– GrassPlot Newsletter No. 8 –

26 December 2020

Dear members of the GrassPlot Consortium,

The year 2020 is coming to an end, certainly the most unusual year of the recent decades. None of us could do science as planned, all of us were affected by severe restrictions in their lives and some from the GrassPlot members even personally suffered from a Covid-19 infection. Therefore, we are happy that, after all these bad news of the past 12 months, we can report that for GrassPlot 2020 was a very successful year – also thanks to all of you. You will find reports from our achievements as well as announcements of future plans below.

We wish you a calm, peaceful and healthy time during the holidays at the end of the year,

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

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GrassPlot expanded & improved

The latest version of GrassPlot, v.2.10, now contains a total of **202,580 plots** of different grain sizes across **32,105 independent plots** (Fig. 1), of which 25,441 are individual plots and **6,664 are nested-plot series** including at least two grain sizes (Fig. 2). The plots stem from **225 contributing datasets** and **47 countries**. Data harmonization has continued this year, and header data are now much more complete and consistent than in the previous versions.
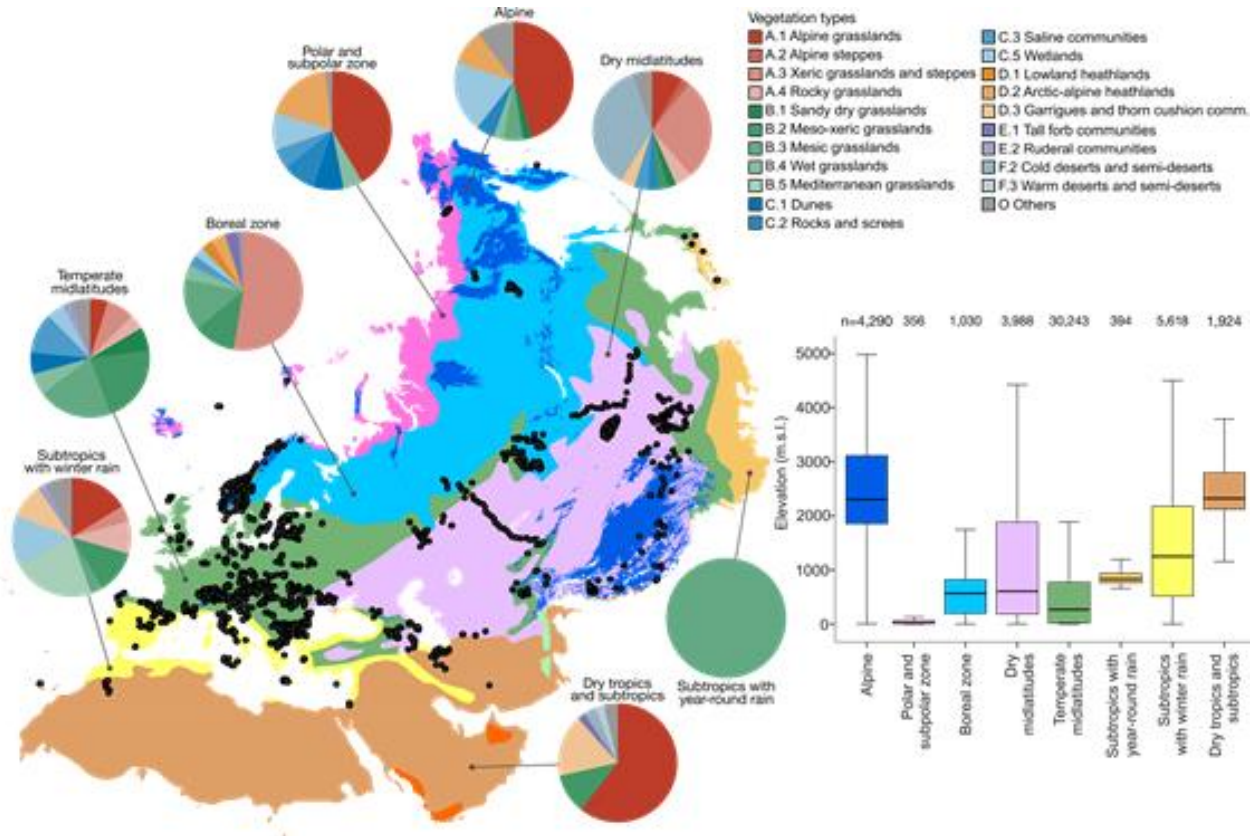

