The **Chair of Forest Growth and Yield Science** and the **Chair for Strategic Landscape Planning and Management** announce for a master thesis on the following topic:

„Quantifying the cooling effectiveness of street trees in reducing urban heat island“

The majority of people in today's world live in urban areas and this ever-increasing urbanization process alter ecological processes to make our cities warmer. Modified terrain such as concrete, asphalt and bricks, found in urban areas, absorb more heat during the day than the former vegetated surface and re-radiate it at night. This heat storage and re-emission leads to the creation of a phenomenon called the "Urban Heat Island". Urban streets, which also include street canyons (high building to street width ratio), are a major source as well as sink of heat. Researchers have shown that planting trees in these urban streets can reduce the surrounding temperature mainly by transpirational water loss. However, the full potential of the effects of urban street trees in terms of water relations and the species difference have not been widely investigated. The current study proposes experiments to compare two contrasting tree species namely lime and black locust of approximately the same age in three different plazas and in park setting close to the city centre of Munich, Germany. Ecophysiological and biometeorological data will be collected to quantify their cooling effect (evapotranspirational) in terms of tree growth in urban settings in Munich. The prospective student will measure stomatal conductivity of these two tree species in sunny days three times over the summer to calculate the transpirational water loss and measure morphological characteristics (tree height, dbh, canopy width, canopy height) of selected trees. The water loss per unit leaf area will be converted to canopy water loss; ultimately to the energy loss per tree. The result of this study will help us to answer some of the uncertainties regarding the urban ecosystem services provided by urban trees and also to provide empirical data to be used in urban eco-physiological growth models.

Required skills:

1. Basic understanding of tree growth, tree physiology.
2. Dedicated to fieldwork especially during the summer.
3. Ability to do basic statistical data analysis.
4. Tree climbing experience could be an added advantage.

Start: a.s.a.p

Further information:

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Waldwachstumskunde Systemanalyse

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