

PROJECT INFORMATION

Project title: Effects of phosphorus limitations on Life, Earth system and Society (IMBALANCE-P)

Project ID: 55

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PROJECT DESCRIPTION

It was recently discovered that nutrient availability is the key factor determining the efficiency of trees (Vicca et al 2012) and ecosystems as a whole (Fernandez-Martinez et al 2014) to store the assimilated carbon. However, the lack of a standardized metric for nutrient availability currently impedes fully unraveling the observed patterns and also hampers including the observed patterns in global models. Therefore, one of the objectives of the IMBALANCE-P project is to develop a standardized metric of nutrient availability that combines the most important determinants of plant nutrient availability. To this end, we aim to test which factors are most determining tree growth and combine these factors in a standardized metric that facilitates comparison of different sites as well as model implementation of newly acquired knowledge.

The ICP forest dataset is ideally suited as a starting point of such analysis, as it contains most of the data of interest for a wide variety and high number of forest sites. Among the variables of interest for this analysis are: soil texture, pH, soil organic matter content, total exchangeable bases, NH₄ and NO₃ in soil solution, and Olsen P (but many more will be included in the exploratory analysis). Using PCA analysis, the best combination of these variables for explaining variation in tree growth (probably normalized for climatic conditions) will be determined. The resulting metric will then be tested against additional datasets, such as the datasets that will be obtained in the IMBALANCE-P project (fertilizer experiments are being set up in French Guyana).

For more information about IMBALANCE-P, I refer to our website:
<https://www.uantwerpen.be/en/rg/pleco/research/erc-grant-imbalance-p/>