Programme AIL 2026 Bilbao

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1. General calendar

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2. General sessions

SG01. Biology and conservation of freshwater organisms
SG02. Ecology of rivers, estuaries, lakes, reservoirs and wetlands
SG03. Processes and functioning of freshwater ecosystems
SG04. Ecohydrology and underground water
SG05. Aquatic ecotoxicology and environmental risk assessment
SG06. Microbial ecology
SG07. Global change: climate change, human impacts, past and current
SG08. Invasive species and ecosystem functioning
SG09. Ecosystem restoration
SG10. New methodologies and techniques in limnology
SG11. Ecosystem services and assessment methods

3. Special sessions

SE01. Freshwater ecosystem functioning in a rapid-changing world. Ariadna García-Astillero, Guillermo García-Gómez, Ignasi Arranz Urgell y Javier Sánchez-Hernández

Freshwater ecosystem functioning integrates key processes such as nutrient cycling and energy fluxes, which underpin the integrity and stability of these ecosystems. However, the mechanisms regulating these processes remain far from fully understood, particularly in the context of a rapid-changing world. Ecosystem functioning spans multiple levels of biological organization, from how individual organisms allocate energy among growth, reproduction, and survival to how energy flows through food webs via predator–prey interactions. This thematic session will address key aspects of energy dynamics and stability in freshwater ecosystems, from the body size scaling of metabolic rates among individuals to connectance among food web compartments, trophic roles, competitive interactions within animal communities. The session will encompas a wide range of approaches, including stable isotope research, size scaling rules, and energy budget models, using diverse experimental, field-based, and theoretical study designs. As freshwater ecosystems face increasing anthropogenic pressures, new research questions arise: how are energy fluxes, nutrient cycling, and predator–prey relationships being reshaped, and how do these systems respond to emerging environmental conditions?

SE02. The dark side of stream ecology: Advancing our understanding of the hyporheic zone role for stream biogeochemistry. Clara Mendoza-Lera, Marina Victoria Ríos y Julia Pasqualini

Over the past seventy years, research on the hyporheic zone has highlighted its fundamental role in whole-stream dynamics. However, compared to the sediment surface, i.e., the benthic zone, quantitative data on the contribution of the hyporheic zone to essential ecosystem functions is scarce. This is problematic because failing to consider the hyporheic zone's contributions can lead to miscalculations of whole-stream ecosystem rates. Additionally, the hyporheic zone has been shown to respond differently to anthropogenic stressors compared to the benthic zone. Thus, our understanding of the mechanisms through which stressors affect whole-stream functioning might be incomplete. Therefore, it is crucial to advance our understanding of the contribution of the hyporheic zone to whole-stream functioning both in streams under reference conditions, and in those exposed to anthropogenic stressors to develop solutions that enhance streams' resilience. Achieving this requires a holistic perspective through interdisciplinary collaboration, bringing together experts from various disciplines. Therefore, this session aims to advance discussions and research on hyporheic zone functioning by addressing key themes, including i) methodological advancements for studying hyporheic processes , ii) fundamental ecological and biogeochemical processes, particularly related to nutrient cycling and the fate of trace compounds, and iii) the impact of stressors on benthic and hyporheic functioning. By focusing on these themes, we seek to deepen our understanding of the functional contributions of the hyporheic zone to overall stream processes. Specifically, we aim to highlight its role in nutrient and organic pollution attenuation and highlight the diverse ecosystem services it provides. Through this session, we hope to foster interdisciplinary dialogue, bridge methodological gaps, and support future research directions that enhance our ability to manage and protect freshwater ecosystems.

SE03. Miguel Alonso, the naturalist and his lagoons. Antonio Camacho, Concha Duran, Manuel Toro y Francesc Mesquita

The origins of limnology in the Iberian Peninsula can be explained, among other things, by the curiosity of our naturalists about our great variety of lagoons and ponds. Its growth has developed around an ever-increasing specialization and depth of research in aquatic ecology, which has placed Iberian limnology in a leading position in the study of inland waters worldwide. This growth, amidst a highly competitive environment, sometimes leaves little room for limnological research to be based on curiosity and a desire to protect aquatic ecosystems. Miguel Alonso, an atypical limnologist, driven by his scientific curiosity but also committed to making knowledge useful for the conservation of species and ecosystems, is an example of both. With Miguel still active, we believe it is the right time to hold a session inspired by Miguel's limnological career, in which the people associated with the AIL, and especially those who have dedicated themselves to the study of Iberian lagoons and ponds, and to zooplankton and zoobenthos organisms, will meet in this special session to pay tribute to him and share our progress in the knowledge of these ecosystems and these species, showing our most advanced work, also those of a more naturalistic nature, and reflections on the need to maintain scientific curiosity and love for nature as some of the fundamental motivations of Limnology.

