

Aueninstitut-Neuburg (Floodplain Institute)



The Aueninstitut Neuburg was founded in 2006 by the District Administration of Neuburg-Schrobenhausen to provide scientific support for the restoration project in the Danube floodplains. Together with the Floodplain Information Centre it forms the Floodplain Centre of Neuburg (Auenzentrum Neuburg-Ingolstadt). Since January 2008, the Floodplain Institute Neuburg has been based in Schloss Grünau. On 1st October 2010, the District Administration handed over the institute to the Catholic University of Eichstätt-Ingolstadt, where it has since been run as a research centre with an expanded range of tasks.



regional cooperation partners of the AI are for example: Bavarian State Office for the Environment; Water Management Authorities of Ingolstadt and Donauwörth; Bavarian Academy for Nature Conservation and Landscape Management. Furthermore, the Floodplain Institute is an active member of the International Association for Danube Research (IAD) www.danube-iad.eu

Initiation and implementation of research projects: Since 2006, more than a dozen research projects with a third-party funding volume of around 3.4 million euros have been acquired and carried out, several times as project leader.

Knowledge transfer and exchange of experience: editing of „Auenmagazin“ and „Danube News“; organisation of conferences together with LfU and ANL; presentation of current research results at regional, national and international conferences, publications in scientific journals and books.

Funding

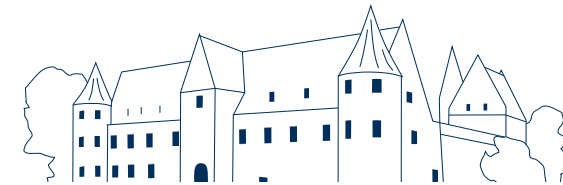
- District Administration of Neuburg-Schrobenhausen
- Catholic University of Eichstätt-Ingolstadt

Aims and tasks of the Aueninstitut

The AI investigates possibilities and limits of restoration of the Danube floodplains in order to improve nature conservation measures, but also to test new methods. National and international cooperation is used to extend research questions to other geographical areas and floodplain ecology topics so that findings can be transferred to Bavarian floodplains. Important components of the work are:

Applied research on floodplain ecology and floodplain restoration: development and improvement of solutions for near-natural floodplains, for the ecological assessment of floodplains and for the valorisation of near-natural floodplains.

Establishment and maintenance of an inter- and transdisciplinary network on floodplain expertise at local, regional, national and international level: Important



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Local floodplain research

Since 2006, Aueninstitut Neuburg has been conducting long-term monitoring of the floodplain forest between Neuburg and Ingolstadt. Furthermore, a floodplain forest of the „Danube Natural Heritage Foundation“ near Bertoldsheim is available to the Aueninstitut for research purpose.

Floodplain-related research fields and focal points

- Floodplain and vegetation ecology
- Nature and species conservation
- Ecosystem services
- Hydromorphology, ecohydrology and sediments
- Biodiversity, wetland and climate protection
- Remote sensing by drones and satellites
- Assessment methods in nature conservation

Restoration of the Danube floodplains

between Neuburg and Ingolstadt

The aim of the restoration project is to recreate near-natural dynamics of water in the floodplain despite dike embankments in order to maintain habitats for typical floodplain species. **Three measures** were implemented for this purpose:

1 **Dynamic discharge** from the Danube of up to 5 m³ of water per second into a new, 8 km long watercourse to bypass the Bergheim hydropower station

2 **Ecological flooding** of parts of the floodplain forest at higher water levels of the Danube (two to three times per year) with discharge volumes of up to 25 m³ of Danube water per second.

3 **Temporary lowering of the groundwater level** in the floodplain in times of low water of the Danube in areas where the groundwater level is permanently too high due to the Ingolstadt hydropower station.

Funding body for this flagship project of water management and nature conservation is the Free State of Bavaria, represented by the Ingolstadt Water Management Authority.

Monitoring of floodplain ecological processes

The research project (2009–2014) of nine partners under the lead of the Aueninstitut monitored the restoration project in the Danube floodplain and was funded with more than 1.3 million euros from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety provided by the Federal Agency for Nature Conservation (BfN).

The knowledge gained will be used as a basis for future projects on regulated rivers at national and European level, thus providing important ideas for the implementation of the European Water Framework Directive.

Main focus of the monitoring, which has been continued since the end of the project on a long term basis by the Aueninstitut Neuburg with its own resources, is the systematic recording and detailed analysis of hydrological and hydromorphological processes as well as changes in vegetation.

National

RESI River Ecosystem Service Index: In cooperation with nine other scientific institutions as well as numerous authorities and agencies, the RESI was developed which evaluates the various uses of a river landscape spatially and across disciplines on the basis of ecosystem services. In this way, recommendations for action can be derived for practical use.

RESI Lahn In the follow-up project RESI Lahn, the developed River Ecosystem Service Index was tested on the River Lahn.

BioAu Development of a practical biological procedure for a biocenotic assessment of the floodplain status: Funded by the BfN, a standardised assessment procedure for various plant and animal species groups is currently being developed together with four partners. Typical key habitats and their indicator species serve as the basis for the assessment.

CityRiver This project is about enhancing the river habitat in urban areas. Rivers in urban areas are usually squeezed into a narrow riverbed. They are difficult to reach for citizens and offer hardly any suitable habitats for flora and fauna. The EU life-project „CityRiver“ on the Danube aims to improve this situation in the fields of ecology, hydraulic engineering and socio-economics. The Aueninstitut is in charge of the development of watercourse and floodplain.

International

IDES Near-natural floodplain areas along the Danube and its tributaries play a vital role in improving water quality. At the same time, the sensitive floodplain ecosystems are also important for flood protection, as potential land for agriculture and settlement areas. Humans use numerous so-called ecosystem services in floodplains. The EU Interreg project IDES is currently developing an evaluation system for these services of nature and thus a sustainable, transnational water management system and is implementing it in five pilot areas in the entire Danube basin.

Danube Floodplain Project

Within the framework of the EU project, more than 20 cooperation partners of ten Danube bordering countries are currently investigating how flood protection along the Danube and its tributaries can be ensured and how the ecological condition of the floodplains can be improved at the same time. The resulting recommendations for action are to be incorporated into the Danube River Basin Management Plan.