

Rivers, Cities and Borders under Global Change

Nature-Based Solutions, Socio-Ecological Governance and Environmental Law

ACROSS Summer School

University of Girona

29 June - 3 July

Introduction and summary

Rivers play a central role in shaping cities, rural landscapes and cross-border territories. Under global change conditions, including climate change, land use transformations and increasing social and institutional complexity, rivers have become critical spaces where environmental challenges, social demands and governance frameworks intersect. They are at once sources of ecosystem services, areas exposed to risk and conflict, and laboratories for innovation through Nature-Based Solutions.

This ACROSS Summer School offers an integrated and interdisciplinary approach to rivers as socio-ecological systems. Using Girona and the Muga river basin as core case studies, the program combines field-based learning, academic lectures and legal perspectives to explore urban, rural and transboundary river contexts. The Summer School brings together students and staff from the ACROSS European University Alliance to co-create knowledge and reflect on sustainable, inclusive and legally grounded forms of water governance.

I. Background and rationale

Rivers connect ecological processes with social practices, economic activities and institutional arrangements. In urban contexts, they are closely linked to flood risk, biodiversity management and public space. In rural areas, rivers sustain agricultural production and local livelihoods, while also generating competition between uses. In cross-border settings, rivers reveal governance asymmetries, legal fragmentation and the need for cooperation.

Nature-Based Solutions have emerged as key approaches to address water-related challenges, but their implementation depends on social acceptance, governance structures and legal frameworks. Understanding rivers

therefore requires combining ecological knowledge, social analysis and environmental law.

This Summer School responds to these challenges by adopting a place-based and comparative perspective, firmly embedded in the objectives of the ACROSS alliance.

2. Objectives

The main objectives of the Summer School are:

- To analyse rivers as socio-ecological systems across urban, rural and cross-border contexts
- To explore Nature-Based Solutions for water management, risk reduction and ecological restoration
- To examine the role of social actors, values and power relations in river governance
- To introduce the legal frameworks governing water, rivers and marine environments from public and private law perspectives
- To foster interdisciplinary and international collaboration among ACROSS participants
- To co-create integrated proposals linking ecology, governance and law

3. Case studies and learning settings

3.1 Urban rivers: Girona as a living lab

Girona provides an exemplary case of urban river management under global change. The city illustrates how rivers are embedded in flood risk management, urban biodiversity strategies, public space design and social uses.

A half-day field visit will be organised using the Gironat project as the main reference framework. This visit will focus on integrated urban water management, Nature-Based Solutions for flood mitigation, urban ecosystem services and social and territorial dimensions of water management.

3.2 Rural and cross-border rivers: the Muga river basin

A full-day field trip will explore the Muga river basin from upstream to downstream. The visit will address agricultural water uses, irrigation

systems, ecosystem services, stakeholder conflicts and governance challenges in a rural and transboundary context.

The itinerary will include a visit to The Pioneers Foundation, highlighting innovation, territory and sustainability initiatives linked to rural development and environmental transition.

This block will be conceptually grounded in the doctoral research carried out on the Muga basin, which analysed water ecosystem services, stakeholder perceptions and participatory mapping from a socio-ecological systems perspective.

4. Environmental law block: water, rivers and sea

A dedicated thematic block will address the legal dimension of water governance, providing participants with an overview of environmental law related to water, rivers and marine environments.

This block will cover public environmental law, including water planning, European directives and administrative responsibilities, as well as private law perspectives related to water uses, concessions, conflicts and liability. Particular attention will be given to the river to sea continuum, water quality issues and the need for integrated governance frameworks.

The objective is to critically assess how legal instruments shape, enable or constrain Nature-Based Solutions and adaptive governance strategies.

