46th IAD Conference - *The Socio-Ecological Future of the Danube: Integrating Riverine and Terrestrial Systems for a Sustainable Danube*

13 August 2026, Baja, Hungary,

Project networking event - Fostering synergies for nature restoration through European projects in the Danube River Basin – Black Sea Region

9.00 – 9.15	Setting the scene
	Aim of the event. *Cristina Sandu* Three IAD Projects – One Danube Research Network. *Katrin Teubner*
9.15 – 11.30	**Session I. The DANSER project.** **Challenges of sustainable sediment management and its importance for ecosystem restoration in the Danube River Basin**
	Restoring Sediment Balance and Its Flow: An Integrated Framework for Sustainable River Basin Management. The DANSER project. *Iulian Nichersu.* Upper Danube DEMO site activities. Progress report. The DANSER project. *Ronald Pöppl, Michael Wagreich, Sonia Recinos, Thomas Hein, Andreas Lang, Severin Hohensinner, Diana Hatzenbühler, Johannes Kowal, Jakob Eder, Ulrich Schwarz.*
	Innovative sediment management. The INNOSED project. *Albert Scrieciu, Daniela Florea, Andrei Toma.*
	From Sediment Science to Risk Resilience - How Danube Sediment Q2 results underpin the Danube Risk Prevention Project. *Vlad Florea Gabrian*.
	The importance of sediment restoration for ecosystem recovery: case studies. Danube4all project. *Albert Scrieciu, Daniela Florea, Andrei Toma, Adrian Stănică.* The Danube Ecosystem Service Atlas (DANESA) and the Nature-based Solutions Pertinence Index (NbSPI). Danube4all project. *Martin Pusch, Lisa Waldenberger, Ellis Penning, William Ries, Helmut Habersack.*
	Interdisciplinary Approaches to Wetland Restoration - The Danube Delta Pilot Case in the DaWetRest Project. *Dragos, Balaican, Iulian Nichersu, Matei Simionov, Oliver Livanov.*
	Restore4Life: delivering an integrated accelerator for scalable wetland reconstruction in Europe. *Mihai Adamescu, Magdalena Bucur, Javier Bustamante, Sorin Cheval, Georgia Cosor, Vasile Craciunescu, Ricardo Diaz Delgado, Alexandru Dumitrescu, Diego García Díaz, Paul Goriup, Tim Grandjean, Denisa Igescu, Martin Pusch, Gabriela Costea, Tudor Racoviceanu, Gabriela Romero Olivos, Martin Tschikof, Gabriele Weigelhofer.*
11.30 – 12.00	**Coffee break**

12.00 – 13.00	**Session II. The INTERLAYER Project.** **Climate change adaptation measures in extreme hydrological conditions – the example of Living Labs.**
	River–Pondscape System for Flood Protection: A GIS and Hydrogeological Screening Method for Pond Positioning and Sizing. Varebro River case study. *Marina Bergen Jensen, Thomas Balstroem, Ida Seidenfaden, Maria Ondracek.*
	Slowing down climatic pressures during low flow: evidence from Liesingbach in the Danube catchment. *Helene Mueller, Magdalena von der Thannen, Hans Peter Rauch.*
	A pilot sub-basin of the Guadiana watershed as an example for flash-flood and drought protection. *Miguel Potes, Ana Mendes, Amalia Oliveira, Ana Pedro, Daniel Bortoli, Diogo Costa, Joao Santos, Jorge Duque, Josue Figueira, Maria Penha, Maria Novais, Maria Costa, Maria Morais, Rui Oliveira, Samuel Barias, Soheil Zehsaz.*
	Hydrological monitoring and modelling for slow hydrology in the Lower Danube floodplain: preliminary evidence from the Salcia-Maglavit Living Lab. *Albert Scrieciu, Daniela Florea, Andrei Toma.*
13.00 – 14.00	**Lunch break**
14.00 – 15.30	**Session III. The SWIM Project** **The Source to Sea approach for restoring migratory fish communities in the Danube River Basin and Black Sea region**
	Supporting restoration and protection of migratory fish habitats in the Danube River Basin and Black Sea - the SWIM project. *Stela Perkovic, Filip Jurić, Hrvoje Mikulčić.*
	Safeguarding Migratory Fish and their Habitats in the Danube River Basin and beyond. The Danube Lifelines project. *Marija Smederevac-Lalic.*
	Sturgeon monitoring in the Danube River Basin and Black Sea Region - MONSTUR project. *Marija Smederevac-Lalic, Jovana Kostić, Jelena Đorđević Aleksić, Gorčin Cvijanović.*
	Shad investigations and monitoring in the Lower Danube Region and guidelines for transnational management. *Mirjana Lenhardt, Stefan Hont, Sergiy Afanasyev, Olena Hupalo, Dumitru Bulat, Tihomir Stefanov.*
	Impact of fish stocking on mountain lakes – how to mitigate the negative effects? FishMe project. *Dan Cogalniceanu, Sabina Elena Vlad, Ovidiu Dragan.*
	Same Mission, Different Waters: Translating A-AAgora's Nature-based Solutions for the Danube River Basin. A-AAgora project. *Hugo Faria, Joana Lucio*.
15.30 – 16.00	**Coffee break**
16.00 – 17.30	**Session IV. SOS2LEARN DBS Project** **Advancing sustainable development in the Danube – Black Sea Region.**

