1-2 Master theses

Neighbour effects on tree growth and carbon sequestration in a reforestation project in Costa Rica

Background: In tropical wet climates, trees can grow very fast, absorbing CO_2 from the atmosphere as their biomass accumulates. An important strategy against climate change is therefore protecting existing rainforests as well as converting deforested areas back to forests either through natural regeneration or through active reforestation. We work in a reforestation project in La Gamba, Costa Rica, where >100 native tree species have been planted in 2012-15 and where tree growth is being monitored annually. These studies serve to monitor and learn from the reforestation trial as well as to study basic questions on tropical trees and forests.

Aim: An important question that could not be addressed so far is the effect of tree neighbours. Neighbouring trees can either compete (for light, nutrients or water) or provide benefits, for instance by shading species that are not adapted to full sunlight. The growth rates and thus the size of the planted neighbouring trees differs very much. We therefore expect to see neighbour effects depending on tree size, and that these interactions become stronger with time. To quantify these interactions, the distance between neighbours needs to be known, but to date the position of the individual trees has not been recorded accurately enough. In 2018, the tree positions and sizes should be measured with a new laser-based electronic mapping equipment.

Time/location: Research will be based at the La Gamba field station (lagamba.at) and should be carried out in c. 2 months between Jan. and May 2018. Ideally, a team of 2 students will work together in the field and later analyse separate aspects of the dataset.

Qualifications: Ability and willingness to work in the field in tropical climate; basic knowledge in botany and ecology, data handling and statistics (data analysis should be in R). Spanish would be a plus.

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