Project acronym: DEEPMUNC

Project title: Linking Above- and Below-ground communities: Microbial effects on Carbon cycling under changing Tundra vegetation

Project leader: Allan Buras, Technische Universität München, Germany

Discipline: Earth Sciences & Environment

Station(s): M&M Kłapa Research Station (Poland)

DEEPMUNC will study the eco-physiology of Pinus mugo ssp. mugo in the Tatra National Park by application of dendrochronological means. In close proximity to Kłapa research station each one stem from 20 Pinus mugo individuals will be sampled and analysed for climate growth relationships as well as inter- and intra-individual growth divergence. Application of specific analysis tools (digitization of stem disc area increments using GIS software (Buras and Wilmking, 2014), exploration of measurements using Principal Component Gradient Analysis (Buras et al., 2016)) in combination with a stratified sampling will allow for a deeper insight into the eco-physiology of Pinus mugo. The expected results will provide a scientific basis for estimating the climate change vulnerability of Pinus mugo in the Northern Carpathians.

Moreover, DEEPMUNC will reveal whether Pinus mugo also is affected by inter- and intra-individual growth divergence, as has been observed for Juniperus communis ssp. nana accross the tundra biome in terms of two earlier (EU-FP7) INTERACT funded projects (CONGRA and ATINAO). Finding growth divergence for other species than juniper may indicate this phenomenon to be common for shrubs in general, which may have a significant impact on the steadily growing field of shrub-dendrochronology.

DEEPMUNC results will be compared to the outcome of another running project (KLIMAGRAD) which studies Pinus mugo in a similar manner in the Northern Alps. Comparison between these two mountain ranges may reveal differences between the two different Pinus mugo populations which experience different climate conditions and have been separated from each other since the early Holocene.