Networks of cross-sectoral coordination: Research at Eawag

CASPISNET Annual Meeting 2023

5.6.2023

eawag
aquatic research


PSI
ETH Zurich
Empa
Eawag
WSL
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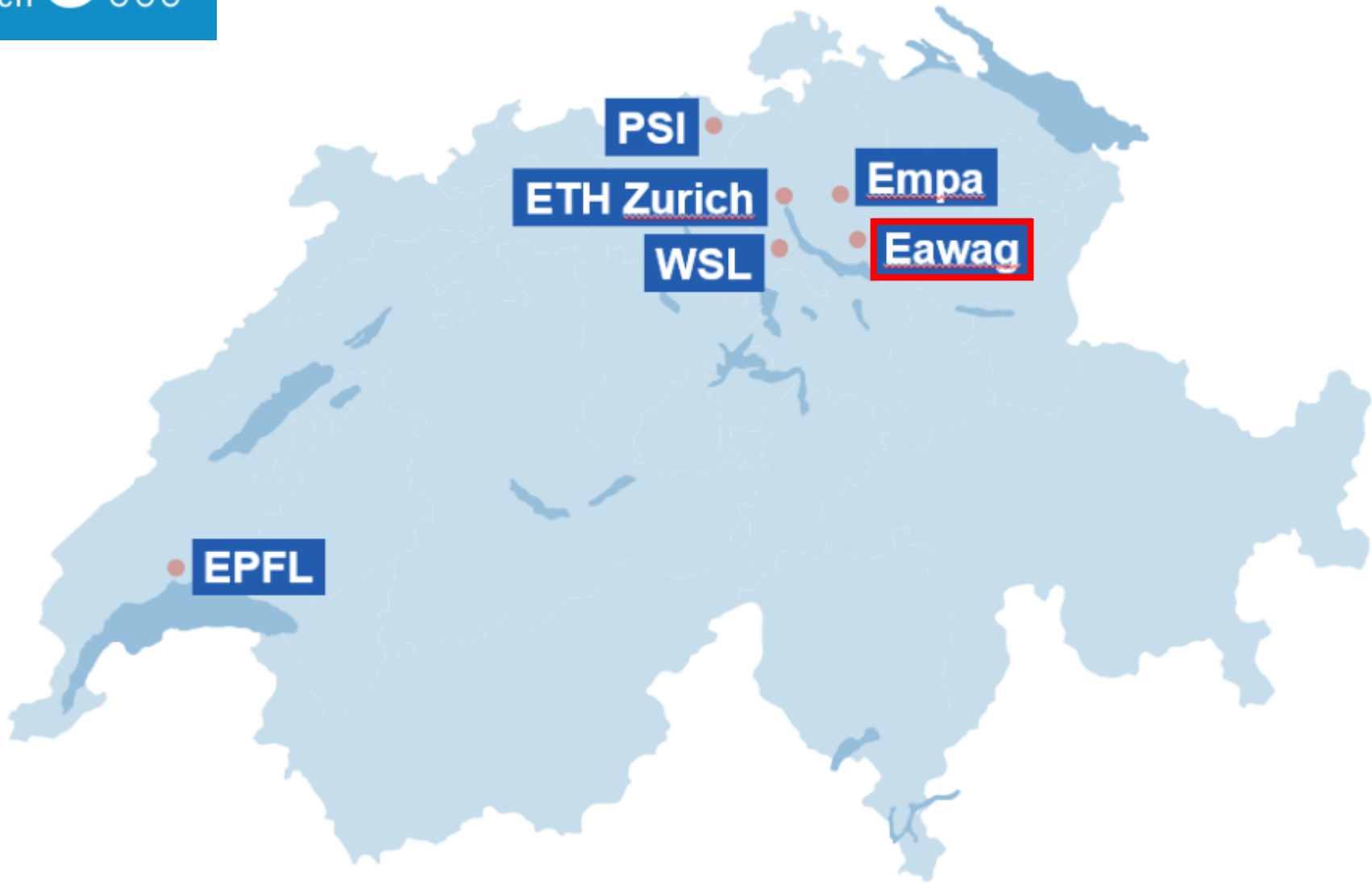