Fig. 1. Current distribution of standard grain plots in GrassPlot (from the manuscript of paper #02).
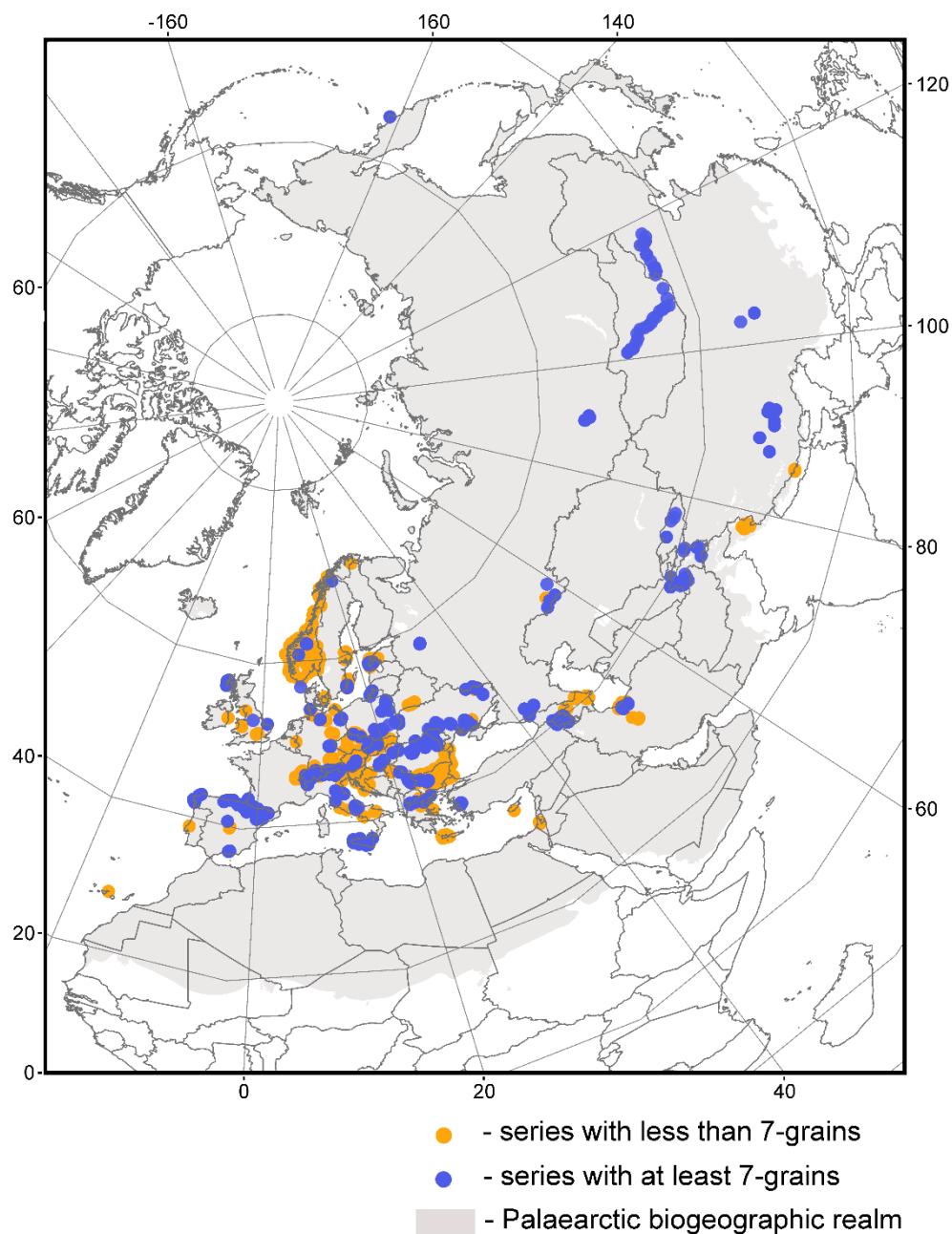