



- GrassPlot Newsletter No. 1 -

21 March 2017

Dear current and potential members of the GrassPlot Consortium,

Just after a very successful first GrassPlot Workshop in Bayreuth, we want to report on the current status of the GrassPlot database and the GrassPlot Consortium and announce forthcoming paper projects and deadlines.

Table of contents:

GrassPlot Workshop in Bayreuth	1
Criteria for inclusion of data in GrassPlot.....	3
GrassPlot Bylaws.....	3
GrassPlot database and its structure	4
GrassPlot content (vers. 43)	5
GrassPlot paper projects	6
GrassPlot webpage.....	8
GrassPlot logo.....	9
Next steps and deadlines.....	9

GrassPlot Workshop in Bayreuth

Thanks to funding from the **BayIntAn program of the Bavarian Research Alliance (BayFor) and co-funding from BayCEER**, an **international workshop on Scale-dependent phytodiversity patterns in Palaearctic grasslands** took place in Bayreuth from **6-10 March 2017**. The main aims were the organisation of the further development of the database, planning of overarching analyses of the data and papers as well as third-party grant proposals based on them. The 13 workshop participants from nine countries combined representatives of the main data contributors with specialists in ecological theory and state-of-the-art statistical analyses of such huge macroecological datasets. During one intensive week, the participants mainly planned about one dozen papers based on the common database (see below), but also coined an **acronym for our database (GrassPlot)** and developed **Bylaws** that balance the rights and interests of data contributors and data users (see below). During the Workshop one of the participants, **Prof. Dr. David Storch** (Charles University of Prague), gave a **public lecture on "Biodiversity scaling: between biology and geometry"**, closely related to some of the main research topics that will be addressed with the GrassPlot data.

Host: Jürgen Dengler (BayCEER, DE)

Participants: Idoia Biurrun (ES), Timo Conradi (DK/DE), Iwona Dembicz (BayCEER, DE/PL), Goffredo Filibeck (IT), Itziar García-Mijangos (ES), Riccardo Guarino (IT), Elisabeth Hüllbusch (BayCEER, DE), Monika Janišová (SK), Alireza Naqinezhad (IR), Santiago Soliveres (CH/ES), Manuel J. Steinbauer (DK/DE), David Storch (CZ), Viktoria Wagner (CZ/AT)

Remote participants: Steffen Boch (CH/DE), Alessandro Chiarucci (IT), Francesco de Bello (CZ), Swantje Löbel (SE/DE), Werner Ulrich (PL)



Fig. 1. Participants of the GrassPlot Workshop I. Left to right: back row: Santiago Soliveres, Viktoria Wagner, Idoia Biurrun, Itziar García-Mijangos, Timo Conradi, Manuel Steinbauer; middle row: Alireza Naqinezhad, Goffredo Filibeck, David Storch, Riccardo Guarino, Jürgen Dengler, Monika Janišová; front: Iwona Dembicz.



Fig. 2 and 3: Some more workshop impressions.

Criteria for inclusion of data in GrassPlot

Our database aims at **complementing existing broad-scale vegetation databases** such as the [European Vegetation Archive \(EVA\)](#) and the [global database "sPlot"](#) with which we closely cooperate. The special focus of GrassPlot is on multi-scale and multi-taxon sampling in precisely delimited plots with extensive environmental data. Thus for example, only a small subset of EVA grassland data, probably less than 5%, is suitable for us, while on the other hand EVA does not contain small plots below 1 m² nor nested-plots and does not provide plot-scale environmental data in an integrated, harmonized format. Where GrassPlot data are also suitable for EVA and/or sPlot, we recommend inclusion in all databases, but overall the overlap is very small.

Obligatory requirements for data contributions to GrassPlot are:

- (a) origin in the Palaearctic biogeographic realm;
- (b) grassland vegetation in the wide sense, i.e. terrestrial and semi-terrestrial vegetation types dominated by hemicryptophytes, therophytes, geophytes, and occasionally bryophytes, lichens and chamaephytes (forests, shrublands, aquatic, ruderal and segetal vegetation are not considered);
- (c) careful sampling of precisely delimited plots with the aim of complete species lists;
- (d) providing details of sampling methodology (in particular, whether rooted or shoot presence was recorded and which plot shape was used); and
- (e) meeting one of the following criteria (or a combination of these): **(i) data for one or several of our eight standard grain sizes** (0.0001; 0.001 or 0.0009; 0.01; 0.1 or 0.09; 1; 10 or 9; 100; 1000 or 900 or 1024 m²) **or (ii) nested-plot series with at least four different grain sizes.**

Additional desired (but not obligatory) criteria are:

- (f) precise GPS coordinates;
- (g) **complete** sampling of one or several macroscopic non-vascular taxa of the terricolous vegetation (bryophytes, lichens, "algae") in addition to vascular plants;
- (h) multi-scale, nested-plot sampling;
- (i) direct cover estimates of species in percent for at least one grain size; and
- (j) extensive environmental variables measured or determined at the plot scale (vegetation structure, topography, soil, land use).

