

Drought-induced intra-annual variations of vessel parameters and water conductivity in European beech

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Purpose of the STSM

The purpose of the STSM was the application of plant hydrological models to calculate the impact of seasonal drought on hydraulic conductivity. We wanted to use dendrometer and wood anatomical data to determine the timing and duration of vessel distribution to weather events and to find out which phase of xylogenesis is most sensitive to modification by drought.

Description of the work carried out during the STSM

After an induction into the program, we discussed the possibility of implementing wood anatomical parameters into the existing models or to build up a new model. We figured out that in general it is possible to extend existing models by adding new functions; however it requires a lot of preparation and monitoring to create mathematical equations to relate anatomical parameters and their detailed response to climatic events. This could be a next big step towards a general understanding of climate-related cell formation. Because of the complexity of the models and our fragmentary data we changed our task and postponed the work on a possibility to use the wood-anatomical parameters we measured as proxies for the already implemented model parameters because it would be a waste of the valuable time in Gent. We decided to go more in detail with the program Phyto-Sim to get an overview on the huge possibilities this model provides.

Description of the main results

We got insight about additional necessary parameters to record that are requested by the model, and new ideas how to adjust the models to different tree species of scientific interest. To not leave the time unexploited, I tried to do some work considering my doctorate. It was important to get to know the different possibilities of adjusting the models to different plant functional types like stem or root succulence.

Description about how the results contribute to the Action aims

The attempt to modify the existing model to tropical trees will provide us with additional understanding of the parameters and other possible coherences amongst them. We will communicate our conclusions to the participating institutions and the FP1106 STReESS. If there is the possibility of a publication, we will acknowledge the COST-Action.

Authorization to post the report at the Action website

I authorize to post this report at the Action website.

Comments

All in all it was an amazing experience for me to get in contact with the great working group of Prof. Kathy Steppe in a scientific, but also in a social way. Thank you for providing me with this influential possibility.