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## Water transport in European Beech roots (<5mm) under drought in the south of Lower Saxony

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Climate models predict hotter and dryer summers in Germany, with longer periods of extreme droughts like in summer 2018. How does this affect the water uptake and transport in tree roots growing in the top- and subsoil?

In summer 2018 and 2019 we measured the water transport in fine roots (<5mm) of European Beech on tertiary sand and triassic sandstone up to 2 m depth. We adapted the well-established HRM technique to enable measurements of very small sap flow rates in small roots. Thus, we measured the water transport as a temperature ratio of a stretching heat pulse.

Relating sap flow to root surface area, root depth, anatomy, soil moisture, and VPD allows for interesting insights in tree water uptake rates: Where are the limits of drought intensity and duration, for water uptake and recovery of small roots? Are there differences in the function of top- and subsoil roots? Are roots specialized for water transport or nutrient uptake? The investigated data gives a first hint on how the water transport in Beech roots differs with changes in the soil moisture and VPD under changing climate.