sPlot

66th ANNUAL SYMPOSIUM IAVS
From local to global: vegetation patterns across spatial scales in a changing World

sPlot 3rd ordinary meeting: News, updates and ideas

Gabriella Damasceno, in name of the sPlot Consortium

iDiv

MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG

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One year ago in Australia…

sPlot meeting in Coff’s Harbor

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- Quantify the influence of traditional communities and/or indigenous people on plant biodiversity conservation;
- Explore global patterns of stability and resilience, using time-series data and long-term monitoring microclimate data;
- Identify globally threatened vegetations, similarly to EUNIS Red List;

Ideas we discussed:

- Analyze plant functional diversity by vegetation formations, evidencing climatic envelopes for distinct vegetations, similarly to Whitaker's biomes graph.

Use plant co-occurrences to identify vegetation types

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- Led by Helge, with help from Georg Röhrborn
- Faber-Langendoen (2016) vegetation types
- Training model: classified plots in sPlot 4.0 (1.9 million plots)

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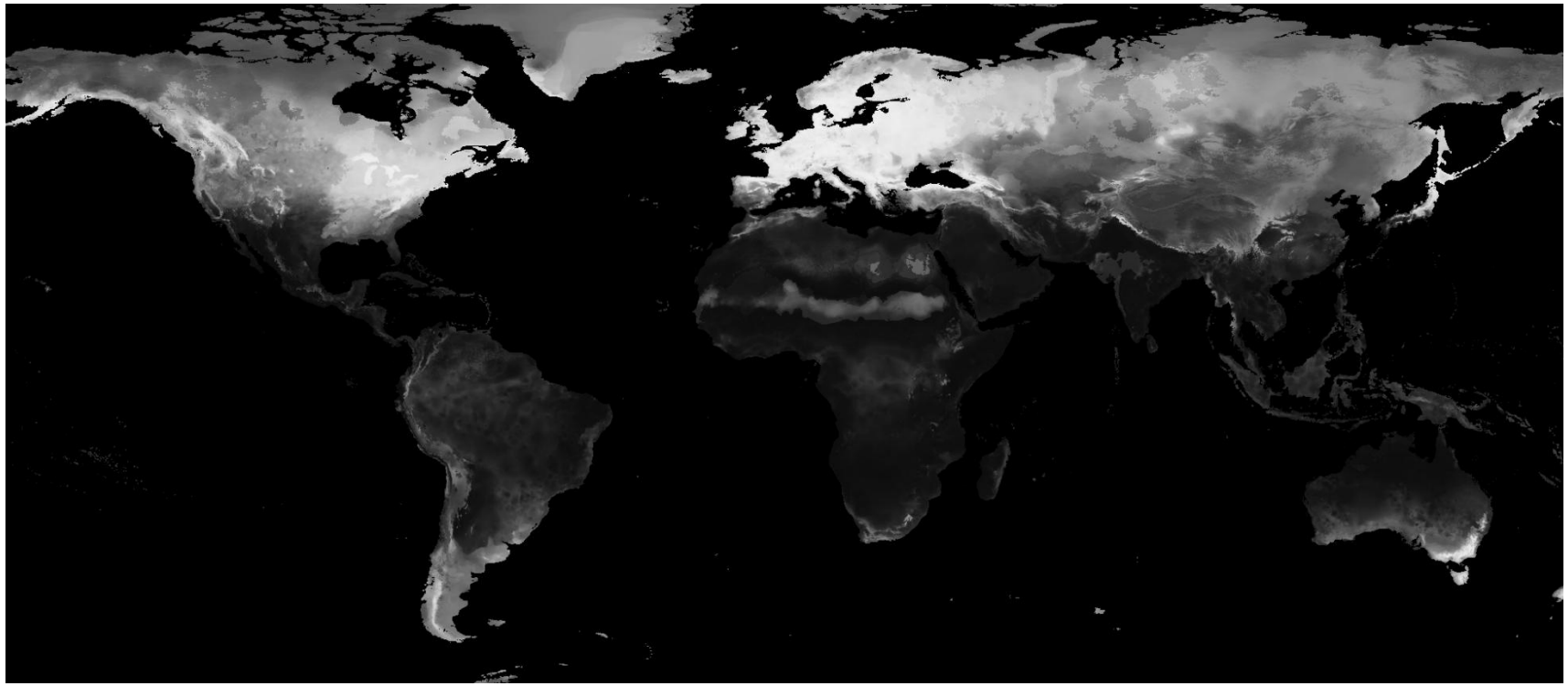

Probability occurrence map for formation 1.B.2: Cool Temperate Forest and Woodland