5. Programme structure (29 June – 3 July)

Monday 29 June

Conceptual and International Perspectives

09.00–09.30

Institutional welcome
University of Girona and ACROSS representatives

09.30–10.30

Francesco Boscutti (Università degli Studi di Udine)

Riverine Plant Ecology under Climate Stress: Mediterranean Landscapes in Transition

10.30–11.00

Coffee break

11.00–11.30

Antonio Tomao (Università degli Studi di Udine)

Remote Sensing and Spatial Monitoring of Riverine and Forest Ecosystems

11.30–12.00

Maurizia Sigura (Università degli Studi di Udine)

Landscape Ecology and Territorial Resilience in Rural River Basins

12.00–13.00

Roundtable discussion with international faculty

Ecology, Technology and Landscape as Lenses to Read Rivers under Global Change

13.00–14.30

Lunch

15.00–15.30

Dr. Gianluigi Buttiglieri (ICRA – Catalan Institute for Water Research)
Nature-Based Water Solutions in Cities: Treatment and Reuse for Urban Resilience

15.30–16.00

Dr. Xavier Garcia (ICRA – Catalan Institute for Water Research)
Urban Metabolism, Water Security and Socio-Technical Transitions

16.00–16.30

Comparative River Governance under Global Change: Insights from the South Caucasus

Dr. Mikheil Elashvili & Dr. Nikoloz Vacheishvili (Ilia State University, Georgia)

17:00 - 17:30

Major Rivers of the Baltic Sea Catchment Basin and the Environmental State of the Baltic Sea: Transboundary Governance and Marine Implications
Dra. Aniela Staszewska (Bialystok University of Technology)

17:30–18.00

Open discussion: Integrating Technological Innovation, Governance and Comparative Perspectives

Tuesday 30 June

Urban rivers and water management in Girona

09.00–13.00

Field visit in Girona

Urban Rivers as Socio-Ecological Infrastructures: Risk, Adaptation and Governance

Lead coordination: Dr. Enric Cassú (LEQUIA – Universitat de Girona)

Participation of the Councillor and technical staff of the Ajuntament de Girona

The visit explores:

- *Integrated urban water management*
- *Flood risk and drought governance*
- *Urban biodiversity strategies*
- *Water reuse and circular systems*
- *Planning instruments and regulatory frameworks*

13.00–14.30

Lunch

14.30–15.30

Albert Llausàs, Lena Hommes, Edurne Bagué & Anna Ribas (University of Girona)

The Territorial Construction of Water Security: Hydro-Social Territories and Governance Transformation

15.30–16.30

Enrica Garau (University of Almeria)

Ecosystem Services, Stakeholder Perceptions and Participatory Mapping in the Muga River Basin

16.30–18.00

Interactive group session - Enrica Garau (University of Almeria)

Framing Water Security: Actors, Narratives and Territorial Trade-offs

Participants form international working groups and identify competing definitions of water security, dominant narratives and key governance tensions in Mediterranean river systems.

Wednesday 1 July

Rural and Cross-Border Rivers: The Muga Basin

09.00–09.15

Departure from Girona

Brief introduction to the field itinerary

Participants are required to bring a picnic lunch and sufficient water.

Morning session: downstream to upstream dynamics

09.45–10.45

Empuriabrava – Coastal pressures and water demand

Urban-tourist development, irrigation systems and groundwater stress
Water scarcity, sectoral competition and drought exposure

11.15–12.15

La Plana Litoral de la Muga – Agricultural uses and ecosystem services

Irrigation communities and allocation dynamics
Trade-offs between agricultural production and ecological flows

12.45–13.30

Boadella Reservoir – Infrastructure and water security

Role of hydraulic infrastructure in regional supply
Environmental flows, planning instruments and governance challenges

13.30–14.15

Picnic lunch (participants bring their own food)

Afternoon session: headwaters and territorial innovation

14.30–15.00

Albanyà – Upstream territories and ecological resilience

Hydrological variability, forest systems and upstream–downstream interdependencies

15.00–17.00

The Pioneers of Our Time Foundation

Innovation, Territory and Sustainability in the Upper Muga

Presentation and structured debate session focused on:

- Rural innovation under climate stress
- Local adaptive initiatives
- Community-scale governance experimentation
- Linking territorial action with basin-scale water management

Interactive exchange with participants and invited experts.

17.00–18.00

Return to Girona

Arrival at approximately 18.00.

