
2 SIE Master Projects, Spring 2021

30 ECTS

Start: February 2021

End: June 2021

Master Projects: measuring and modeling water age in the Panke watershed, Berlin.

Context	<p>How old is the water that flows in our landscape? How does water age affect water quality? And how are water age and quality affected by urbanization? This is an open challenge that needs to be addressed through a joint collaboration between earth scientists and urban planners. Bringing together a diverse team to work on this problem is precisely the goals of the ENAC <i>Water-Age-Neutral</i> Habitats project, developed by the ECHO and LAB-U laboratories, which will start in December 2020.</p>
Call	<p>As part of this interdisciplinary project, there is a special call for 2 master projects for SIE students. The goal of the master projects is to measure (project 1) and model (project 2) water age in the urbanized landscape of the Panke river in Berlin, Germany. See page 2 for more details.</p>
When and where	<p>The projects are based at EPFL and will include a fully-funded 2-month exchange in Berlin, to collaborate with the group of prof. Chris Soulsby and prof. Doerthe Tetzlaff (TU Berlin and IGB Berlin). The exchange period may be subjected to modifications depending on the evolution of the COVID-19 epidemic.</p>
Supervisors	<p>Dr. Paolo Benettin, Dr. Martina Barcelloni Corte, Prof. Andrea Rinaldo</p>
Applications	<p>Everyone is welcome to apply for these projects. If you feel unsure about the requirements, please feel free to contact us. The two master projects will be developed independently but candidates are expected to work in close collaboration. Thus, we are open to individual candidacies as well as joint candidacies by 2 students who would like to take the 2 positions. For applications, please contact Paolo Benettin (paolo.benettin@epfl.ch) with a short description of yourself and why you are interested in the position. The call will close as soon as two valid candidates are found.</p>

PROJECT 1: Measuring water age by collection of environmental tracer data

Objective Collect water samples from the Panke watershed and analyze them for stable isotope composition and major ions.

- Tasks**
1. Design of a water sampling campaign in the Panke river watershed
 2. Collection of approximately 100-150 water samples from stream water and soil water
 3. Help with the analysis of the sample in the lab
 4. Data analysis

- Requirements**
- Successful completion of a hydrology/hydrochemistry course (e.g. ENV-221)
 - Previous experience with lab work (or evidence of being able to learn fast)
 - Knowledge of German is not mandatory but it is a plus

PROJECT 2: Modeling water age through the EcH₂O-iso model

Objective Model flow and isotope composition of the Panke river based on various hydrologic and isotope data.

- Tasks**
1. Learn how to use the spatially-distributed hydrological model EcH₂O-iso
 2. Setup the model for the Panke river watershed
 3. Run the model for different urban development scenarios

- Requirements**
- Successful completion of a hydrology/hydrochemistry course (e.g. ENV-221)
 - Good programming skills (any language)
 - Knowledge of German is not mandatory but it is a plus