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aquatic research

Research departments

Surface Waters Research and Management Surf
Helmut Bürgmann

Water Resources and Drinking Water W+T
Michael Berg

Aquatic Ecology Eco
Christoph Vorburger

Process Engineering Eng
Eberhard Morgenroth

Fish Ecology and Evolution FishEc
Ole Seehausen

Urban Water Management SWW
Christoph Ort

Environmental Chemistry Uchem
Juliane Hollender

Sanitation, Water and Solid Waste for Development Sandec
Christoph Lüthi

Environmental Microbiology Umik
Frederik Hammes

Systems Analysis, Integrated Assessment and Modelling Siam
Nele Schuwirth

Environmental Toxicology Utox
Kristin Schirmer

Environmental Social Sciences ESS
Manuel Fischer

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ESS Competence Clusters

EHP

Environmental Health Psychology (EHP)

DA

Decision Analysis

EnvEco

Environmental Economics

Cirus

Sustainability Transitions and Innovation Dynamics

PEGO

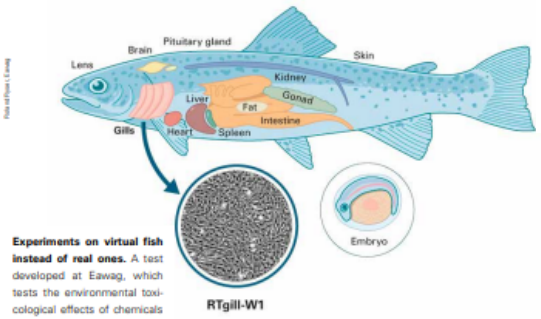
Policy Analysis and Environmental Governance

ITD

Inter- and Transdisciplinary Research

Spotlight

Monitoring antibiotic resistance in wastewater. Antibiotic-resistant bacteria enter wastewater treatment plants with the wastewater. As part of the new National Research Programme NRP 72, Eawag researchers have found that although wastewater treatment plants remove a large part of these bacteria, they can still enter rivers, especially when it rains. The researchers recommend setting up a monitoring system for antibiotic resistance in Swiss wastewater treatment plants.



RTgill-W1

Experiments on virtual fish instead of real ones. A test developed at Eawag, which tests the environmental toxicological effects of chemicals only on gill cells instead of live fish, was released as a guideline by the OECD in 2021. As part of a new National Research Programme, the researchers are experimenting with further tests based on cultured intestine or nerve cells from the fish. This data is to be fed into a single computer model – the virtual fish – to replace further animal testing.

Research station LéXPLORE opens its door in virtual form

A globally unique research facility called LéXPLORE has been floating on Lake Geneva since 2019. The platform is equipped with high-tech sensors that collect physical, chemical and biological measurements around the clock – and down to a depth of 110 metres. Now the research station is opening its doors in virtual form: those who wish can also visit the cabin on the platform. And learn more about the instruments, the data collected, the research projects and the objectives of LéXPLORE.

Urine separation on track for success. Vuna GmbH, which was established six years ago as an Eawag spin-off, is now fully independent – and has even founded a sister company, Vuna Nexus AG, to further develop the reactor, which can be used to process urine into certified fertiliser. To celebrate these successes, the team held a party at the Chriesbach site in Dübendorf and also inaugurated the world's first urinoduct, which transports urine from two Eawag buildings across the Chriesbach stream (in the picture) to the central processing facility.

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Information on flooding via social media

Thanks to an automatic image processing method, mobile phone videos posted on th Internet can be used as an important source of data during a flood. This should allow rescue workers to take targeted protective measures – and warn the population at ar early stage.

Heavy rainfall leads to flooding in urban areas: because the mass of water cannot seep away on the asphalted surfaces, it seeks its way through rows of houses. Within a very short time, streets become raging torrents. Not only does it cause huge damage, but human lives are also endangered.

