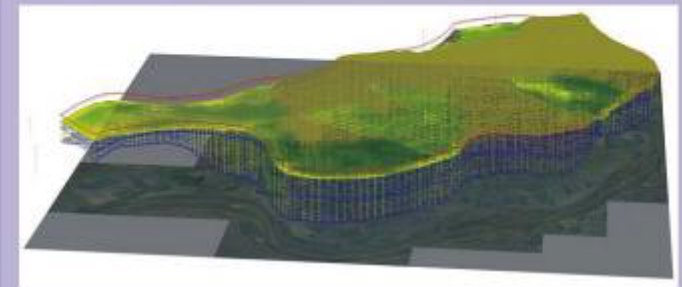
- UNESCO IHP VI, Focal Area 3.5
 - Data requirements for integrated urban water management
 - UGROW (UrbanGROundWater) – An advanced modelling tool for the transient simulation and management of urban groundwater systems
 - Published books



- COST

- Action C18: Performance assessment of urban infrastructure services: the case of water supply, wastewater and solid waste
- Action C22: Urban flood management

3Dnet-UGROW



- Components of the water balance:

ETa - Actual evapotranspiration

R_{off} - surface runoff

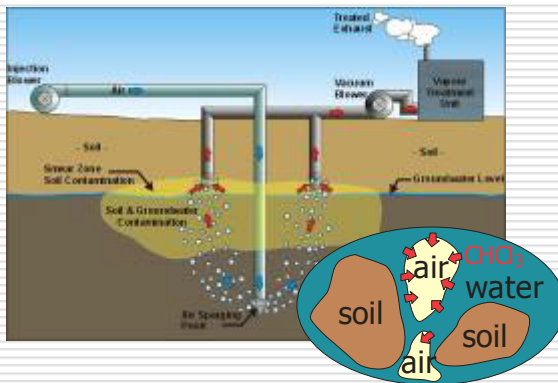
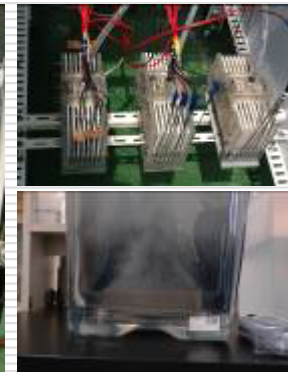
q - leakage from the bottom boundary (outflow) or inflow from the groundwater

ΔS - difference in soil storage



Research, cont.

- Long term cooperation with Kyoto University - Japan
 - Numerical modeling of environmental hydraulics
 - Modeling of hydrodynamics and water quality in lakes and reservoirs
 - Application of advanced technologies for lake revitalization



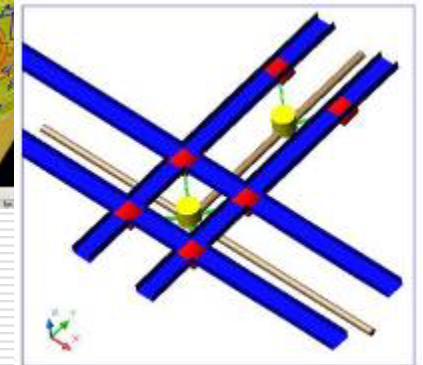
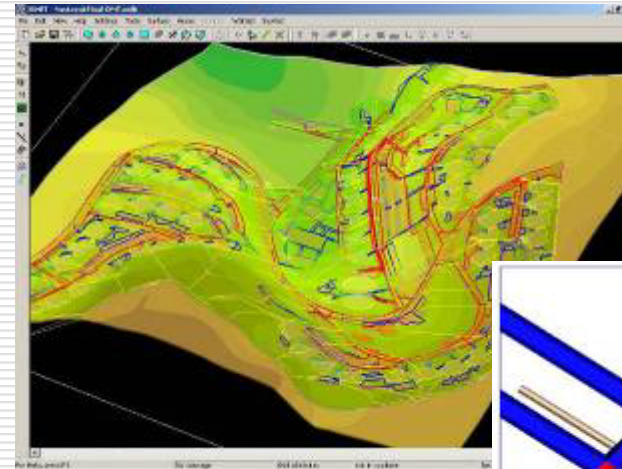
- Aquifer restoration technologies



Research, cont.

- ❑ Flood Risk Management Consortium 1 and 2
- ❑ Development of Integrated Hydroinformatic Tools GIS Based (Geology, Geotechnics, Groundwater, Water Distribution, Sewerage, etc.)
- ❑ Dynamic Monitoring of Distribution Networks Leakage Detection
- ❑ CARDS programme – Pilot River Basin Plan for the Sava River
- ❑ UNESCO: International Network of Water-Environmental Centres for the Balkans
- ❑ DAAD - Improvement of Science and Research in Serbia and Montenegro in the Field of Water Management