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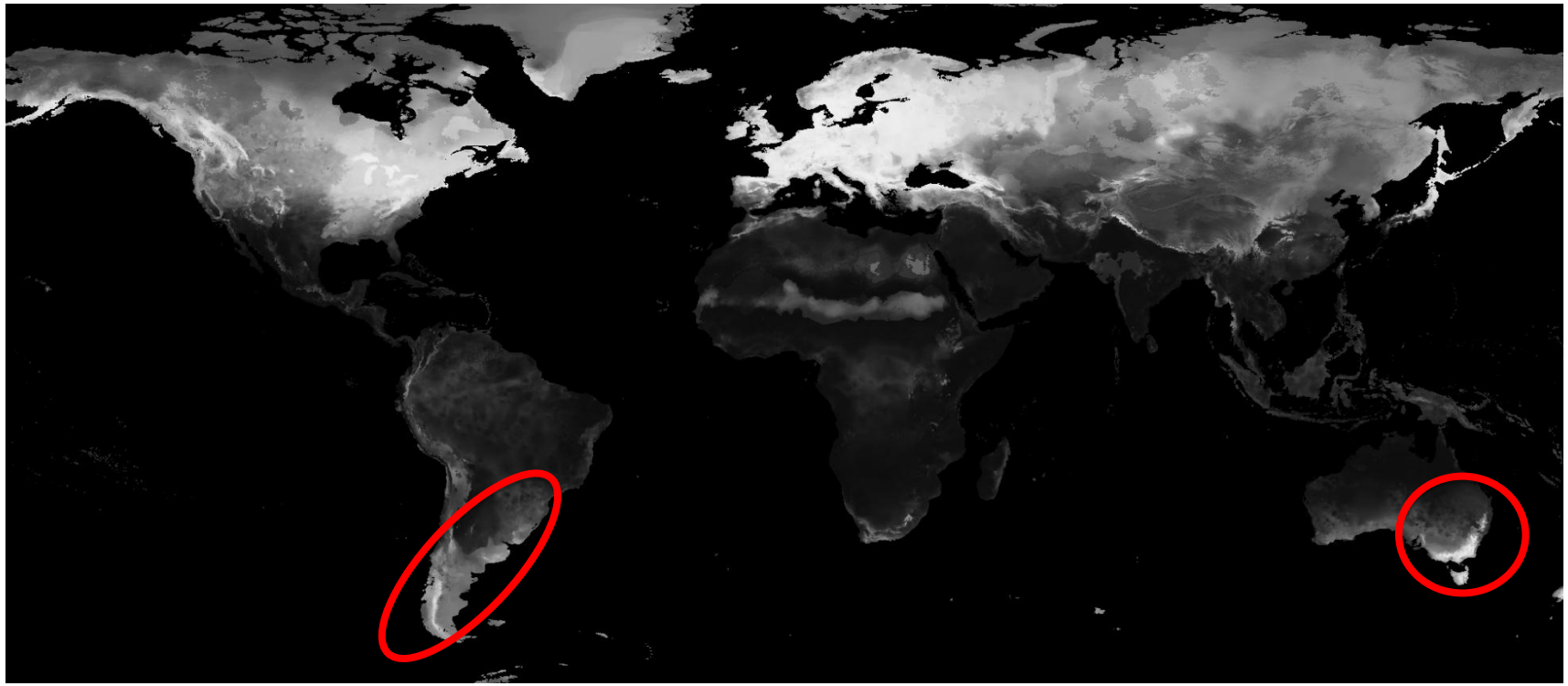

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New projects

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- **#52**: Linkages between plant functional traits and phenology across temperate zones. Nan Zhang (Chinese Academy of Sciences)

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- **#53**: Mapping global trait distributions by combining citizen science data and Earth observation satellites. Teja Kattenborn (University of Freiburg)

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- **#55**: Leveraging plant and spectral traits for distinguishing tropical ecosystem types. Leon Nill (Humboldt-Universität zu Berlin)

Finished projects

Finished projects

#31: The adaptive value of xylem physiology within and across global ecoregions

Research

New Phytologist

Rooting depth and xylem vulnerability are independent woody plant traits jointly selected by aridity, seasonality, and water table depth

