

Do plants grow differently on eroding soils?

Analysing plant traits and controlling factors from a soil erosion experiment in the botanic gardens

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Research group: River and Delta Morphodynamics

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Project description

Running water frequently erodes soil on hillslopes. Plants reduce this soil erosion by increasing surface roughness and keeping the soil in place with their roots. While we know how plants limit soil erosion, we know little about how plants respond to frequent erosional processes. Do individual plant traits, such as number, size and arrangement of stems, leaves and roots, adapt to erosion? So do plants grow differently on eroding soils?

Over the summers of 2023 and 2024, we are running soil erosion experiments in the botanic gardens, subjecting six different alpine plant species to frequent soil erosion. In September 2024, we will finally dig up all plants, including control plants on a stable soil, to compare their above and below ground traits, such as leaf size and root density.

Together with MSc students, you will work in a small team to measure plant traits in field (botanic gardens) and lab (ESL, e.g. root tensile strength). This will also include image analysis and potentially GIS work. Subsequently, you will compare measured traits to existing trait data from previous measurements and trait databases. Using data acquired during the experimental period on soil erosion dynamics, soil moisture and temperature, you can furthermore evaluate the role of these environmental factors on intraspecific trait variance. This will mostly be done using statistical analyses in R. Let's see if we can find out if, how and why plants grow differently on eroding soils!

To ensure that you get most out of your work and we achieve great results, we will have weekly meetings within our small team to discuss your problems, findings and progress. For urgent questions, we will be available directly on campus or via email and Teams. We aim to prepare a scientific publication together with you on the results.

Job requirements

Most importantly, you are interested in plant traits and like to get your hands dirty outside, but also enjoy meticulous labwork and sticking your nose into data to find relationships. You will work a lot with R, so (basic) coding skills will come in handy!