

Programme & Registration

River Management and Ecology 2024

European Policies | River Restoration | Hydropower



Salzburg | Austria

21 and 22 March 2024



In cooperation with:

**RENEXPO
INTERHYDRO**

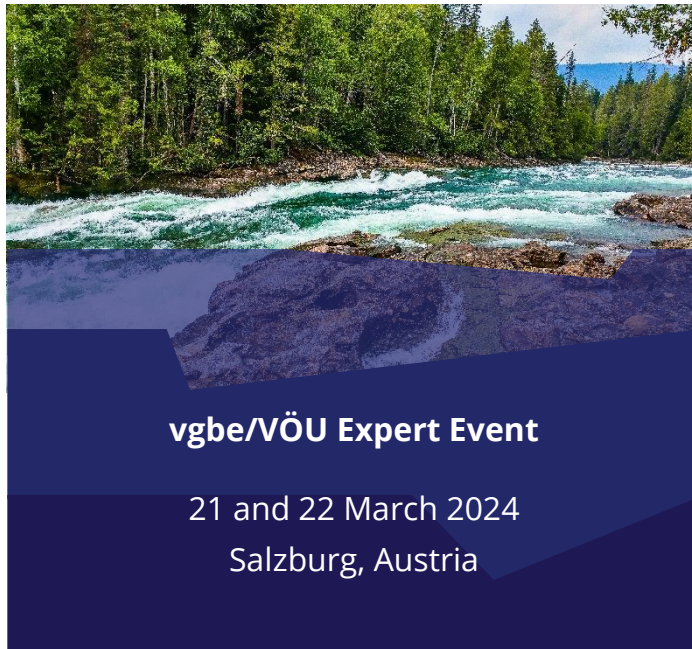




River Management and Ecology

European Policies | River Restoration
Hydropower

Conference is embedded
within the trade fair
RENEXPO® INTERHYDRO



vgbe/VÖU Expert Event

21 and 22 March 2024
Salzburg, Austria

vgbe/VÖU Expert Event “ River Management and Ecology “

The joint Expert Event of vgbe energy and VÖU brings together experts from policy, authorities, operators, manufacturers and suppliers, scientists, NGOs and other relevant stakeholders to discuss crucial issues in the fields of river management, restoration and ecology.

Rivers serve as vibrant hubs of biodiversity, providing essential water for domestic, agricultural, industrial, and energy needs, as well as supporting various ecosystem services. Effective river management optimizing these diverse benefits is pivotal for ensuring water security and addressing multiple policy objectives. Challenges related to environmental conservation, ecosystem preservation and restoration extend beyond specific industries, encompassing our entire society.

There exists a pressing need to bolster capacity, exchange knowledge, and facilitate information sharing to address these challenges using current research as well as widely accepted best practices beyond disciplines. This year, one main focus is on ecohydraulics — an interdisciplinary field merging aquatic ecology and fluid mechanics.

CONFERENCE VENUE	CONFERENCE LANGUAGE
Messezentrum Salzburg Am Messezentrum 1 5020 Salzburg / Austria	English

EVENING EVENT

On Thursday, 21 March 2024, starting at 5:00 p.m., all conference participants are invited to a get-together at RENEXPO® INTERHYDRO´s Evening Networking Event.

IN COOPERATION WITH



**RENEXPO
INTERHYDRO**

CONFERENCE TICKET

Participation	Single ticket*
Non-members of vgbe or VÖU	€ 380.--
Members of vgbe or VÖU	€ 300.--
Universities, Authorities	€ 200.--

*Participation fee plus Austrian VAT.

The participation fees include the conference presentations (after the conference), coffee breaks, lunch, participation in the Evening Networking Event and a two-day ticket to the trade fair RENEXPO® INTERHYDRO.

Austrian VAT will be shown in the invoice.

ONLINE REGISTRATION

All participants of the conference are requested to register online. It is not possible to accept credit cards or currency at the conference office.

<https://t1p.de/RME2024>

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Have direct access
to the event [website](https://t1p.de/RME2024).

CONFERENCE OFFICE

On March 21st the conference office will be open starting from 09:15 a.m.

