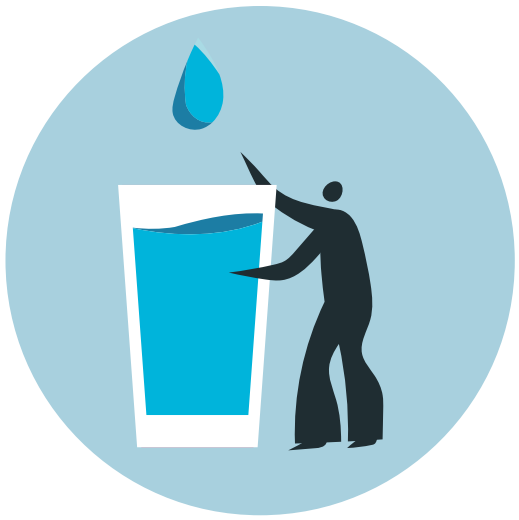
Eawag
Swiss Federal Institute of Aquatic
Science and Technology

MISSION & STRATEGIC OUTLOOK 2025 – 2028

eawag
aquatic research

Eawag is an internationally leading research institute focused on pioneering strategies to preserve and provide water for both people and the environment. As water resources face increasing strain from a growing human population and global change, Eawag is driving progress to alleviate these pressures and balance ecological, economic, and social needs for water. We create impactful solutions for Switzerland and beyond with disciplinary, inter-, and transdisciplinary methods. Collaborating within the ETH Domain and with partners worldwide, we develop cutting-edge approaches that set new standards in water research and innovation.



Science that matters

Eawag's Unique Strengths

Eawag, the Swiss Federal Institute of Aquatic Science and Technology, is one of four independent research institutions of the ETH Domain. Firmly anchored in its home country of Switzerland, but with a global network and activities, Eawag is at the forefront of developing and pioneering sustainable concepts and technologies for managing water bodies and water as a resource. Through collaboration with universities, research institutions, public agencies, industry, and non-governmental organizations, Eawag integrates ecological, economic, and social interests related to water usage and thereby serves as a bridge between science and society.

Eawag has established a unique research environment to address pressing water-related challenges with societal relevance. Our interdisciplinary framework combines social sciences, engineering, and natural sciences, enabling holistic and rapid responses to emerging issues. Eawag's scientists are encouraged to dedicate most of their time and resources to research, and our workplace culture fosters mutual understanding and efficient teamwork. Collaborating closely with diverse stakeholders ensures that our research meets real-world needs and supports practical implementation, thereby maximizing impact and facilitating effective knowledge and technology transfer.

Equipped with cutting-edge research infrastructure and state-of-the-art expertise in our research support, Eawag continually updates and enhances its research environment to meet the thighest standards. Strong partnerships within the ETH Domain and beyond amplify our analytical and interdisciplinary capabilities, especially in leveraging big data and advanced computational tools.

Strategic Framework

Our research foci

Water is fundamental to life on Earth. It is essential for all organisms, dissolves and distributes nutrients as well as pollutants, and plays a central role in the dissemination of energy in the atmosphere. Together with energy and food production, water is at the center of our livelihood. Water, food, energy, and human health are deeply interconnected, as well as tightly linked with natural ecosystems. A sustainable approach to water resources is therefore crucial for fostering human and planetary health.
In recent decades, global change has significantly interfered with water-related processes leading to modifications that are occurring at rates and on scales unprecedented in human history. Water quality and quantity are increasingly compromised due to population growth, urbanization, industrialization, and agriculture, causing hydropolitical conflicts over water resources. Aquatic ecosystems retain, transform, and distribute nutrients, chemical pollutants, and invasive species, making them particularly vulnerable to environmental contamination and biodiversity loss. Rising temperatures are profoundly altering the water cycle, driving alterations in the stratification of water bodies, precipitation patterns, and water availability. Climate change is also increasing the frequency of droughts and floods, putting additional pressure on aquatic ecosystems and related ecosystem services. Many of the world's most challenging problems – among them climate change adaptation, environmental protection, sustainable energy, food security, and global health – are closely linked to water. Addressing these challenges requires innovative solutions, technological advances, and practical approaches. For the upcoming funding period, we have identified four topics as strategic priorities for Eawag. These strategic priorities support the UN's Sustainable Development Goals and align with the Planetary Boundaries framework, which emphasizes the prevention of irreversible environmental damage.

Strategic priorities and key objectives

Our overarching goal is to achieve impact through research and innovation, developing technical, political, and societal solutions to water-related challenges that are sustainable. We build on our leadership in the topic of water quality and its importance for organisms and ecosystems, leveraging expertise in environmental chemistry, ecotoxicology, ecology, engineering, and social sciences. At the same time, we are expanding our focus to address pressing global challenges, including those of climate change, biodiversity loss, circular economy in the water sector, and the central role of water for public health.

Climate Change: Water is at the center of the climate crisis. Warming alters the thermal structure of water bodies, leading to profound changes in ecosystems and biogeochemical cycles that contribute to biodiversity decline. Rising temperatures cause shifts in rainfall patterns, floods, and droughts that have detrimental impacts on the water cycle and make water availability unpredictable. Mitigating climate change is essential but insufficient on its own; adaptation strategies – measures to better cope with the effects of climate change – are also crucial. Eawag is advancing research in climate mitigation and adaptation, focusing on scalable solutions to protect water resources and maintain water quality, addressing both the resilience and emissions aspects of water management.

