

The EU Danube Strategy Flagship Project DREAM and the UNESCO World's Large Rivers Initiative: two contributions to water education



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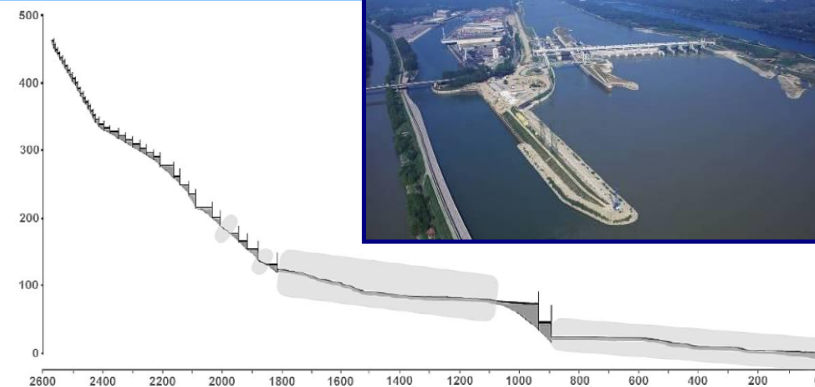
Background: Danube River - Examples for Pressures and Impacts

Hydroelectric Energy



Danube River Basin – Hydropower

- 78 barriers along the Danube
- 5 free-flowing sections



International Waterway

Danube River Basin - Navigation

- 2411 km navigable (Sulina-Kelheim)
- Waterway transport in the Danube aims to be increased from 10 mio to 30 mio t / year (e.g. in Austria)



Flood Risk Management

Danube River Basin – Flood protection

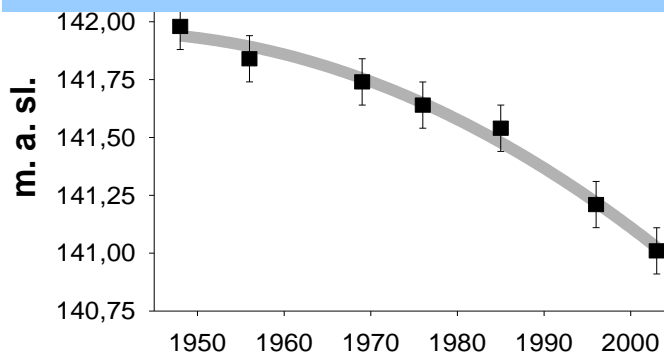


Loss of 80 % of
the original
floodplain area

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River Bed Degradation

Danube River Basin – Bed erosion



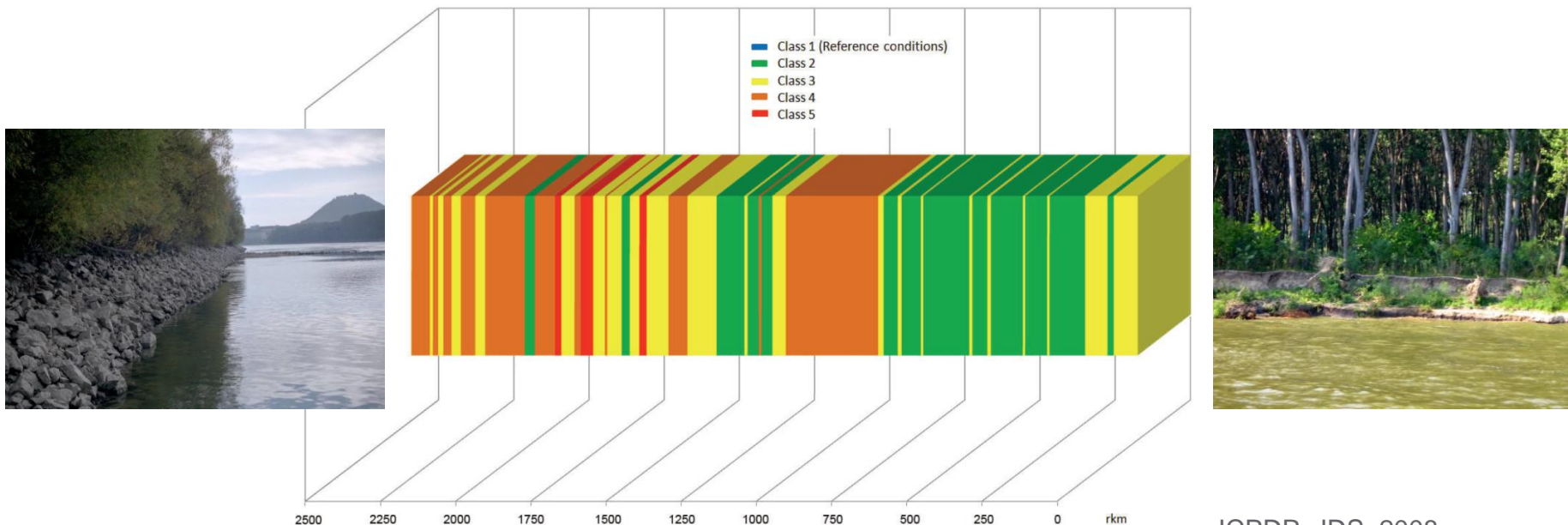
Danube bed degradation:
despite an artificial gravel
supply of up to 200.000 m³/year
river bed erosion of
2 cm/year East of Vienna

