Université de Strasbourg

Sciences, Technologies, Santé | 2025-2026

DIPLÔME NATIONAL DE MASTER CONTRÔLÉ PAR L'ÉTAT

Master Sciences de la Terre et des planètes, environnement
Continental Water Sustainability (ouverture à la rentrée 2026-2027)

Présentation

Le changement climatique, la gestion des risques naturels, le développement des énergies décarbonées pour la transition énergétique, la recherche et la gestion de la ressource en eau, la lutte contre les pollutions, la caractérisation du sous-sol préalable à toute installation d'infrastructure… ouvrent de nombreuses perspectives d'emploi aux diplômés en master des sciences de la Terre et de l'environnement pour les prochaines décennies.

Le master mention STPE de Strasbourg propose trois parcours centrés sur les problématiques environnementales ouvert à l'alternance (ISIE), l'utilisation des géosciences pour la transition énergétique (GeOT), et un parcours qui vise des métiers en lien avec une compréhension globale du système Terre, les risques naturels et les ressources minérales (GDT). Le parcours recherche pour les ingénieurs est ouvert aux élèves ingénieurs. Le parcours Geosciences (UFAZ) est délocalisé en Azerbaïdjan.

Composante	• École et observatoire des sciences de la Terre (EOST)
Langues d'enseignement	• Anglais
Niveau d'entrée	BAC +3
Durée	2 ans
ECTS	120
Formation à distance	Non, uniquement en présentiel
Régime d'études	• FI (Formation initiale)
Niveau RNCP	Niveau 7
RNCP	• RNCP39700 : Master Sciences de la Terre et des planètes, environnement
Campus	• Campus Esplanade • Campus Karlsruhe
Stage	Oui
Alternance	Non

Autres contacts

Service de scolarité de l'Eost

Objectifs

Fully taught in English, the Master's program in Continental Water Sustainability (CWS) offers a solution-oriented education and prepares students to tackle the complex challenges related to water sustainability worldwide. Graduates are equipped to analyze problems related to socio-hydrosystems, and to design, communicate, and coordinate the implementation of innovative solutions.

Graduates are qualified for positions of responsibility in industrial companies, engineering offices, local and state authorities, and international development organizations. Additionally, students learn scientific methods and gain qualifications that allow them to pursue an academic career.

In the CWS program, students gain a thorough understanding of various disciplines related to aquatic ecosystems. They grasp the continuum from functional understanding to impact assessment and problem-solving. Students acquire knowledge in both natural and engineering sciences (such as hydrology, hydrogeology, ecology, or hydraulics), in humanities and social sciences (such as sociology, economics, management or communication). Beyond technical knowledge, students gain an understanding of systems through an interdisciplinary approach, allowing them to analyze and grasp socio-ecological interdependencies. In a holistic approach, they integrate social aspects into the processes and interactions between the physical and biological elements of the ecosystem.

Students learn to work effectively within a team, present results to non-specialists, and gain expertise in stakeholder engagement, negotiation and conflict resolution while respecting ethical standards. They also develop methods for efficient and rapid knowledge acquisition (i.e. *learning by action* and *Hackathons*).

Students progressively acquire knowledge of a wide range of solutions developed worldwide to address problems related to socio-hydrosystems. With this extensive database and multi-criteria analysis methods, including intangible aspects, they can adapt solutions already tested in other socio-ecological contexts and propose new innovative solutions. They identify obstacles to implementation and communicate solutions effectively. Additionally, they are aware of long-term monitoring and evaluation strategies to assess the performance and impact of implemented solutions over time.

Graduates of the CWS program gain the ability to apply interdisciplinary approaches to solve complex problems in water resources / socio-hydrosystem management by means of their deep understanding of water sustainability issues and their advanced methodological skills. They are well-equipped to contribute to research, innovation, and sustainable development in various water sectors

On completion of the master's CWS, graduates will be able to:

A. Explain the structure and functioning of socio-hydrosystems (rivers, wetlands, ecosystems, urban environments, etc.)

1. Describe the structure and functioning of hydrosystems

2. Describe hydrosystems in terms of socio-ecosystems

B. Initiate and lead the development or transfer of solutions for the management of hydrosystems

1. Form a work team
2. Analyze the situation from a bio-physico-chemical perspective
3. Analyze stakeholder dynamics to define issues and constraints
4. Rigorously use data science techniques to support the search for best practise examples and lessons learned
5. Evaluate the transferability of an existing solution from a technical and social perspective
6. Develop and test a prototype solution in a team using an iterative approach

C. Interact with the team and public and private stakeholders to develop and present solutions for hydrosystem management

1. Guide group dynamics
2. **Define a communication strategy according to the target audience**
3. **Define an interaction format (conferences, workshops, meetings) according to the target audience**

