Minutes of the IV sPlot workshop

Date: 31.03.2025 – 02.04.
Venue: Botanical Garden, Halle, Germany
By Gabriella Damasceno


The workshop offered possibilities to discuss sPlot projects not only during talks and break-out groups, but also during friendly discussions over lunch time.

Background

sPlot started in 2013 as a project from the synthesis center (sDiv) of the German Centre for Integrative Biodiversity Research Halle-Jena-Leipzig (iDiv). As an sDiv project, sPlot was granted three meetings, the so called sPlot workshops. The I sPlot workshop happened in 2013 and reunited researchers interested in building a global database for vegetation plots. In 2014, the II workshop happened to explore how such a database could be used to tackle distinct aspects of plant biodiversity. Finally, the III sPlot workshop happened in 2016 to further develop not only the database through the compilation of its second version (sPlot 2.1), but also to advance the projects making use of it. Since 2016, the sPlot project grew into a consortium with more than 300 data contributors, which supplies vegetation data for the development of 59 research projects. Nevertheless, only now in 2025 we could organize the sPlot workshop to bring vegetation scientists, statistical modelers and experts in remote sensing together to advance sPlot even further.

Participants

In total, we were 50 participants based in 16 different countries (Figure 1). While most of the participants were from Germany and Europe (40), we counted with participants from South (4) and

North America (3), as well as from Africa (1) and Asia (1). A full list of participants can be found at the end of this document.

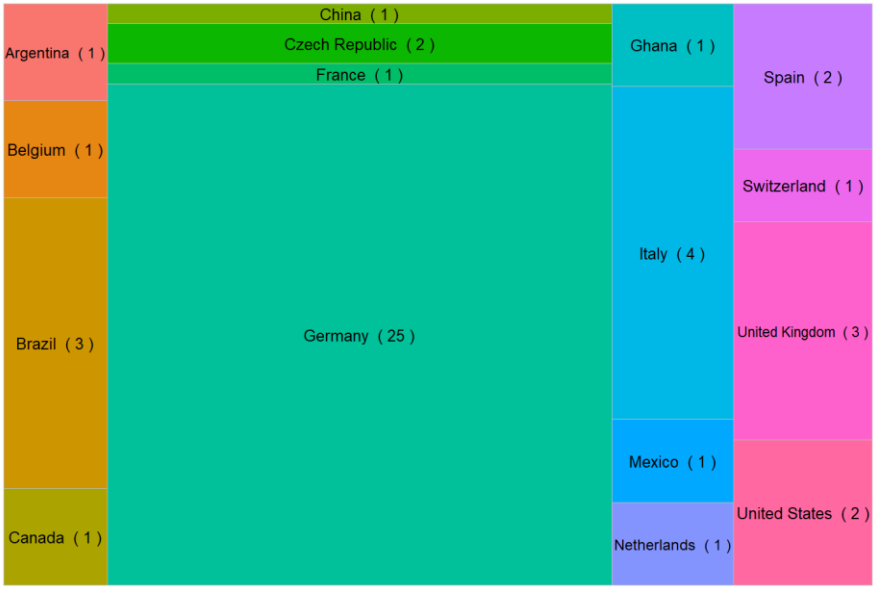

Figure 1. Tree map graph showing the number of participants per country.

Talks

In the first day of the workshop (Monday, 31.03) there were 17 talks reporting on the progress of 22 sPlot projects. Of those, 17 are ongoing projects and five are projects already concluded. There were also talks about the history and development of sPlot, as well as about initiatives for the digitization of data and for vegetation classification. The workshop agenda and the list of sPlot projects are included in the Appendices at the end of this document.

Discussions and next steps

Following up the presentations held on Monday, we discussed new ideas for sPlot projects on Tuesday. For this, we first gathered in a plenary to collect ideas, which were then distributed into three working groups on 1) how to use co-occurrence data in sPlot to predict plant communities in areas where there is few or no data available; 2) how to use sPlot data to derive information about plant phenology; 3) how to use sPlot data for investigating biodiversity trends across time, either with and without time-series data. Robert Rauschkolb volunteered to be the person leading point

2; and Teja Kattenborn and Sophie Wolf are happy to keep pushing ideas discussed in point 3. There was no leading person attributed to point 1.

In the afternoon we again gathered in a plenary session, where the working groups reported back the discussions and new ideas were collected. We then split into two new working groups to discuss how sPlot can be used to 1) validate and extrapolate results of local experiments on a global scale; and 2) tackle new challenges related to invasive species. We then reunited to share the main points discussed in the working groups, as well as to briefly discuss two other potential ideas to be developed with sPlot: 1) socio-ecological aspects of biodiversity; and 2) multi-trophic interactions, such as, for example, between plant communities and fungi and animals. Unfortunately, there were no people taking the lead in any of these potential projects.