GrassPlot Bylaws

During the GrassPlot workshop the participants developed Bylaws that regulate the data contribution and data use. Following the well-established and successful examples of similar Rules of, among others, those of [EVA](#), [sPlot](#) and the [Nordic-Baltic Grassland Vegetation Database \(NBGVGD\)](#), we developed regulations that aim at balancing the interests of data providers and data users in a fair and transparent manner. To avoid further delays in the progress of the GrassPlot project, we discussed the Bylaws only among the 18 founding members of the **GrassPlot Consortium** (i.e. the actual and remote participants of the

workshop in Bayreuth) who **approved them on 19 March 2017**. The agreed text of the Bylaws is available [here...](#)

Everyone who provides data to GrassPlot by doing so implicitly agrees with the Bylaws. For each provided dataset one or several **data owners** (see details for ownership in Bylaws) become member of the GrassPlot Consortium. The data owners can decide on the **data access regime** of their data, either (1) **restricted**, (2) **semi-restricted** or (3) **free**. While semi-restricted is the most beneficial for both data owners and data users, those owners who are particularly concerned about others using their data, can opt for "restricted access", meaning that any use (apart from papers #1 and #2 below) needs their explicit case-wise agreement (without their written agreement, their data will not be released for any project).

Only **members of the GrassPlot Consortium** can **propose paper projects** using the GrassPlot data. Data owners who contributed data by the deadline 30 April 2017 will automatically become authors of papers #1 and #2 below unless they do not want (**opt-out papers**). Options for opting-in to other papers using their data are regulated in the Bylaws. However, co-authorship of papers #3 et seq. (**opt-in papers**) requires active contribution to the respective paper beyond pure data provision, in agreement with common standards in publication ethics. Additionally, the members of the GrassPlot Consortium every two years **elect the GrassPlot Governing Board** to represent their interests and they are entitled to change the Bylaws with a majority vote.

If you have questions concerning certain regulations in the Bylaws, please ask a member of the GrassPlot Governing Board (see end of letter). Since these Bylaws only put the general principles into words that Idoia Biurrun and Jürgen Dengler communicated previously to those who have already contributed data, **we will assume the silent agreement of the data owners** of a particular dataset if the respective Dataset Custodians does not inform us **until 9 April 2017 that under these Bylaws they wish to withdraw their data**. Those **who respond positively or remain silent will automatically become GrassPlot Consortium members with all rights on 10 April 2017**. Our experience with the European Vegetation Archive showed that the access regime 2 (semi-restricted) is the most beneficial for data providers since offers a good trade-off of data control vs. e-mail overload. Thus, by default, we will assume that your data are in data access regime 2. You can inform Idoia Biurrun at any point of time that the regime should be changed to 1 (restricted)

GrassPlot database and its structure

The GrassPlot database is available to the core team of the GrassPlot project, i.e. the 18 founding members of the GrassPlot Consortium, and in the future it will be made available also to the lead authors of other approved paper projects. Data management is mainly in the hands of the GrassPlot Governing Board and coordinated by Idoia Biurrun. While a range of people thus have access to the data, none of them is entitled to use the data except for paper projects that have been formally proposed and approved according to the Bylaws.

Unlike most supranational (EVA, sPlot) and many national vegetation-plot databases, GrassPlot is not managed in Turboveg, mainly because Turboveg does not have the required functionalities to handle nested plots in an effective manner. Instead GrassPlot essentially consists of one EXCEL file and one CSV file.

The **EXCEL file** contains the metadata, the header data (plot ID, coordinates, environmental data) and the richness data and is stored in fixed versions that allow it going back to previous versions once an analysis has been started with one version. The EXCEL file has four spreadsheets: (1) "Log book & versions" documents what has been changed from version to

version; (2) "Data owners" stores name and contact data of each data owner, identified by a two-letter acronym; (3) "Datasets" contains the metadata per dataset, including the list of its owners, related publications and calculated GrassPlot Score; and (4) "Data", where each (sub-)plot is a separate line with information such as plot size, sampling methodology (shoot vs. rooted presence, shape of the plots,..), richness data, coordinates and the various structural and environmental data.