DonauConsult

River Morphology and Ecology

Hydromorphological conditions

1/3 good hydromorphological conditions, 1/3 strongly altered, Upper Danube - most affected by significant hydromorphological changes



ICPDR, JDS, 2008



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Danube River REsearch And Management *DREAM*

...from Basic Research to Knowledge Society



Description of Activities (I)

- (1) Construction of **two large Responsible River Modelling Centers/hydraulic engineering laboratories (up to 10 m³/s)**: one in the upper/middle part of the Danube and one in the lower part; the reason for two labs (upstream section/downstream section): gravel bed vs sand bed river, up to ten times slope difference and different problem areas.
- (2) Cooperation of **existing hydraulic engineering laboratories** for improvement of expertise in all partner countries. An **upgrade** of laboratory instrumentation improves the ability of modern scale models to solve river engineering models. Cooperation with the large scale laboratories (act. 1) is intended.
- (3) Formation of a **cluster/network** of river engineering **simulation tools** to be used by Danube countries (common software development and implementation), being applied both on computer clusters and individual servers.

Description of Activities (II)

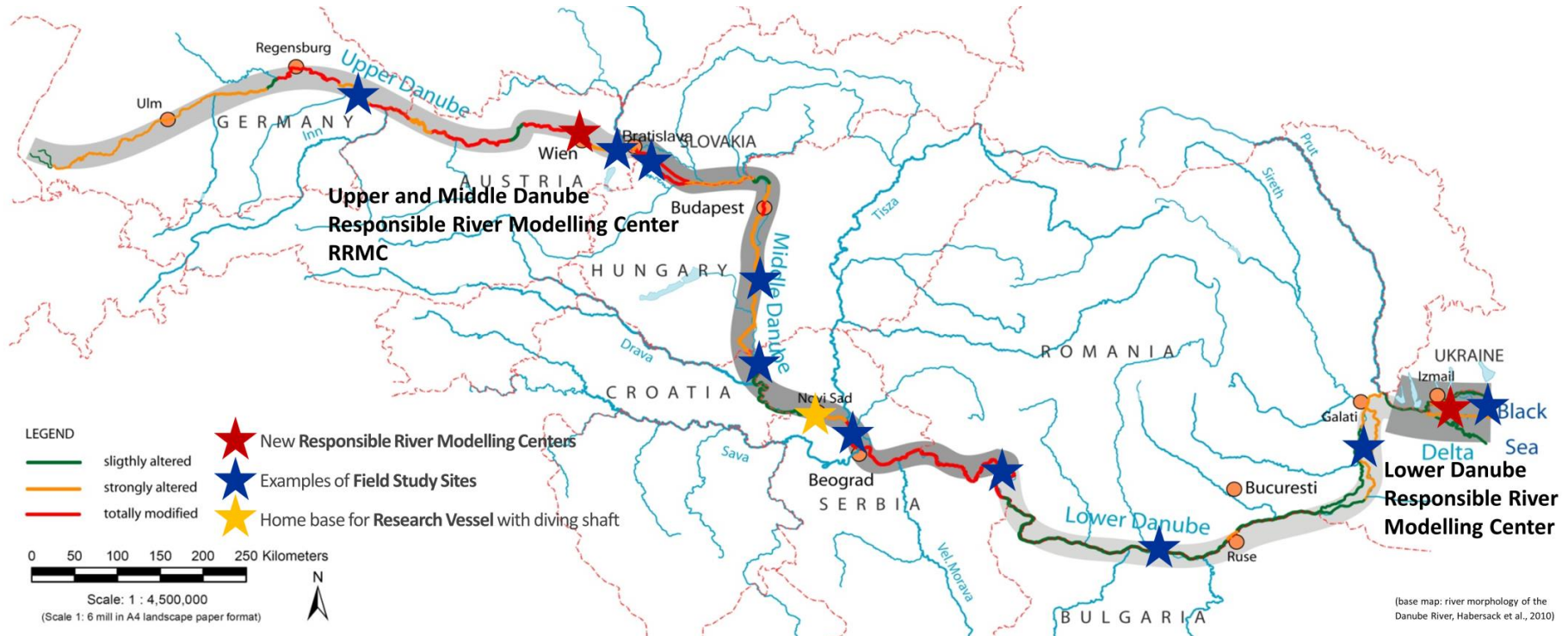


- (4) Establishment of a **network** of **field study sites** along the Danube River and tributaries for process analysis, model calibration and validation AND test of advanced river engineering solutions
- (5) Construction and operation of a **research vessel with diving shaft** for the whole Danube area to enable river bed research at various parts of the Danube river.
- (6) Establishment of a **network** of existing and extended **Danube River Research Institutions** throughout all riparian countries, including a strong link to management and society (...from Basic Research to Knowledge Society).

Implementation Ideas for Research Infrastructure



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- LEGEND**
- slightly altered
 - strongly altered