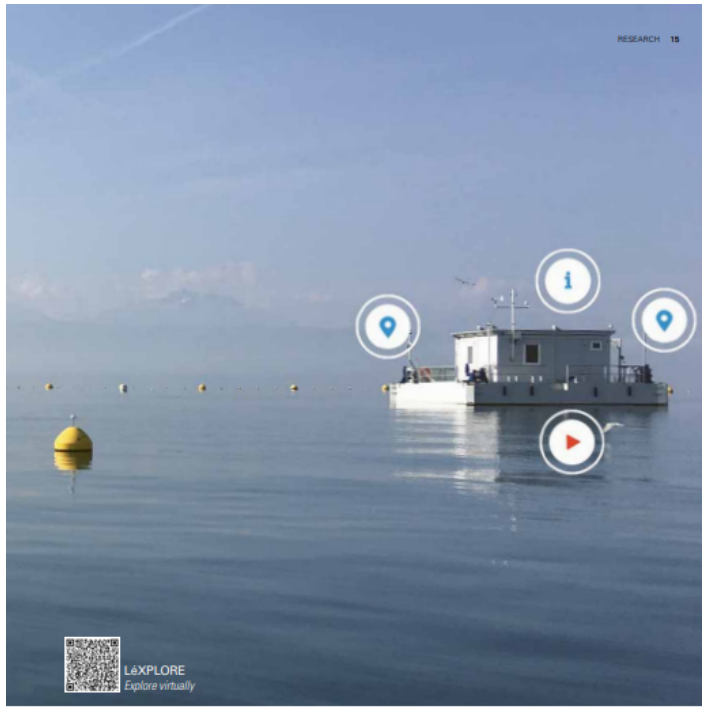
How fast does the water flow?

In order to be able to take protective measures in good time, the rescue services need to know, among other things, how fast the water is flowing. In very few places are sensors installed that reliably provide this information in the event of a flood. But now a research team at Eawag has tapped into a new data source.

evaluates these images to determine the flow ve city, for example, based on the wave structures on t water surface.

Experiments in the army's training facility

However, the researchers first had to calibrate the alg rithm. To do this, they flooded the streets and cellars a flood training facility where the army and fire briga normally practice for emergencies. While conventic al surveillance cameras filmed what was happenir a radar device recorded how high and fast the floo were. Now it was only a matter of aligning t radar measurements and the image evaluation wi each other. "With our fully automated image proce ing, mobile phone videos can be used practically real time to warn the affected population at an ea



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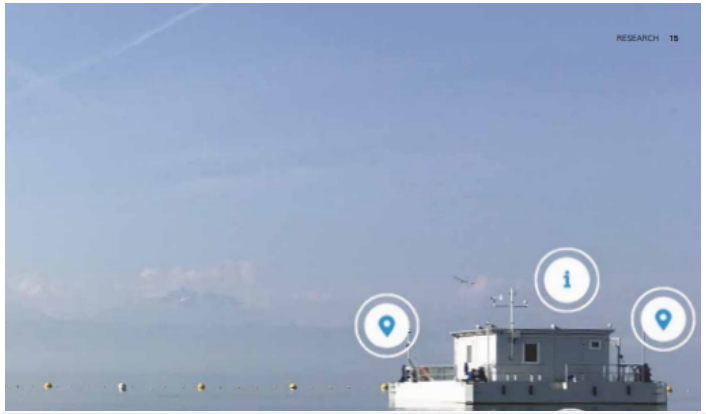

