Project Database of ICP Forests

PROJECT DESCRIPTION

PROJECT INFORMATION

Project title: **Multi-decadal variations in catchment evapotranspiration and their drivers**

Project ID: 281

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PROJECT DESCRIPTION

Estimates about future changes in the partitioning of precipitation into evapotranspiration, streamflow and storage in response to climate change are critical for the management of water resources, as well as landscape and forest management. Due to the difficulty in measuring evapotranspiration, particularly at larger spatial scales, our knowledge on changes in catchment evapotranspiration and the relation to its drivers is still limited. A focus at the catchment scale is crucial to enable including observations that integrate over a catchment, such as streamflow and its composition. The overarching goal of the project therefore is to quantify and better understand changes in catchment evapotranspiration over recent decades through an integrated analysis of observed data and process-based modelling.

Estimates on long-term changes of the water balance will be integrated in conjunction with data from eddy-covariance and lysimeter stations, satellite-derived data on soil moisture, land surface temperature, snow cover and vegetation indices, and precipitation and stream water isotopic data into a process-based ecohydrologic model to account for temporal variations (seasonal to multi-decadal), spatial patterns, and the seasonal origin of the water used for catchment evapotranspiration. ET-Change will provide new insights on how individual aspects of a changing climate, including changes in snow cover dynamics, seasonal precipitation patterns and the frequency of warm and dry periods, as well as climate-induced changes in vegetation dynamics affect catchment evapotranspiration.

Combining these advances and linking the data-driven and model-driven analyses, the project will create new quantitative knowledge on the contributions of the drivers of changes in catchment evapotranspiration over recent decades and their spatio-temporal variations. This improved understanding of past changes in catchment evapotranspiration will provide a key step for more reliable predictions under future climate change.