On Wednesday, the agenda was shared with the MOTIVATE project. The morning started with talks about the project and its development, followed by the collection of ideas to be discussed in an integrated way among sPlot and MOTIVATE members. Three working groups emerged to discuss how 1) we can obtain new data for vegetation databases like EVA and sPlot; 2) collective projects as MOTIVATE can optimize the storage and use of ancillary data used for modelling; 3) we can use sPlot data to address socioeconomic topics, like the ways humans use plants. After the discussions in the break-out groups, we gathered again to report on the main findings, as well as to discuss how to advance the ideas proposed, although no one stood up for the leadership in these potential projects.

APPENDICES

Agenda

08:30 - 17:00	**Monday | 31.03.2025**	
08:30 - 10:00	**Welcoming (Lecture Hall)**	
08:30 - 09:00	Arrival and welcoming notes	Helge Bruelheide
09:00 - 09:45	Overview of sPlot: data and projects	Gabriella Damasceno
09:45 - 10:00	Vegetation of Southern Patagonia in the 1970s – Digitization of a gray-literature data set as a monitoring baseline in a changing world	Karina Speziale
10:00 - 10:30	**Coffee break**	
10:30 - 12:00	**Classification & mapping: vegetation and biomes (Lecture Hall)**	
10:30 - 10:45	Climatic definitions of the world's terrestrial biomes	Denys Vynokurov
10:45 - 11:00	Formation classification in sPlot: from species life forms to modelling	Helge Bruelheide
11:00 - 11:15	Using language models for vegetation classification	César Leblanc
11:15 - 11:30	Functional convergence of terrestrial ecosystem withing world biomes (***sPlot Project #14***)	Borja Jiménez-Alfaro
11:30 - 11:45	Identifying ground-water dependent vegetation in the mediterranean biome (**sPlot *Project #42***)	Léonard El-Hoyakem
11:45 - 12:00	Mapping traits from vegetation relevés, citizen science and remote sensing (***sPlot Project #53***)	Daniel Lusk
12:00 - 13:00	**Lunch break**	
13:00 - 14:45	**Biodiversity: causes & consequences (Lecture Hall)**	
13:00 - 13:15	Global patterns of vascular plant taxonomic and phylogenetic diversity (***sPlot Project #11 and #46***)	Francesco Sabatini
13:15 - 13:30	Strong correlation of soil phosphorus contents and plant-community leaf phosphorus contents at the global scale (***sPlot Project #47***)	Georg Hähn
13:30 - 13:45	Global patterns of taxonomical and functional diversity above the treeline (**sPlot Project #18A and #18B**)	Riccardo Testolin
13:45 - 14:00	Effects of diversity on ecosystem stability during climatic anomalies (***sPlot Project #08A***)	Valério Pillar
14:00 - 14:15	Effects of diversity on ecosystem stability during climatic anomalies (***sPlot Project #08B***)	Daniela Hoss
14:15 - 14:30	Diversity of the desert vegetation of Saharo-Arabian region (***sPlot Project #36***)	Mohamed Zakaria Hatim
14:30 - 14:45	Analysing the vegetation of Siberia for determining the ethnobotanical significance of regional flora (***#51***)	Gayana Bexultanova
14:45 - 15:15	**Coffee break**	
15:15 - 17:00	**Biodiversity: causes, consequences and threats (Lecture Hall)**	
15:15 - 15:30	Global plant invasions: the role of native diversity, human disturbance, and mutualisms (***sPlot Project #49***)	Camille Delavaux
15:40 - 15:45	Dependence of warming responses of global plant species on their local abundances ***(sPlot Project #56)***	Yanhao Feng
15:45 - 16:00	Tree diversity and plant functional types in the temperate biome (***sPlot Project #12B and #14***)	Victor González
16:00 - 16:15	Do dominant and non-dominant species follow the same assembly rules? (***sPlot Project #29***)	Carlos Arnillas
16:15 - 16:30	Impacts of land use change on plant species composition across ecoregions (***sPlot Project #44***)	Francesco Sabatini
16:30 - 16:45	The role of microclimate in the relationship between overstory and understory vegetation in forest communities **(*sPlot Project #59*** **)**	Georg Hähn
16:45 - 17:00	Belowground functional trait distributions along global environmental gradients (***sPlot Projects #25, #31, #50***)	Daniel Laughlin
19:00 - 21:00	**Social dinner**	
08:30 - 16:30	**Tuesday | 01.04.2025**	
08:30 - 16:30	**Developing new sPlot projects**	
08:30 - 09:00	Presentation of ideas to be developed (Lecture Hall)	Gabriella Damasceno
09:00 - 10:00	Break-out sessions: organizing the working group (Seminar Room and Conference Room)	
10:00 - 10:30	**Coffee break**	
10:30 - 12:00	Break-out sessions: starting the work (Seminar Room and Conference Room)	
12:00 - 13:00	**Lunch break**	
13:00 - 15:00	Break-out sessions: delineating the manuscript (Seminar Room and Conference Room)	
15:00 - 15:30	**Coffee break**	
15:30 - 16:30	Share outcomes of break-out sessions (Lecture Hall)	
17:00 - 18:00	**Guided City Tour**	
08:30 - 17:00	**Wednesday | 02.04.2025**	
08:30 - 09:30	**How to keep coolaboration going? (Seminar Room)**	
09:30 - 10:30	**Presentation of MOTIVATE project (Lecture Hall)**	
09:30 - 09:45	Welcoming notes	Helge Bruelheide
09:45 - 10:30	Presentation of the MOTIVATE project	Stephan Kambach
10:30 - 11:00	**Coffee break**	
11:00 - 13:00	Presentation of MOTIVATE projects	
13:00 - 14:00	**Lunch break**	
14:00 - 15:30	**Cooperations and time series analysis between sPlot and MOTIVATE (Lecture Hall)**	
15:30 - 16:00	**Coffee break**	
16:00 - 17:00	**Wrapping-up and concluding notes (Seminar Room)**	
17:00 - 20:00	**Barbecue at the Botanical Garden**	

