



## **Analysis of floodplain forest sensitivity to drought**

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Floodplain forests are dynamic ecosystems representing an interface between terrestrial and aquatic ecosystems. They play an important role in terms of the global carbon, nutrient and hydrological cycling, sediment deposition and the maintenance of species biodiversity. Recent changes in floodplain forests in Central Europe are mainly caused by hydrological management as well as more frequently occurring droughts in the course of climate change.

The studied ecosystem Lanžhot is a floodplain forest situated 6.5 km north of the confluence of Morava and Dyje rivers in Czech Republic (48°40'53.574"N, 16°56'46.794"E). The long-term average annual precipitation at this site is around 550 mm and the mean annual temperature is 9.3 °C. The average groundwater level is -2.7 m. Since a long time flooding occurs here very rarely, the last flooding event was in 2013. In addition, the site is hydrologically managed. Consequently, the water regime of the site changed over the years and represents nowadays relatively dry conditions for such type of ecosystem.

Our main research goal is the evaluation of the floodplain forest sensitivity to drought at the Lanžhot site. Specifically, we plan to identify the sensitivity of the forest to drought regarding precipitation deficit, soil water potential, evapotranspiration demand, drought indices as well as the characteristics of forest Gross Primary Production (GPP), Ecosystem Respiration (Reco) and Net Ecosystem Exchange (NEE) in comparison with the average of a reference period. The recent fluxes of greenhouse gases will be derived via the eddy covariance technique.

Our study will be supported by dendrochronological measurements, which will, in combination with sap flow analysis, provide information about drought stress according to e.g. tree water deficit ( $\Delta W$ ). Furthermore, dendrometer measurements can be used for deriving stem diameter variations and basal area increment (BAI, cm<sup>2</sup>). Thereafter, BAI and SF are the basis for computing the growth water use efficiency of each tree species ( $WUE_{BAI} = BAI/Q$ ).

Finally, we would like to reconstruct historical diameter breast height from tree ring width data in order to have input data for calculating the biomass (carbon sequestration) of the two most common tree species in Lanžhot, namely oak and ash, based on allometric equations developed specifically for this location.

Studying this ecosystem will give a chance to extend our knowledge about the behavior of floodplain forests under ongoing changing climate with drier conditions. We plan to connect historical information derived via dendrochronological methods with current data and compare the results with other published studies.