Thursday 2 July

Environmental law: water, rivers and jurisdictional waters

This day is dedicated to the legal dimension of water governance, combining public environmental law, administrative structures and private law perspectives on liability and responsibility. The sessions will explore how legal systems organise water allocation, planning, control and accountability in contexts of climate stress and environmental transformation.

09.15–09.30

Welcome and contextualization of the School's legal track

Morning session: legal principles, structures and governance

09.30–10.30

Albert Lladó Martínez (Universitat de Girona)

Classical principles of Water Law under climate stress: continuity, transformation or structural mutation?

11.00–12.00

Berta Bastús Ruíz (Universitat Abat Oliba)

Water concessions and administrative control of water use

12.00–13.00

Guglielmo Cevolin (Università degli Studi di Udine)

River-Based Territorial Regeneration and Administrative Autonomy: European Law, Constitutional Law and Environmental Public Law

This morning session examines the evolution of water law principles, concession systems and administrative autonomy in European contexts, assessing how legal doctrines adapt to global change and territorial regeneration challenges.

Afternoon session: actors, actions and responsibilities

14.30–15.30

Albert Ruda González (Universitat de Girona)

Liability for water pollution damage: go with the flow?

15.30–16.30

Johanna Chamberlain (Uppsala Universitet)

The Development of PFAS Damages in Swedish Tort Law – Challenges and Possibilities

16.30–17.30

Linda Miotto (Università degli Studi di Udine)

Implementation in Italy of Environmental European Directives. Stakeholder involvement in environmental decision-making processes within companies

The afternoon focuses on environmental liability, contamination risks (including emerging pollutants such as PFAS) and the implementation of European environmental directives, highlighting the role of courts, administrations and private actors in shaping water governance outcomes.

Friday 3 July

ACROSS Integrated River Governance Lab

Girona and the Muga Basin: Ecology, Governance and Law in Practice

Morning session: co-creation and applied design

09.00–09.30

Introduction to the Governance Lab

Objectives, methodology and expected outputs

Participants will work in their international groups established earlier in the week.

09.30–10.45

Group work session I

Integrated Diagnosis: Girona and the Muga Basin

Each group must identify:

- Key ecological challenges
- Sectoral tensions (urban, agricultural, environmental)
- Governance asymmetries
- Infrastructure dependencies
- Legal and regulatory constraints

10.45–11.15

Coffee break

11.15–12.30

Group work session II

Designing an Integrated Water Governance Proposal

Each group develops a proposal including:

1. Ecological dimension
2. Urban and rural articulation
3. Infrastructure and technological feasibility
4. Legal viability (planning instruments, concessions, liability, EU directives)
5. Governance architecture (actors, participation, coordination)
6. Justice, resilience and climate adaptation criteria

Facilitators:

Ignasi Rodríguez-Roda

Albert Lladó Martínez

Josep Vila Subirós

Late morning session: presentations and debate

12.30–13.15

Group presentations

Integrated River Governance Proposals

Each group presents:

- Core diagnosis
- Proposed governance model
- Legal implications
- Trade-offs and expected impacts

13.15–13.45

Collective debate

Ecology, Governance and Law in Mediterranean Hydro-Social Territories

Discussion linking:

- Girona (urban river management)
- Muga basin (rural and cross-border dynamics)
- Environmental legal frameworks

13.45–14.00

Closing session

Synthesis of the week and future collaboration perspectives within ACROSS

6. Target group and expected outcomes

The Summer School is addressed to Degree, Master and PhD students from ACROSS universities, early-career researchers and interested academic staff.

Expected outcomes include integrated conceptual proposals on river governance and Nature-Based Solutions, strengthened interdisciplinary and international competencies, shared teaching materials within ACROSS and a basis for future joint teaching, research or publication initiatives.

7. Added value for ACROSS

The Summer School provides strong place-based learning, genuine interdisciplinarity, a clear European and cross-border perspective and a replicable model for future ACROSS educational activities. It directly

contributes to the alliance's objectives on sustainability, societal challenges and innovative teaching formats.