SE04. Collaborative netwokrs in limnology. Javier Pérez, Cayetano Gutiérrez-Cánovas y Juan Rubio-Ríos

Today, limnology faces the challenge of addressing global problems such as climate change, biodiversity loss, and the degradation of aquatic ecosystems. However, these challenges operate on a large scale, limiting the potential to extrapolate results from local or regional studies to broader spatial and temporal contexts. In recent decades, collaborative networks have emerged as a robust alternative to traditional meta-analyses, providing answers to less explored scientific challenges. These networks develop coordinated experiments using common protocols across a range of locations that encompass a wide variety of biogeographical and climatic conditions, addressing ecological questions at a continental or even global level. Thanks to methodological standardization, coordination among multiple teams, and the scale of the work, the information generated fosters significant advances in knowledge while integrating a wide diversity of expertise, institutions, and countries, promoting the participation of researchers and regions that have traditionally had fewer opportunities to contribute to scientific progress. The expansion of coordinated studies and large-scale networks promises to significantly advance our understanding of how key processes in freshwater ecosystems are affected by multiple biological and environmental factors, providing valuable information for the conservation and management of river resources. Therefore, the need arises for a special session that shares not only the progress made, but also the lessons learned and the challenges faced by collaborative projects, in order to inspire new generations of limnologists. This special session aims to bring together experiences, results, and reflections derived from the development of coordinated experiments, both from established networks and new initiatives. Furthermore, it provides an opportunity to showcase collaborative projects led by young researchers through grants awarded by various ecology associations (e.g., AIL, AEET, SIBECOL, EFFS).

SE05. Research and management challenges on non-perennial rivers. María Mar Sánchez-Montoya, Núria Bonada, Núria Cid, Pablo Rodríguez-Lozano y Daniel von Schiller

Research on non-perennial rivers has grown exponentially in the last few decades. Although our understanding of these ecosystems is still limited compared to perennial rivers, researchers worldwide have established a robust knowledge base concerning the ecology of non-perennial rivers, particularly regarding biogeochemical cycles and biological communities. However, significant research gaps persist, such as a more comprehensive understanding of the dry phases, groundwater-surface linkages, and the human dimensions of these ecosystems. In addition, many management challenges exist and limit the development of appropriate methodologies for their assessment, conservation, and restoration. This session aims to address key research gaps and challenges—both fundamental and applied—regarding non-perennial rivers by bringing together researchers and managers. Accordingly, the session will be divided into two main parts: the first will focus on research that presents new insights, perspectives, and approaches to understanding non-perennial rivers from ecological and social viewpoints, while the second will adopt an applied perspective, emphasizing the assessment, conservation, and restoration challenges of these ecosystems. A comprehensive and inclusive picture of non-perennial rivers will contribute to a better understanding of these complex ecosystems, which should serve as the foundation for actionable management outcomes that lead to the protection and conservation of non-perennial rivers.

SE06. Bridging science and society in Limnology: citizen science, education and stakeholder participation. Maria Soria, Meritxell Abril y Pau Fortuño

Limnology is increasingly shaped by approaches that bridge scientific research with societal participation. In recent years, initiatives grounded in immersive citizen science and hands-on activities have gained momentum, offering new opportunities to connect people with freshwater ecosystems. These initiatives not only support data collection but also enhance participants' ecological literacy, fostering a deeper appreciation of lakes, rivers, and wetlands through direct, meaningful engagement. A key contribution of these activities is their ability to capture citizens' perception of aquatic environments. Understanding how communities interpret ecological conditions, environmental change, or management actions provides valuable complementary knowledge for researchers and decision-makers. Such perceptions often reveal local priorities, motivations, and concerns that traditional scientific monitoring alone may overlook. To strengthen this collaborative landscape, limnology is increasingly influenced by frameworks such as the quadruple helix model, which promotes cooperation between academia, public authorities, industry, and citizens. Applying this model to freshwater research encourages more integrated and participatory decision-making processes, especially in contexts where environmental, social, and economic interests intersect. These interactions also contribute to more inclusive water governance, ensuring that the management of freshwater systems reflects scientific evidence while incorporating societal values, local knowledge, and shared responsibility. Despite these advances, a key challenge remains: fully harnessing the potential synergies among the many social dimensions embedded in limnological practice. Concepts such as environmental education, citizen science, public participation, and stakeholder engagement often operate in parallel rather than in coordination. Bringing these perspectives together—rather than treating them as separate approaches—could significantly enhance the impact of limnology on both scientific outcomes and community involvement. In this special session, we welcome everyone who, in one way or another, brings limnology closer to society.