The **CSV file**, by contrast, will contain the compositional data of all plots of which we have cover or presence-absence data of species in a "long table"-format. This CSV file is currently extracted from the provided individual datasets, which mostly are (sub)plot \times species-tables ("wide format") and will contain species taxonomy already harmonized with a suitable standard, probably mainly a combination of The Plant List (TPL) and the Euro+Med PlantBase. Completing the CSV file with compositional data will need a few more months.

GrassPlot content (vers. 43)

As of 20 March 2017 GrassPlot had the following content (while it is still growing at high pace):

- **78 datasets**
- **101 data owners**
- **25 countries**
- **1418 nested-plot series** with at least four grain sizes
- **24,707 plots** with vascular plant data, 10,887 additionally with bryophyte and lichen data
- Number of plots (vascular plants) per standard grain size:
 - 0.0001 m²: 1,599
 - 0.001 or 0.0009 m²: 2,359
 - 0.01 m²: 3,047
 - 0.1 or 0.09 m²: 1,891
 - 1 m²: 6,722
 - 10 or 9 m²: 4,279
 - 100 m²: 2,623
 - 1000 or 1024 m²: 136



Fig. 4: Overall distribution of GrassPlot data (20 March 2017) in the Palearctic biogeographic realm (Source of base map: GoogleEarth).