Daniel C. Laughlin[1], Andrew Siefert[1], Jesse R. Fleri[1], Shersingh Joseph Tumber-Dávila[2], William M. Hammond[3], Francesco Maria Sabatini[4,5], Gabriella Damasceno[6,7], Isabelle Aubin[8], Richard Field[9], Mohamed Z. Hatim[10,11], Steven Jansen[12], Jonathan Lenoir[13], Frederic Lens[14,15], James K. McCarthy[16], Ülo Niinemets[17], Oliver L. Phillips[18], Fabio Attorre[19], Yves Bergeron[20], Hans Henrik Bruun[21], Chaeho Byun[22], Renata Ćušterevska[23], Jürgen Dengler[24,25], Michele De Sanctis[19], Jiri Dolezal[26,27], Borja Jiménez-Alfaro[28], Bruno Hérault[29,30], Jürgen Homeier[31,32], Jens Kattge[6,33], Patrick Meir[34,35], Maurizio Mencuccini[36,37], Jalil Noroozi[38], Arkadiusz Nowak[39,40], Josep Peñuelas[36,41], Marco Schmidt[42], Željko Škvorc[43], Fahmida Sultana[44], Rosina Magaña Ugarte[45] and Helge Bruelheide[6,7]

Finished projects

#46: Comparison of the global distribution of functional and phylogenetic diversity in plant communities

1 **Global decoupling of functional and phylogenetic diversity in plant**
2 **communities**

3 Georg J. A. Hähn[1,2,3,*], Gabriella Damasceno[2,1], Esteban Alvarez-Davila[4], Isabelle Aubin[5],
4 Marijn Bauters[6], Erwin Bergmeier[7], Idoia Biurrun[8], Anne D. Bjorkman[9,10], Gianmaria Bonari[11],
5 Zoltán Botta-Dukát[12], Juan A. Campos[8], Andraž Čarni[13,14], Milan Chytrý[15], Renata
6 Ćušterevska[16], André Luís de Gasper[17], Michele De Sanctis[18], Jürgen Dengler[19], Jiri Dolezal[20],
7 Mohamed A. El-Sheikh[21], Manfred Finckh[22], Antonio Galán-de-Mera[23], Emmanuel
8 Garbolino[24], Hamid Gholizadeh[11], Valentin Golub[25], Sylvia Haider[26], Mohamed Z. Hatim[27],
9 Bruno Hérault[28,29], Jürgen Homeier[30], Ute Jandt[1,2], Florian Jansen[31], Anke Jentsch[32], Jens
10 Kattge[33,2], Michael Kessler[34], Larisa Khanina[35], Holger Kreft[36], Filip Küzmič[37], Jonathan
11 Lenoir[38], Jesper Erenskjold Moeslund[39], Ladislav Mucina[40,41], Alireza Naqinezhad[42], Jalil
12 Noroozi[43], Aaron Pérez-Haase[44], Oliver L. Phillips[45], Valério D. Pillar[46], Gonzalo Rivas-Torres[47],
13 Eszter Ruprecht[48], Brody Sandel[49], Marco Schmidt[50], Ute Schmiedel[51], Stefan Schnitzer[52],
14 Franziska Schrodt[53], Urban Šilc[54], Ben Sparrow[55], Maria Sporbert[1], Zvjezdana Stančić[56], Ben
15 Strohbach[57], Jens-Christian Svenning[58], Cindy Q. Tang[59], Zhiyao Tang[60], Alexander Christian
16 Vibrans[61], Cyrille Violle[62], Donald Waller[63], Desalegn Wana[64], Hua-Feng Wang[65], Timothy
17 Whitfeld[66], Georg Zizka[67], Francesco Maria Sabatini[3,68,†] & Helge Bruelheide[1,2,†]

In production in Nature Ecology and Evolution

sPlot 4.0 manuscript

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- To be submitted to JVS
- First round of reviews soon
  – likely November

sPlot 4: towards a truly global database for understanding vegetation spatiotemporal changes

Running title: Updated version of sPlot with time-series data

Gabriella Damasceno[1,2,*] (https://orcid.org/0000-0001-5103-484X)

Georg Hähn[2,1,3] (https://orcid.org/0000-0003-3733-1498)

Francesco Sabatini[3] (https://orcid.org/0000-0002-7202-7697)

Helge Bruelheide[2,1] (https://orcid.org/0000-0003-3135-0356)

[ALL SPLOT MEMBERS]

[1] *German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Leipzig, Germany*

[2] *Institute of Biology, Martin-Luther University Halle-Wittenberg, Halle, Germany*

[3] *BIOME Lab, Department of Biological, Geological and Environmental Sciences (BiGeA), Alma Mater Studiorum University of Bologna, Bologna, Italy*

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- Work on partnerships with data aggregators

