

Master thesis – Environmental Engineering

Workload: 30 ECTS, 900 hours

Hydrological investigation of a fen in the county of Ostallgäu: data basis, water balance and dimensioning of rewetting measures

Background:

Drained peatlands emit more than 40 tonnes of CO₂ per hectare and year due to decomposition processes and thus contribute significantly to German and global greenhouse gas emissions. The professional rewetting of peatlands is therefore elementary to achieving climate protection goals. The basis for planning to raise water levels is always a detailed understanding of the actual hydrological situation. Groundwater observations and hydraulic conductivity measurements to assess the permeability of the soil horizons play a central role here. In addition, the (possibly approximate) delineation of the underground catchment area is of interest. On this basis, a water balance assessment is to be done. This in turn will serve to assess the chances of success of planned rewetting measures.

Aim:

In close cooperation with the pilot project "MoorLandwirtschaft für Klimaschutz Allgäu" of the Federal Ministry for the Environment and Consumer Protection, groundwater gauges are to be set in a fen peatland in the northern Ostallgäu, and observed groundwater levels are to be evaluated and interpreted. In addition, hydraulic conductivity measurements will be carried out and compared with existing or additionally collected pedological data. The gained understanding of the local hydrological relationships will then be used for the conceptual design and dimensioning of potential interventions for rewetting.

Tasks:

- Planning and implementation of a measurement campaign for local groundwater levels
- Investigation of hydraulic conductivities
- Evaluation of existing stratigraphic investigations and additional soil assessment where necessary
- Data evaluation and analysis of the hydrologic conditions (water balance etc.)
- Evaluation and dimensioning of different approaches to rewetting on the basis of existing plans.

Requirements:

- Willingness to undertake field work and investigations in the county of Ostallgäu
- Close cooperation with the BMUV pilot project and commissioned engineers
- Good technical experience, affinity for data collection in the field and data analysis
- Independent, conscientious and responsible way of working

Start:

starting from December 2022 or later (but not later than April 2023)

Literatur:

Frank S, Dettmann U, Heidkamp A, Piayda A, Oehmke W, Tiemeyer B (2022): Methodenhandbuch zu den Gelände- und Laborarbeiten für den Aufbau des deutschlandweiten Moorbodenmonitorings für den Klimaschutz (MoMoK) – Teil 1: Offenland, Version 1.0. Braunschweig: Johann Heinrich von Thünen-Institut, 111 p, Thünen Working Paper 199, DOI:10.3220/WP1661764883000, https://literatur.thuenen.de/digbib_extern/dn065255.pdf

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