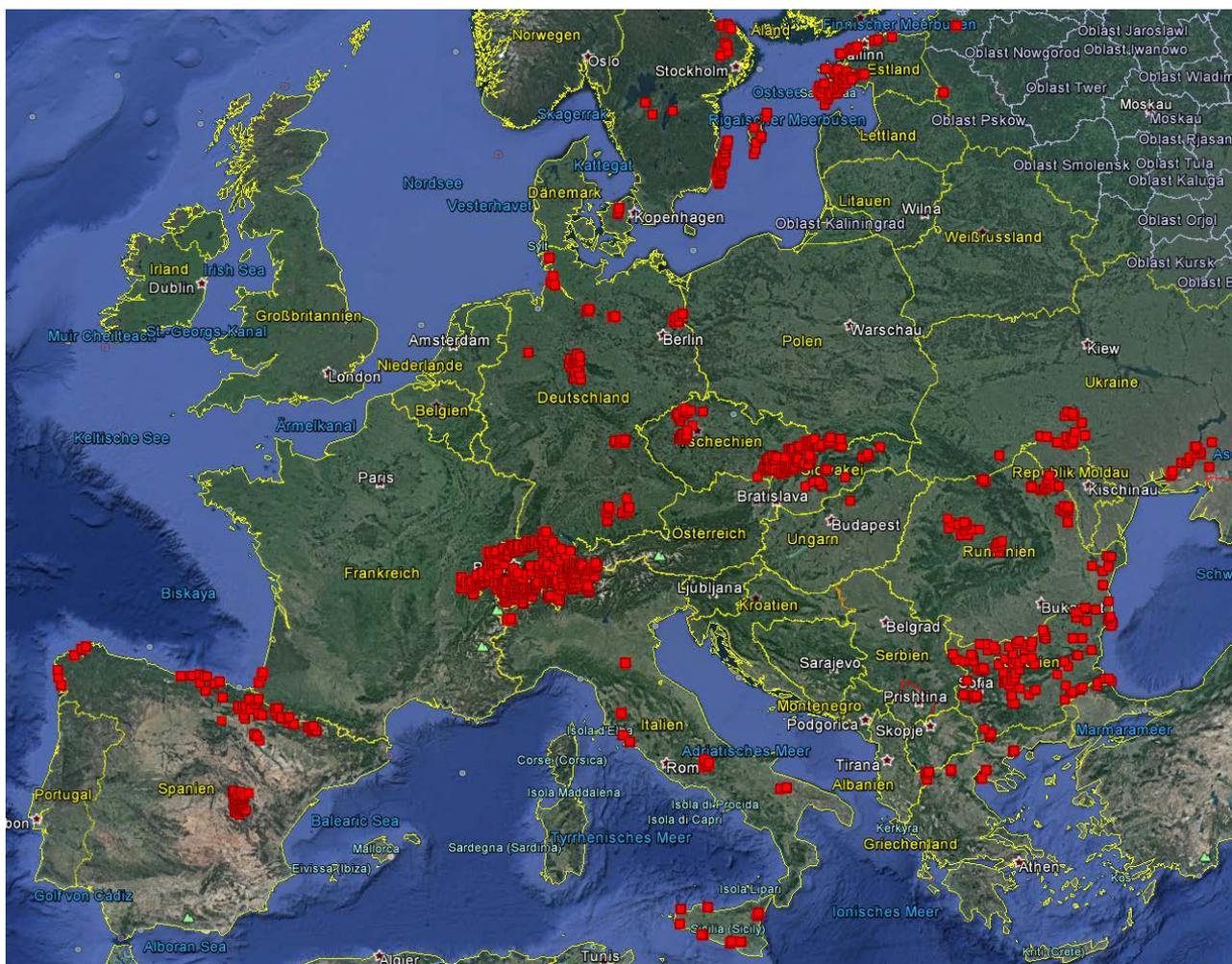


Fig. 5. The highest density of GrassPlot data is currently in hemiboreal – temperate - submediterranean Europe (Source of base map: GoogleEarth).

GrassPlot paper projects

During the workshop, we discussed possible publications and used the opportunity to outline the first series of papers. For some of them, we could already run the analyses with the current preliminary dataset or conduct proof-of-principle analyses with a subset of data. In the following we list the **concretely planned papers with a confirmed lead author (black)** and **papers where we have an idea but no confirmed lead author yet (grey)**. If you are a member of the GrassPlot Consortium and want to become intensively involved in certain papers, please contact the given lead author with your ideas (with cc: to the GrassPlot Custodian Jürgen Dengler). Members of the GrassPlot Consortium can also contact the Governing Board if they wish to take over one of the grey papers or propose a new paper not listed yet. Otherwise we plan to use some of the grey papers as topics for PhD project(s) in a grant proposal. If you are unsure whether the GrassPlot data are suitable for your idea, feel free to consult with anyone of the Governing Board.

Note that all papers except #1 and #2 need environmental data and many also compositional data.

Opt-out papers:

All data owners who contributed data until **30 April 2017** will automatically be listed as co-author unless they do not wish so. They will have the possibility to contribute to these two papers, but no intellectual contribution beyond the provision of the data is required:

#1 (LDR_Jürgen): Long Database Report for *Phytocoenologia* (Lead: Jürgen Dengler)

- describes the history, aims and content of GrassPlot
- to be cited whenever GrassPlot data are used

#2 (Benchmarking_Idoia): Benchmarking plant diversity of Palaeartic grasslands (Lead: Idoia Biurrun)

- provides mean, minimum and maximum richness values for the different grain sizes and taxonomic groups
- Overall stats and subsetting into c. 6 regions and c. 11 grassland types

Opt-in papers:

All Consortium members are informed about the start of the respective paper project (after its approval by the Governing Board) and can declare their interest to become co-author. The lead author has to accept one co-authorship request from each dataset that makes up at least 2% of the data used in the particular paper but is free to accept further requests. Opt-in authors are expected to make significant intellectual contributions to these papers (concept, statistical analyses, interpretation of the results, writing up and/or revising the text).

#3 (Alpha-MuMin_Iwona): Alpha diversity across scales and taxa (Lead: Iwona Dembicz)

- patterns and drivers with multimodel inference (using all plots, including the non-nested ones)
- with interactions; additional predictors compared to paper #5
- nice maps

#4 (SAR_Jürgen): Species-area relationship (SAR) (Lead: Jürgen Dengler)

- Compare fit of different function types (at least: power, quadratic power, two-slope power with smooth transition, logarithm, Michaelis-Menten [as saturation function], possibly Lomolino)
- Dependence of z-values of taxa and main environmental predictors and mean cover per species
- Scale-dependence of z
- relationship of z vs. richness of different grain sizes

#5 (Alpha_SEM_Timo): Alpha diversity of Palaeartic grasslands (Lead: Timo Conradi)

- Multigroup-SEM (structural equation model) to test different drivers but specifically the species pool effect across scales (thus uses only the nested plots)
- Separate taxonomic groups, regions, spatial grains

#6 – Assembly_NN): Community assembly across multiple scales (Lead: Swantje Löbel and/or Francesco de Bello?)