	Leveraging community knowledge and action for ecosystem restoration in the Danube – Black Sea Region. SOS2Learn DBS project. *Mariana Afonso, Catarina Carneiro, Tania Moreira, Hugo Faria.*
	Accelerating the Danube Lighthouse through Living Labs: From Nature-Based Solutions to Policy Uptake for Freshwater Ecosystem Restoration. ECODALLI project. *Iulian Nichersu*
	Strengthening the Science–Policy Interface for Freshwater Biodiversity: Integrating Freshwater Knowledge into the EU Science Service Biodiversity through BioAgora. *Sibylle Schroer, Vanessa Bremerich, Astrid Schmidt-Kloiber, Sonja Jähnig.*
	Connecting projects, communities, and knowledge: Towards a shared environmental educational platform for the Danube Region. *Gabriela Costea, Tim Grandjean, Sandra de Vries, Cristina Sandu, Katrin Teubner.*
	Interactive session
17.30 – 18.00	Winners of the IAD photo contest "Life along the Danube – Wonders of Nature" – inspired by DANSER, SWIM and SOS2Learn DBS projects. Conference closure

Project networking event, 13 August 2026

Foreword

Worldwide, increasing anthropogenic pressures undermine the natural capacity of ecosystems to buffer some of the impacts, exceeding their carrying capacity and triggering a dramatic loss of biodiversity and ecosystem services.

In particular, freshwater, coastal and marine ecosystems are facing multiple risks as a result of e.g. habitat alteration and disruption, overexploitation of natural resources, artificial constructions in the river bed and active floodplain, and climate change impacts.

Aware that the current environmental crisis will lead to a sharp decline of wildlife and human wellbeing, environmental research teams across the Danube – Black Sea region have attracted an increasing number of projects aiming to reduce the anthropogenic pressures and pave the ground for the sustainable development of this region. Since 2025, IAD has participated as a partner in 3 HORIZON projects: DANSER (sustainable sediment management), SWIM (restoring migratory fish habitats and enhancing their protection) and SOS2Learn DBS (supporting local communities to develop sustainable projects).

Considering the interrelations between the three project topics, and willing to build synergies with other projects to enhance support for nature conservation, we decided to organise a project networking event and provide a platform for sharing knowledge, experiences and best practices with other teams.

The networking event encompasses 4 sessions: three centred around the three project topics mentioned above, and the fourth focused on adaptation to climate change in extreme hydrological conditions, a topic that we considered highly relevant for all the projects.

We sincerely hope that this networking event will facilitate future cooperation of the research teams for the implementation of project activities, the replication of best practices in other parts of the region, as well as a sound foundation for future joint applications for nature restoration in the Danube – Black Sea Region.

The IAD Presidium

Abstracts

Session I. DANSER project - Challenges of sustainable sediment management and its importance for ecosystem restoration in the DRB.

Restoring sediment balance and its flow: An Integrated Framework for Sustainable River Basin Management. DANSER project.

Iulian Nichersu

Danube Delta National Institute for Research and Development, Tulcea, Romania

Sediment continuity is a fundamental process sustaining river morphology, aquatic biodiversity, floodplain connectivity, water quality, and the long-term resilience of riverine and coastal ecosystems. Throughout the Danube River Basin, sediment transport has been increasingly disrupted by hydrotechnical infrastructure, channel regulation, intensive dredging, land-use changes, and the growing impacts of climate change, resulting in widespread alterations of sediment budgets and ecosystem functioning. Restoring sediment balance has therefore become a strategic priority within European environmental policies and the EU Mission Restore our Ocean and Waters.

This paper presents the integrated scientific framework developed within the Horizon Europe DANSER (DANube SEdiment Restoration) project to assess, monitor, and restore sediment continuity from the Upper Danube to the Danube Delta and the Black Sea interface. The proposed approach combines multi-source monitoring, hydrographic surveys, sediment characterisation, geophysical investigations, remote sensing, GIS-based spatial analyses, hydrodynamic and sediment transport modelling, biodiversity assessment, and digital decision-support tools into a unified sediment management strategy.

Particular emphasis is placed on understanding the interactions between hydrological variability, sediment transport processes, ecological connectivity, groundwater dynamics, and ecosystem services. The framework integrates advanced technologies, including AI-assisted data analytics, machine learning, Digital Twin-compatible data infrastructures, and real-time environmental monitoring to improve forecasting capabilities and support adaptive management across multiple spatial and temporal scales.

Beyond scientific innovation, DANSER promotes stakeholder participation through Living Labs, citizen science initiatives, and transnational cooperation, facilitating the co-design of restoration measures and the transfer of best practices across the Danube Basin. The proposed methodology supports nature-based solutions, sustainable dredged sediment management, floodplain reconnection, and circular economy principles while contributing to climate adaptation and biodiversity conservation.

The presented framework demonstrates that restoring sediment balance requires an integrated, interdisciplinary, and basin-scale perspective combining environmental monitoring, modelling, ecological assessment, and participatory governance. Such an approach provides robust scientific support for evidence-based river management and offers a transferable model for sediment restoration in large transboundary river systems worldwide.