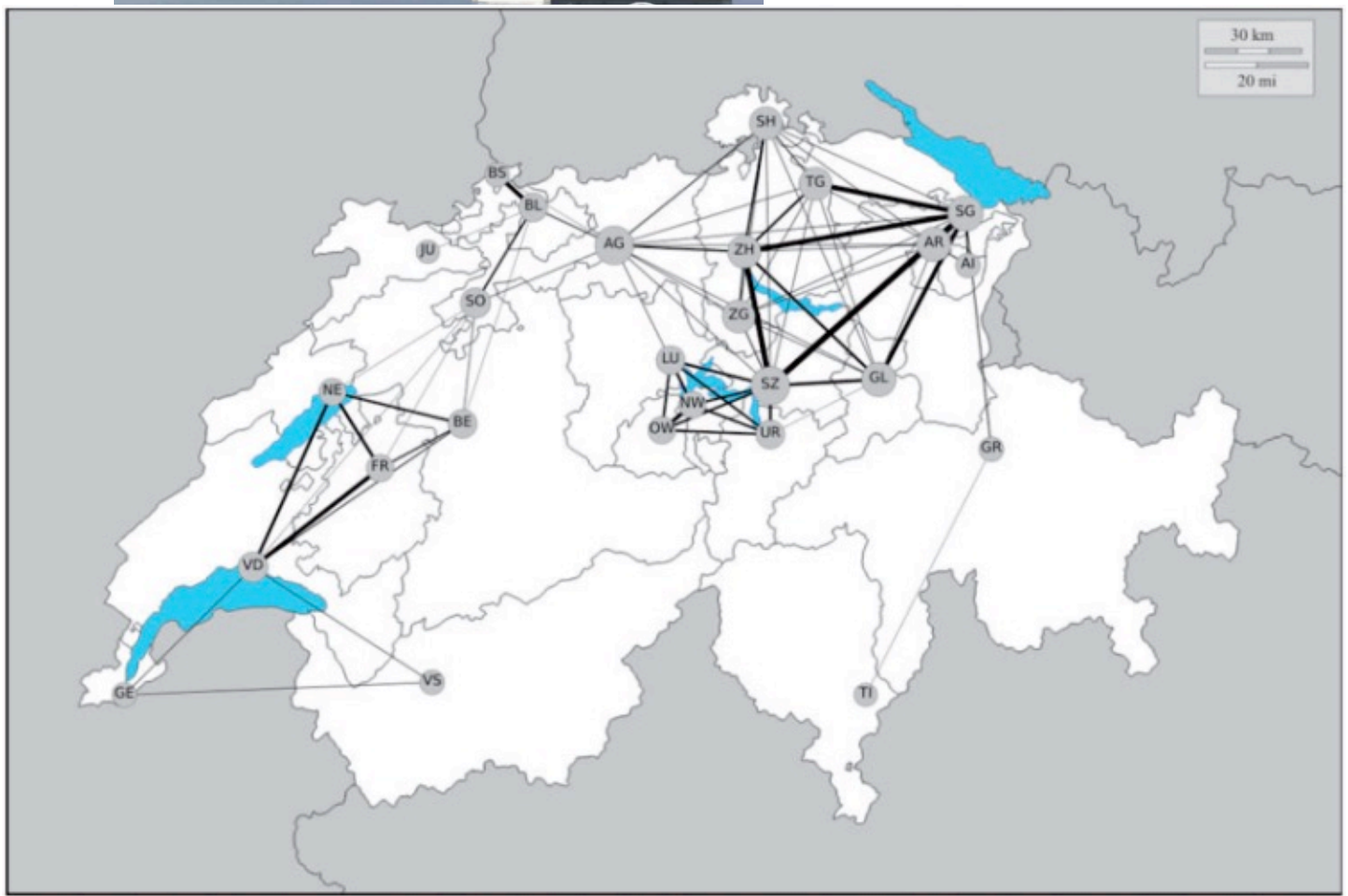
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