- consider all the different scales (our high-quality nested data over several orders of grain size area are a unique source to test at which scales environmental filtering and competitive exclusion take place!)

#7 (CoEx_Santi): Defining minimum co-existence units (Lead: Santiago Soliveres)

- characterise what makes up a co-existence unit (e.g. how are their traits related)

#8 (Alien_Viktoria): Patterns of non-native species in grasslands (Lead: Viktoria Wagner)

- topics: level of invasion between regions and syntaxa; most-frequent non-native species etc.

#9 (Soil_NN) Edaphic niche shifts (Lead: NN?)

- along climatic gradients & from range centre to range margin
- pH, texture, topography, soil depth, precip., possibly EIVE (as soon as available) for soil moisture
- using e-HOF models

#10 (Beta_NN): Beta diversity (taxonomic/functional/phylogenetic) and distance decay (Lead: NN)

- Necessity to separate environmental vs. spatial distance decay
- Method: general dissimilarity models (uses matrices as predictors)
- Two options: either use dissimilarity directly as dependent variable or slope of distance decay per region

#11 (Dispersal_Manuel): Dispersal strategies vs. alpha/beta/functional/phylogenetic diversities (Lead: Manuel Steinbauer)

- separate beta diversities for dispersal strategies...

#12 (SAR-productivity_NN): SAR slope vs. productivity and/or scale-dependence diversity-productivity relationship (Lead: Alessandro Chiarucci and/or David Storch?)

- how can we measure productivity? (use several different measures) (a) NDVI; (b) soil data; (c) duration of vegetation period; (d) cover * height of vegetation; (e) CWM of Relative growth rate from TRY

#13 (S-FD-PD_NN): How do patterns/drivers of S, FD & PD change with scale (Lead: Santiago Soliveres?)

- correlation between the three dimensions of diversity across scale
- how much are the three measures representative of each other

#14 (Rare_Monika): Functional redundancy/uniqueness vs. ecological age, disturbance regime, rich vs. poor communities (Lead: Monika Janišová)

- how is the functional saturation in grassland plant communities affected by climate stability, age of species pools and disturbances?
- what is the contribution of rare species to functional redundancy/uniqueness? Does species richness affect the outcomes?
- which factors affect the slope of the "uniqueness-abundance" relationship and how the results change for different functional spaces (reproduction, resource acquisition, resilience)?

#15 (SADs_Werner): Species-"abundance" distributions (Lead: Werner Ulrich)

- determine for each plot the best-fitting SAD and then check how the shapes are distributed along ecological/geographic gradients (acknowledging that we use % cover, not true abundance)
- probably only plots with direct cover estimates in % should be used, not those applying ordinal cover-abundance scales

GrassPlot webpage

We have established a GrassPlot webpage with several subpages in the framework of the **Ecoinformatics Portal Bayreuth**. Please visit: http://www.bayceer.uni-bayreuth.de/ecoinformatics/en/grassplot/gru/html.php?id_obj=139267.