D. Managing a project within the framework of hydrosystem management

1. Define objectives and structure the project
2. Define the financial and institutional structuring of a project
3. Define the responsabilities and project outcomes (deliverables)
4. Apply project management methods
5. Present project results to stakeholders and write progress and final reports

Proportion of macro-competences

A: 20 %

B: 40-50 %

C: 15-20 %

D: 15-20 %

Programme des enseignements

Continental Water Sustainability (ouverture à la rentrée 2026-2027)

Master 1 - Master Sciences de la Terre et des planètes, environnement - Continental Water Sustainability

Semester 1 (Karlsruhe Institute of Technology)

		CM	TD	TP	CI
Field Trip	1 ECTS	-	-	-	12h
Sustainable Management of Hydrosystems (Introduction to)	2 ECTS	-	-	-	-
Fundamentals of Hydrology: Methods and Tools		2h	-	-	10h
Introduction to Hydronexialism		-	-	-	12h
Mapping of Tangible and Intangible Objects (Introduction to)	2 ECTS	-	-	-	-
Interviewing Techniques		-	-	-	10h
Basics of Stakeholder Analysis and Value Mapping		-	-	-	10h
Data Sourcing		-	-	-	-
Art and Communication		-	-	-	-
Think Like a Scientist: Research Integrity and Best Practices in Water Science and Engineering	3 ECTS	-	-	-	-
Urban Water Infrastructure and Management	6 ECTS	-	-	-	-
Sustainable Management of Rivers and Floodplains	3 ECTS	-	-	-	-
Water and Energy Cycles	6 ECTS	-	-	-	-
Coding	3 ECTS	-	-	-	-
List - choisir 1 parmi 2					
Introduction to Python		-	-	-	-
Introduction to Matlab		-	-	-	-
Preparatory Projects	3 ECTS	-	-	-	-
How to Become a Nexialist ?		-	-	-	-
Stakeholder Analysis		-	-	-	-
Nexialism Training	1 ECTS	-	-	-	20h

Semester 2

		CM	TD	TP	CI
Restoration and Conservation	8 ECTS	-	-	-	-
Sustainable Management of Rivers and Floodplains: Wetlands		-	-	-	-
Hydrosystem-Specific Restoration Techniques		-	-	-	20h
Conservation Concepts and Practices		-	-	-	10h
Laws		20h	-	-	-
Solutions to Pollution	6 ECTS	-	-	-	-
Micropollutants Transfer Management		12h	8h	4h	-

	CM	TD	TP	CI
Water Issues and Opportunities in Agrosystems	-	-	-	14h
Seminaries	30h	-	-	-
Mapping of Tangible and Intangible Objects 7 ECTS	-	-	-	-
Data Management	8h	22h	-	-
Project Management	8h	12h	-	-
Make the Invisible Visible	10h	-	-	10h
Interdisciplinary Projects 5 ECTS	-	-	-	-
Headwater Conservation and Regenerative Hydrology	-	-	8h	-
Nature-Based Solutions and Eco-Engineering in Urban Hydrosystems	-	-	-	-
Hackathon	-	-	-	-
Foreign Language 3 ECTS	-	-	-	-
List - choisir 1 parmi 2				
French as a Foreign Language	-	-	-	-
Other Language	-	-	-	-
Nexialism Training 1 ECTS	-	20h	-	-

Master 2 - Master Sciences de la Terre et des planètes, environnement - Continental Water Sustainability (ouverture en 2027-2028)

Semester 3

	CM	TD	TP	CI
Intelligent Government of Hydrosystems 9 ECTS	-	-	-	-
Water Governance and Water Economics from an International Perspective	20h	17h	3h	-
River Hydromorphology and Integrated Water Management in the Upper Rhine	20h	-	-	-
Artificial Intelligence for Environmental Applications	4h	26h	-	-
Seminaries	30h	-	-	-
Management of Water Quality and Habitat Structures 10 ECTS	-	-	-	-
Studies in Water Resources Management: Restoration	-	-	-	-
Urban Water Treatment	18h	20h	-	-
Interdisciplinary Projects 7 ECTS	-	-	-	-
Adaptation of Socio-Ecosystems to Climate Change	-	-	-	-
Transboundary River Management	-	-	-	-
Global South and Transferability	-	-	-	-
Foreign Language 3 ECTS	-	-	-	-
Liste de cours - choisir 1 parmi 2				
French as a Foreign Language	-	-	-	-
Other Language	-	-	-	-
Nexialism Training 1 ECTS	-	-	-	-

	CM	TD	TP	CI
Optional course Facultatif				
PID	-	-	-	-

Semester 4

		CM	TD	TP	CI
Internship	30 ECTS	-	-	-	-