Project website: https://danserproject.eu/

Upper Danube DEMO site activities. Progress report. The DANSER project.

Ronald Pöppl[1,2], Michael Wagreich[3], Sonia Recinos[1,2], Thomas Hein[1,2], Andreas Lang[4], Severin Hohensinner[1,2], Diana Hatzenbühler[3], Johannes Kowal[1,2], Jakob Eder[3], Ulrich Schwarz[5]

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DANSER aims at addressing the urgent need for sustainable sediment management solutions at the river basin scale, focusing on the Danube River-Black Sea system in Europe. Foci are demonstration of multidisciplinary innovative and holistic solutions and developing deeper insights into the sediment status and cause-effect relationships (e.g. via spatiotemporal mapping of natural and anthropogenic fluvial processes, sediment transport modelling, sediment dating, 3D historical reconstruction, river processes forecast simulations, sediment budget analysis, connectivity modelling and interventions, stakeholder-engaged sediment parametric evaluation and co-management, interlinkages with biodiversity (patterns), water quality and climate change effects. Throughout 3 DEMO areas incl. 13 pilot sites, 7 sibling locations, and 6 associated regions, the DANSER approach will develop, validate, and promote key active and passive measures to mitigate human interference in the sediment flow, related biodiversity and ecological aspects and possibly recover the sediment balance and quality in critical stretches of the basin. In this presentation, we aim to provide an overview of the recent activities in the Upper Danube region (i.e. DEMO site 1).

Project website: https://danserproject.eu/

Innovative sediment management. The INNOSED project.

Albert Scrieciu, Daniela Florea, Andrei Toma
National Institute of Marine Geology and Geoecology (GeoEcoMar), Bucharest, Romania

iNNO SED is a Horizon Europe project developing innovative sediment-management solutions for the Danube River Basin, from mountain rivers to the Black Sea. It focuses on improving both sediment quality and sediment quantity, which are essential for healthy rivers, habitats, flood protection, and sustainable water management.

The project brings together researchers, policymakers, water managers, innovators, stakeholders, and local communities. Its consortium includes 46 partners and associated partners from 15 European countries, covering most of the Danube River Basin area.

A key part of the project is testing solutions in eight demonstration sites across different river types and regions. Six sites will involve physical implementation of measures, while two will use a Digital Twin approach for complex large-scale sediment systems.

Project website: https://innosed.eu/

From Sediment Science to Risk Resilience - How Danube Sediment Q2 results underpin the Danube Risk Prevention Project.

Vlad Florea Gabrian
National Administration Romanian Waters, Bucharest, Romania

The Danube River Basin faces a severely disturbed sediment balance, increasing flood risk, groundwater depletion and ecosystem degradation. DanubeSediment_Q2 (DRP0200029, Interreg Danube Region Programme) addresses these issues through three specific objectives: improving sediment quantity and quality (Q2) monitoring across 14 countries, developing practical sediment management measures at 9 pilot case-study sites, and producing the first-ever Integrated Sediment Management Plan (ISMP) for the Danube River Basin — a European road model combining quantity and quality management. The project also delivers new hydromorphological (HYMO) and sediment risk assessment methodologies validated across the basin.

These outputs directly feed into Danube RISK Prevention (ROBG00221, Interreg VI-A Romania–Bulgaria), which promotes climate change adaptation and disaster risk prevention for a population of over 930,000 people in the Romanian–Bulgarian transboundary area. Danube RISK builds on DS_Q2's sediment data to safely identify

floodplain reconnection zones, applies the HYMO and risk methods to dike safety assessment under the climate change coefficient (F100CC), and uses the ISMP as the scientific backbone for a joint RO–BG climate adaptation strategy and programme of measures.
The National Administration Romanian Waters (NARW), involved in both projects, serves as the key institutional bridge ensuring knowledge and data transfer between the two projects.

Project websites: *https://interreg-danube.eu/projects/danubesediment-q2*
https://interregviarobg.eu/ (Danube Risk) – will start later this year

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The importance of sediment restoration for ecosystem recovery: case studies. Danube 4 all project.

Albert Scrieciu, Daniela Florea, Andrei Toma, Adrian Stănică
National Institute of Marine Geology and Geoecology (GeoEcoMar), Bucharest, Romania

DANUBE4all is a Horizon Europe "Lighthouse Initiative" that supports ecosystem recovery in the Danube River Basin by restoring natural river processes, including sediment movement, side-channel dynamics, floodplain connectivity, and habitat diversity.
Sediment restoration is important because sediments build gravel banks, islands, wetlands, and fish spawning habitats. When dams, groynes, and bank reinforcements block sediment flow, rivers become deeper, more uniform, and less suitable for biodiversity.
In the Upper Danube, Austria, restoration focuses on reconnecting side branches, removing hard riverbank structures, and improving sediment and water flow in floodplain habitats. In the Middle Danube, Hungary, groyne optimisation aims to reduce siltation and create more dynamic habitats for rheophilic fish. In the Danube Delta, Romania, reconnection of lagoon and river systems can improve water, sediment, and biota exchange.

