

School for Climate Studies & Botany and Zoology Dept.
INVITED SPEAKERS
Research Seminar Series

| 2025



Wednesday 26th November | 1:00-2:00 PM |

Venue: Lecture Hall #2020, Natural Sciences Building

In person and on Teams

Capucine MARION

PhD candidate, EAWAG – Swiss Federal Institute of Aquatic Science and Technology. Department of Water Resources and Drinking Water.



Dissolved gases in tree sap as new eco-hydrogeological tracers

Soil and groundwater generally contain higher dissolved (noble) gas concentrations than surface water. These natural tracers are widely used to investigate groundwater flow, residence time, and recharge conditions. Extending such approaches to in-situ gas measurements in tree xylem sap provides new insights into plant-mediated water and gas exchange between the hydrosphere, biosphere, and atmosphere. Using a portable mass spectrometer and custom membrane probes, we continuously monitored (noble) gases along the soil-plant-atmosphere continuum over several months. Diurnal variations reflected tree physiological activity, and tracer experiments demonstrated water and gas transport from soil through trees to the atmosphere. This technique offers a new way to quantify plant water and CO₂ cycling under changing climatic conditions.

Short bio: Capucine Marion holds a Bachelor's degree in Environmental Engineering from EPFL (Switzerland) and a Master's in Environmental Sciences with a focus on Biogeochemistry and Pollutant Dynamics from ETHZ (Switzerland). Currently pursuing a PhD at EAWAG (Switzerland), she developed a method to investigate fluid transport using noble gases as tracers in low-flow environmental systems. Her research bridges environmental physics, hydrogeology, and eco-physiology aiming to improve the understanding of fluid exchange processes in environmental systems.