Project Database of ICP Forests

PROJECT DESCRIPTION

PROJECT INFORMATION

Project title: **Crown allometry and Tree fecundity analysis (DECLIC and FORBIC ANR Projects)**

Project ID: 259

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PROJECT DESCRIPTION

We plan to analyse ICP Forests Level II and Level I data for two analysis related to the ANR projects DECLIC (PI G. Kunstler) and FORBIC – MOGPA (PI J. Clark).

First, we want to explore the different ecological strategy driving light competition in European and North American tree species by analyzing the allometric relation between dbh, tree height, crown diameter and crown depth (variables in Assessment of Growth and Increment Level II – GR- survey of Level II plots). We will fit linear and nonlinear allometric function to tree height crown diameter and depth in function of dbh with *nlme* and JAGS (using ICP Forests data and other source of data on tree crown in Europe and North America). We will test if between species there is a tradeoff or synergy between maximum height and crown diameter and depth.

Secondly, we want to predict tree fecundity on all ICP Forests Level I and II plots from the MASTIF model (see Clark et al. 2021 Nature Comm, Journé et al. 2022 Ecol Let), using the tree dbh, species identity and index of competition with the other trees in the Level I and II plots and then compare the prediction of MASTIF with seed production observation (Level I and II variables in survey Visual Assessment of Crown Condition - C1 CC - and in Level II plot variables on fruits in survey Sampling and Analysis of Litterfall - LF). MASTIF is a statistical model fitted to data on tree fecundity (seed trap and crop count) that predict individual tree fecundity (see Clark et al. 2021). We will predict tree fecundity on the ICP Forests plots (and other NFI plot) to map tree fecundity across Europe and analyse its drivers. We will also validate MASTIF prediction against ICP Forests fecundity measurement.

For all analysis we will also need data from the plot installation data survey Y1 and SI to have the information on the plots.