SE07. Molecular ecology and biodiversity: new perspectives in aquatic ecosystems. Jon Garrastatxu, Álvaro Fueyo, Alba M. Losa y Nieves López-Rodríguez

Molecular ecology is undergoing a methodological shift in the study of aquatic ecosystems and the biodiversity they contain. The recent development of DNA- and RNA-based techniques has been revolutionary: on the one hand, it has increased the efficiency and scalability of data collection, and on the other hand, it has provided qualitatively superior information, revealing previously inaccessible aspects. Among these new techniques, metabarcoding, the use of environmental DNA (eDNA), metagenomics, population genetics, and transcriptomics stand out. This development is enabling researchers to address ecological questions with greater resolution and presents great potential for future scaling up. In biodiversity monitoring, these techniques are becoming established as fundamental tools for accurately assessing the state of ecosystems. Molecular ecology facilitates the detection of rare or cryptic species, allows for the early monitoring of biological invasions, and enables the functional characterization of aquatic microbiomes using sensitive and, in many cases, non-invasive methods. In parallel, population genetics facilitates the identification of management and conservation units, the assessment of population connectivity and fragmentation, and the detection of local stress or adaptation signals in different populations. These tools are integrated with biological indicators, quality indices, and monitoring networks, allowing for the systematic evaluation of the ecological status and integrity of the water cycle. All of this provides critical evidence for decision-making in environmental and water resource management, strengthening the conservation, sustainability, and resilience of aquatic ecosystems. The rapid development of molecular ecology demands the creation of rigorous forums for discussion that allow for a critical evaluation of its applicability, limitations, and the technical challenges that still remain for its implementation in monitoring programs. The objective of this session is to bring together the research community involved in the use of molecular ecology tools in aquatic ecosystems, in order to present methodological innovations, analytical developments, and applied studies that demonstrate the real potential of these approaches for the management, conservation, and study of aquatic ecosystems. We aim to promote contributions that help standardize practices, evaluate their effectiveness, and explore their integration into environmental decision-making. Furthermore, we seek to strengthen a working network that facilitates the exchange of experiences and contributes to defining best practices for addressing current and future challenges in management and conservation.

SE08. Freshwaters from the Macaronesia: water resources, biodiversity and conservation management. Núria Cid, Raúl Acosta, Margarita Florencio y Pedro Raposeiro

Global freshwater biodiversity is declining at an alarming rate, faster than marine and terrestrial biodiversity. Within this context, the Macaronesian Region, emerges as a research hotspot. The region contains a rich diversity of freshwater ecosystems (small streams, wetlands, springs) that remain poorly studied in spite of their potential to harbour endemic and cryptic species. Many of these species could be part of the hidden biodiversity and may even become extinct without having been described. The conservation of freshwater ecosystems in Macaronesia is becoming increasingly important due to water resources overexploitation, the expansion of non-native invasive species, increased water pollution and land-use changes, together with ongoing climate change. Actions to halt island biodiversity loss are crucial and several projects are contributing to inform the conservation management of continental waters and its biodiversity in the Macaronesian Region. This session aims at bringing together research from different disciplines conducted in these oceanic islands and at organizing a network of specialists for potentially developing a position paper with the people contributing to it. We welcome abstracts on fundamental and applied aspects of hydrology, water resources, taxonomy, phylogenetics, community ecology, functional ecology, barcoding and metabarcoding, macroecology, species distribution modeling, population genetics, biological invasions, social sciences, water management, biomonitoring, restoration and conservation in the Macaronesian Region.