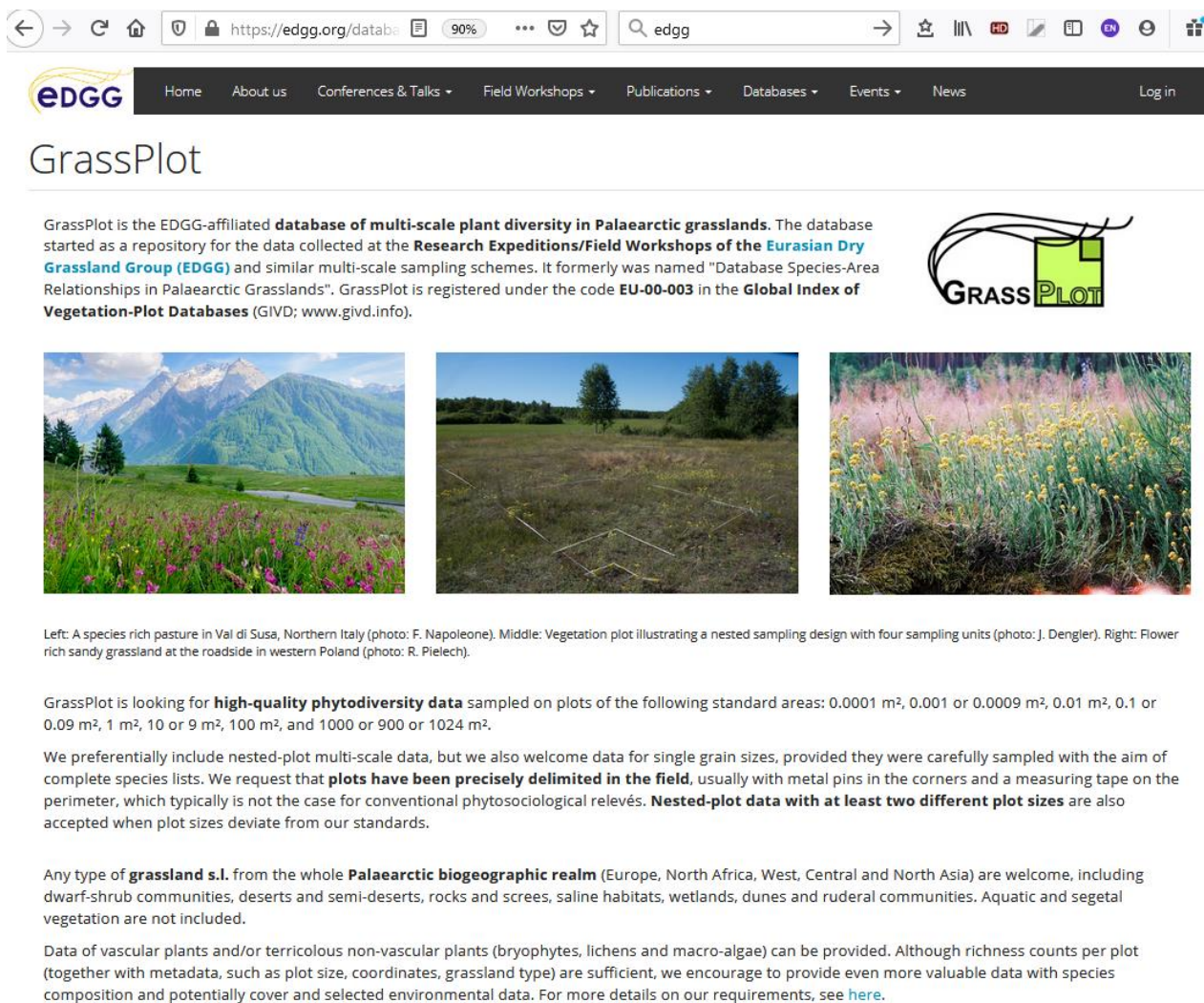
Fig. 2. Current distribution of nested-plot data in GrassPlot (from the manuscript of paper #04C).