PRIVACY POLICY & GENERAL TERMS

Detailed information on data protection as well as the general terms and conditions can be found at:

<https://t1p.de/vgbe-vsAGBen>

European Policies | River Restoration | Hydropower

CET	21 MARCH 2024
10:15	Welcome and opening of the Expert Event <i>L. Estrellado, vgbe energy and M. Schönberg, VÖU</i>
10:30	SESSION 1 Lecture 1 EU Nature Restoration Law and its Implications on Nature and Hydropower <i>C. Cudlik, Schoenherr Attorneys at Law</i> Lecture 2 Global assessment of migratory freshwater fish populations and management challenges <i>L. G. M. Silva, ETH Zürich</i> Lecture 3 IEA Hydro Annex XIII: Roadmap for Best Practice Management for Hydropower and Fish <i>M. Szabo-Meszaros, SINTEF Energy Research & Budapest University of Technology and Economics</i>
12:00	Lunch break and visit to trade fair
14:00	SESSION 2 Lecture 4 Environmentally Sustainable Hydropower: Strategies for Impact Mitigation <i>I. Boavida, CERIS, Instituto Superior Técnico, University of Lisbon</i> Lecture 5 Enabling automated environmental compliance monitoring for hydropower <i>J. Tuhtan, Tallinn University of Technology</i> Lecture 6 Implementation of ecological measures at Fratel dam in Tagus River <i>J. M. Oliveira, EDP - Energias de Portugal</i> Lecture 7 Data-based assessment of fish passage conditions in operating turbines <i>P. Romero-Gomez, ANDRITZ Hydro GmbH</i>
16:00	Q&A and closing words
17:00	Start of RENEXPO®'s Evening Networking Event

CET	22 MARCH 2024
9:00	Welcome <i>L. Estrellado, vgbe energy and M. Schönberg, VÖU</i>
9:15	SESSION 3 Lecture 8 EcoAdvance: Advancing Freshwater Restoration - the Prone2Success Checklist <i>L. Waldenberger, BOKU</i> Lecture 9 Early warning system for salmon smolts in the river Meuse - Development and evaluation <i>T. Schneider, RWE</i> Lecture 10 Turbine Design Innovation for Improved Environmental Compatibility <i>U. Stoltz, Voith</i>
10:45	Coffee break
11:15	SESSION 4 Lecture 11 Jet-like flows in a vegetated sea and river current <i>M. Mossa, Politecnico di Bari, DICATECh</i> Lecture 12 Numerical modelling as a planning instrument for ecohydraulics measures - opportunities and challenges <i>C. Dorfmann, flow engineering</i> Lecture 13 Multi-scale research for sustainable hydropeaking management <i>D. S. Hayes, BOKU</i>
12:45	Closing words <i>L. Estrellado, vgbe energy and M. Schönberg, VÖU</i>

CET	22 MARCH 2024
13:00	Opportunity to visit the trade fair
15:00	End of RENEXPO® INTERHYDRO



<https://www.renexpo-interhydro.eu/en/>

vgbe energy | Hydro Power
Essen, March 2024



be informed www.vgbe.energy

LECTURE CONTENT FROM THE SPEAKERS

WELCOME AND OPENING OF THE EXPERT EVENT

Welcome and current activities of vgbe energy



Speaker: Lee Estrellado, Advisor Hydropower, vgbe energy e.V.

Potential environmental issues often associated with hydropower projects depend heavily on the size, type, operating mode and location of the plant and may include management of environmental risks and impacts, watershed management aspects, conversion of aquatic and terrestrial habitats, connectivity and fish entrainment as well as changes in stream flow including water, sediment and aquatic biota flows.

Within the vgbe energy | Hydro Power community, a comprehensive and profound experience transfer takes place in committees and events. Based on practical examples participants report on how environmental solutions have been successfully implemented and what are the practical experiences in operation. The expert exchange of experiences and information offers valuable insights for your own solutions.

