RÉPUBLIQUE FRANÇAISE

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UR1469

RiverLy

Management

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Research topics

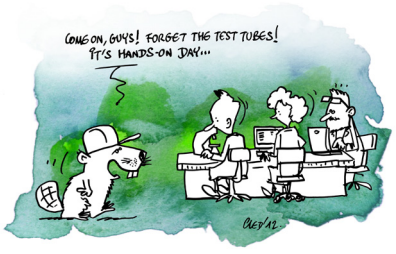
- Flows and transfer mechanisms
- Contaminants exposure, stress and biological effects
- Pressure-impacts: scales and multiple stresses
- Spatialization of flows, integrated catchment management

Key figures

- 37 researchers and equivalent
- 33 engineers and technicians
- 7 research teams
- 1 experimental hydraulic hall
- Chemistry, ecotoxicology and ecology testing laboratories

Keywords

- Rivers, Catchments
- Modelling
- Chemical contamination
- Pressure / Impact
- Toxicity
- Intermittence

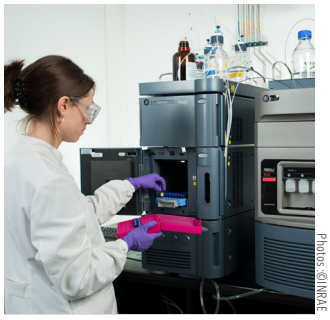


Mission and objectives

RiverLy is a multi-disciplinary research and development unit studying the functioning, quality and dynamics of aquatic systems and the associated risks. It combines skills in ecology, microbiology, ecotoxicology, environmental chemistry, hydrology, hydraulics and physics.

It develops approaches to the different scales that structure aquatic systems (from microsites to large catchments) and cover every level of organization of the living world (from cells to communities of organisms).





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Its main objectives are to:

- evaluate and predict the consequences of human activities and climate change on aquatic systems and biodiversity;
- hierarchize and guide the actions to be undertaken in order to restore and preserve aquatic environments;
- anticipate the risks associated with global change over the next few decades, propose adaptive solutions.

Riverly's work contributes to:

- qualitative (various pollutants) and quantitative (low water levels and floods) management of water in habitats subject to anthropic influence (rural, urban and peri-urban);
- anticipation of, and adaptation to, the effects of global changes;
- conservation or restoration of biodiversity and associated ecosystem services.

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RiverLy Teams

- Multiscale Eco-Hydrology (EcoFlowS)
- Catchment Hydrology (HYBV)
- River hydraulics (HYR)
- Non point source Pollutions (PollDiff)
- Aquatic Chemistry (LAMA)
- Ecotoxicology (Ecotox)
- Aquatic Microbial Ecotoxicology (EMA)

Glossary

- AQUAREF: National reference laboratory for aquatic habitat monitoring
- BIOEENVIS : Biodiversité, Eau, Environnement, Ville & Santé
- ENTPE: Graduate School of Civil, Environmental and Urban Engineering
- EVS: Environment City Society
- IMU: Intelligence of Urban Worlds
- INSA DEEP: Laboratoire Déchets, Eaux, Environnement et Pollutions
- ISA: Institut des Sciences Analytiques
- LBBE: Laboratory of Biometry and Evolutionary Biology
- LEHNA: Laboratory for Ecology of Natural and Man-impacted Hydrosystems
- LMFA: Fluid Mechanics and Acoustics Laboratory
- OTHU: Field Observatory for Urban Water Management
- OZCAR: French Network of Critical Zone Observatories: Research and Application
- SHF: Hydrotechnical Society of France
- ZABR: Rhone Basin Long Term Environment Research

Research

Multi-disciplinary approaches combining theoretical developments, modelling, in situ observations and laboratory experiments are implemented in order to:

- understand and model the elementary processes for the transfer of water, sediments and associated chemical and biological pollutants from springs to watercourses;
- describe the biological responses and predict changes in aquatic communities and the ecotoxicological risks related to environmental modifications of habitats and the dynamics of contamination;
- understand the ecological responses to various stresses and quantify the responses of organisms and communities at different spatial and temporal scales;
- understand and model the interactions between anthropic activities and hydrological and ecosystem responses in catchments, including changes in climate, water use, natural resource management practices and risks.

Collaboration and expertise

Its main local academic partners are ISA (analytical chemistry), LEHNA (ecohydrology, ecology and molecular tools), LBBE (ecotoxicological modelling), LMFA (environmental mechanics), EVS (physical and human geography), INSA DEEP and LMFA (hydraulics and hydrology). With these partners, RiverLy is part of the BIOEENVIS and OTHU research federations, the IMU LabEx and EUR H2O'Lyon. Regionally, RiverLy co-chairs OTHU and ZABR, which federates cross-disciplinary research into water using field observatories (9 sites).

Its national partnerships are diverse and involve several INRAE centres, universities and public and private operational partners. RiverLy co-leads the OZCAR research facility, is a driving force in several federative organizations including the Aquatic Ecotoxicology research group and the AQUAREF consortium, chairs the scientific and technical committee of SHF and the Hydrology-Energy commission of the Conseil Supérieur de la Météorologie (Météo-France supervisory body). Finally, RiverLy research unit is involved in several Priority Research Programmes and Infrastructure (PEPR), co-managing the OneWater PEPR.

At the international level, RiverLy is strongly involved in running and developing networks such as the international Microbial Ecotoxicology network, EcotoxicoMic (linked to Evertea Foundation for environmental research), and the NORMAN European network (particularly on passive sampling networks for chemical contaminants and non-targeted analysis). RiverLy coordinates the H2020 project DRyVER (aiming to guarantee biodiversity, functional integrity and ecosystem services in drying river networks). RiverLy is a reference research unit for European intercalibration (Ecostat) in ecohydrology.

Scientific facilities

- RiverLy's Hydraulics and Hydromorphology Laboratory (HHLab) has two 18-metre-long channels and an Urban Model (MURI) to study hydro-sedimentary flows and floods in rivers and in cities.
- RiverLy also has a variety of microcosms and mesocosms for conducting ecological and ecotoxicological experiments, a group with expertise in aquatic invertebrate biodiversity (identification, photographs), a cutting-edge analytical chemistry laboratory, as well as abundant field equipment for sampling and experimenting in watercourses.

Teaching

RiverLy contributes to several courses in ecology, ecotoxicology, chemistry, hydrology and hydraulics in local universities and engineering schools (ENTPE, universities of Lyon 1, Lyon 2 and Savoie-Mont-Blanc) and in the Ile-de-France Region (around Paris). It also hosts many students.

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