GrassPlot website online

We are happy to present our new GrassPlot website, which has successfully been moved from the Ecoinformatics Portal Bayreuth and substantially been updated. I can now be found as part of the website of the Eurasian Dry Grassland Group (https://edgg.org/, see Fig. 3). In addition to many illustrative pictures from various grasslands, the website contains all kinds of useful and interesting information about, for instance, GrassPlot history, the database as well as ongoing and completed paper projects. Materials such as the data request form or various types of publications can also be accessed and downloaded directly from the website.

► https://edgg.org/databases/GrassPlot

Fig. 3. Screenshot from the GrassPlot website.

If you have suggestions for further improvement of the GrassPlot website, you can send them to the responsible member of the Governing Board, Jutta Kapfer (jutta.kapfer@nibio.no).

GrassPlot Diversity Explorer and GrassPlot Diversity Benchmarks

Along with the paper on "benchmarking phytodiversity in Palaearctic grasslands" led by Idoia Biurrun (see below), we developed an online tool called **GrassPlot Diversity Explorer** (Fig. 4). It was first presented at the IAVS conference in 2019 in Bremen. This tool provides the end-user with great flexibility in exploring and visualizing the GrassPlot database. One can compare the species richness of different taxonomic groups between vegetation types and regions. In 2020, the GrassPlot Diversity Explorer was updated and new functionalities are now available, including plots exploring species-area relationships. Also, data can be now filtered on the basis of the sampling method (a type of presence recording) among phytosociological classes, among others.

► https://edgg.org/databases/GrasslandDiversityExplorer
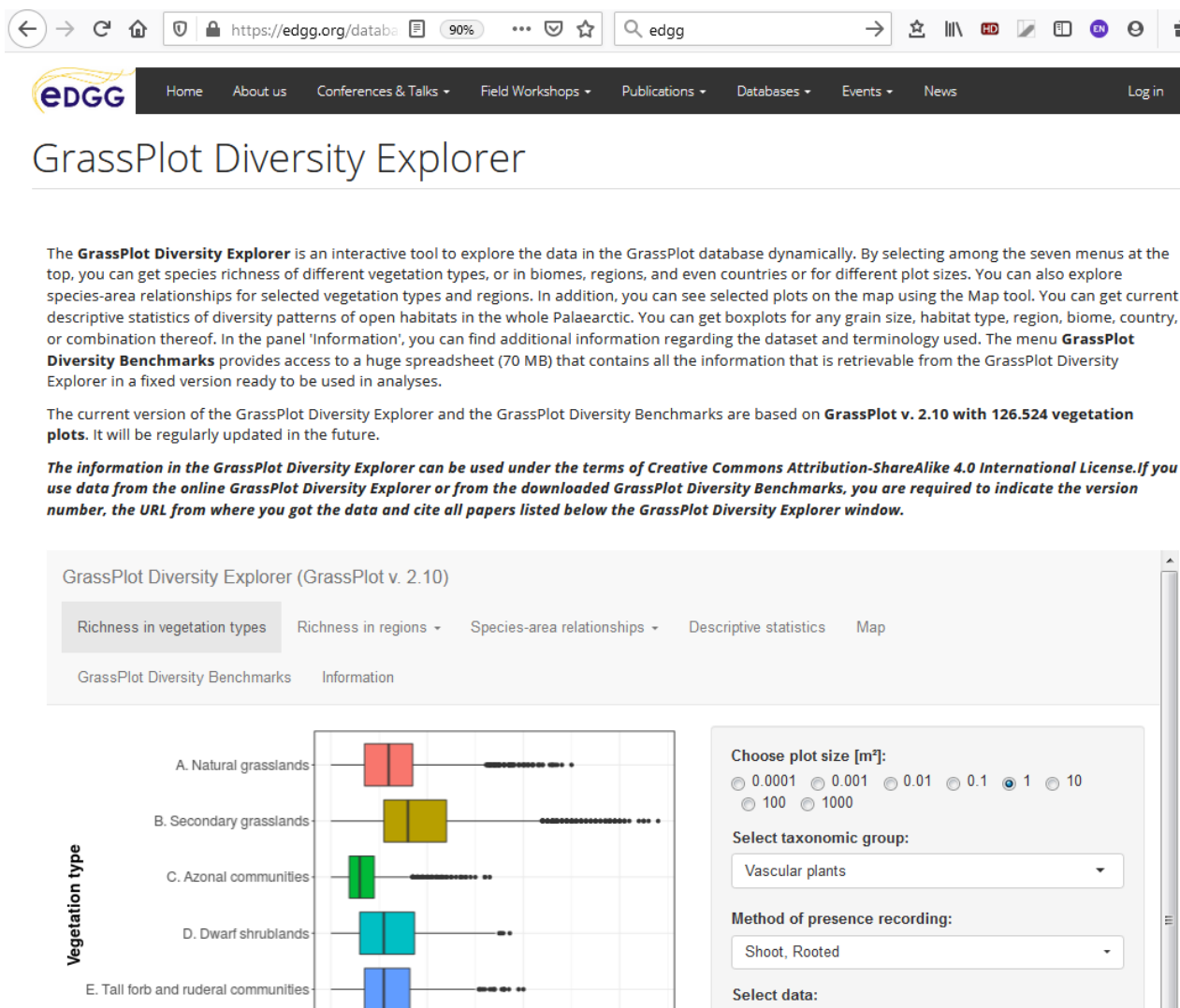
Fig. 4. Screenshot from the GrassPlot Diversity Explorer.