Welcome and opening of the Expert Event



Speaker: Martin Schönberg, Managing Director VÖU and Environmental Project Manager, VUM

In order to understand the climate-water-energy-food nexus better, it is of utmost importance to bring various stakeholders together, especially industry and experts in applied research. Providing the energy sector with a platform for further exchange is the core aim of the VÖU (Verein für Ökologie und Umweltforschung), an Austrian association for ecology and environmental research, founded in 1984 on the initiative of Professor Otto Koenig (ethologist and scholar of the Nobel Prize Laureate Konrad Lorenz). The VÖU is supporting and cofinancing scientific projects with a focus on water management and sediment research. Findings and current topics are presented and discussed in workshops, publications and in annual environmental conferences.

SESSION 1:

L1 – EU Nature Restoration Law and its Implications on Nature and Hydropower



schönherr

Speaker: Christoph Cudlik, Partner, Schoenherr Attorneys at Law

Since the first drafts were published, the Nature Restoration Law (NRL) has been met with both enthusiasm and controversy. It sets lofty objectives for the Member States to restore ecosystems, aiming at the union-wide and long-term recovery of biodiversity and nature's resilience, stipulating inter alia for 25,000 km of freeflowing rivers in the EU and for a restoration of at least 20 % of the Union's land and sea areas. This lecture provides a closer look at the possible effects of the Nature Restoration Law both on nature and on hydropower.

L2 – Global assessment of migratory freshwater fish populations and management challenges



ETH zürich

Speaker: Dr. Luiz G. M. Silva, Senior Researcher, ETH Zürich

About 51% (circa 18,000 species) of all known fish species are found in freshwater. One-third of them are threatened to extinction. These include populations of migratory fish that have been experiencing significant declines over the last 50 years. A global assessment of freshwater migratory fish populations based on the Living Planet Index (LPI) quantified a decline of 76% since 1970. In this talk I will provide an overview of the global assessment developed and discuss the need to improve management approaches to freshwater ecosystems.

L3 – Reporting on climate mitigation and resilience becomes a must



Speaker: Marcell Szabo-Meszaros, Researcher, Budapest University of Technology and Economics/SINTEF Energy Research

IEA Hydro Annex XIII were a dedicated program for Hydropower and Fish with over 10 years of international work. Its main objective was to raise awareness on problems caused by hydropower development in freshwater ecosystems, with a particular focus on fish migration. The Roadmap compiles sustainable solutions known to the 20+ authors with developed decision-support tool to guide the readers between them. Beyond fragmentation, the document addresses changes in hydromorphological conditions, water quality and quantity in regulated watercourses.



SESSION 2:

L4 – Environmentally Sustainable Hydropower: Strategies for Impact Mitigation



Speaker: Isabel Boavida, Senior Researcher, CERIS, Instituto Superior Técnico, University of Lisbon

The EU's goal for net-zero greenhouse gas emissions by 2050 emphasizes the need to increase green energy sources, especially hydropower, as a swift replacement for solar and wind. The urgent need to enhance hydropower production and support the development of self-sustainable fish populations is urgent and recognized in the EU policy (e.g., EU taxonomy and DNSH). Implementing fish passages, fish flow refuges, and other techniques mitigates hydropower impacts on fish species and populations guaranteeing the maximum societal benefits of a regulation.



L5 – Enabling automated environmental compliance monitoring for hydropower



Speaker: Jeffrey A. Tuhtan, Associate Professor, Tallinn University of Technology

Environmental monitoring of hydropower and compliance reporting is often expensive, complicated and not scientifically-based. Commercial technologies for monitoring most environmental parameters are readily available, but technologies which turn their data into compliance reports are largely missing. In this presentation, I will show you how data from underwater sensors and cameras can be used to generate automated compliance reports for fish migration and fish safety at European hydro sites, and discuss opportunities for future innovation.



L6 – Implementation of ecological measures at Fratel dam in Tagus River



Speaker: João Miguel Oliveira, Senior Engineer, EDP - Energias de Portugal S.A.

As part of the studies to optimize the hydroelectric generation portfolio in Portugal, EDP identified opportunities to improve the Fratel hydroelectric plant, located on the Tagus River. In parallel with the study of the civil engineering works and interventions in the plant's equipment, ecohydraulics interventions were studied with the aim of improving fluvial connectivity in the River Tagus, in conjunction with measures to improve fish passage conditions in the Belver dam, located downstream.