Project website: https://www.danube4allproject.eu/

The Danube Ecosystem Service Atlas (DANESA) and the Nature-based Solutions Pertinence Index (NbSPI). The Danube4all project.

Martin Pusch[1,2], Lisa Waldenberger[3], Ellis Penning[4], William Ries[3], Helmut Habersack[3]
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[4] Deltares, Delft, Netherlands

The protection of rivers and their floodplains is much supported by the demonstration of their benefits to humans. In the Danube4all project, the ecosystem services provided by the river corridors of the Danube and its major tributaries are hence mapped to produce a 'Danube Ecosystem Service Atlas' (DANESA). This enables the visualisation of the whole array of services, including often neglected ones, and the identification of the spatial hotspots of their availability. In addition, positive and negative effects of any river or floodplain management measures on ecosystem service availability can be demonstrated. As nowadays traditional 'grey' management measures should be replaced by more integrative 'blue-green' nature-based solutions, a novel 'Nature-based Solutions Pertinence Index' (NbSPI) enables the classification of measures into more 'grey' or more 'blue-green' ones. The NbSPI may hence also be used to prevent 'greenwashing' of 'grey' management measures.

Project website: https://www.danube4allproject.eu/

Interdisciplinary Approaches to Wetland Restoration - The Danube Delta Pilot Case in the DaWetRest Project

Dragos Balaican, Iulian Nichersu, Matei Simionov, Oliver Livanov
Danube Delta National Institute for Research and Development, Tulcea, Romania

Wetland restoration has become a strategic priority for achieving the objectives of the European Green Deal, the EU Biodiversity Strategy for 2030, and the EU Mission Restore Our Ocean and Waters. However, restoring highly dynamic ecosystems such as the Danube Delta requires more than ecological interventions alone. It demands interdisciplinary approaches that integrate hydrology, ecology, socio-economic analysis, governance, and stakeholder participation into a coherent restoration framework.

This paper presents the Danube Delta pilot case developed within the Horizon Europe DaWetRest project, highlighting how interdisciplinary collaboration supports the design, implementation, and validation of nature-based restoration solutions. The pilot focuses on improving hydrological connectivity, restoring degraded wetland habitats, enhancing ecosystem services, and strengthening climate resilience through integrated planning and adaptive management. Restoration measures are supported by hydrodynamic modelling, ecological monitoring, biodiversity assessments, water quality evaluation, and spatial analysis using remote sensing and GIS technologies.

A key component of the DaWetRest methodology is the establishment of Living Labs, which provide a participatory platform for co-creation among researchers, public authorities, local communities, economic stakeholders, and environmental organisations. Through structured dialogue, the Living Labs address three complementary dimensions of restoration: environmental (ecological restoration and monitoring), social (community engagement and governance), and economic (financing mechanisms and replication pathways). This interdisciplinary process enables scientific knowledge to be translated into practical restoration actions and policy recommendations while increasing stakeholder acceptance and long-term sustainability. The Living Labs are designed to bridge technical ecological restoration with governance by identifying policy barriers, promoting cross-border cooperation, and co-developing strategies for scalable wetland restoration across the Danube Basin.

The Danube Delta pilot demonstrates that successful wetland restoration depends on integrating scientific evidence with participatory governance and socio-economic considerations. The proposed framework contributes to improving ecosystem resilience, biodiversity conservation, and water resource management while offering a transferable model for wetland restoration throughout the Danube River Basin and other European wetlands facing similar environmental and climate-related challenges.

Project website: https://dawetrest.eu/

Restore4Life: delivering an integrated accelerator for scalable wetland reconstruction in Europe

Adamescu Mihai[1], Bucur Magdalena[1], Bustamante Javier[6], Cheval Sorin[2], Cosor Georgia[1], Craciunescu Vasile[2], Diaz Delgado Ricardo[6], Dumitrescu Alexandru[2], García Díaz Diego[6], Goriup Paul[4], Grandjean Tim[7], Igescu Denisa[1], Pusch Martin[5], Costea Gabriela[5], Racoviceanu Tudor[1], Romero Olivos Gabriela[6], Tschikof Martin[3], Weigelhofer Gabriele[3].

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Wetland restoration in Europe is still constrained by fragmented data, inconsistent monitoring approaches, limited access to practical guidance, weak links between science and implementation, and insufficient mechanisms for financing and scaling successful interventions. Restore4Life addresses these barriers by developing and validating an integrated Wetland Reconstruction Accelerator that converts scientific knowledge, monitoring data and

restoration experience into operational tools for planning, implementing, evaluating and financing wetland reconstruction.

The project has established a common framework for assessing restoration potential, defining ecological baselines, selecting indicators, monitoring reconstruction outcomes and comparing restoration trajectories across freshwater, floodplain, deltaic and coastal wetlands. These methods are being tested in contrasting demonstration sites and translated into harmonised protocols, practical roadmaps and transferable solutions that can be applied beyond the initial project areas.

A central result is the Danube Restoration Hub, a web-based decision-support environment integrating Earth observation, in situ monitoring, hydrological and climate information, spatial datasets, restoration case studies and modelling resources. The Hub enables users to identify restoration opportunities, explore alternative interventions, assess climate and hydrological risks, document project implementation and communicate expected benefits. It is complemented by a Restoration Wiki, interactive project pages, statistical and reporting tools, citizen-science modules, training materials and an AI-supported assistant.