An integral part of the Explorer is also the **GrassPlot Diversity Benchmarks**, designed as a basis for the "Benchmark paper" mentioned above. It enables to explore species richness data included in the GrassPlot database in a form of an Excel table or R by using a variety of filters.

► http://www.forestdatabase.pl/GrassPlotBenchmarks/Benchmarks.zip

If you have suggestions for further improvements of the Explorer (Remek Pielech: remekpielech@gmail.com) or the Bechmarks (Iwona Dembicz: i.dembicz@gmail.com), please contact the named responsibles form the Governing Board.

Four GrassPlot papers submitted

During the course of 2020, four GrassPlot papers have been submitted and are currently under review:

Paper project #02:
Biurrun, I., Pielech, R., Dembicz, I., Gillet, F., Kozub, L., Marcenò, C., Reitalu, T., Van Meerbeek, K., Guarino, R., (…) & Dengler, J. subm. Benchmarking plant diversity of Palaearctic grasslands and other open habitats.

► This opt-out paper was submitted on 30 November 2020 to the Special Issue of *Journal of Vegetation Science* on "Macroecology of Vegetation".

Paper project #04B:
Dembicz, I., Dengler, J., Steinbauer, M.J., Matthews, T.J., Bartha, S., Burrascano, S., Chiarucci, A., Filibeck, G., Gillet, F., (…) & Biurrun, I. subm. Patterns and drivers of fine-grain beta diversity in Palaearctic grassland vegetation.
► Originally this opt-in paper had been submitted to *Global Ecology and Biogeography* on 13 July 2020. but after a "reject and resubmit" decision, whose requests the lead authors considered inadequate, we submitted it on 6 December 2020 to the Special Issue of *Journal of Vegetation Science* on "Macroecology of Vegetation".

Paper project #04C:
Zhang, J., Gillet, F., Bartha, S., Alatalo, J.M., Biurrun, I., Dembicz, I., Grytnes, J.-A., Jaunatre, R., Pielech, R., (…) & Dengler, J. subm. How do environmental factors shape the scale dependence of *z*-values in Palaearctic grasslands?
► This opt-in paper was submitted on 4 December 2020 to the Special Issue of *Journal of Vegetation Science* on "Macroecology of Vegetation".

Paper project #19:
Graco-Roza, C., (…), Biurrun, I., (…), Dembicz, I., Dengler, J., (…) & Soininen, J. subm. Distance decay 2.0 – a global synthesis of taxonomic and functional turnover in ecological communities. Manuscript for *Nature Ecology and Evolution*.
► This paper is not a GrassPlot paper s.str., but it uses the vascular plant data from the EDGG Field Workshops provided via GrassPlot together with many other datasets from various taxonomic groups worldwide. Originally it had been submitted on 10 June 2020 to *Ecology Letters*, and after a negative decision has now been submitted to *Nature Ecology and Evolution*.

Ongoing GrassPlot paper projects

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?": This paper is a bit delayed as the integration of new data to GrassPlot in spring 2020 took quite some time and the two main protagonists (Iwona Dembicz & Jürgen Dengler) were also substantially involved in most of the other submitted and ongoing GrassPlot papers. Together with a team of specialists in advanced ecological statistics we have more or less decided on the analytical approach. Now, we only need to find a time window in 2021 to resume the joint work. Possibly some recent high-quality datasets of particular importance for the overall statistical models will be added to GrassPlot in between…

Paper project #04B.2, entitled "Fine-grain beta diversity in Palaearctic open vegetation: variability within and between biomes and vegetation types": This opt-in paper has been split-off from paper #04B (Dembicz et al., see above) when we realised that the content is too much for a single paper. Paper #04B.2 is led by Iwona Dembicz, Jürgen Dengler, Idoia Biurrun together with François Gillet. It studies how z-values as measures of fine-grain beta diversity are related to different vegetation typologies (biomes, vegetation type coarse, vegetation type fine, phytosociological class). It is already half-written and will be finalised as soon as paper #04B is accepted. We plan to submit it to the new IAVS journal *Vegetation Classification and Survey*.