L7 – Data-based assessment of fish passage conditions in operating turbines



Speaker: Pedro Romero-Gomez, Hydraulic Designer, ANDRITZ Hydro GmbH

Fish passage conditions in hydro turbines can be assessed via deployments of Sensor Fish (SF), which measure key fish-relevant hydraulic magnitudes to link them with the likelihood of survival based on biological response models. We present the outcomes of four field campaigns with SF in prototypes and physical models in test rigs. We also provide the outcomes from corresponding passage evaluations based on flow simulations, a technique that allows us to implement effective passage enhancement strategies during early turbine design phases.

SESSION 3:

L8 – EcoAdvance: Advancing Freshwater Restoration - the Prone2Success Checklist



Speaker: Lisa Waldenberger, Research Assistant/PhD Student, BOKU - Institute of Hydraulic Engineering and River Research (IWA)

While there have been recent advancements in examining the primary factors contributing to the decline of freshwater ecosystems, the challenge of successful freshwater ecosystem restoration continues to pose significant difficulties.

The Horizon Europe project EcoAdvance is building a tool, the Prone 2 Success checklist, to address this problem. It will feature a matrix of factors that contribute to project success and allow decision-makers to choose those most relevant to their specific circumstances.

L9 – Early warning system for salmon smolts in the river Meuse - Development and evaluation



Speaker: Till Schneider, Hydro & Storage – Environment, RWE Generation SE

In the 1960s there was no notion of the damage that was caused to fish by hydro power stations (HPS). Now it is clear that fish species like salmon and eel are seriously threatened in their existence. In 2018 an Early Warning System (EWS) has been developed with which the peak of smolt migration can be predicted. During this period, the HPS is closed to guide the young salmon safely across the weir. The EWS was evaluated and tested against practice. This showed that mortality can be reduced efficiently, with minimal loss of green energy.

L10 – Turbine Design Innovation for Improved Environmental Compatibility



Speaker: Ulli Stoltz, Development Engineer, Voith Hydro Holding GmbH & Co. KG

Advancements in hydro turbine design technologies can address environmental concerns such as fish passage and water quality. In warmer climates low dissolved oxygen levels in rivers can harm fish and other aquatic life. Specialized hydro turbine designs are capable to improve water quality through aeration. Innovations in design, prediction, and manufacturing capabilities have led to a new generation of turbines applying distributed aeration from the blade trailing edges.

SESSION 4:

L11 – Jet-like flows in a vegetated sea and river current



Speaker: Michele Mossa, Full professor of Hydraulics, Politecnico di Bari - DICATECh

Jetlike flows are ubiquitous in the atmosphere and oceans, and thus a thorough investigation of their behaviour is fundamental. Nevertheless, how they are affected by vegetation or, generally speaking, by obstructions is a crucial aspect which has been poorly investigated up to now. The aim of the lecture is to propose an analytical model developed for jetlike flows in the presence of rigid vegetation. Other types of flow fields interacting with rigid vegetation will also be presented.



L12 – Numerical modelling as a planning instrument for ecohydraulics measures – opportunities and challenges



Speaker: Clemens Dorfmann, Manager and owner, flow engineering

The talk starts with the fundamentals of numerical modelling approaches in the context of river engineering. From there an arc will be drawn to the use of numerical models for ecohydraulic studies by presenting use cases from e.g. residual flow, hydropeaking or instream river training studies. The focus will be set on the data requirements and the modelling approaches at use, which define the opportunities but also the restrictions of ecohydraulic modelling. Finally, an outlook will be given about emerging technologies.



L13 – Multi-scale research for sustainable hydropeaking management



Speaker: Daniel S. Hayes, Researcher, BOKU - Institute of Hydrobiology and Aquatic Ecosystem Management (IHG)

To improve impact and mitigation assessments in hydropeaked rivers, multi-scale approaches are needed to better understand ecological processes. Therefore, this talk synthesizes key advances in our understanding of flow-ecology relationships in hydropeaked rivers at the national and the river bar scale, integrating data-driven, field, and experimental approaches. These findings are placed in the larger context to bridge the gap between science, river management, and policy in hydropeaked rivers.