Restore4Life is also delivering tools that extend restoration beyond ecological design. Citizen-science methods support participatory monitoring and local engagement; business models and financing guidance help identify viable investment pathways; and good-practice roadmaps translate project evidence into actionable recommendations for authorities, practitioners and investors. Together, these outputs connect restoration planning with implementation capacity, long-term monitoring, stakeholder participation and financial sustainability.

The principal result of Restore4Life is therefore not a single restoration method or digital platform, but an operational system that links data, models, field evidence, communities, governance and finance throughout the restoration cycle. By making restoration knowledge accessible, comparable and reusable, the project supports replication and upscaling of wetland reconstruction across Europe and contributes directly to the EU Mission “Restore our Ocean and Waters”, the EU Biodiversity Strategy for 2030 and implementation of the Nature Restoration Regulation.

Project website: https://restore4life.eu/

Session II. INTERLAYER Project. Climate change adaptation measures in extreme hydrological conditions – the example of Living Labs.

River–Pondscape System for Flood Protection: A GIS and Hydrogeological Screening Method for Pond Positioning and Sizing. Varebro River case study.

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The River–Pondscape system provides a method for reconciliation of heavily developed catchments with nature, where most land remains available for agriculture and settlements, while selected areas are reconfigured into multifunctional ponds. The concept involves modifying local bluespots in proximity to streams to allow them to receive water from rivers during high-flow events, thereby enhancing the detention capacity of the landscape. The ponds are designed as landscape elements that support biodiversity and recreation, while being dimensioned to significantly reduce downstream flood risk. We present a GIS-based screening method for identifying potential donor sections of the stream and potential bluespots storages. The GIS interface allows users to define parameters such as the maximum distance between stream and pond (e.g. 400 m), as well as thresholds for minimum slope between stream and pond, minimum bluespot storage volume, and minimum stream discharge.

Following the screening process, we propose the use of a hydrogeological model to predict groundwater levels in the proposed ponds and to further refine assessments of flood risk and detention demand at sub-catchment level. The method is demonstrated for the catchment of the Vaerebro River.

Website: https://www.interlayer.uevora.pt/

Slowing down climatic pressures during low flow: evidence from Liesingbach in the Danube catchment.

Helene Mueller, Magdalena von der Thannen, Hans Peter Rauch

Institute of Soil Bioengineering and Landscape Construction, BOKU University, Vienna, Austria.

Urban watercourses provide a wide range of ecosystem services in the context of urban climate change adaptation. These range from river ecology, flood protection to the urban climate. To ensure that these ecosystem services remain available in the future, it requires sustainable and innovative low flow water management. Urban rivers like Liesingbach in Vienna (Austria) are impacting local microclimate and supply cooling effects for the surrounding areas. Furthermore, elevated water temperatures not only pose biological challenges, but also impair water quality and affect the interaction between the river environment The results of the INTERLAYER Living Lab at the river Liesingbach show that riparian vegetation along the Liesingbach plays an essential role and is a key element of urban river systems. Specifically in terms of shading, different vegetation configurations buffer up to 4.2°C in water temperature. It represents one of the few controllable mechanisms for limiting a further rise in water temperature downstream.

Project website: https://www.interlayer.uevora.pt/

A pilot sub-basin of the Guadiana watershed as an example for flash-flood and drought protection.

Miguel Potes[1], Ana Mendes[1], Amália Oliveira[1], Ana Pedro[1], Daniele Bortoli[1], Diogo Costa[1,2], João Santos[3], Jorge Duque[1], Josué Figueira[1], Maria Penha[1], Maria Novais[1], Maria Costa[1], Maria Morais[1], Rui Oliveira[1], Samuel Bárias[1], Soheil Zehsaz[1]

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[2]University of Saskatchewan, Canada

[3]Polytechnic Institute of Beja, Portugal

The INTERLAYER project (Water4All-2022-2026) aims to explore water retention technologies to protect water resources from hydroclimatic extreme events in four contrasting European edaphoclimatic regions. The concept of Slow Hydrology is tested in four living lab watersheds to reduce the runoff and fill-up groundwater storages, thereby minimizing the impact of extreme events on water quantity, water quality, and biodiversity. This study presents an interdisciplinary framework developed in Toutalga basin, Guadiana watershed, combining field-based meteorological and hydrological monitoring, GIS-based basin characterisation, and hydrological modelling to promote water retention, detention and infiltration in the aquifer for flash-flood protection and improve water availability in the dry phase. The characterization of the basin based on GIS GIS-based basin characterisation was conducted using high-resolution Digital Elevation Models and land use data, allowing basin delineation, stream network validation, terrain morphometric analysis, and derivation of area-weighted Curve Number values under wet antecedent moisture conditions. Hydrological modelling was performed using HEC-HMS, applying the SCS Curve Number method, unit hydrograph transformation, and Muskingum routing for channel flow propagation. The models were calibrated and validated based on extreme rainfall–runoff events observed between December 2024 and November 2025. Results show that the integrated monitoring–GIS–modelling framework adequately reproduces catchment response and peak flow timing during extreme events, providing valuable support for flood risk assessment and climate adaptation strategies in Mediterranean catchments.