Paper project #16 (Burrascano et al.), entitled "Components of beta-diversity across different sampling grains in Eurasian grasslands": This opt-in paper has progressed

slowly since it had to face the harmonization of species composition data first. Also, some issues related to the use of the smaller grains had to be faced (several nested plots in one series, smaller grain plots with no vascular plant species, etc. At the moment, the data are ready, the script for the analysis should be run again, also accounting for different vegetation types. We plan to send the draft to co-authors within February.

Paper project #17 (Ceulemans et al.), **entitled "RECALL – Revisiting CriticAL Loads of atmospheric nitrogen deposition"**: Lead author Tobias Ceulemans wrote on 3 December: *At the beginning of 2020 we received GrassPlot data to evaluate critical loads of atmospheric nitrogen deposition with large-scale empirical data. We started out with developing an algorithm to analyze the data where we could take non-independence of geographically clustered plots into account. Then we also needed to incorporate biogeographical distribution of individual species as otherwise non-occurrence in regions with high atmospheric nitrogen deposition due to biogeographical distribution may be erroneously interpreted as sensitivity to nitrogen deposition. These analyses required high computational power due to the large amounts of data. Unfortunately, the pandemic crisis meant that we did not have access to our lab computers which caused serious delays. As of October we restarted our work, but the sizeable dataset takes up more time than originally estimated so work is slow-going. We hope to present the results of the analyses in January to co-authors for input, consultation and remarks. We are looking forward to continue our work together.* Note that paper project #17 uses different data sources to assess N-impact for different taxonomic groups. The European Vegetation Archive (EVA) provides the data for vascular plants, GrassPlot provides the data for bryophytes and lichens and yet another database data on butterflies.

New GrassPlot paper projects

There are three newly started paper projects from GrassPlot:

Paper project #04D (Gillet et al.): This paper is not a GrassPlot paper s.str. as it does not use GrassPlot data, but it has been inspired by the work on GrassPlot papers #04A, #04B and particularly #04C. These papers together suggest that overall fine-grain species-area relationships follow a power law unexpectedly well (i.e. no scale-dependence in z-values), while more rarely there is a peak of local z vs. log (grain size), usually below 1 m². Paper project #04D will be a simulation study to explore under which conditions we get a constant z and under which conditions we get unimodal relationships of local z vs. log (grain size). We will vary such parameters as granularity of the environment, frequency distribution and spatial aggregation patterns of species. This paper is planned as a co-production of François Gillet, Sanyi Bartha, Renaud Jaunatre, Jinghui Zhang and Jürgen Dengler, normally without opt-in procedure (as no GrassPlot data are used). However if someone has good ideas and specific competences he or she can contact the first author (francois.gillet@univ-fcomte.fr) to discuss options to join the author team.

Paper project #15 (Ulrich et al.), entitled "Environmental drivers and spatial scaling of species abundance distributions in Palaearctic grassland vegetation" (description attached): This is a regular opt-in paper to which you can declare your interest of collaboration (see below).

Paper project #19: (Pielech et al.), entitled "Biases in species richness data in large phytosociological databases" (description attached): This is a joint project together with the European Vegetation Archive (EVA) with the aim to explore systematically data quality issues in both databases (such as incomplete species lists or spatial biases). In both databases, it is an opt-in paper, allowing one representative being nominated as tentative co-

author for each dataset that contributes at least 1% of the final dataset of the respective database.

How to opt in to papers #15 and #19 (and also make available/unavailable your data for these)

Following the GrassPlot Bylaws, becoming a co-author of #15 or #19 is a two-step process (for #04D, see deviating rules above):

- If you should be **interested in becoming co-author** you need to contact Jürgen Dengler (GrassPlot Custodian) within 14 days, **i.e. until 15 January 2020**, expressing your interest, indicating which dataset(s) you are representing and which contributions you could make to the paper (the latter is particularly important if you are not nominated by a dataset that contributed at least 1% of the final data used in the paper). Please send mails subject lines "GrassPlot #15 opt-in" or "GrassPlot #19 opt-in" to dr.juergen.dengler@gmail.com.
- Please coordinate yourself with the other owners of your dataset. Normally one representative of each dataset that contributes at least 2% of the final data (#15; GrassPlot standard threshold) or at least 1% of the final data (#19; special threshold for this paper) will be considered. If you do not belong to this category of members, you can still apply to become co-author. Such applications will be decided by the lead authors on a case by case basis.
- Following the first step you will be considered **tentative co-author** and be included in the e-mail exchange and discussion of the analyses and the paper. If you make an intellectual contribution until the submission you will be **listed as co-author**.
- Please note that **15 January 2020** is also the deadline until which contact persons of semi-restricted datasets can require their exclusion from this study and contact persons of restricted datasets can allow their usage.

