



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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Woody Species Responses to Extreme Living Conditions: An ongoing PhD story

Wednesday, February 5, 2020 - 12:00pm to 1:00pm

Room: Bannister 110

Woody species distributions and health status strongly depend on their capacity to cope with variable environmental conditions. Such environmental conditions can be, or might become, extreme both in terms of long-term environmental setting (e.g., at the species distribution limit) and short-term events (e.g., drought). My PhD research aims to provide insights on woody species responses to extreme conditions, linking dendrochronology, dendroanatomy and ecophysiology.

Regarding the distributional limit of woody species, for instance, *Pinus cembra* is a typical treeline species of the Alps. Despite its treeline habitat and old ages, *Pinus cembra* is not often considered in dendrochronology likely due to its more complacent tree-ring width responses to climate variability. However, from the analysis of anatomical traits, this species showed significant responses to temperature, opening opportunities for new investigations. Furthermore, despite their ecological importance, even less is known about the climate sensitivity of dwarf shrubs at their elevational and latitudinal limits. Since plants respond to different conditions within the range of their plasticity, xylem hydraulic architecture of *Juniperus communis* L. was assessed along an elevational transect and in a common garden experiment. We found a surprisingly stable hydraulic behaviour of the species, despite the different genotypes and morphologies.

Regarding the responses to extreme short-term events, drought is a phenomenon causing increasing tree mortality worldwide. Comparing the anatomical chronologies of healthy and declining trees, we aim to deepen the understanding of the long-term effect of drought on woody species and delineate a species-specific threshold between survival and mortality together with common indicators of drought events. In this sense, we are building a worldwide network of dendro-anatomical data, including Southwest US species.