– GrassPlot Newsletter No. 11 –

15 November 2023

Dear members of the GrassPlot Consortium,

With this second Newsletter of this year, we would like to update you on recent developments of our database. Not overly much has happened in the past half of a year, which was a busy field season for all of us like probably most of you. However, stay tuned for many upcoming exciting new paper projects, which are presented below.

Enjoy reading!

The GrassPlot Governing Board
(*Jürgen Dengler*, *Idoia Biurrun*, *Sabina Burrascano*, *Iwona Dembicz*, *Riccardo Guarino*, *Remigiusz Pielech & Denys Vynokurov*)

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Elections to the Governing Board 2023–2025

Upon our call to nominate candidates for the next Governing Board this spring, only the names of the seven Governing Board members of the period 2021-2023 have been put forward, and all of them agreed to serve for another term of duty. According to our Bylaws, the nominees are automatically elected if there are as many or fewer candidates than seats. Accordingly, the new Governing Board is the old one. Moreover, within the Governing Board we also left the assignment of duties as they were, most importantly Jürgen remains Custodian and Idoia Deputy Custodian and Database Manager.

Current state of the GrassPlot database

Due to a busy summer for all of us, the actual content of GrassPlot has only moderately grown in recent months. However, Francesca Napoleone continued to prepare species composition data and recently, Idoia Biurrun resumed work on preparing provided datasets for inclusion into GrassPlot. Currently, GrassPlot contains **204,309 vegetation plots and subplots from 6,741 nested plot series and 32,939 independent plots**. They stem from 49 countries, 229 datasets and 322 owners.

However, we assume that in the next few months (November – February) we will significantly increase the size of GrassPlot for several reasons: (1) The Governing Board members have more time than during the field season. (2) Iwona Dembicz won a "tandem project" with Jürgen Dengler to work on the long-planned alpha diversity paper with GrassPlot data (see below). In this context she also got money to employ Nadiia Skobel to help with data preparation for inclusion in GrassPlot. (3) Several exciting paper projects are planned for 2024 (see below).

Together, these are good reasons to contribute suitable new data as soon as possible, preferentially before end of this year.

Clarification on inclusion criteria in case of woody layers

The focus of GrassPlot are open vegetation types, not forests, nor tall shrublands, but the border was not always clear. Thus, we have now decided as follows:

1. GrassPlot also collects data of dwarf shrub communities, such as heathlands, garrigues or thorn cushion communities.
2. Since many species commonly considered dwarf shrubs (woody chamaephytes), such as *Calluna vulgaris* or *Vaccinium* spp., regularly exceed the traditional 0.5-m threshold, we consider every woody species below 1 m height for the purpose of GrassPlot as dwarf shrub.
3. Not accepted in GrassPlot are plots with a combined cover of woody species > 1 m of more than 33%. If cover values for tree and shrub layers are given only separately (p, q), the combined cover is approximated as $p + (p - 1)\ q$.
4. Exempt from Rule #3 are plots that represent a succession of a former open habitat (e.g. managed grassland, heathland or quarry) with information on the (approximate) duration of succession in years – even if the woody cover is now higher. Such data can stem from true time series or space-for-time substitutions (please indicate).

Call for new data

All data meeting the GrassPlot criteria (see https://edgg.org/databases/GrassPlot) are welcome, most importantly nested-plot data, but also single grain data from our standard plot sizes. There are still major gaps in geographic data coverage (see the map in Newsletter No. 8), basically **extra-tropical Asia** (except Tajikistan and the Caucasus countries), **North Africa, some countries in Europe (mainly France, Finland, Sweden, Iceland, Ireland, Montenegro, Albania, Moldova, Georgia, Russia and the whole Mediterranean part of Europe)**. Also, vegetation types are still quite unevenly represented (see Newsletter No. 9). While we have already quite good data coverage of alpine grasslands, meso-xeric grasslands, xeric grasslands, mesic grasslands, dune grasslands; other types within the GrassPlot scope are still very sparsely populated, e.g. **Mediterranean grasslands, wet grasslands, wetlands (fens, bogs, reed beds, springs), heathlands, rocky communities (outcrops, screes,…) ruderal and tall-herb communities as well as desert grasslands**.

If you want to contribute data, please download the data entry forms from the GrassPlot website (https://edgg.org/databases/GrassPlot). In "Materials" you find three files:

- *GrassPlot Data entry form:* here you must fill data at plot and subplot level (in case of nested plot series). General instructions to fill this form are in the sheet «Instructions».
- *Entry form for datasets and Consortium members:* here you must fill some information at the level of the dataset, as well as the affiliation and email of the data contributors. One very important piece of information in this file concerns the inclusion of your data in the EVA and sPlot datasets. If they are already included there, please indicate it, and also fill which is their GIVD code. If they are not included there, and you wish to include them via GrassPlot, please indicate it in the suitable column.
- *Explanation of variables:* each column of the Data entry form is explained in this file.

As regards composition data, you can deliver them in any format, but it is convenient you specify which is your nomenclatural source. Please pay attention that the plot number in the composition data and in the Data entry form are the same.