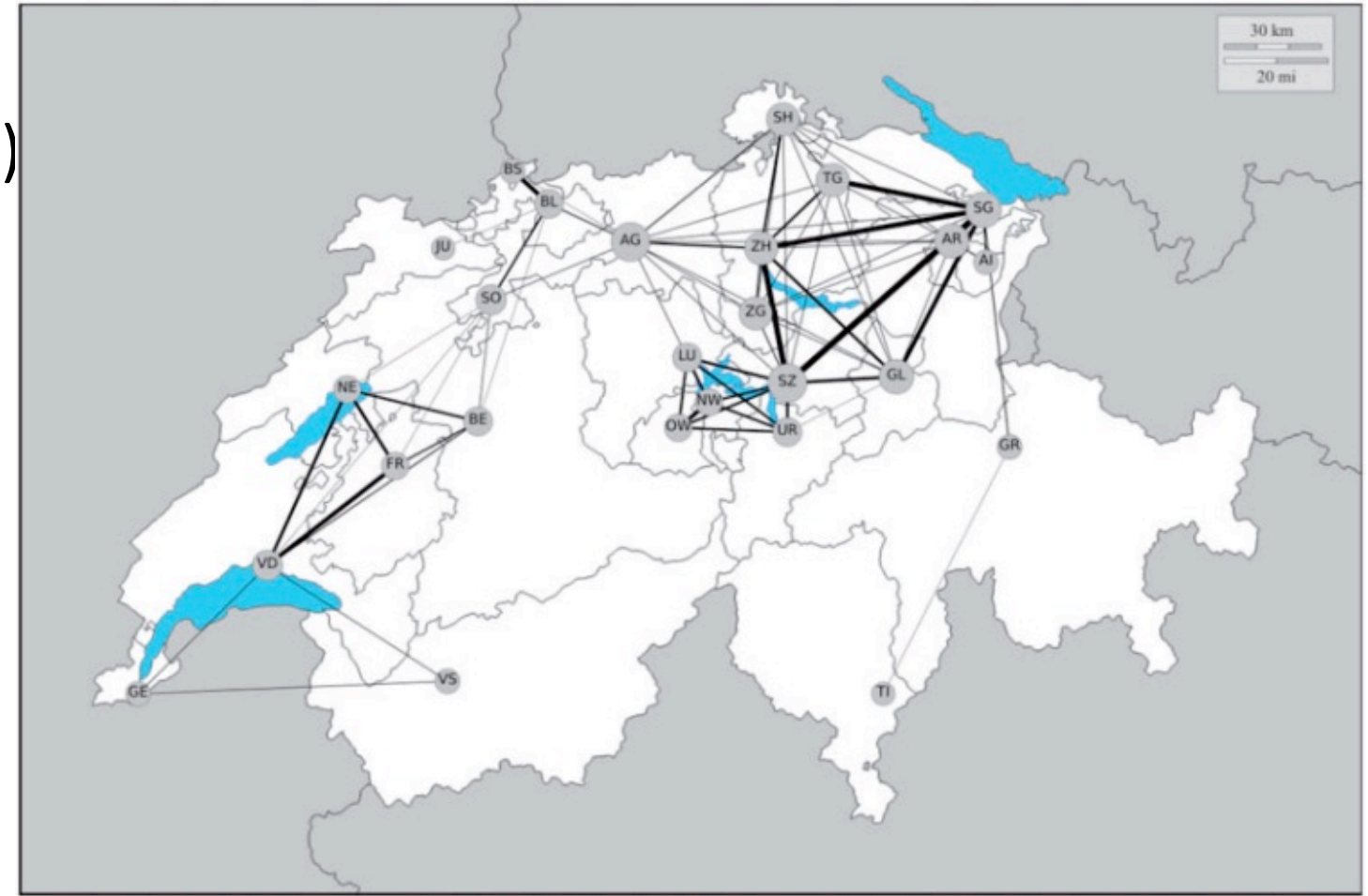
Transboundary collaboration

