

# Department of Hydraulics, Hydrology and Hydrogeology: international projects starting in 2025

At the T. G. Masaryk Water Research Institute (TGM WRI), two international projects were launched in 2025. These include the *SWIM* project, funded under the Horizon Europe programme, and the *FrauNyLu* project, supported by the Interreg cross-border cooperation programme. Both projects also address hydrological topics, which will be managed by the Department of Hydraulics, Hydrology and Hydrogeology.

## THE SWIM PROJECT (HORIZON)

The *SWIM* project (*Sustainable Water and Integrated Management of Fish Migration and their Habitats in the Danube River Basin and NW Black Sea*) focuses on the restoration, protection, and improvement of habitats for migratory fish species in the Danube River Basin and the north-western Black Sea region. The project is implemented within the framework of the European Restore our Ocean and Waters Mission; it builds on long-term activities in the field of international cooperation for the protection of aquatic ecosystems. More than 20 partners from Central and Southeast Europe are involved in the project, including key scientific research institutions, river basin authorities, environmental organisations, and regional governments.

### Objectives and main activities

The main objective of the *SWIM* project is to restore river network connectivity, improve habitat quality, and strengthen the protection of key migratory routes of fish populations. The project is structured into thirteen activities implemented at seven pilot sites along the upper, middle, and lower Danube, including the Danube Delta and the Black Sea coast.

The key outputs of the project include:

- identification and mapping of key habitats for fish migration,
- design and implementation of measures to restore river connectivity (e.g. lateral reconnections, fish passes),
- establishment of *ex-situ* conservation facilities for breeding selected endangered fish species (e.g. sturgeons, Black Sea salmon, gudgeon),
- creation of a network of protected areas (fish refuges) and preparation of plans for their long-term management,
- use of digital technologies for monitoring and data sharing (including the extension of the MEASURES Info system and integration with the European Digital Twin Ocean),
- involvement of local communities and support for sustainable local models (e.g. eco-tourism, environmentally friendly aquaculture).



**SWIM**  
Sustainable Water and Integrated Management of Fish  
Migration and their Habitats in the Danube River Basin and NW  
Black Sea

### The role of TGM WRI in the *SWIM* project

TGM WRI focuses primarily on providing hydrological support to the project, assessing the impacts of climate change, and designing restoration and adaptation strategies. This also includes modelling the water regime at pilot sites and evaluating the effectiveness of nature-based solutions for ensuring connectivity and improving conditions for fish migration.

The Institute is also involved in methodological harmonisation of monitoring procedures and in sharing experience among research partners from different countries. An important component is the engagement of local stakeholders, including the general public, which contributes to raising awareness of the importance of fish migration for the conservation of biodiversity and ecological stability of aquatic ecosystems.

### Significance of the project for the Czech Republic and international cooperation

The *SWIM* project represents a significant advancement in the protection of migratory fish species within the Czech Republic, particularly through research on the upper Danube and its tributaries. The restoration of migratory routes and the improvement of the ecological status of river stretches contribute to the achievement of the objectives of the Water Framework Directive (2000/60/EC), the EU Biodiversity Strategy for 2030, and the new Nature Restoration Regulation.

Thanks to its transnational approach and collaboration across scientific disciplines and administrative levels, the project has the potential to become a model example for the restoration of river ecosystems throughout Europe. Through its involvement in the *SWIM* project, TGM WRI is actively contributing to shaping future approaches to the protection of freshwater biodiversity and the adaptation of water management to climate change.

The *SWIM* project represents a unique opportunity to link ecological restoration, research, innovation, and regional development. Its success will depend not only on a professional scientific approach but also on the ability to engage the wider public, relevant institutions, and communities along the watercourses. In the coming years, TGM WRI will play a key role in achieving the objectives of this ambitious international project.

## THE FRAUNYLU PROJECT: JOINT SOLUTIONS FOR SAFE DRINKING WATER SUPPLY IN THE CZECH–BAVARIAN BORDER REGION (INTERREG PROGRAMME)

TGM WRI has also become involved in the new cross-border *FrauNyLu* project, which will assess the interconnection of the Nýrsko, Lučina, and Frauenau water reservoirs. The aim of the project is to develop joint measures that will enhance



the resilience and safety of drinking water supply in the Czech–Bavarian border region, particularly in view of the expected impacts of climate change.

The *FrauNyLu* project was initiated in response to a shared challenge faced by both regions: to establish long-term sustainable and efficient water resource management in an environment characterised by low rock retention capacity and limited groundwater availability. The crystalline regions of the Šumava, Český les, and Bavarian Forest are highly sensitive to droughts and precipitation fluctuations, which are becoming increasingly frequent and intense due to climate change. The project therefore aims to strengthen cooperation and create a comprehensive system for information sharing, water balance assessment, and the design of joint technical and organisational measures.

## Joint approach

A completely new approach applied in the *FrauNyLu* project is cross-border assessment of the current and future state of water supply based on mutually harmonised methods and jointly shared data. Whereas similar analyses were previously carried out separately at the national level, the *FrauNyLu* project provides an integrated perspective on the entire area supplied by the key water sources – the Nýrsko, Lučina, and Frauenau reservoirs.

Based on the established database, it will be possible to determine the water resource balance, assess potential deficits, and propose specific adaptation measures. These may include technical solutions (e.g. system interconnections, resource sharing during periods of drought) as well as organisational measures (intelligent management of water abstractions, contingency scenarios, and coordination platforms).

The *FrauNyLu* project will deliver tangible benefits to both the Czech and Bavarian parts of the region, particularly in the following areas:

- increased resilience of drinking water supply during periods of drought or in the event of emergencies,
- improved planning of investments in water management infrastructure through shared analyses and models,
- utilisation of synergies in water resource management – reducing duplication and making efficient use of existing capacities,
- strengthening Czech–Bavarian cooperation at both local and institutional levels,
- enhanced safety and self-sufficiency of residents in areas with potential water scarcity.

## The role of TGM WRI in the *FrauNyLu* project

TGM WRI contributes to the project primarily in a professional capacity, providing hydrological analysis and designing adaptation measures. In doing so, it draws on

long-term experience in water balance modelling and the development of methodologies for assessing the impacts of climate change on the water regime.

TGM WRI contributes expertise gained from previous international projects, such as *Thaya* (Interreg), *Dyje* (Czech Science Foundation), *RAINMAN* (Interreg), and the *DALIA* project (Horizon Europe). The Institute also actively contributes to the transfer of research results into practice, both within public administration and in collaboration with water users, such as farmers and reservoir managers.

## Cross-border cooperation

The aim of the *FrauNyLu* project is to demonstrate that joint management of water resources across national borders is crucial not only for ensuring an adequate supply of drinking water but also for maintaining ecological balance in the Czech–Bavarian border region. Given the similar natural conditions and shared challenges, a coordinated approach is more effective than isolated national solutions.

The use of large reservoirs as strategic multi-year water storage facilities in areas with low groundwater retention potential is crucial in the context of climate change. The project therefore represents not only a technical and institutional innovation but also a symbol of cooperation and solidarity between neighbouring countries.

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An informative article that is not subject to peer review.

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