How to propose own paper projects based on GrassPlot

We would like to highlight that as members of the GrassPlot Consortium each of you can also **propose paper projects** using the GrassPlot data. If you plan to do so, please use the **proposal form,** which you find on our website at:

► https://edgg.org/sites/default/files/page/GrassPlot_Paper%20proposal%20form_v.03.docx.

IAVS funding for EDGG projects beneficial for GrassPlot

We are happy to announce that IAVS has approved to fund three EDGG projects to expand the GrassPlot data from several EDGG Field Workshops and to improve the data quality in GrassPlot in general. These small grant will allow us during the next few months to improve some aspects of GrassPlot considerably which would be hard to achieve with volunteer work only:

- **Preparation of the species composition data in GrassPlot:** In the framework of GrassPlot paper project #16, Sabina Burrascano and Salza Palpurina have largely prepared the composition data for approx. 1/3 of GrassPlot data. This project is a great opportunity to get the compositional data also ready for the other 2/3 of our data, both for forthcoming GrassPlot paper projects and for feeding valuable data from many

underrepresented regions into the large databases EVA and sPlot (which both are interested in filling gaps). This extremely tedious work started with extracting the composition data from the files provided by the data owners in many different formats, "cleaning" of the names (typos, ranks, authorities,…) and finally harmonizing plant nomenclature to an international standard. With the grant, Dr. Salza Palpurina thus will complete this task for GrassPlot. The well-documented procedure and R script by Salza Palpurina, when finished, would be published open access and also allow other researchers who have to prepare and clean vegetation plot data from many different sources, to benefit from this useful tool.

- **Preparation of the cryptogam data of several EDGG Field Workshops in GrassPlot:** With the grant, Dr. Beata Cykowska-Marzencka will prepare the bryophyte and lichen data of several EDGG Field Workshops to make the fully usable in GrassPlot.
- **Soil analysis of the data of the EDGG Field Workshops in Switzerland:** Since soil analysis in Switzerland is extremely expensive, the soil data of the two Swiss Field Workshops (No. 12/2019 and No. 14/2020) had not been analysed before. With the grant these analyses will now be done in Poland and enrich the valuable data in GrassPlot.

Planned cooperation with EVA and sPlot

We plan to provide data from GrassPlot to the two biggest vegetation-plot databases worldwide, the **European Vegetation Archive (EVA) and the global database "sPlot"**. While both mega-databases prefer to receive data from comprehensive national databases, they recognize that GrassPlot has additional data that can fill important data gaps and thus in 2019 agreed with us that we can contribute such data if it is a substantial amount and thus can become members of the EVA and sPlot Consortia. In 2021 we plan to provide the suitable European data to EVA (and EVA will provide them to sPlot) and the extra-European ones to sPlot. Suitable are those data with plot sizes of 1 m² or larger, provided they are not yet included in another member database of EVA or sPlot. This will be possible after the composition data are prepared, and we have checked with the owners or representatives of suitable datasets whether they should be provided also to EVA/sPlot (i.e. they are not there yet and the owners agree). Contribution to EVA and sPlot would mean that you would have the possibility to participate in the numerous emerging EVA/sPlot papers, too. In parallel to the above mentioned IAVS grant project, we thus will approach those GrassPlot contributors with suitable data who have not yet responded to ask for their agreement of data provision to EVA and sPlot.

