



The impact of drought and rewetting on biogeochemical cycles in trees and forest ecosystems

Arthur Geßler

Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Forest Dynamics, Birmensdorf, Switzerland
(gessler@zalf.de)

Trees are large global stores of carbon (C) that will be impacted by increased carbon dioxide levels and climate change. However, at present we cannot properly predict the carbon balance of forests in future as we lack knowledge on how plant physiological processes, the transfer of carbon within the plant, carbon storage, and remobilization in the plant tissues as well as the release of carbon from the roots to the soil interact with environmental drivers and ecosystem-scale processes.

Moreover, precipitation variability will increase in future and drought and rainfall periods will alternate. As a consequence, the ability of roots to utilise intermittent rainfall events will be crucial for tree performance and survival. This talk will summarise how stable isotope techniques can give new insights in the fate of newly assimilated C in plants and ecosystems on the one hand and water uptake and use on the other hand.

The talk will span from the molecular to the ecosystem scale and will also highlight how physiological information can be transferred on larger spatio-temporal scale levels in order to predict the effects of environmental drivers and biotic interactions under future climatic conditions.