 - totally modified
 - New Responsible River Modelling Centers
 - Examples of Field Study Sites
 - Home base for Research Vessel with diving shaft

0 50 100 150 200 250 Kilometers
Scale: 1 : 4,500,000
(Scale 1: 6 mill in A4 landscape paper format)

(base map: river morphology of the Danube River, Habersack et al., 2010)



PA 07 (Knowledge Society through research, education, IT)



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Especially between **PA 07** (Knowledge Society), **PA 1A** (MobilityWaterways), **PA 02** (Energy), **PA 04** (Quality of waters), **PA 05** (Biodiversity, Landscapes, Quality of Air and Soils) and **PA 06** (Environmental Risks) **strong synergies** are given and **win-win** effects could be gained.

Within **PA 07** this project would contribute significantly to the Action - “To strengthen the capacities of research infrastructure” and Action - “To strengthen cooperation among universities and research facilities and to upgrade research and education outcomes by focusing on unique selling points”.

PA07 Flagship Project

26.6.2012

DREAM

1st Scientific Flagship Project of PA07 EUSDR

EUSDR Priority Area 7:

To develop the Knowledge Society through research, education and information technologies

In reference to the minutes from the fourth PA7 Steering Group meeting

LABEL PRIORITY AREA 7 FLAGSHIP PROJECT

The project proposal *Danube River Research and Management – DREAM*, proposed by Prof. Dr. Helmut Habersack and Prof. Dr. Herwig Waidbacher, the BOKU University, Vienna, with the partners from 13 Danube region countries (Hungary, Serbia, Bulgaria, Romania, Croatia, Slovak Republic, Czech Republic, Austria, Germany, Slovenia, Bosnia and Herzegovina, Moldova, Ukraine) was unanimously elected for the *“Label Priority Area 7 Flagship Project”* within European Union Strategy for the Danube Region, Priority Area 7, at the fourth PA7 Steering Group meeting held on 26 June 2012 in Vienna, which was attended by the official representatives of 7 EUSDR countries (Austria, Germany-Baden Wurttemberg and Bavaria, Bulgaria, Hungary, Slovenia, Slovakia and Serbia).