SE09. From limnology to technological innovation: Nature-Based Solutions as contributors to the European Water Resilience Strategy. Ainhoa Gaudes, Julio C. López Doval y Lluís Bertrans Tubau

Under current global change, both the chemical and biological quality and quantity of freshwater resources are increasingly threatened. Intensified land-use change, particularly urban expansion and extensive agricultural and livestock activities, continues to degrade surface waters. Across Europe, only about 31% of surface waters achieve good chemical status, and only 40% reach good ecological status. Specifically, in the Mediterranean region, the contribution of wastewater treatment plant effluents to the total river flow can reach up to 80% and climate projections indicate a significant decline in river flow, associated with water scarcity and quality deterioration challenges. Considering that in the Iberian Peninsula, approximately 70% of the public water supply is withdrawn from rivers and reservoirs, Nature-Based Solutions (NBS), implemented alone or in combination with conventional technologies, represent a promising response to these challenges. Designed through ecological and engineering knowledge, NBS create new or enhanced ecosystem services through low-cost and soft-technology interventions that intentionally improve ecological processes. NBS can reduce the economic and environmental costs associated with traditional water treatment while preserving landscape values and enhancing biological and functional diversity. In the context of water treatment and ecological restoration, NBS can recover and maintain certain ecosystem services like biodiversity and hydrological connectivity and key ecological functions, including biogeochemical cycling. NBS can optimise nutrient removal (C, N, P) through microbial and plant assimilation processes, retain and transform metals with natural filtration, adsorption, and precipitation, and capture microplastics and other emerging contaminants through physical retention, bio-adsorption and biodegradation of substrates by sediments and biofilms. These systems require sustained, high-frequency monitoring to ensure their long-term functionality and to detect changes in performance under variable environmental conditions. Although NBS share some similarities with ecological restoration, their objectives go beyond it: NBS are built as infrastructures designed to provide specific ecosystem services where they are absent or insufficient and may be combined with other technologies. This session invites researchers, public administrations and companies working on the development, implementation or management of NBS designed to preserve the ecological and chemical quality of water resources. Contributions are welcome on all aspects of NBS, including the design and optimisation of ecological processes, environmental monitoring, and the treatment or conditioning of diverse water types, including urban wastewater, agricultural runoff, livestock wastewater, stormwater, drinking water, and food-grade water.

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SE10. Cross-scale biogeochemical–microbial interactions in freshwater ecosystem functioning. Nuria Perujo y Anna Freixa

Freshwater ecosystem functioning emerges from the tight coupling between biogeochemical processes and the structure, activity, and metabolism of microbial communities. The transfer and transformation of nutrients and organic matter by microorganisms at the interface of riparian zones, sediments, and the water column are central to the functioning and resilience of freshwater ecosystems. This session seeks to bring together cutting-edge research that unifies: nutrient stoichiometry (e.g., C:N:P), nutrient fluxes across sediment-water and land–water interfaces, dissolved organic matter (DOM) reaction dynamics, microbial community composition, microbial functional traits and microbial enzyme activity. We particularly encourage studies that investigate how microbial activity, community composition and functional diversity regulate nutrient cycling, DOM transformations, and carbon processing. Moreover, contributions adopting a land–water–sediment perspective are also welcome, including studies on spatial transport from riparian zones to aquatic bodies, internal nutrient loading from sediments, and DOM transformations under varying environmental conditions (e.g., hydrology, temperature, land use). Understanding biogeochemical processes and microbial community responses is essential for predicting ecosystem functioning and designing effective restoration, management, and mitigation strategies. Topics of interest: i) Stoichiometric characterization (C:N:P) of water, sediments, microbial biomass, or enzymes; linking stoichiometry to nutrient limitation, decomposition rates or nutrient processing, including microbially nutrient processing. ii) Microbial community composition, diversity, and functional gene expression related to organic matter decomposition, nutrient mineralization, and carbon cycling. iii) Role of microbial enzymes (quantity, stoichiometry, kinetics) in regulating organic matter decomposition and nutrient mineralization in sediment and water. iv) Internal nutrient loading: microbial degradation, nutrient release, seasonal dynamics, legacy nutrient effects. We expect abstracts from studies that combine experimental, field- based, and/or modelling approaches, including how land-use change, climate change (e.g., temperature, hydrology), or management interventions influence nutrient and carbon cycles in freshwater ecosystems and microbial community functioning and composition.