Proposed adjustment of Bylaws for voting

Working on GrassPlot projects and on the GrassPlot database during the past years made the Governing Board aware of a few shortcomings of our current Bylaws. We have thus propose some corrections and amendments of the Bylaws:

1. **Throughout: Linguistic and formal corrections** in various places.
2. **Article 1:** Modification in the **eligibility of datasets**: Based on the need of several projects, we would like to accept now nested-plot series with at least two grain sizes (currently: four). Moreover, we clarified that for any of our eight standard grain sizes a deviation in area of up to 10% is allowed (but has to be reported), instead of enumerating the possible deviating plot sizes one by one.
3. **Article 6:** More and more journals, particularly the higher-ranked macroecological journals, which are typical publication venues for GrassPlot papers, request the data used to be published open access before a paper is accepted. We faced this problem

already with our paper in *Journal of Biogeography* (Dengler et al. 2020) where this request "hit" us after the paper was accepted content-wise. At that point we needed to seek the agreement of all individual data contributors that we are allowed to publish the used data on Dryad – otherwise our paper would have been rejected. To avoid similar problems in the future, the Governing Board has decided to propose a slight modification of the Bylaws that would allow in such cases to meet the journal requirements. **All header data as well as derived community data (diversity indices, *z*-values, community-weighted means) that are used in a GrassPlot paper could then be published without specific approval of the contributors**, while complete relevés would remain restricted.

According to Article 3 of our Bylaws, you, the Consortium members have to vote on these proposed changes during a 14-day voting period before they can be implemented. Therefore, please send your votes in an e-mail with subject line "GrassPlot Bylaws changes". In the body of the e-mail put either YES or NO or, if you would like to accept some of the three proposed changes but not others with 1: YES, 2: YES, 3: NO. Your votes should be received by the GrassPlot Custodian (dr.juergen.dengler@gmail.com) **until 15 January 2021**. The GrassPlot Governing Board will then evaluate the votes and announce the results.

Call for data contributions

We are always eager to add new datasets that meet our requirements, particularly datasets with extensive environmental data and multi-scale data, both of which set GrassPlot apart from other vegetation-plot databases such as EVA and sPlot. While independent plots are already quite nicely distributed across the Palaearctic biogeogeographic realm, we are still largely **lacking multi-scale data from big parts of the realm**, most urgently **Russia, China, Mongolia, Japan, Korea, Kazakhstan, Turkey, France, North Africa and Arab Peninsula**. While dry grasslands and steppes are already quite well covered, we would appreciate more high-quality data from **underrepresented vegetation types**, such as **mesic and wet grasslands, alpine grasslands, Mediterranean grasslands, heathlands and garrigues, all types of wetlands (bogs, fens, springs, reed bed communities), saline habitats, tall forb communities, screes, snowbed vegetation, semi-deserts and deserts**. However, keep in mind that in GrassPlot **quality is more important than quantity**. Therefore, please only submit data that meet our quality requirements, i.e. the plot area has been precisely delimited in the field (e.g. with pins in the corners and a tape around) and the area has been sampled with sufficient time to achieve a complete species list. *If every GrassPlot member would sample one full EDGG Biodiversity Plot (nested-plot series with standard methdology) from his/her favoured open habitat type in 2021, this would boost GrassPlot in the new year.* If you have such suitable data or know colleagues who have, please contact Idoia Biurrun (idoia.biurrun@ehu.es).

► EDGG sampling methodology: https://www.researchgate.net/publication/308249089

Of course, you are not forced to use exactly the EDGG standard sampling methodology. However, the closer you follow it, the better suited will your data be for the forthcoming paper projects of GrassPlot.

As an inspiration, we include some impressions from the 14th EDGG Field Workshop in Switzerland in autumn 2020, which sampled EDGG Biodiversity Plots in alpine grasslands, screes, heathlands, snowbeds and fens (Fig. 5):

► Detailed report: https://www.researchgate.net/publication/344596399

Fig. 5. Impressions from the 14th EDGG Field Workshop during which high-quality data of alpine grasslands, screes, heathlands and other alpine habitats were sampled for GrassPlot (Photos: J. Dengler).

Join EDGG!

Most of the GrassPlot Consortium members are already EDGG members, but for the few who are not yet, it is worth to continue reading: GrassPlot is a project of the EDGG, the largest Working Group of the International Association for Vegetation Science, dealing with all aspects of natural and semi-natural grasslands across the whole Palaearctic biogeographic realm. If you are not yet a member, you can join for free, just by sending an e-mail to idoia.biurrun@ehu.es. As a member you will receive 4–5 issues of the diamond open access journal Palaearctic Grasslands per year, be invited to EDGG's events, such as the Eurasian Grassland Conferences (EGCs), the EDGG Field Workshops (which generated a big part of the GrassPlot data) and the new online lectures (Talk Grasslands!) of distinguished grassland researchers. For more information, see:

► https://edgg.org