List of participants

Participant	Institution	City	Country
Alessandra Fidelis	São Paulo State University	Rio Claro	Brazil
Alireza Naqinezhad	University of Derby	Sheffield	United Kingdom
Borja Jiménez-Alfaro	University of Oviedo	Mieres	Spain
Camille Delavaux	ETH Zurich	Zurich	Switzerland
Carlos Alberto Arnillas	University of Toronto	Toronto	Canada
Carolin Plos	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
César Leblanc	University of Montpellier	Montpellier	France
Daniel Doktor	Helmholtz Centre for Environmental Research	Leipzig	Germany
Daniel Laughlin	University of Wyoming	Laramie	United States
Daniel Lusk	University of Freiburg	Freiburg	Germany
Daniela Hoss	Martin-Luther University Halle-Wittenberg	Leipzig	Germany
Daria Svidzinksa	Leipzig University	Leipzig	Germany
Denys Vynokurov	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Erik Welk	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Florian Jansen	University of Rostock	Rostock	Germany
Francesco Maria Sabatini	Alma Mater Studiorum University of Bologna	Bologna	Italy
Gabriella Damasceno	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Gayana Bexultanova	University of Glasgow	Glasgow	United Kingdom
Georg Hähn	Alma Mater Studiorum University of Bologna	Bologna	Italy
Glenda Mendieta-Leiva	Marburg University	Marburg	Germany
Helge Bruelheide	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Henrique Pereira	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Jacob Willie	Royal Zoological Society of Antwerp	Ghent	Belgium

Jacopo Iaria	University of Bologna	Bologna	Italy
Joice Klipel	Leuphana Universiy Lüneburg	Lüneburg	Germany
Karin Mora	Leipzig University	Leipzig	Germany
Karina Speziale	INIBOMA (CONICET-UNCOMA)	Bariloche	Argentina
Klára Klinkovská	Masaryk University	Brno	Czech Republic
Léonard El-Hoyakem	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Lirong Cai	Leipzig University	Leipzig	Germany
Markus Bernhardt-Römmermann	Jena University	Jena	Germany
Marten Winter	German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig	Leipzig	Germany
Milan Chytrý	Masaryk University	Brno	Czech Republic
Mohamed Zakaria Hatim	Wageningen University	Wageningen	Netherlands
Reginald Tang Guuroh	Forestry Research Institute of Ghana	Kumasi	Ghana
Reinhard Klenke	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Ricard Arasa Gisbert	National Autonomous University of Mexico	Mexico City	Mexico
Riccardo Testolin	University of Bologna	Bologna	Italy
Richard Field	University of Nottingham	Nottingham	United Kingdom
Robert Peet	University of North Carolina	Chapel Hill	United States
Robert Rauschkolb	Jena University	Jena	Germany
Sandra Cristina Müller	Rio Grande do Sul Federal University	Porto Alegre	Brazil
Sophie Wolf	Leipzig University	Leipzig	Germany
Stephan Kambach	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Teja Kattenborn	University of Freiburg	Freiburg	Germany
Tim Meier	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Ute Jandt	Martin-Luther University Halle-Wittenberg	Halle (Saale)	Germany
Valério de Patta Pillar	Rio Grande do Sul Federal University	Porto Alegre	Brazil
Victor González	University of Oviedo	Mieres	Spain
Yanhao Feng	Lanzhou University	Lanzhou	China