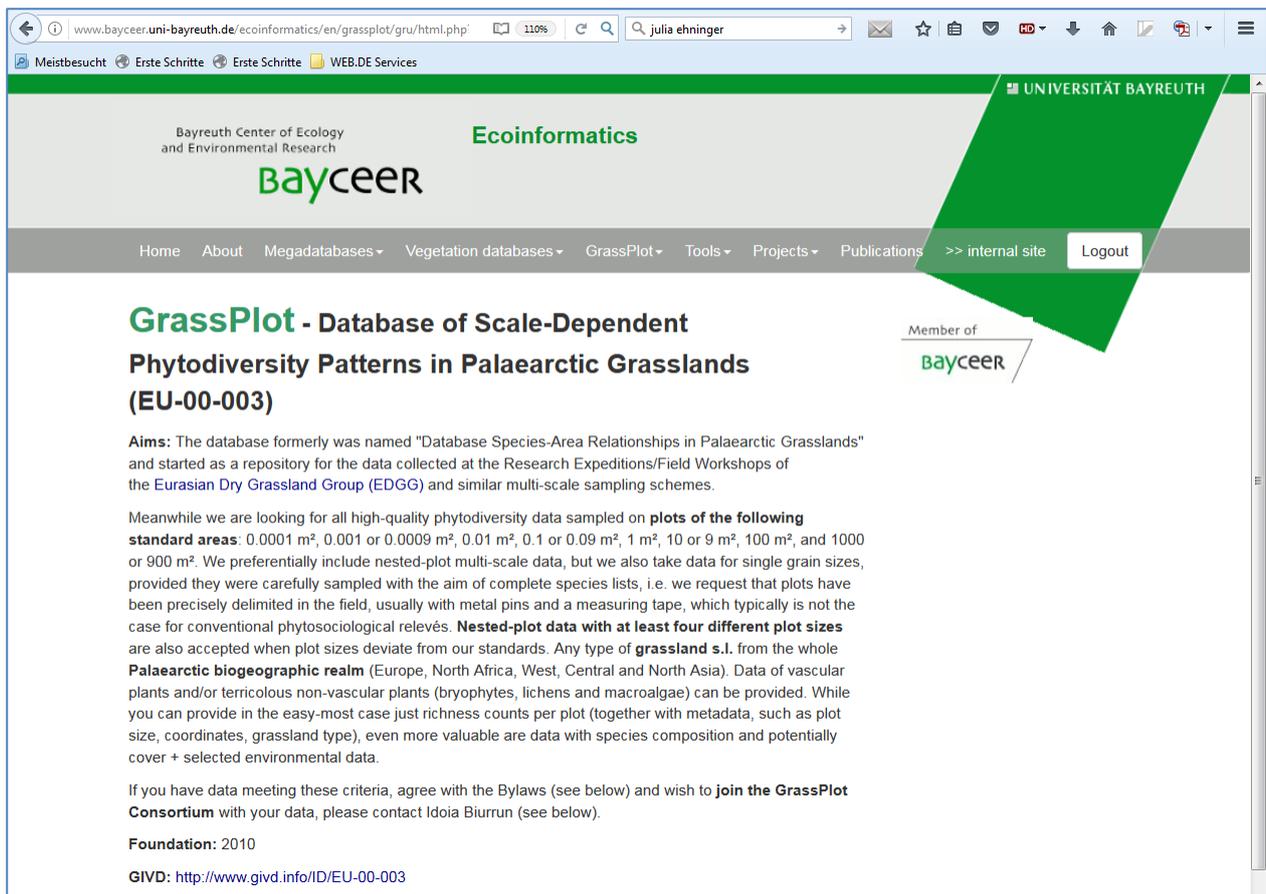


Fig. 6. Screenshot of the GrassPlot webpage.

GrassPlot logo

GrassPlot would like to have a logo with high recognition value, similar to the EVA and sPlot databases. If you are creative and have artistic skills, you are invited to send your idea to the Governing Board. Unfortunately, we cannot pay any honorarium.

Next steps and deadlines

To achieve all the plans above, we aim to proceed with the impetus gained during the workshop. Important deadlines for you are:

- **Until 9 April:** inform us if you wish to withdraw already contributed data because of disagreement with the Bylaws.
- **10 April 2017:** all data owners of contributed data become GrassPlot Consortium members
- **19–21 April 2017:** first poster presentation of GrassPlot on [Macroecology conference in Vienna](#)
- **30 April 2017:**
 - deadline to contribute datasets (richness data and metadata) to be included in papers #1 and #2
 - deadline to contribute missing environmental and/or compositional data to already provided datasets if you want to be part of the first series of opt-in papers that use such data.

- **From 1 May 2017 onwards:**
 - paper production starts
 - in parallel: contribution and integration of new datasets continues
- **20–24 June 2017:** presentation(s) of GrassPlot and first results on [IAVS Symposium in Palermo](#)
- **5–8 July 2017:** presentation of GrassPlot and first results on the [Eurasian Grassland Conference \(EGC\) in Riga](#)
- **13–16 September 2017:** presentation(s) of GrassPlot analyses on the [conference of the European Vegetation Survey \(EVS\) in Bilbao](#)

Last but not least, we encourage you to invite colleagues with suitable data, particular from so far uncovered regions, to join the GrassPlot Consortium.

We look forward to your feedback and data contributions, with our best regards,

Jürgen Dengler (Governing Board and Custodian: juergen.dengler@uni-bayreuth.de)

Idoia Biurrun (Governing Board and Deputy Custodian: idoia.biurrun@ehu.es)

Timo Conradi (Governing Board: timo.conradi@bios.au.dk)

Iwona Dembicz (Governing Board: iwodem@op.pl)

Riccardo Guarino (Governing Board: guarinotro@hotmail.com)

Alireza Naqinezhad (Governing Board: anaqinezhad@gmail.com)

Viktoria Wagner (Governing Board: wagner@sci.muni.cz)