The Priority Area 7 Flagship Projects are outstanding projects which are expected to make a significant impact on the Danube Region as a whole in the field of research, education and/or information technologies. To be eligible for the Label the project must be jointly developed by a minimum of three Danube Region countries, having a decisive impact in at least five Danube regions.

The “Label Priority Area 7 Flagship Projects” acknowledges the extraordinary importance of a project for the Danube Region Knowledge Society.

Novi Sad, 7 September, 2012.

no: 01-273/E

On behalf of EUSDR PA7 Coordinators

Dr. Lubomir Felan and Prof. Dr. Miroslav Veskovc



Prof. Dr. Miroslav Veskovc,
Rector, University of Novi Sad

DREAM WL

Sediment Research and Management at the Danube (SEDDON)

Research channel in Vienna (10 m³/s free flowing discharge) betw. Danube and Danube canal



... finished in 2015
... also serves as supply line for the planned hydraulic engineering laboratory (HEL)

EUROPEAN UNION
European Regional
Development Fund

creating the future
Program zur grenzüberschreitenden Kooperation ÖSTERREICH - UNGARN 2007-2013
AUSZTRIA - MAGYARORSZÁG Határon Átívelő Együttműködési Program 2007-2013

United Nations
Educational, Scientific and
Cultural Organization

- UNESCO Chair on Integrated River Research and Management
- Vienna, Austria





THE WORLD'S LARGE RIVERS INITIATIVE

a UNESCO IHP Programme

Helmut Habersack

Background & Aims



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- **Rivers are complex, dynamic and diverse ecosystems with major ecological, social, economic and cultural significance, they are fundamental to life and water security**
- **Rivers provide people with multiple goods and services, such as drinking water, food, hydropower, navigation, irrigation and recreation**
- **At the same time large rivers are among the most modified systems worldwide**
- **The WLRI is of scientific nature and aims to create the knowledge base required for a holistic scientific assessment of the status and possible future of the world's large rivers. Furthermore, it aims to develop innovative strategies based on best practices for their sustainable management. The WLRI will, as a scientific platform for peer learning, create a reference for innovation and development**



WLRI – Activities



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- Act. 1:** Create a global overview of the status and future of WLRs
- Act. 2:** Close knowledge gaps, foster knowledge transfer
- Act. 3:** Formulate a collaborative International Research Action Plan to focus on WLR
- Act. 4:** Establish a World River Forum, World Rivers Day and WLR Commission Meetings
- **Act. 5:** Organize future Conferences on the World's Large Rivers



WLRI – Activities



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Act. 2: Close knowledge gaps, foster knowledge transfer

Several activities have been successfully implemented by the WLRI including student exchanges, outreach activities (e.g. Children University programme), the supervision of Master and PhD theses and the organisation of guest seminars.

A website for information and data exchange has been set up (<http://unesco-chair.boku.ac.at/>).

A separate website is maintained for the WLR Conferences (<http://worldslargerivers.boku.ac.at/wlr/>)

WLRI – Activities

Act. 5: Organize future Conferences on the World's Large Rivers



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Three International World's Large Rivers Conferences have been organised in Vienna/Austria (2011), Manaus/Brazil (2014) and New Delhi/India (2017). The fourth conference will take place in 2020 and planning is currently underway.

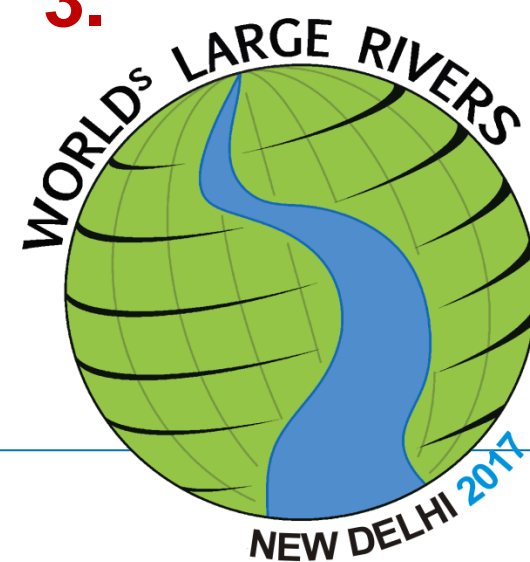
1.