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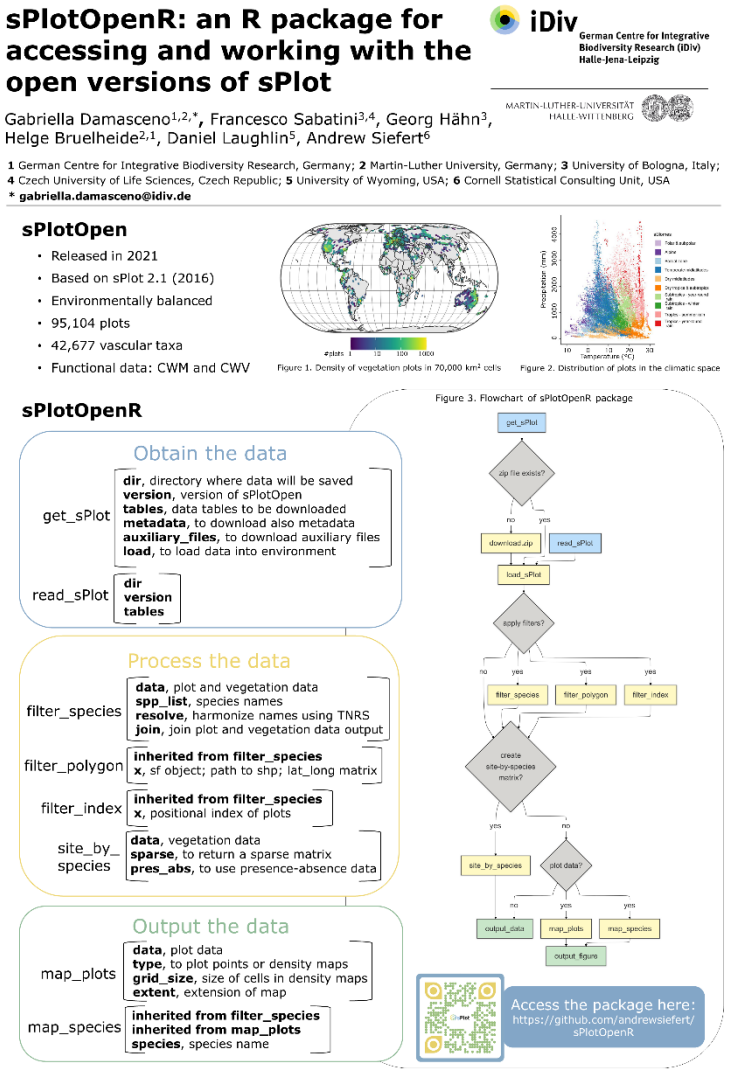
- sPlotOpen 2: Plots balanced by vegetation types
- sPlotOpenR – Check poster P1-B 20

Check out poster P1-B 20!



sPlotOpenR: an R package for accessing and working with the open versions of sPlot

iDiv German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig

MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG

Gabriella Damasceno[1,2,*], Francesco Sabatini[3,4], Georg Hähn[3], Helge Bruelheide[2,1], Daniel Laughlin[5], Andrew Siefert[6]

1 German Centre for Integrative Biodiversity Research, Germany; 2 Martin-Luther University, Germany; 3 University of Bologna, Italy; 4 Czech University of Life Sciences, Czech Republic; 5 University of Wyoming, USA; 6 Cornell Statistical Consulting Unit, USA
* gabriella.damasceno@idiv.de

sPlotOpen

- Released in 2021
- Based on sPlot 2.1 (2016)
- Environmentally balanced
- 95,104 plots
- 42,677 vascular taxa
- Functional data: CWM and CWV

Figure 1. Density of vegetation plots in 70,000 km² cells

Figure 2. Distribution of plots in the climatic space

sPlotOpenR

Figure 3. Flowchart of sPlotOpenR package

Obtain the data

get_sPlot: **dir**, directory where data will be saved; **version**, version of sPlotOpen; **tables**, data tables to be downloaded; **metadata**, to download also metadata; **auxiliary_files**, to download auxiliary files; **load**, to load data into environment

read_sPlot: **dir**; **version**; **tables**

Process the data

filter_species: **data**, plot and vegetation data; **spp_list**, species names; **resolve**, harmonize names using TNRS; **join**, join plot and vegetation data output

filter_polygon: **inherited from filter_species**; **x**, sf object; path to shp; lat_long matrix

filter_index: **inherited from filter_species**; **x**, positional index of plots

site_by_species: **data**, vegetation data; **sparse**, to return a sparse matrix; **pres_abs**, to use presence-absence data

Output the data

map_plots: **data**, plot data; **type**, to plot points or density maps; **grid_size**, size of cells in density maps; **extent**, extension of map

map_species: **inherited from filter_species**; **inherited from map_plots**; **species**, species name

Access the package here: https://github.com/andrewsiefert/sPlotOpenR

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- More applied approaches taking anthropogenic factors into account

Anyone interested in leading it?

Thank you for your collaboration!

Any new ideas? Comments?


www.idiv.de/en/splot


@sPlot-iDiv


gabriella.damasceno@idiv.de

Please approach me if you have questions!