SE11. Advancing equity and inclusion in limnology: achievements and future challenges. María Sánchez-Montoya, Mireia Bartrons, Anna Freixa y Maria Anton-Pardo

In 2026, substantial progress is expected in the recognition and promotion of the rights of women and other minority groups in Spain and across Europe, motivated primarily by the transposition of recent European directives and the implementation of national equity and anti-discrimination strategies. These developments are aligned with broader international commitments—such as the United Nations Sustainable Development Goals and the European Commission's strategies on gender equality and diversity—which call for more inclusive, safe, and equitable scientific environments. In this context, Limnology must not lag behind; our field should be at the forefront of social progress through the implementation of inclusive policies and by ensuring environments free from discrimination for groups historically excluded from science, including women, LGTBIQ+ individuals, racialized and ethnic minorities, individuals from diverse socioeconomic backgrounds, and people with disabilities. This session, organized by the AIL Gender and Science Group, is aimed at addressing this challenge and fostering constructive debate across the limnological community. We welcome contributions focused on: i) the creation of inclusive environments and a sense of belonging; ii) the identification of systemic barriers and implicit biases; iii) accessibility in science and inclusive scientific communication; iv) inclusive leadership and mentoring practices; and v) any sharing experiences, studies, initiatives, or policies that may contribute to equity and inclusion in the field of Limnology.

SE12. Conservation and restoration of small water bodies: advances & challenges. Serena Sgarzi, Lena Fehlinger y Sandra Brucet

Small water bodies, such as ponds, streams, ditches, and small wetlands, can provide disproportionate ecological benefits despite their limited size. As the most abundant type of freshwater bodies, they often support high biodiversity and generally deliver essential ecosystem services besides providing habitat for many species, such as water purification, flood control, and carbon sequestration. However, they face severe threats from agricultural intensification, pollution, and land-use changes, leading to rapid degradation and biodiversity loss, so their conservation and restoration must become a priority. Understanding and managing these systems requires interdisciplinary and evidence-based approaches that combine knowledge about ecological processes and set them into the context of socio-economic dimensions. In this regard, Nature-based Solutions offer promising pathways to protect, restore, and enhance abundances of small water bodies while sustaining biodiversity and the ecosystem services on which society depends. This special session will explore targeted conservation and restoration strategies to enhance small water bodies resilience and ecosystem services, bringing together recent research, particularly applied studies, methodological innovations and reflections on restoration and management strategies. We welcome contributions addressing ecological processes (biogeochemical dynamics, land–water interactions, community structuring, organism dispersal), as well as applied aspects such as assessment of restoration effectiveness, governance, the socio-economic dimension of restoration actions, and stakeholder inclusion. Studies incorporating new technological tools, ecological modelling, nature-based solutions or indicators for evaluating restoration success are also encouraged. Submissions from a wide range of perspectives (ecology, environmental engineering, hydrology, water management and conservation, sociology) and across different spatial and temporal scales are welcome. We particularly encourage the participation of early-career researchers and projects that foster collaboration among institutions, public administrations and stakeholders. Through this session, we aim to improve restoration practices that enhance the ecological integrity of small water bodies and their resilience under current and future pressures, in line with the objectives set by the new EU Nature Restoration law (2024).

SE13. Latin American wetlands: biodiversity, sustainable management, and socio-environmental challenges in the 21st century. Sylvina Casco

Latin American wetlands represent strategic ecosystems for biodiversity, water regulation, and carbon storage. From the Pantanal to the Iberá Wetlands, and from coastal mangroves to tropical lowlands, their biological and cultural diversity is unique. Despite this, these systems face increasing pressures from agricultural expansion, urbanization, infrastructure development, and climate variability. This special session proposes an interdisciplinary forum to highlight the importance of Latin American wetlands, share experiences in conservation and sustainable management, and discuss public policies and management strategies. It seeks to integrate science and local knowledge, strengthen regional networks, and promote educational and communication initiatives that bring their value closer to society. Its objectives include raising awareness of the ecological and social importance of Latin American wetlands; analyzing public policies, regulatory frameworks, and socio-environmental challenges. The special session will be organized as an interdisciplinary exchange, a roundtable discussion with specialists from various countries, where emblematic cases will be presented and an open debate on conservation and sustainable management strategies will be established. The expected outcome is a synthesis document with recommendations for the integrated management of wetlands and their recognition as natural and cultural heritage of Latin America.

