Data Request Form

To obtain data from the European Vegetation Archive (EVA), please first make an enquiry to the EVA database administrator Ilona Knollová (ikuzel@sci.muni.cz) whether the data meeting your needs are available. If they are, please fill in the form below and submit it to Ilona or another member of the EVA Coordinating Board.

- Applicant's name:
  Guillaume DECOCQ
- Applicant's institutional address:
  Jules Verne University of Picardie, 1 rue des Louvels, F-80037 Amiens, France
- Applicant's e-mail:
  guillaume.decocq@u-picardie.fr
- Project title:
  Integrating species distribution models and plant resource economics theory
- Brief description of the aims and methods of the study:

Aims. We propose a new framework for SDMs based on the physiology of resource uptake and allocation in plants, which differentiates environmental gradients according to whether they 1) support carbon gain (e.g., light, AET, growing season duration), 2) incur carbon costs associated with nutrient harvest (e.g., soil nutrient availability, pH), or 3) enhance resource uptake of other gradients (e.g., temperature). We have particular interest in modeling the interaction of climatic and soil variables in SDMs, because climatic warming and elevated CO2 is likely to promote C gain for many species in temperate and boreal habitats whose annual C budgets are limited by growing season duration. Such increases are widely expected to promote northward range shifts in the northern hemisphere. However, OPT predicts that plants 'living on the edge' where their annual C budget is low should not have sufficient energy to cover the C costs of surviving in stressful substrate conditions, such as very low or high pH, high salinity or heavy metals, anoxia, or low availability of essential soil resources like N and P. Our prediction is that, if water is not limiting, then plants should have larger edaphic niches (including both resource and regulating factors like pH) in regions of longer growing seasons, or under any conditions that promote higher energy budgets (e.g., open habitats versus shaded). This should be most evident in SDMs that reflect the potential for resource exchanges rather than substitution. If SDMs are largely consistent with C-based resource exchanges, then northward range expansions of native and invasive species should be biased toward particular substrate conditions. This would significantly increase the accuracy of SDMs used for prediction under climate change scenarios (e.g., the noxious invader Ambrosia artemisiifolia in Europe).
Methods. We will use (1) Environmental data: Temperature and water as regulating factors; Growing season / climatic energy availability; Soil nutrients and pH; Soil

organic C ; (2) Species abundance/occurrence data. [This is what we request from EVA].
Following data extraction we will implement a Bayesian modeling framework including multiple species through joint estimation. Model comparison will use two potential approaches: 1) Fit models separately and compare via DIC or similar; or 2) use composite model that expresses the loss function as a generalized power function. It is unlikely that the above theory applies equally to species of strongly contrasting ecology, so we may wish to perform separate models or exclude some types of species from the analysis. Relevant attributes include native/alien, annual/perennial, herbaceous/woody, evergreen/deciduous, and perhaps exclusion of certain habitat types although this remains to be discussed.

- Will someone else be involved in data editing or analysis in addition to the applicant?

  Jason FRIDLEY

- Estimated time of delivery of results (e.g. manuscript submission):

  <1 yr

- Geographic area needed (e.g. countries or range of geographic coordinates):

  Entire Europe at a first glance

- Do you need plots to be georeferenced? If so, what is the minimum accuracy of plot location (in metres or kilometres) needed for your project?

  We need distribution maps of vascular plant species, not exact georeferenced plots. Note that we can cope with different grains.

- Vegetation types needed (syntaxa):

  All

- Other data selection criteria:

  no

- Envisaged publications:

  Too early to say since our research hypotheses are very speculative. In case of success we should target a journal like Global Change Biology or Global Ecology and Biogeography.

- Plant trait data from the TRY consortium. If you plan to combine your analysis of vegetation-plot data with plant trait data, you can also request for a dataset of 18 gap-filled traits for a large number of plant taxa prepared by the TRY consortium. These traits include Leaf area, Specific leaf area, Leaf fresh mass, Leaf dry matter content, Leaf C, Leaf N, Leaf P, Leaf N per area, Leaf N:P ratio, Leaf delta15N, Seed mass, Seed length, Seed number per reproductive unit, Dispersal unit length, Plant height, Stem specific density, Stem conduit density, and Conduit element length. This dataset can be provided to you from the EVA manager together with the vegetation-plot data. If you use this dataset, you must inform about your project the TRY data contributors who might be potentially interested and invite them as potential co-

authors, assuming they will make an intellectual contribution to your paper. The list of the TRY data contributors will be sent to you together with the gap-filled trait dataset.

No

- Specification of the co-authorship arrangements in publications based on the requested data. Note that the EVA Rules recommend that co-authorship is offered to a representative of each database providing data that are particularly important for the project (e.g. relatively large proportion of the final dataset used in the analyses or data from unique vegetation types or under-represented geographic areas). This database representative should be an expert in the topic of the project (not necessarily the custodian or deputy custodian) and this person should contribute to the project more than just by providing the existing data, e.g. by intellectual contribution to the concept of the paper, preparation of new data, or helping with data analysis, interpretation of the results or writing parts of the paper (see the IAVS Code of Professional Ethics: http://iavs.org/Governance/Code-of-Professional-Ethics.aspx). The project leader should enable active participation by regularly informing potential co-authors about the progress of the project from its early stage. The project leader should also make final co-authorship arrangements based on the real input of the individual contributors.

All data providers will be informed about the preliminary results and, for those who are experts in the topic and are willing to provide intellectual contribution to this study, they will be offered co-authorship (in case of publication) and, for the others, they will be acknowledged.

- Eligibility of the applicant to receive EVA data. Specify to which EVA database the applicant has contributed; if the applicant is not the custodian or deputy custodian of an EVA database, give a name of a custodian or deputy custodian who supports this data request.

My phytosociological relevés from the 1990s are incorporated in SOPHY database.

This data request is supported by Jonathan Lenoir & Milan Chytrý

I agree with the terms of EVA Data Property and Governance Rules as approved on 26 May 2012 (http://euroveg.org/download/eva-rules.pdf).

If I ask for the plant trait data from TRY, I agree to invite to my project the TRY data contributors following the list received from the EVA database manager.

Amiens (France), January 16th 2020

Guillaume DECOCQ