European Vegetation Archive
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 Milan Chytrý (chytry@sci.muni.cz) or another member of the EVA Coordinating Board.

- **Applicant's name:** Jürgen Dengler

- **Applicant's institutional address:** German Centre for Integrative Biodiversity Research (iDiv), Deutscher Platz 5e, 04103 Leipzig

- **Applicant's e-mail:** juergen.dengler@uni-bayreuth.de

- **Project title:** Integrating trait observations and macroecological data across Europe

- **Brief description of aims and methods of the study:**

The TRY initiative — a global community effort to collect trait observations of vascular plants (Kattge et al., 2011)— is currently providing an unprecedented collection of structural and morphological plant properties. TRY is itself a treasure chest for better understanding typical multivariate constellations of plant traits across species. The TRY initiative meets times where a multitude of organismic, biogeochemical, and remote sensing observations are being made available in global data bases. The joint extraction of knowledge from large data sets via modern tools of machine learning and data mining is currently advocated as the "fourth prardigm" (Hunt et al., 2011) in science. Along this line of reasoning, we propose to advance the following **key objectives**:

- 1. **Upscaling traits in Europe:** TRY data are of particular accuracy within Europe where we are also equipped with relatively accurate species distribution data, e.g. the "Atlas Flora Europea" (AFE) and the EVA database. The intersection of both kind of databases – traits and tree distribution - will be used as baseline for estimating trait maps ("upscaling") using machine learning approaches. One innovation is that our methods can directly ingest remote sensing, pedological, and possibly climatological observations in the prediction of trait distributions. The goal is to estimate the biogeographical distribution of traits over Europe considering both within–species trait variability as well as multivariate trait constellations.

- 2. **Understanding multidimensional trait constellations:** Based on 1. we explore the multivariate constellations of traits weighted by geographical relevance. Exploring these high dimensional data will be used to understand features such as the intrinsic dimensionality of the trait space (its "complexity"), and how these patterns change with geographical space. We expect an accurate picture of how traits within and across species are mutually (possibly nonlinearly) interlinked. Thus we can infer and hypothesize spatially varying trade–off between different traits, depending on environmental constraints. In addition, we plan to explore correlations between trait space/trade-offs and ecosystem functional properties, such as Water Use Efficiency in a spatially explicit way.

- **Will someone else be involved in data editing or analysis in addition to the applicant?**
Data analysis, interpretation and paper writing in this project will be led by Dr. Franziska Schrodt (fschrodt@bgc-jena.mpg.de), who is is based at the Max-Planck Institute for Biogeochemistry, Jena, and a member of the iDiv Workshop sPlot. Further, Miguel D. Mahecha, Martin Jung, Jens Kattge (all Max-Planck Institute for Biogeochemistry, Jena) and Ingolf Kühn (Helmholtz Centre for Environmental Research UFZ) and Jürgen Dengler (iDiv) will be involved in the analysis if needed. Confidentiality in data use will be guaranteed.

- **Estimated time of delivery of results (e.g. manuscript submission):** Start of 2015 (submission of first manuscript)

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

- **Vegetation types needed (syntaxa):** Any

- **Other data selection criteria:** All plots with a spatial precision of ≤ 10 km
Recquired information is per each 0.5°x0.5° grid cell (a) total number of such georeferenced plots; (b) constancy and (c) mean cover for all the species listed in the attached Excel file
(Jürgen Dengler will help with data extractions and problems of synonymy; it is also possible to provide just an unfiltered constancy list per grid cell including all species; if possible, species occurring in different layers should be merged prior to constancy calculation; Franziska and Jürgen will be available for any question regarding data requirements and handling).

- **Envisaged publications:** 1-3 publications in international journals that target an audience in ecology, biogeography and/or vegetation science

- **Specification of the co-authorship arrangements in publications based on the requested data:** Franziska Schrodt will be the lead author of the planned publications. Co-authorship will be offered to a representative of each database that is represented by at least 10% of relevés included in the final analysis or fewer if they are from regions with general lack of data as well as to Milan Chytrý, Borja Jimenéz-Alfaro and other EVA data managers if they are strongly involved in data preparation. Further, persons with significant contribution to data analysis (see above) or providers or analysts of other data (trait data, floristic data, geographical data) may be involved as co-authors.

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

Bayreuth, Leipzig & Jena, 16 July 2014

Jürgen Dengler & Franziska Schrodt

References:

Hunt, J. R., D. D. Baldocchi, and C. van Ingen. 2011. The Fourth Paradigm: Data Intensive Scientific Discovery, In: Redefining ecological science using data. Microsoft Research

Kattge, J., Díaz, S., Lavorel, S., Prentice, I.C., Leadley, P., Bönisch, G., Garnier, E., Westoby, M.W., Reich, P.B., Wright, I.J. (…) Wirth, C. (2011): TRY – a global database of plant traits. – Global Change Biol. 17: 2905–2935.