SE14. Reservoirs at risk: emerging challenges and solutions for water quality management. Sara C. Antunes, Sara Rodrigues, Jesús Delegido y Catarina Guimarães

The Water Framework Directive (WFD) provides a legislative framework to ensure the ecological status of all water bodies, including groundwater, rivers, lakes, reservoirs, transitional and coastal waters. However, these ecosystems are increasingly threatened by climate change, which drives temperature rise, alters hydrological regimes, and reduces water availability. Additionally, microplastic pollution, already recognized as a major environmental concern, remains poorly studied in inland lentic waters, which are critical for human water supply. Water quality assessment under the WFD relies on a multidisciplinary approach, integrating biological, physicochemical, and hydromorphological parameters, as well as expertise in taxonomy (e.g., algae, macroinvertebrates, fish) and computational analysis. In lentic ecosystems such as reservoirs, phytoplankton is currently the only biological element used for ecological status evaluation, highlighting an important gap in the current WFD implementation for reservoirs, despite growing evidence of the importance of zooplankton as a complementary indicator. Zooplankton plays a key role in ecosystem functioning, providing phytoplankton control and responding rapidly to trophic and environmental changes, which makes it a valuable tool for monitoring ecological dynamics and supporting management decisions. The need for real-time water quality assessment has driven the adoption of innovative technologies. Remote Sensing (RS) has emerged as a powerful tool for inland water monitoring over recent decades, offering cost-effective solutions and broad spatial coverage compared to traditional field-based methods. Satellite platforms, such as Sentinel-2 and Sentinel-3 enable the estimation of parameters including turbidity, suspended matter, nutrient concentrations, trophic state indices, and algal bloom indicators (chlorophyll-a, phycocyanin, cyanobacterial dominance). In parallel, Citizen Science initiatives are gaining traction as complementary strategies, engaging the public in data collection and analysis. These initiatives foster scientific literacy, environmental awareness, and community involvement in water resource management, while providing valuable datasets for researchers and water authorities. This special session will explore key research areas and challenges, including: i) Climate change impacts on water quantity and quality. ii) Microplastic pollution in lentic ecosystems. iii) Integration of zooplankton as a bioindicator in WFD assessments. iv) Advances in Remote Sensing for real-time water quality monitoring. v) Citizen Science as a tool for data collection and environmental stewardship. vi) Multidisciplinary approaches for sustainable water managementBy bridging traditional WFD methodologies with emerging technologies and participatory science, this session aims to foster innovative solutions for the sustainable management of lentic ecosystems under global change scenarios.

SE15. Dispersal in freshwater ecosystems: quantification, mechanisms, and applications. José María Fernández Calero y Núria Bonada

Dispersal is a key ecological process that regulates gene flow, species exchange, and the movement of matter and energy between habitats. In freshwater ecosystems, dispersal plays an especially critical role because these systems are embedded within a terrestrial matrix, which imposes challenging conditions for organisms to move between habitat patches. Lentic habitats such as lakes, ponds, and reservoirs are patchily distributed across the landscape, while rivers and streams form dendritic networks with higher connectivity, facilitating species movement. However, even in fluvial networks, transversal barriers (e.g., dams, weirs) can impede longitudinal dispersal between downstream reaches and headwaters, limiting connectivity for many freshwater species. Beyond these structural barriers, habitat availability further shapes dispersal opportunities. Dispersal also varies according to organism type, influencing population, community, and ecosystem dynamics. Strictly aquatic species, such as fish, propagules of macrophytes, and snails, can only disperse through connected water bodies, whereas some macroinvertebrates—particularly those with winged adult stages—can disperse across the terrestrial landscape, increasing their colonisation potential. Additional pathways, such as zoochory—animal-mediated dispersal by birds or invertebrates—can transport plants, diatoms, and aquatic invertebrates between sites. Considering dispersal in its specific ecological context is therefore essential to understanding fundamental ecological processes and patterns. Despite its ecological importance, empirical quantification of dispersal remains scarce for most freshwater species (e.g., zooplankton, phytoplankton, diatoms, macrophytes, macroinvertebrates, and fish). Fundamental ecological studies, including those on metacommunities or on conservation and restoration strategies, often rely on general dispersal databases that aggregate information at coarse taxonomic levels (e.g., entire invertebrate families), while direct measurements of dispersal are limited. In this special session, we invite submissions addressing the quantification of dispersal using a variety of approaches, including molecular methods (e.g., microsatellites, haplotypes), isotopic tracers, and physical marking and recapture techniques, among others. We particularly encourage contributions exploring the role of dispersal in fundamental ecological processes, conservation, and restoration of any freshwater organisms.

