Faculté de l'Environnement Architectural, Naturel et Construit (ENAC)
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ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

ENAC-SIE, Master Project, Fall 2018	Start:	18/09/2018
30 ECTS credits	End:	21/12/2018 (approx.)

Title

Hydrology and trees: water uptake by vegetation during a highly-monitored experiment

Supervisors

Doct. Paolo Benettin, Prof. Andrea Rinaldo

Objective

Estimating 15-min evapotranspiration fluxes using data from high-precision weighed lysimeters.

Abstract

Evapotranspiration (ET) is a crucial component of the water cycle, typically accounting for up to 50% of the annual water balance. Direct estimates of ET are difficult at the larger scales, but can be achieved at smaller experimental scales through high-precision lysimeters. High-frequency ET data have been collected at EPFL campus in Spring 2018 from several lysimeters and from an evaporation bucket. Analysis of this data is expected to give new insights on the role of plant water uptake in the hydrologic cycle.

Task description

1. setup a routine to access and display the raw data (timeseries of a few millions elements)
2. estimate ET from the raw data
3. comparison of ET from the different lysimeter and from the evaporation bucket
4. creative analysis of ET (estimates during day/night, differences among the vegetation regimes, dependence on temperature and solar radiation, etc...)

Required skills

- basic notions of hydrology
- strong programming skills (e.g. Matlab, R or Python)

Location

EPFL campus, Lausanne (CH)

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