To speed up your data provision, for the next few months you do not have to do the time-consuming adjustment to our GrassPlot template (see above) yourselves, but you can send us your data in any well-structured and well-documented digital format. Nadiia Skobel, who is employed in Iwona's Tandem project, will then take care of the data preparation. This is an exceptional offer that is valid for data provisions **until 15 February 2024**, the earlier the better.

New GrassPlot projects with opt-in possibility

There are four new paper projects that requested data from GrassPlot.

Paper project #20 (Ulrich), entitled "The proper middle class: Assessing the importance of intermediate abundant species on plant community assembly and functional diversity".

Paper project #21 (Moeys, Van Meerbeek & Dengler), entitled "Validating EIVE 1.0". This project aims at testing the two new European ecological indicator value systems (Dengler et al. 2023; Tichý et al. 2023) in comparison to existing national indicator value systems via correlations of mean indicator values against measured environmental variables. GrassPlot due to its well-curated in situ measured environmental variables will be one of the main data sources of this important methodological comparison.

Paper project #22 (Bashirzadeh & Naqinezhad), entitled "How do the combined effects of climate and land use changes shape functional and phylogenetic plant diversity across Palaearctic grasslands?".

Paper project #23 (Liu & Van Meerbeek), entitled "Exploring the effects of climate and land-use change on ecosystem functioning of grasslands using trait models and large ecological databases".

If any of these projects is going to use data from you (or if you are involved in GrassPlot data management) you can **opt in to become a potential co-author** during 14 days following this call. According to our Bylaws, lead authors are required to accept opt-ins by colleagues who are representing one or several datasets that in total contribute 2% or more to the analyses, while for smaller contributions it is upon their discretion whether or not to accept opt-ins. Contact persons of a dataset can also propose someone else from the dataset to become co-author. **Opt-in requests must be sent until 30 November 2023 to dr.juergen.dengler@gmail.com, separately for each of the four projects. Please use a subject line in the following**

format: *GrassPlot #xx opt-in request*. In the text, please specify which dataset(s) you represent and preferentially (in particular if you contribute less than 2%) also why are you interested in the study and what you could potentially contribute. In early December, we will clarify whose opt-ins will be accepted according to the Bylaws and the preferences of the lead author and then release the data. Please note that all opt-in authors are requested to make intellectual contributions to the paper in order to be included in the final author list.

Note that there will be at least one more new paper to be started in early 2024 (Vynokurov et al. – beta diversity vs. landscape heterogeneity).

Tichý, L, Axmanová, I., Dengler, J., Guarino, R., Jansen, F., Midolo, G., Nobis, M.P., Van Meerbeek, K., Aćić, S., (…) & Chytrý, M. 2023. Ellenberg-type indicator values for European vascular plant species. *Journal of Vegetation Science* 34: e13168.

Dengler, J., Jansen, F., Chusova, O., Hüllbusch, E., Nobis, M.P., Van Meerbeek, K., Axmanová, I., Bruun, H.H., Chytrý, M., (…) & Gillet, F. 2023. Ecological Indicator Values for Europe (EIVE) 1.0. *Vegetation Classification and Survey* 4: 7–29.

GrassPlot projects to be re-started

There are three long-announced paper projects that had been announced before and were on hold, but will be restarted in the next few months:

Paper project #02B (Dengler et al.), entitled "Differences in alpha diversity between vegetation classes of the Palaearctic non-forest vegetation": This paper will complement the similar paper by Dembicz et al. (2021b) on beta diversity and provide important "benchmark" values on how many species are to be expected on average in plots within a given vegetation class and region if sampled with one of our standard grain sizes. It thus will put the benchmark concept presented in Biurrun et al. (2021) into practice.

Paper project #03 (Dembicz et al.), entitled "How do environmental factors shape the diversity of vascular plants, bryophytes and lichens in Palaearctic grasslands at multiple scales?": Sabatini et al. (2022) modelled scale-dependent species richness of both forests and grasslands s.l. at a global scale for three grain sizes and found major incongruencies between these, like what Biurrun et al. (2021) visualised for Palaearctic grasslands. In this new paper we want to take advantage of the high-quality nested-plot data in GrassPlot in combination with modern statistical approaches like Sabatini et al. (2022) or Večeřa et al. (2019) to describe the patterns and to attribute them to drivers.

For both papers, there had been an opt-in procedure for co-authors in the past and all those who declared their interest in joining, will automatically be invited to give feedback to the manuscripts. Since we, however, will take advantage of the then significantly increased data coverage in GrassPlot, we will send out **opt-in offers** to all data providers who were not included in the past invitation.

New Long Database Report: In Dengler et al. (2018) we described the GrassPlot database shortly after its start and Biurrun et al. (2019) provided an update 1.5 years later. Meanwhile, four more years have passed, and the database has grown considerably in content and functionality. Thus, we believe the time is ripe to present an update on content and functionality, once the bulk of the current data import is completed. According to the GrassPlot Bylaws, this is an **opt-out paper**; thus, automatically the owner of each dataset will be offered co-authorship – unless he/she declines.