Biodiversity: Biodiversity is vital for ecosystem stability and resilience. Intact ecosystems provide vital protection against natural hazards and support essential resources like food, clean air, and water. Yet, freshwater ecosystems worldwide are experiencing rapid declines due to pollution, habitat fragmentation, and climate change leading to an urgent need for biodiversity monitoring as well as management and protection. Eawag is pioneering scalable biodiversity monitoring techniques, including remote sensing, automated imaging, and environmental DNA (eDNA), to track changes in aquatic ecosystems. These efforts aim to inform conservation strategies that balance habitat protection with other societal needs, such as energy production and food security.

Circular Economy: The demand for water increasingly exceeds its availability. With climate change and pollution additionally compromising water quality, circular economy approaches are critical to alleviate pressures on water resources and facilitate their sustainable use. This includes the protection of water bodies from chemical and microbial pollution and retrieving and reusing nutrients and other valuable resources that are carried in water. Eawag's circular economy research is focusing on the entire loop, where biomass, nutrients, and chemicals discharged into the (aquatic) environment can be recovered, treated, and reused instead of being lost or causing pollution.

Health: Human health and water are intricately linked. Access to clean water and sanitation is essential for preventing waterborne infections and promoting overall well-being and health. Yet, pollution compromises water quality, with billions lacking access to water and adequate sanitation. With climate change exacerbating extreme weather events such as droughts and floods, solutions for decentralized, sustainable and resilient water, sanitation, and hygiene (WASH) systems will become even more critical in the future. Eawag is developing solutions for the reduction of microbial and chemical pollution, including the development of materials that are safe and sustainable by design (SSbD) to ensure safe water. Eawag will, together with partners in the domain, continue to innovate wastewater-based public health monitoring, offering scalable, rapid tools to track health indicators and support public health management.

Impact

Creating Impact

Our impact strategy aims at providing innovative, forward-looking solutions for the problems of today and tomorrow. It centres on aligning research outputs with stakeholder needs while ensuring the necessary funding to support our initiatives. Our partnerships are therefore central to our impact, enabling **knowledge and technology transfer** (KTT) from research to applications in policy and industry. We work closely with stakeholders in the water sector and beyond, contributing expertise through initiatives such as joint research programmes or consulting in expert commissions.

We work with industry, federal and international authorities, and policymakers to implement scientific ideas in practice and policy. We plan to strengthen our partnerships with federal offices (FOEN, FOPH, SFOE, FOAG) and to develop new collaboration formats, such as platforms that combine monitoring with research. We also aim to expand our engagement in consultation processes to inform water-related regulations and to utilize platforms like FIBER and the Ecotox Centre for stakeholder engagement especially in the Romandie. We see opportunities to expand our interactions with industry in the areas of drinking and wastewater as well as in materials that are safe and sustainable by design. With our Technology Transfer Office (TTO) and our membership in the Glatec Incubator, we are equipped for the transfer of knowledge via start-ups and spin-offs. Lastly, we plan to maintain ongoing international partnerships and strengthen our interactions especially with WHO and ESA. Another strategy for close stakeholder relationships is the active exchange with Eawag alumni who work for private companies, NGOs, and public authorities at all levels. The necessary (human) resources for increasing our KTT activities will be made available also by encouraging and training more researchers at Eawag to engage in such activities.

Our **teaching** and education efforts transfer knowledge to society. Through partnerships with degree-granting institutions, primarily ETH Zurich and EPFL, Eawag contributes to training the next generation of environmental experts. Our researchers offer courses that provide hands-on training and fieldwork opportunities, preparing students with the skills and knowledge to address water-related challenges. Joint professorships enhance Eawag's educational impact. Despite budget constraints, we seek to further strengthen the links with higher education institutions through joint professorships as they are of major importance for our teaching efforts. We also aim to position Eawag as an attractive host for Bachelor or Master students through our teaching and through benefits such as free housing for students in Kastanienbaum. We are aware that new technologies will also affect the teaching sector and are interested in employing these to develop, for example, remote and module-based teaching tools, including MOOCs and VR for immersive learning experiences.

We further host **outreach and training** programs such as PEAK (Practice-oriented Eawag courses) or our Eawag Partnership Program EPP that puts our activities into a developing world context. Our **vocational training** implements new training ordinances and provides young professionals with access to cutting-edge technology.

Impact is maximized when our outcomes are both sustainable and accessible to stakeholders across relevant sectors. To this end, Eawag supports **Open Science** and is committed to making scientific research and data accessible to all to enhance participation, transparency, and collaboration. A commitment to Open Sciences increases not only the visibility but also the practical application of our research. **Sustainability** is another essential part of our mission and identity. Our research is revolving around the sustainable use of water and aims at providing sustainable solutions to tackle the water crisis. Sustainability is also at the heart of our institutional culture, and we promote a sustainability approach for our campus, operation, and research activities.