Website: *www.interlayer.uevra.pt*

Hydrological monitoring and modelling for slow hydrology in the Lower Danube floodplain: preliminary evidence from the Salcia-Maglavit Living Lab.

Albert Scrieciu, Daniela Florea, Andrei Toma
National Institute of Marine Geology and Geoecology (GeoEcoMar), Bucharest, Romania

This study quantifies drought stress and the potential effectiveness of Nature-based Solutions in the degraded Danube floodplain at Salcia and Maglavit, southern Romania. Based on a 7-month field monitoring campaign, soil moisture and weather data were used to calibrate a daily root zone water balance model, which was then applied to a 33-year climate record and future RCP4.5 and RCP8.5 scenarios. Summer 2025 showed severe water limitation, with only 54 mm of precipitation compared to 619 mm of reference evapotranspiration, while the calibrated model achieved strong agreement with observed soil water storage. Long-term simulations indicated that drought stress is episodic rather than chronic, averaging 19.3 stress days per year historically, but increasing substantially under future warming scenarios. Increasing root zone water storage by 30 mm could halve stress days under current climate, although benefits decline under high-end warming. The results provide a quantitative basis for designing Nature-based Solutions such as shallow retention ponds, controlled floodplain reconnection, and soil organic matter improvement, while emphasizing the importance of early implementation.

Website: *https://www.interlayer.uevora.pt/*

Session III. SWIM project. The Source to Sea approach for restoring migratory fish communities in the Danube River Basin and Black Sea region

Supporting restoration and protection of migratory fish habitats in the Danube River Basin and Black Sea. The SWIM project.

Stela Perkovic, Filip Jurić , Hrvoje Mikulčić
Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia

Migratory fish species in the Danube River Basin and the North-Western Black Sea are increasingly threatened by habitat degradation, river fragmentation, pollution, invasive species, and climate change. These pressures limit access to critical spawning, nursery, feeding, and wintering habitats and hinder the recovery of vulnerable species.

The Horizon Europe SWIM project — Sustainable Water and Integrated Management of Fish Migration and their Habitats in the Danube River Basin and NW Black Sea — addresses these challenges through an integrated, transnational approach to habitat restoration, protection, monitoring, and stakeholder engagement. Across seven pilot sites, SWIM will implement innovative and scalable solutions, including fish passage improvement, lateral reconnections, nature-based restoration measures, ex-situ conservation, migratory fish monitoring, habitat assessment, modelling, and digital decision-support tools. Through cooperation among researchers, authorities, NGOs, local communities, and sectoral stakeholders, SWIM aims to strengthen ecological connectivity, support the recovery of migratory fish populations, and provide policy-relevant recommendations for the long-term protection of key habitats. The project will deliver a replicable model for restoring migratory fish habitats and enhancing aquatic ecosystem resilience across the Danube region and beyond.

Project website: https://swim-danube.eu/

Safeguarding Migratory Fish and their Habitats in the Danube River Basin and beyond. The DanubeLifelines project

Marija Smederevac-Lalić
Institute for Multidisciplinary Research, University of Belgrade, Serbia

The DANUBElifelines (DLL) project funded under the Horizon Europe programme within the “Restore our Ocean and Waters” mission for the period 2025–2029, aims to restore fish migration routes and their habitats across the Danube River Basin, thereby contributing to biodiversity conservation and the improvement of ecological connectivity in river systems. The project brings together partners from 11 countries. DLL addresses one of Europe’s most pressing environmental challenges, the disruption of migration corridors caused by dams, barriers, and other hydraulic structures that hinder or completely block the movement of migratory fish species. Special attention is given to endangered species such as sturgeons, huchen, and Pontic shad.

Across eight demonstration sites in the upper, middle, and lower Danube regions, the project will test and implement nature-based solutions, including the removal of obsolete barriers, reconnection of side channels and tributaries, restoration of floodplains, and improvement of habitat quality. These actions will contribute to the restoration of ecological connectivity in river systems and the long-term recovery of migratory fish populations. One of the key outputs of the project will be the development of the Danube fish migration and connectivity Atlas, the identification of priority areas for conservation and restoration, and the creation of a joint action plan for the protection of migratory species and their habitats. The project will also support the achievement of the European target to restore at least 25,000 km of free-flowing rivers by 2030. By combining scientific research, practical restoration measures, and collaboration with local communities, institutions, and decision-makers, DLL represents an important step towards preserving the Danube’s natural heritage and establishing sustainable freshwater ecosystem management in Europe.

Project website: https://danubelifelines.eu/

Sturgeon monitoring in the Danube River Basin and Black Sea region. MONSTUR project.