- Among substates
- Among countries

(international lakes, rivers…)

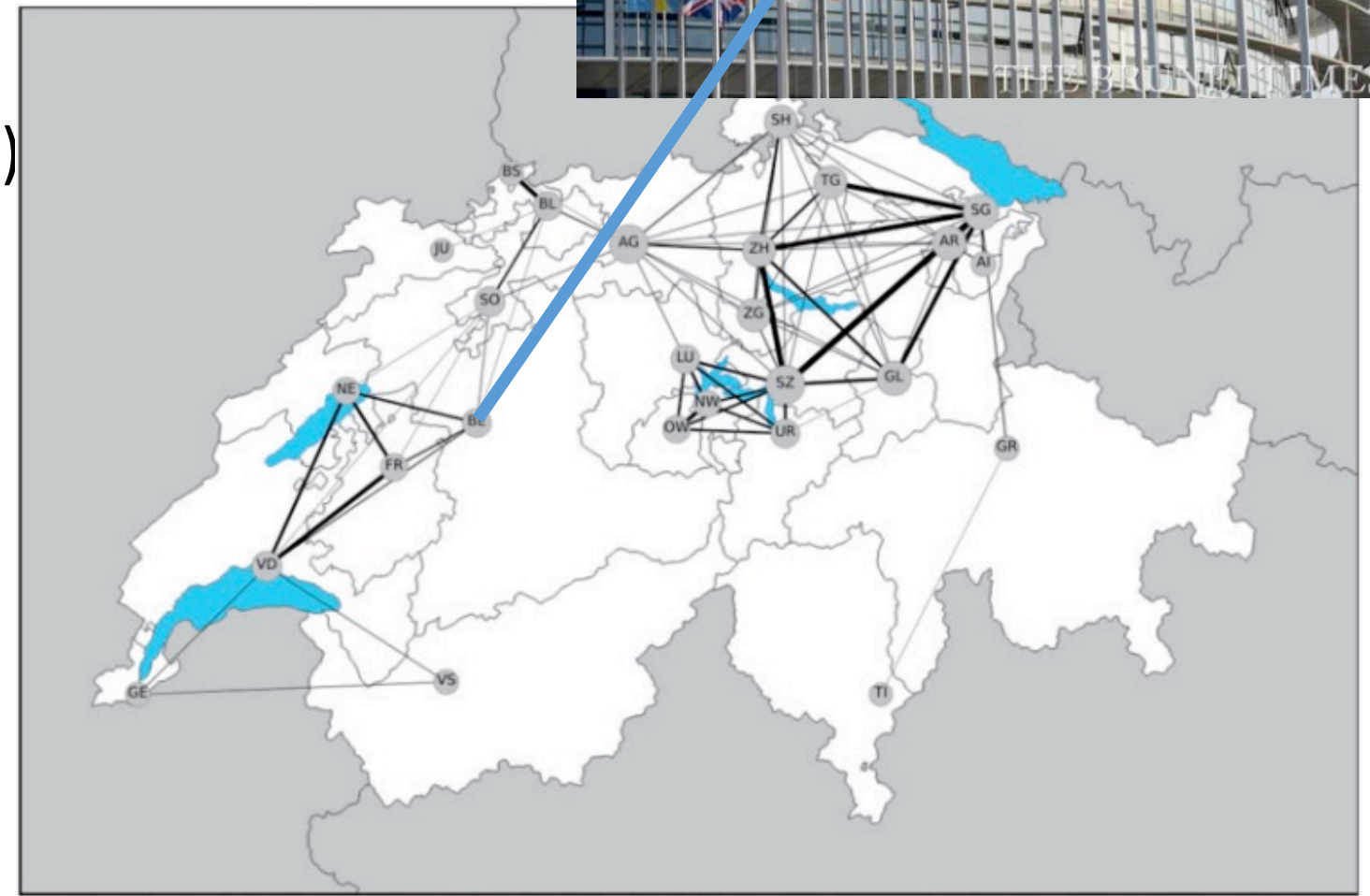