List of sPlot projects

Project	Title	Status	Leader	Coleader	DOI
(#01)	sPlot - a global databse of fine-grain plant community data	finished	Helge Bruelheide		https://doi.org/10.1111/jvs.12710
(#02)	A resampling strategy to analyze community assembly rules in a big data world	finished	Jonathan Lenoir		https://doi.org/10.1111/geb.13346
(#03)	Global trait-environment relationships revealed by sPlot	finished	Helge Bruelheide		https://doi:10.1038/s41559-018-0699-8
(#04)	The role of climate stability for trait variability across scales and biomes	discontinued	Oliver Purschke		
(#05)	Can Earth observation data be used to measure changes in taxonomic and functional diversity?	discontinued	Brody Sandel		
(#06)	Global patterns of phylogenetic similarity and abundance of plants in their native and exotic ranges	finished	Tiffany Knight		https://doi:10.1111/geb.13027
(#07)	Scaling taxonomical, functional and phylogenetic community diversity	discontinued	Oliver Purschke		
(#08A)	A global assessment of functional diversity and redundancy effects on ecosystem stability during climatic anomalies	finished	Valério Pillar	Thore Engel	https://doi:10.1111/geb.13644
(#08B)	A global assessment of functional diversity and redundancy effects on ecosystem stability during climatic anomalies	ongoing	Valério Pillar	Daniela Hoss	
(#09)	Downscaling of species distribution models: towards fine-grain presence-absence for grasses	discontinued	Brody Sandel		

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Project	Title	Status	Leader	Coleader	DOI
(#10)	A global model of local fern diversity	finished	Michael Kessler		https://doi.org/10.1111/jbi.13782
(#11)	Global patterns of vascular plant alpha diversity	finished	Francesco Sabatini	Helge Bruelheide	https://doi.org/10.1038/s41467-022-32063-z
(#12B)	Temperate deciduous forests of the northern hemisphere	ongoing	Javier Loidi	Eduardo Fernández-Pascual	
(#12B)	Temperate deciduous forests of the northern hemisphere	ongoing	Victor González	Borja Jiménez-Alfaro	
(#13)	Global patterns of aquatic macrophyte diversity - environment relationships with focus on native versus invasive species	discontinued	Franziska Schrodt		
(#14)	Functional convergence of terrestrial ecosystem withing world biomes	ongoing	Borja Jiménez-Alfaro		
(#15)	Cross-scale transferability of species niche breadth estimates	discontinued	Stephan Kambach		
(#16)	Projecting tree diversity and distributions in a changing world	discontinued	Jose Serra-Diaz		
(#17)	Spatial patterns of plant assemblages in mountains. A global analysis	discontinued	Gwendolyn Peyre		
(#18A)	Global patterns of taxonomical and functional diversity above the treeline	finished	Riccardo Testolin		https://doi.org/10.1111/geb.13297
(#18B)	Global patterns of taxonomical and functional diversity above the treeline	finished	Riccardo Testolin		https://doi.org/10.1111/jvs.13000
(#19)	Toward a mechanistic description of land uses for ecological studies: Building a Vegetation <> Land-use converter for Europe	discontinued	Anne Mimet		

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Project	Title	Status	Leader	Coleader	DOI
(#20)	Trait-dependent extinctions across flowering plants in biodiversity hotspots	discontinued	Renske Onstein		
(#21)	Reaching for the sky: Unravelling global patterns and processes to explain convergent evolution of woodiness in angiosperms	discontinued	Alexander Zizka		
(#22)	A macroecological survey of intraspecific plant trait variation	discontinued	Gabriel Walther	Susanne Tautenhahn	
(#23)	Global patterns of plant beta diversity in tree assemblages	discontinued	Zhiyao Tang		
(#24)	Worldwide niche breadth estimates of beech (Fagus) species	finished	Zhiyao Tang		https://doi.org/10.1111/jbi.14074
(#25)	Global variation in fine root traits along climate and soil gradients	finished	Daniel Laughlin		https://doi.org/10.1038/s41559-021-01471-7
(#26)	Global patterns of leaf carbon, nitrogen and phosphorus stoichiometry in plan communities	discontinued	Zhiyao Tang		
(#27)	Relationship between herbaceous plant species large-scale distribution, small-scale dominance and plant functional traits	finished	Maria Sporbert		https://doi.org/10.1111/jvs.13016
(#28)	Functional composition of a species' native vs invaded range: A global analysis using plant functional traits	ongoing	Hamada Ali		
(#29)	Do dominant and non-dominant species follow the same assembly rules?	ongoing	Carlos Alberto Arnillas		
(#30)	Estimating dark diversity by using species co-occurrences: refining methods for large vegetation plot databases	ongoing	Meelis Pärtel		