4. Courses (They will have a maximum duration of 5 hours. They will be held in parallel, and participants may attend one. They have a maximum capacity of 30 people)

Course 1. Species distribution models. Janine Pereira da Silva and Federica Rossetto

Species distribution models (SDMs) are widely used for linking species occurrences to environmental conditions and predicting potential distributions across space and time, with applications such as conservation planning, invasive species management, and climate-change impact. This workshop will guide participants through the full SDM workflow, including data acquisition and integration, model fitting, evaluation, interpretation, and geographic visualization. We will provide a theoretical foundation followed by a hands-on practical session in which participants build and interpret a SDM using real data. The workshop aims to provide both conceptual understanding and practical skills that participants can apply to their own study systems.

Course 2. Remote sensing of inland waters made easy with Google Earth Engine. Camille Minaudo

This workshop introduces the fundamentals of acquiring, processing, and analyzing satellite imagery using the Google Earth Engine platform. Participants will learn how to efficiently filter datasets for a selected water body and export data in multiple formats using Google Earth Engine's tools. The session will demonstrate how these data can be used to generate long-term time series and to visualize spatial variability across aquatic ecosystem surfaces. By the end of the workshop, participants will have a clear understanding of both the advantages and limitations of this approach.

Course 3. From papers to people: science dissemination across academia and society. Kamil Hapalo, Maria Soria and Pau Fortuño

A large part of the scientific activity is communication: writing publications and theses, presenting results, exchanging and discussing with colleagues, stakeholders or the public. Successful science means successful communication - scientific results can only translate to actionable impact when they are effectively communicated beyond their immediate academic context. But what makes communication successful? This workshop will present the principles of successful science communication, in which storytelling plays a central role. At the workshop, we will also discuss ethical responsibilities, structural limitations of academic communication, and practical tools to transform complex research into engaging presentations, concise manuscripts and informative visuals which resonate both with researchers and society.

5. Technical workshops (They will have a maximum duration of 2.5 hours. They will be held in parallel, and participants may attend one. They have a maximum capacity of 30 people)

Workshop 1: Sharing (in)experience in DIY environmental sensors. Cedric Tentelier

With the advent of platforms like Arduino or RaspberryPi, prototyping of interactive electronic devices has become widely accessible to the layman. The versatility, low cost and ease of use of these open-source tools have aggregated a huge community of hobbyists, artists, teachers and scientists in different fields, who make their own observation devices. This workshop aims at sharing (in)experience on DIY environmental sensors, introducing some concepts, material, resources, questions, ongoing projects, failures and opportunities so that participants unleash their creativity and get started in building their own devices for the monitoring of aquatic systems.

Workshop 2. Inclusive science communication: practical tools for research and leadership. Gender and Science AIL group

Scientific communication often struggles to engage diverse audiences due to exclusionary language, implicit power dynamics, and one-way messaging. This interactive, non-frontal workshop introduces inclusive science communication principles. Participants will explore how language, framing, and visuals shape how science is received across cultural, racial, gender, and social contexts. Through case studies, playful exercises, and hands-on activities, we will identify barriers to inclusion and develop concrete, audience-centred tools for research, teaching, and leadership. Grounded in participants' real communication challenges, the workshop targets researchers, educators, and group leaders seeking to broaden the reach of their work and foster more inclusive spaces.

Wokrshop 3. eDNA in action: advancing implementation for a future-ready WFD. Jovenomics

Environmental DNA (eDNA) has strong potential to support the Water Framework Directive (WFD), but its effective implementation requires coordinated dialogue across science, management, and industry. This integrative session brings together researchers, stakeholders, and private companies to discuss the full eDNA implementation pathway. Through cross-sector perspectives and open discussion, the session aims to identify key bottlenecks, align expectations, and co-develop a practical roadmap for advancing eDNA-based tools toward a future-ready, policy-relevant WFD.