Multi-level collaboration

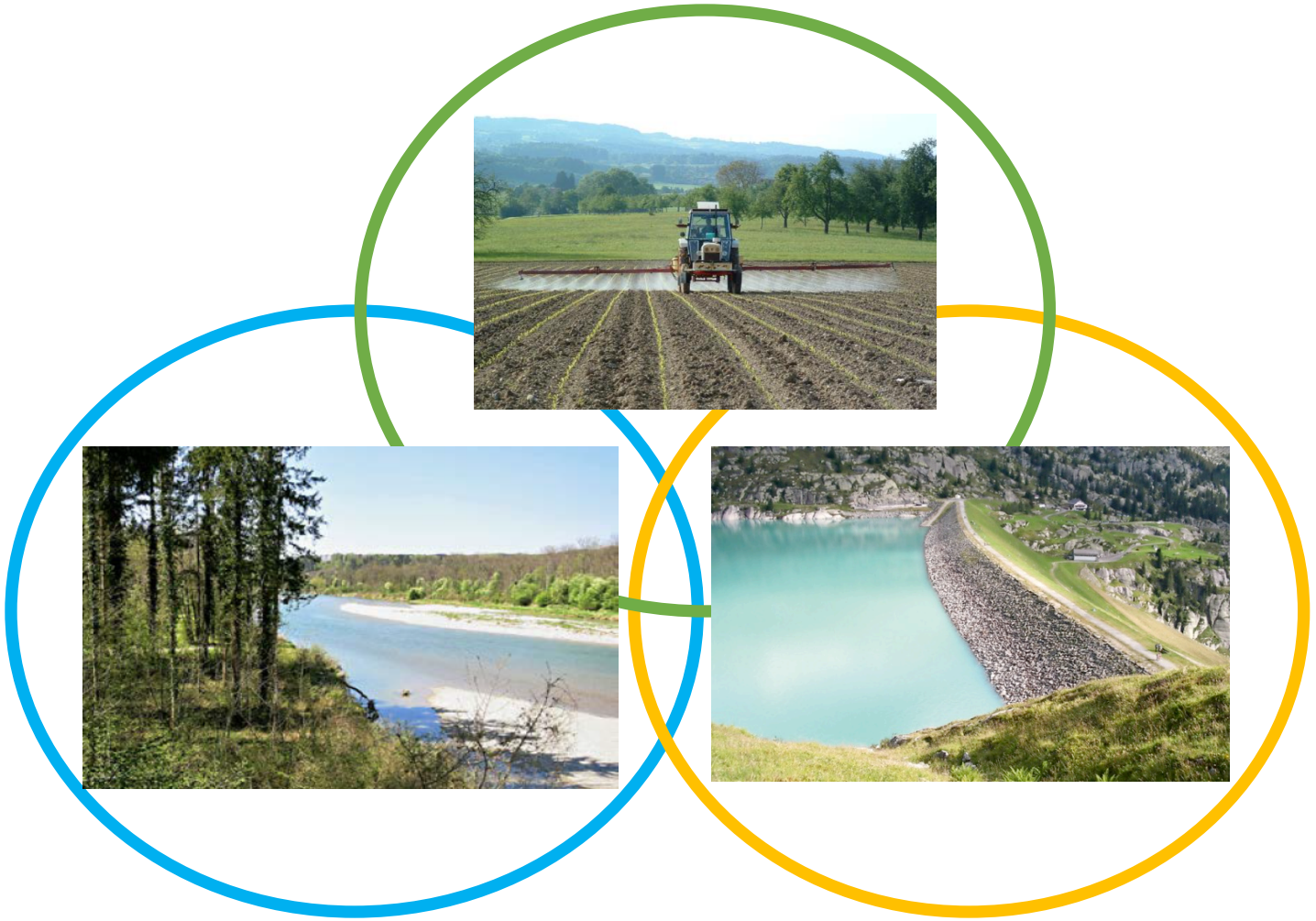
- Among substates
- Among countries

(international lakes, rivers…)