Marija Smederevac-Lalić, Jovana Kostić, Jelena Đorđević Aleksić, Gorčin Cvijanović
Institute for Multidisciplinary Research, University of Belgrade, Serbia

The "MonStur in the Danube" project is developing the first joint sturgeon monitoring system across the Danube River Basin (DRB) to ensure the protection of these species and the preservation of biodiversity through international cooperation. MonStur addresses one of the Danube Region's most critical ecological challenges: the decline of migratory fish, particularly sturgeons, caused by the fragmentation of river connectivity, as well as overfishing and poaching. The project brings together partners from 12 DRB countries. The project will create a transboundary sturgeon monitoring system, uniting DRB countries to safeguard sturgeon populations, their habitats and ecological corridor and improve data integration for policy and conservation.
The University of Belgrade - Institute for Multidisciplinary Research, National Institute of the Republic of Serbia, plays a key role in implementing advanced, non-invasive monitoring methods, including environmental DNA (eDNA) analysis, which enables the detection of species presence without disturbing their habitats, as well as hydroacoustic telemetry for tracking fish movements. Other partners will address critical knowledge gaps concerning Danube sturgeon habitats, including the identification and characterization of spawning grounds through side-scan sonar (SSS) mapping and the confirmation of sturgeon presence in tributaries whose status is currently unknown through eDNA sampling.
The project is establishing the first joint transnational sturgeon monitoring system for the entire Danube River Basin by integrating existing and newly collected data on sturgeon populations and habitats. Based on these data, a joint Conservation Action Plan will be developed, along with recommendations for infrastructure projects aimed at reducing pressures on these species. MonStur is funded through the Interreg Danube Region Programme, with a total budget exceeding two million euros. Its results will be significant not only for preserving the Danube's natural heritage but also for strengthening international cooperation and improving biodiversity conservation policies across the region.

Project website: https://interreg-danube.eu/projects/monstur-in-the-danube

Shad investigations and monitoring in the Lower Danube Region and guidelines for transnational management.

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Pontic shad (*Alosa immaculata*) and Black Sea shad (*Alosa tanaica*) are anadromous fish species that inhabit the Black Sea and migrate to the Danube River and other large rivers of the Black Sea Basin for spawning. According to the IUCN Red List of Threatened species, both species are currently listed as Least Concern (LC). However, according to the national Red Books, Pontic shad is listed as Critically Endangered (CR) in Serbia, Vulnerable (VU) in Bulgaria and it is not included in the Red Book of Romania, Ukraine and Moldova. Pontic shad is a commercial species in Romania, Ukraine and Bulgaria. Research and monitoring of Pontic and Black Sea shad remain limited and fragmented despite the fact that both species represent a shared natural resource for the countries of the Lower Danube Region. A programme supporting cross-border cooperation and coordinated management efforts among the involved countries is strongly needed.

Impact of fish stocking on mountain lakes – how to mitigate the negative effects? FishMe project.

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The project FishME (Social and ecological effects of Fish removal in Mountain Ecosystems) was funded by the BiodivRestore COFUND Action during 2022-2024 and consisted of a consortium of 6 European partners. The project has shown that high-mountain lakes are extremely sensitive ecosystems facing three major pressures: introduced fish, climate warming and atmospheric pollution. It focused on the impact of introduced fish and proposed effective measures for improving the management, restoration and conservation of high mountain lakes. Its findings demonstrated that mountain lakes are biodiversity hotspots requiring targeted protection and provided evidence on the ecological harm caused by salmonid and minnow introductions. It thus supported a shift towards biodiversity-first management and long-term ecological monitoring.

Project website: https://fishme.ecoportal.ro/
FishME Toolbox: https://next.mountainbiodiversity.org/projects/fishme/

Same Mission, Different Waters: Translating A-AAgora's Nature-based Solutions for the Danube River Basin. A-AAgora project.

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The Horizon Europe project A-AAgora, part of the EU Mission "Restore our Ocean and Waters by 2030," demonstrated ecosystem-based management and nature-based solutions at three Atlantic-Arctic coastal sites: Ria de Aveiro (PT), County Cork (IE) and Troms (NO). Most of its results fed into replicable, upscaling-oriented blueprints. This presentation explores how those innovations may transfer or apply beyond their original sites into the DBS Basin. For the freshwater sectors of the basin, the most portable results are governance and social innovations (the Living Lab and Quadruple-Helix model, EBM planning cycles, volunteer-led wetland restoration, participatory digital mapping, and water-literacy and gamification tools). For the Black Sea's brackish coast, marine-oriented solutions apply more directly: ports and marinas as biodiversity nurseries, erosion resilience, decarbonisation paired with habitat restoration, keystone-species recovery, and ecotourism. The talk identifies which A-AAgora practices are genuinely replicable, and under what conditions, to hopefully foster curiosity, cross-cooperation and actions.

Project website: https://a-aagora.eu/

Session IV. SOS2LEARN DBS Project. Advancing sustainable development in the Danube – Black Sea Region.

Leveraging community knowledge and action for ecosystem restoration in the Danube – Black Sea region. SOS2Learn DBS project.

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Ecosystem restoration in the Danube–Black Sea region requires approaches that integrate scientific evidence with local knowledge, priorities and implementation capacities. SoS2LearnDBS operationalises this principle through cascade funding for community-led actions, combined with capacity building, technical assistance, monitoring and peer learning. This contribution presents the methodological and governance framework developed to support local actors in co-designing and implementing context-specific restoration solutions. It examines how the funding mechanism combines common Mission Ocean objectives and monitoring requirements with sufficient flexibility to respond to diverse territorial challenges, including water retention, pollution reduction, biodiversity restoration and local governance. Particular attention is given to meaningful participation, the inclusion of vulnerable and underrepresented groups, and the integration of scientific and experiential knowledge. The presentation will focus on the programme design and support approach, and discusses its potential to translate community knowledge into accountable, measurable and transferable restoration action.