2.



3.



International Conferences on the Status and Future of WLRs



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Manaus (21 to 24 July 2014)

Vienna (11 to 14 April 2011)

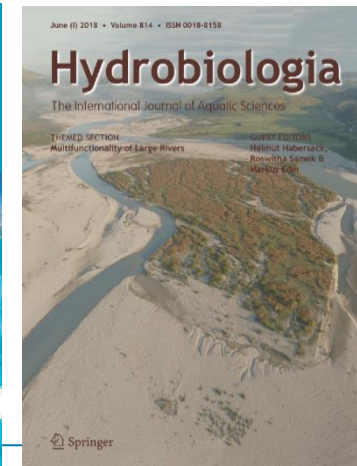
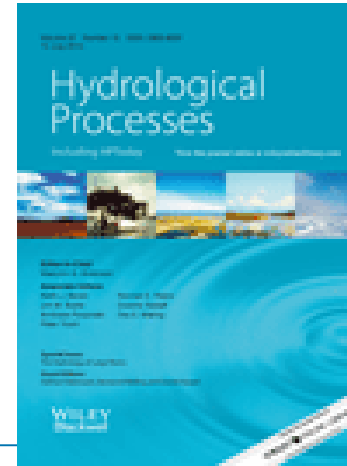
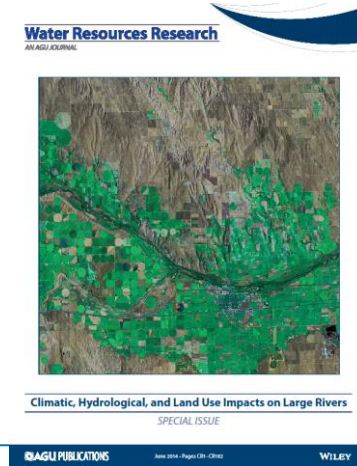
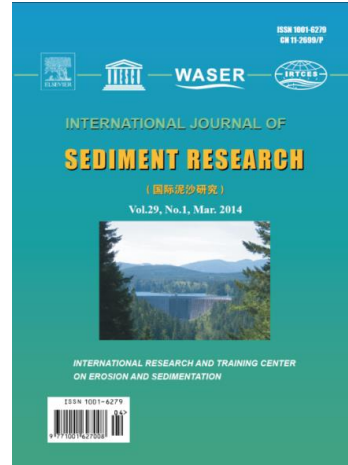
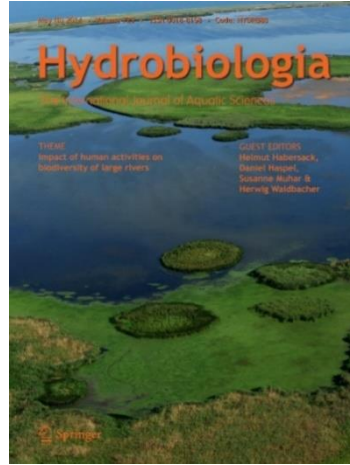
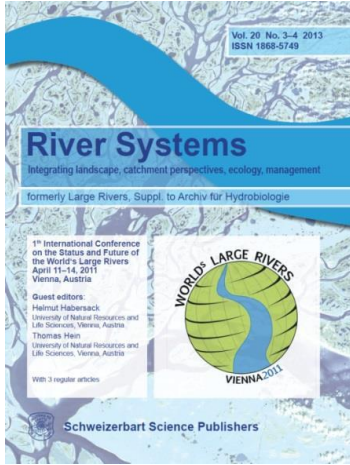



New Delhi (18 to 21 April 2017)



DRE

Ten Special Issues in intern. SCI-Journals (additional three in preparation)



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