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Project	Title	Status	Leader	Coleader	DOI
(#31)	The adaptive value of xylem physiology within and across global ecoregions	finished	Daniel Laughlin	Andrew Siefert	https://doi.org/10.1111/nph.19276
(#32)	A quest for biodiversity shortfalls: global-scale species abundance estimation of woody plants	discontinued	Keiiche Fukaya	Yasuhiro Kubota	
(#33)	Large-scale mappping of plant diversity patterns from satellite-borne hyperspectral imaging	ongoing	Pedro Leitão	Mike Harfoot	
(#34)	Life cycle assessment methodology for assessing land use impacts on functional plant diversity	finished	Francesca Rosa		https://doi.org/10.1111/geb.13947
(#35)	Does temporal climatic variability correlate with the environmental tolerance of plant communities?	ongoing	Aldo Compagnoni		
(#36)	Diversity of the desert vegetation of Saharo-Arabian region	ongoing	Mohamed Hatim		
(#37)	Toward a Comprehensive Understanding of Global Nitrogen-fixer Abundance Patterns and their Ecological Drivers	discontinued	Benton Taylor		
(#38)	Testing the Biotic Resistance Hypothesis in the Tropics from a functional perspective	ongoing	Matthias Grenié		
(#39)	How can trait-based ecology improve paleoclimate and paleoenvironment reconstructions?	discontinued	Eric Garnier		
(#40)	Species diversity of beech (Fagus) forests worldwide	discontinued	Qiong Cai		
(#41)	Multifaceted tree diversity and evolution across elevations worldwide	ongoing	Maria Laura Tolmos		
(#42)	Identifying threatened groundwater dependent ecosystems as local	ongoing	Léonard El-Hokayem		

Project	Title	Status	Leader	Coleader	DOI
	biodiversity hotspots globally via remote sensing				
(#43)	Coniferous forests of the Earth: looking for common patterns	discontinued	Dario Ciaramella		
(#44)	Impacts of land use change on plant species composition across ecoregions	ongoing	Francesco Sabatini		
(#45)	A leaf trait-based classification to better trace the paleoecological context of fossil assemblages	discontinued	Agathe Toumoulin		
(#46)	Comparison of the global distribution of functional and phylogenetic diversity in plant communities	finished	Georg Hähn	Helge Bruelheide	https://doi.org/10.1038/s41559-024-02589-0
(#47)	Strong correlation of soil phosphorus contents and plant-community leaf phosphorus contents at the global scale	ongoing	Georg Hähn	Helge Bruelheide	
(#48)	Inclusion of biodiversity-related data in Ecosystem Service models increases model performance	ongoing	Matt Scowen		
(#49)	Global plant invasions: the role of native diversity, human disturbance, and mutualisms	ongoing	Camille Delavaux		
(#50)	Belowground functional trait distributions along global environmental gradients	ongoing	Daniel Laughlin	Helge Bruelheide	
(#51)	Analysing the vegetation of Siberia for determining the ethnobotanical significance of regional flora	ongoing	Gayana Bexultanova		
(#52)	Linkages between plant functional traits and phenology across temperate zones	ongoing	Nan Zhang		

Project	Title	Status	Leader	Coleader	DOI
(#53)	Mapping global trait distributions by combining citizen science data and Earth observation satellites	ongoing	Teja Kattenborn		
(#54)	Latitudinal gradient patterns of Darwin's naturalization conundrum across spatial scales	ongoing	Shuya Fan	Mark van Kleunen	
(#55)	Leveraging plant and spectral traits for distinguishing tropical ecosystem types	ongoing	Leon Nill		
(#56)	Dependence of warming responses of global plant species on their local abundances	ongoing	Yanhao Feng	Helge Bruelheide	
(#57)	Distribution and plant traits of native and invasive species in fire ecosystems across the world	ongoing	Marta Carboni	Francesco Sabatini	
(#58)	Global overview of non-native plant invasions in temperate grasslands (TempGrassInvade)	ongoing	Viktoria Wagner	Helge Bruelheide	
(#59)	The role of microclimate in the relationship between overstory and understory vegetation in global forest communities	ongoing	Georg Hähn	Helge Bruelheide	