- Across multiple levels of governance

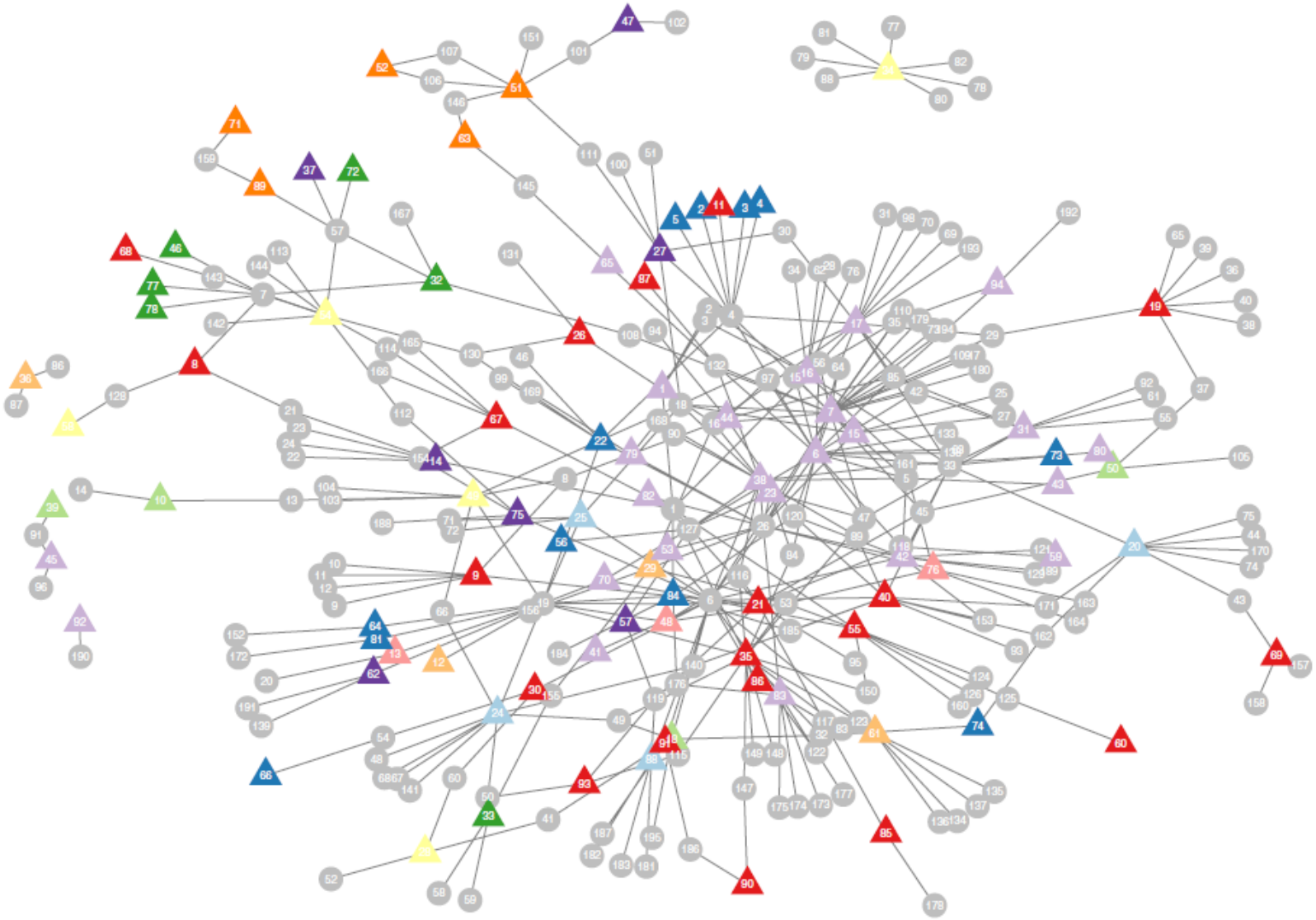


Cross-sectoral collaboration



Cross-sectoral collaboration

Cr


actor
agriculture
biodiversity
climate change
development
protection from water
protection of water and water contamination
spatial planning
transport
water energy issues
water supply
water use and tourism

Recommendations

-> Consider (multiple types of) interdependencies in the first place.

-> Consider multiple ways of dealing with them.

-> Dealing with them takes time and implies failures.