Project website: https://sos2learndbs.eu/

Accelerating the Danube Lighthouse through Living Labs: from Nature-Based Solutions to Policy uptake for Freshwater Ecosystem Restoration. ECODALLI project.

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The EU Mission "Restore our Ocean and Waters by 2030" establishes an ambitious pathway towards protecting and restoring marine and freshwater ecosystems, contributing to the European Green Deal and the Biodiversity Strategy for 2030, including the restoration of at least 25,000 km of free-flowing rivers and the large-scale deployment of Nature-based Solutions (NBS). Within this framework, the Danube Lighthouse acts as the regional innovation platform for accelerating freshwater restoration across the Danube Basin, creating strong synergies with the EU Strategy for the Danube Region (EUSDR) and the Strategic Research and Innovation Agenda (SRIA) for the Black Sea, which together promote integrated governance, ecosystem connectivity, climate resilience and sustainable blue economy development. EcoDaLLi acts as the Coordination and Support Action that consolidates the scientific evidence, stakeholder needs and restoration experiences generated by Danube4All, DALIA, DaWetRest, Restore4Life and DANSER into a coherent innovation ecosystem supporting the Danube Lighthouse. EcoDaLLi was specifically designed to strengthen this governance architecture by connecting innovation ecosystems, Living Labs and policy actors across the basin.
Within this strategic context, the Danube Delta Living Labs represents one of the key operational environments for identify restoration priorities, supporting stakeholder co-creation and collaborative governance for freshwater restoration. The Living Labs integrates scientific knowledge, ecosystem functionality assessments, hydrological connectivity analysis, Nature-based Solutions and participatory planning into a common decision-support framework. Local authorities, researchers, businesses and civil society jointly identify restoration priorities while evaluating ecological, socio-economic and climate adaptation benefits of proposed interventions. Stakeholder dialogue has been combined with ecosystem functionality assessment, hydrological connectivity analysis, and ecosystem service evaluation to establish common restoration objectives and increase local ownership of proposed interventions. The Living Labs has served as an innovation platform where ecological knowledge, local experience, and governance needs converge into practical restoration pathways. This approach strengthens ecological connectivity while increasing local ownership and long-term sustainability of restoration measures.

The paper also highlights the contribution to Work Package 7. Agenda, Vision and Strategy, where knowledge generated through the Living Labs is transformed into policy recommendations, transferable methodologies and replication pathways supporting the implementation of the Danube Lighthouse. By combining ecosystem impact assessment, integrated spatial planning, stakeholder engagement and evidence-based governance, EcoDaLLi facilitates the translation of local innovation into macro-regional policy action. The resulting framework contributes to Mission Ocean objectives by strengthening the science-policy interface, enhancing governance capacities and enabling replication of successful restoration practices throughout the Danube Basin and neighbouring Black Sea.

Project website: https://ecodalli.eu/

Strengthening the Science–Policy Interface for Freshwater Biodiversity: Integrating Freshwater Knowledge into the EU Science Service Biodiversity through BioAgora.

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BioAgora is a Horizon Europe project dedicated to strengthening the science–policy interface for biodiversity by improving the flow of knowledge between knowledge holders and policy-makers. The project is developing the Science Service Biodiversity (SSBD) as a core component of the EU Knowledge Centre for Biodiversity (KCBD). Central to this effort are thematic Knowledge Exchange Networks (KENs), which mobilise expertise and facilitate knowledge sharing across biodiversity domains. The Freshwater KEN leverages the Freshwater Information Platform (FIP) as a central hub for freshwater knowledge and resources. Through its integration into the SSBD, scientific evidence, datasets, tools and expertise become more readily available to policy-makers and practitioners, helping to bridge the gap between research, policy and implementation.

Project website: https://bioagora.eu/

Connecting projects, communities, and knowledge: Towards a shared environmental educational platform for the Danube Region.

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Many Horizon projects develop innovative educational and citizen-engagement tools, yet sustaining and expanding these resources beyond individual project lifetimes remains a major challenge. This presentation explores how the Restore4Life Living Floodplains: Learn, Explore, Restore4Life Toolbox can evolve from a project output into a long-term educational platform dedicated to rivers, wetlands, and floodplains in the Danube Basin.
Drawing on experiences from the Horizon Europe projects Restore4Life and Danube4all, the presentation will showcase educational materials, interactive visualizations, games, citizen-science tools, and storytelling approaches developed to strengthen floodplain literacy and stewardship. Particular attention will be given to opportunities for cross-project collaboration, including the planned integration of new sediment-related topics through cooperation with the DANSER project.
The discussion will focus on key challenges and opportunities for ensuring long-term sustainability, community ownership, and growth through synergies among Danube projects, institutions, educators, and stakeholders, ultimately contributing to a shared Community of Practice for river restoration and education.

Project websites: https://restore4life.eu/, https://www.danube4allproject.eu/, https://danserproject.eu/