

PhD position (IMPRS-gBGC)
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PhD project offered by the IMPRS-gBGC in July 2018

Dimensions in trait variability on different spatial scales and organizational levels
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Project description

Plant functional traits are widely used to detect and explain responses of ecosystem processes to climate and land-use change and they are important to inform global vegetation models. These large-scale studies use trait data from databases such as TRY, representing an extensive source of information for different traits and species on European and global scales. The problem of this approach is that often only few values per trait and species are available in these databases. Studies relying on these sources of information therewith ignore the potential impact of intraspecific trait variability on their results.

In the framework of this PhD project, we aim at quantifying the relevance of trait variability on different spatial scales and for different aggregation levels combining large trait databases (TRY) with data on species distributions, vegetation plots and remote sensing products in macroecological approaches. More specifically, we aim at (1) disentangling functional groups showing large vs. small intraspecific variation (i.e., when is it essential to include aspects of intraspecific variability), (2) identifying the position of species in their environmental space where trait variability is highest (i.e., where is it essential to include aspects of intraspecific variability). Finally, we aim at (3) producing and contrasting global trait maps relying on different data streams related to (a) species distributions (presence/absence vs. abundances/ co-occurrences), (b) trait values (one mean value per species vs. intraspecific variability), and (c) landscape matrices (uniform grid cell vs. information on habitat distributions within grid cell). This approach allows including more species biology into global vegetation models. If required/ desired, own field measurement campaigns may complement the database analyses. The output of the thesis improves our understanding of the spatial distribution of plant traits, being essential biodiversity variables also used to model biogeochemical cycles.

Working group & planned collaborations

The successful candidate will work in the Plant Biodiversity Group of the Friedrich Schiller University Jena focusing on aspects of intraspecific trait variability under different climate and land-use change scenarios. In this project we closely cooperate with the Functional Biogeography group and the Empirical Inference of the Earth System groups of the MPI for Biogeochemistry. All three groups are members of the Research Institute for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig and the sPlot initiative, combining global data on vegetation plots, plant traits and abiotic/environmental conditions.

Requirements

Applications to the IMPRS-gBGC are open to well-motivated and highly-qualified students from all countries. Prerequisites for this PhD project are:

- a Master's degree in Biology, Ecology, Geography or a similar discipline
- Experience in functional ecology and statistical analyses
- Interest in combining local-scale information with large-scale data to better understand the global distribution of traits, species and vegetation types
- Excellent oral and written communication skills in English

The Max Planck Society seeks to increase the number of women in those areas where they are underrepresented and therefore explicitly encourages women to apply. The Max Planck society is committed to increasing the number of individuals with disabilities in its workforce and therefore encourages applications from such qualified individuals.