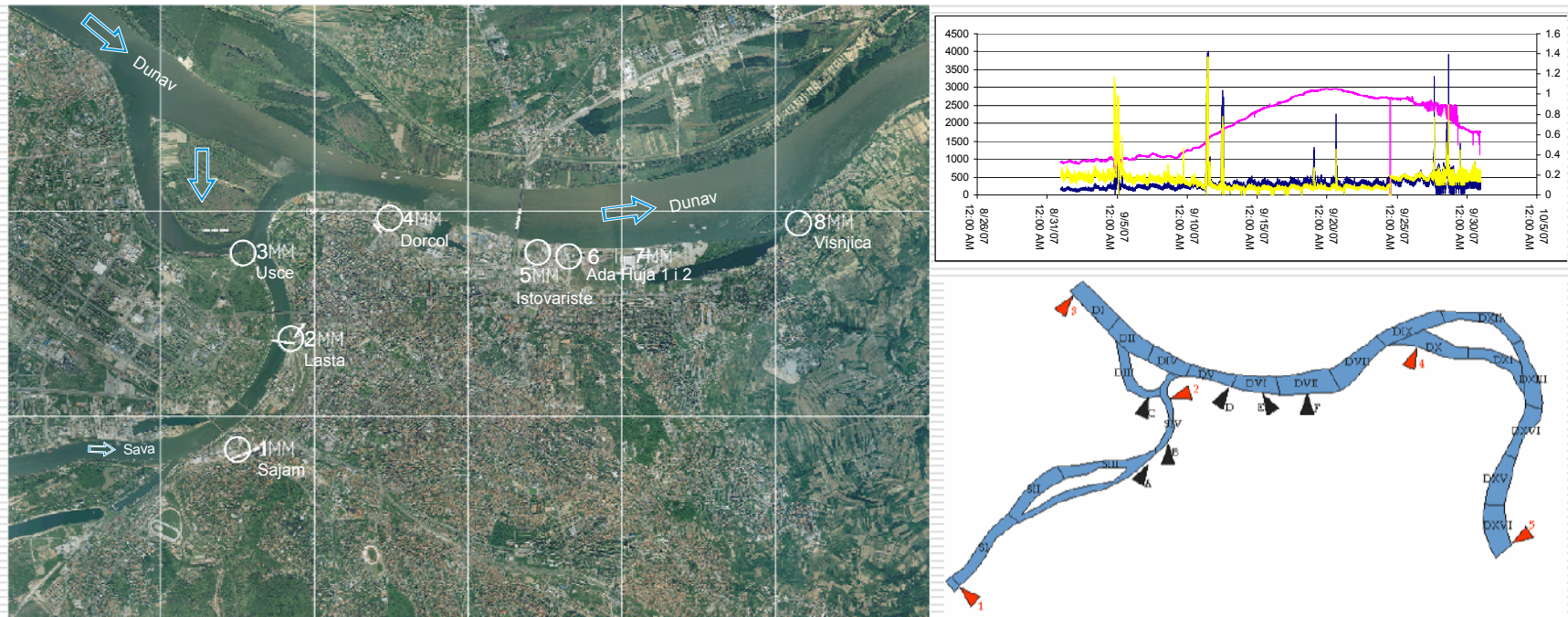
- ❑ National scientific projects





Cooperation with Industry (few selected projects ...)

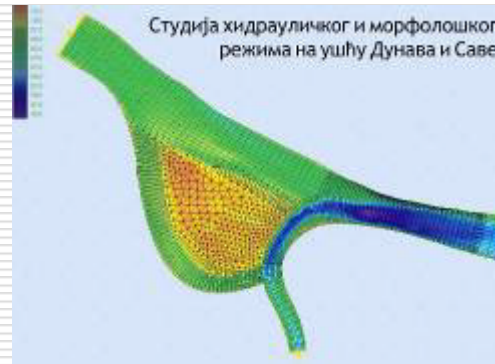
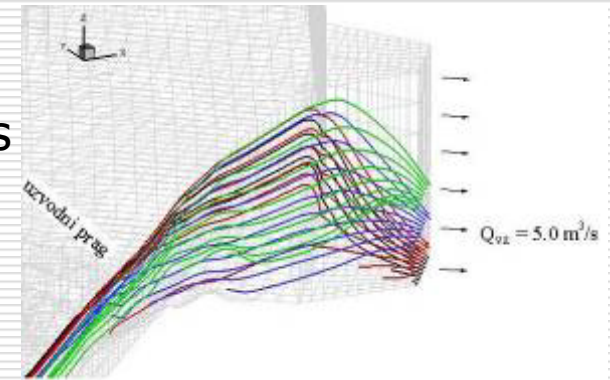
- ❑ Measurement of waste water in Belgrade sewerage system
- ❑ Mathematical Model of water quality in the Sava and Danube River in Belgrade using WASP 7.0





Cooperation with Industry, cont.

- Advanced 2D and 3D hydraulic modelling:
 - Study of the flow structure at the water intake Makis
 - Study of hydraulic and morphological regime at the Danube and the Sava confluence in Belgrade
 - Revitalization of the streams on the Great War Island, confluence of the Danube and Sava - **An action to preserve conditions for fish breeding**





Cooperation with Industry, cont.

- ❑ Environmental and hydraulic engineering issues of Fly Ash Landfills and Mine Tailings of major Thermal Power Plants and Mining Sites in the Region
- ❑ Environmental Impact Assessment studies of Planned and Constructed Dams and Reservoirs





Cooperation with Industry, cont.

- Urban Drainage modelling and technology - Tradition and world-wide recognition