Taller 4. Psychosocial barriers to the transicion towards sustainability. Laura Vozmediano

Although most people accept that humans are responsible for ecosystem degradation and climate change, the habits of the majority are not as sustainable as they could be; in other words, a gap exists between attitudes and behaviors. Even environmentally conscious individuals and groups fail to incorporate changes into their habits or oppose certain interventions or legislative changes in this direction. In this workshop, we will explore the psychological and psychosocial barriers that underpin this resistance, as well as strategies for overcoming them.

Workshop 5. Not a service: the symbiosis of scientific illustration. Jagoba Malumbres-Olarte

Scientific illustration communicates science visually through objective, descriptive and analytical images. When illustrators create images with researchers, the process becomes a true scientific collaboration, as both learn from each other in a symbiotic way. In my workshop, I will show how illustration can describe, recreate or synthesise non-observable, complex or highly technical ideas. I will present different types of scientific illustrations, how illustrators and researchers can work together, and the phases of co-creation. Participants will also engage in a role-playing activity to explore challenges and good practices in such collaborations.

Workshop 6. The art of asking questions: an introduction to quantitative surveys in socio-limnology. Pablo Rodríguez Lozano

This workshop introduces quantitative surveys as a powerful tool in socio-limnology to understand human–freshwater interactions, social perceptions, and decision-making. It first presents the diversity of Social Sciences and Humanities methods applicable to socio-limnology and examines their epistemological implications (i.e. how knowledge is produced and understood). Participants will then explore when and why quantitative surveys are useful, how to design clear and robust questions, and common pitfalls and biases to avoid. The session also covers ethical considerations when working with human subjects, as well as basic strategies for data processing and analysis.

6. Technical field trips (They will last the entire day. They will take place on the same day, and participants may attend one. They have different capacities)

Field trip 1. Bilbao Water. Organized by: Bilbao Bizkaia Water Consortium. Capacity: 50 people.

Bilbao is a special case in water management, as a large part of its water supply comes from a transfer from the Ebro basin in the Mediterranean to the Cantabrian Sea. This water is collected in the Urrunaga and Ulibarri-Ganboa reservoirs in the Álava plains and transferred to the Undurraga reservoir on the Arratia River. The water is then treated at the Venta Alta water treatment plant in Bilbao, and its cycle is completed at the Galindo wastewater treatment plant, which discharges into the Abra estuary. On this tour, organized and guided by the Bilbao Bizkaia Water Consortium, we will follow the water's journey and treatment process from Undurraga to Galindo.

Fielf trip 2. Restoration of Basque aquatic ecosystems. Organized by: URA, Basque Water Agency. Capacity: 50 people.

URA, the Basque Water Agency, is one of the most active organizations in river restoration. On this tour, they will guide us through Araba to show us the projects carried out at Lake Arreo, a small endorheic lake on gypsum soil; the Añana salt flats, one of the oldest continuously exploited salt flats in Europe; and we will finish in Salburua, a wetland on the outskirts of Vitoria-Gasteiz whose restoration is an example of a nature-based solution, as it has simultaneously allowed for the recovery of impressive levels of biodiversity, provided a recreational space for the public, and reduced flooding in the lower part of the city.

Field trip 3. The Artibai River and its basin. Organized by: Provincial Council of Biscay. Capacity: 50 people.

On this field trip, organized and guided by the Department of Environment and Agriculture of the Provincial Council of Bizkaia, we will visit the Artibai River, a typical Cantabrian river affected by numerous pressures. We will visit sections where improvement and restoration work has been carried out on the riparian forests, and the technicians from the Provincial Council, primarily responsible for flora and fauna management, will explain the work they do.

Field trip 4. Artikutza and the Enobieta dam. Organized by: Donostia-San Sebastián City Council. Capacity: 30 people.

Artikutza is a valley acquired by the Donostia-San Sebastián City Council over a century ago to guarantee a supply of quality water. One hundred years of conservative management have resulted in some of the best-preserved forests and rivers on the Cantabrian Coast, boasting spectacular biodiversity. Among other sites, we will visit the decommissioning works at the Enobieta reservoir, which, at 42 meters high, will be the tallest dam removed in Europe. The tour will be led by technicians from the Donostia-San Sebastián City Council. The total journey involves a 4-hour bus ride with very winding sections and a 2-hour hike in the rainiest area of the Iberian Peninsula.