Biurrun, I., Burrascano, S., Dembicz, I., Guarino, R., Kapfer, J., Pielech, R., Garcia-Mijangos, I., Wagner, V., Palpurina, S., (…) & Dengler, J. 2019. GrassPlot v. 2.00 – first update on the database of multi-scale plant diversity in Palaearctic grasslands. *Palaearctic Grasslands* 44: 26–47.

Biurrun, I., Pielech, R., Dembicz, I., Gillet, F., Kozub, L., Marcenò, C., Reitalu, T., Van Meerbeek, K., Guarino, R., (…) & Dengler, J. 2021. Benchmarking plant diversity of Palaearctic grasslands and other open habitats. *Journal of Vegetation Science* 32: e13050.

Dembicz, I., Dengler, J., Steinbauer, M.J., Matthews, T.J., Bartha, S., Burrascano, S., Chiarucci, A., Filibeck, G., Gillet, F., (…) & Biurrun, I. 2021. Fine-grain beta diversity of Palaearctic grassland vegetation. *Journal of Vegetation Science* 32: e13045.

Dembicz, I., Dengler, J., Gillet, F., Matthews, T.J., Steinbauer, M.J., Bartha, S., Campos, J.A., De Frenne, P., Dolezal, J., (…) & Biurrun, I. 2021b. Fine-grain beta diversity in Palaearctic open vegetation: variability within and between biomes and vegetation types. *Vegetation Classification and Survey* 2: 293–304.

Dengler, J., Wagner, V., Dembicz, I., García-Mijangos, I., Naqinezhad, A., Boch, S., Chiarucci, A., Conradi, T., Filibeck, G., (…) & Biurrun, I. 2018. GrassPlot – a database of multi-scale plant diversity in Palaearctic grasslands. *Phytocoenologia* 48: 331–347.

Sabatini, F.M., Jiménez-Alfaro, B., Jandt, U., Chytrý, M., Field, R., Kessler, M., Lenoir, J., Schrodt, F., Wiser, S.K., Arfin Khan, M.A.S., Attorre, F., Cayuela, L., De Sanctis, M., Dengler, J., (…) & Bruelheide, H. 2022. Global patterns of vascular plant alpha diversity. *Nature Communications* 13: Article 4683.

Večeřa, M., Divíšek, J., Lenoir, J., Jiménez-Alfaro, B., Biurrun, I., Knollová, I., Agrillo, E., Campos, J.A., Čarni, A., (…) & Chytrý, M. 2019. Alpha diversity of vascular plants in European forests. *Journal of Biogeography* 46: 1919–1935.

Ongoing GrassPlot projects

Currently, there are three paper projects working with our data:

Paper project #16 (Burrascano et al.), entitled "Components of beta-diversity across different sampling grains in Eurasian grasslands": For multiple reasons this paper project was significantly delayed, mainly due to waiting for the final version of the composition data. The paper is further delayed due to issues with the preparation of the composition data. Opt-in authors will be informed when there are results.

Paper project #17 (Ceulemans et al.), **entitled "RECALL – Revisiting CriticAL Loads of atmospheric nitrogen deposition"**: For this complex project, Tobias Ceulemans took community data of bryophytes and lichens from GrassPlot, vascular plant data from EVA, as well as data of mycorrhizae and butterflies from other sources. While at the start of 2023, the lead author had informed us that he is again intensively working on study, we have not received any updates since then. We will let you know when there is any news.

Paper project #19 (Pielech et al.), **entitled "Biases in species richness data in large phytosociological databases":** Remek has compiled, cleaned and prepared all the data from EVA and GrassPlot to be compared and done some first promising pre-analyses. We anticipate the main analyses and the involvement of co-authors to take place during the next half of a year.

GrassPlot data in EVA and sPlot 4.0

At the start of this year, GrassPlot contributed data to the European Vegetation Archive (EVA; Chytrý et al. 2016) and sPlot database (Bruelheide et al. 2019). Currently, there are 6,366 European plots from 14 datasets in EVA, which will also be included in sPlot 4.0. Moreover, we have directly contributed 2,326 extra-European plots from 11 datasets to sPlot 4.0. Several new versions of EVA have been released meanwhile and accordingly GrassPlot regularly receives opt-in offers for paper projects, which we forward to our contributing members. By contrast, sPlot 4.0 has not yet been finished and published. Thus, you still need to be patient until the first opt-in offer for an sPlot project arrives in your mailbox. Once significantly more composition data are ready in GrassPlot, we will also make a new data delivery to EVA.

Bruelheide, H., Dengler, J., Jiménez-Alfaro, B., Purschke, O., Hennekens, S.M., Chytrý M., Pillar, V.D., Jansen, F., Kattge, J., (…) & Zverev, A. 2019. sPlot – a new tool for global vegetation analyses. *Journal of Vegetation Science* 30: 161–186.

Chytrý, M., Hennekens, S.M., Jiménez-Alfaro, B., Knollová, I., Dengler, J., Jansen, F., Landucci, F., Schaminée, J.H.J., Aćić, S., (…) & Yamalov, S. 2016. European Vegetation Archive (EVA): an integrated database of European vegetation plots. *Applied Vegetation Science* 19: 173–180.