

MASTER PROJECT

Monitoring ecological dynamics using cutting edge environmental sensor-technology



BACKGROUND - The stability of environmental conditions and ecosystem processes has been in the focus of interdisciplinary ecological and evolutionary research for a long time. More recently, scientific advances like automated high resolution sensor-technology and sophisticated modeling of time series data has changed our perception of how temporal variability and resistance to disturbance affects the functioning of ecosystems. High frequency measurements of water parameters like Chlorophyll concentration or dissolved organic matter are an important approach in predicting dynamics of aquatic ecosystems.

OBJECTIVES - The aim of this project is to investigate how macrophytes and other features of aquatic ecosystem affect temporal stability and resistance to single and continuous disturbances. The study system will be an experimental pond facility that recently has been installed on site at Eawag Dübendorf (www.eawag.ch/en/aboutus/working/researchenvironment/experimentierteiche). These experimental ecosystems will be established with and without macrophytes and disturbed over the course of the experiments by the introduction of fish and the addition of nutrients. During the experiment ecosystem parameters will be quantified using several autonomous probes (EXO2 sonde platform - <http://www.exowater.com/exo2>).

EXPERIMENTS AND TASKS

- Investigate how the presence of macrophytes affects ecosystem stability after a disturbance
- Support the installation of a sonde-grid for real-time measurement and monitoring of experimental mesocosms and ponds
- Assist in measuring ecosystem parameters and analysis (e.g. spectral analysis, time series autocorrelation and variance, etc.) using statistical software (e.g. R)

LOCATION – Experiments will be conducted at Eawag Dübendorf, starting in early summer 2016.

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<http://www.eawag.ch/en/departement/eco/main-focus/eco-evolutionary-dynamics>