

sDiv Newsletter

sDiv is the Synthesis Centre for Biodiversity Research of iDiv

Dear Colleagues,

What's been happening at sDiv since our last newsletter in August 2017? First, we say Goodbye to Helmut Hillebrand, who is leaving the *sDiv board* as one of the inaugural members. Many Thanks, Helmut, for all your work and support! We look forward to many synthesis-related collaborations with your new home base, the *HIFMB* in Oldenburg. Further, we welcome Volker Grimm as re-elected speaker and Jonathan Chase as the newly elected co-chair of the board!

Another exciting project for me personally and for the future of sDiv - is my involvement as an advisory board member of the soon to be established new synthesis centre

in Brazil, SinBioSE. Together with other synthesis centre colleagues from *CESAB* (France) & *EOS* (UK), I was invited to support ongoing discussions with the Brazilian research community and funding agencies. We mainly supported the SinBioSE team by sharing our perspectives and experiences in running synthesis centres in different settings. Many of the top biodiversity researchers from across Brazil have been included in the discussions from the beginning, which is an integral contributor to the success of the centre. Over the course of three days, we developed a mission and vision for the centre and debated over strategic and practical decisions, such as possible locations of the centre etc. We very much look



"Cerrado - A major biodiversity hotspot in the world." True, but I see mainly one species, soy bean, here. Pic taken north of Brasilia (Brazil) by Rafael Teixeira

forward to seeing the first biodiversity-focused synthesis centre open in South & Latin America – SinBioSE would be the only centre of its kind in the entire southern hemisphere.

Yours,
sMarten Winter

Mechanism to support our projects

Significantly more plant species are growing on mountain tops today than 100 years ago. The rate of this increase has grown ever faster in recent decades due to global warming. For their study recently published in *Nature*, scientists scrutinised summit vegetation on 302 mountain tops across Europe. The researchers compared their findings with older – in some cases historical – lists of species on the same peaks spanning 145 years of unique data. A very exciting and interesting data driven synthesis. The sDiv project *sUMMITDiv* is one piece in the puzzle, which made this synthesis possible.

Let me briefly highlight two mechanism, with which sDiv supports its projects: First, sDiv offers small amounts of funding for writing retreats based on a very informal application process. The short proposals are reviewed by our internal board. The retreats are a great method to bring researchers of existing sDiv projects together under the primary premise of finalising their work (and delivering outputs). Often those final face-to-face discussions are tremendously helpful in shaping the last bits and pieces and ultimately submitting the product. One of the groups benefiting from a writing retreat held here in Leipzig in December 2017 was the above mentioned *sUMMITDiv* – you can read their report [here](#). sDiv to date has supported ten writing retreats.

The second mechanism is *iDiv's flexible child care service*. Although requested only infrequently by sDiv researchers, it is an important offering to ensure researchers can personally join workshops, meetings and other iDiv events. *sUMMITDiv* made good use of it and only with this support some core members could manage to personally join the group meetings. This is a great way of supporting families of scientists with the opportunities given by the DFG funding for iDiv.



sUMMITDiv working group with happy kids & parents

➔ *Steinbauer, M.J. et al. (2018)*
Accelerated increase in plant species richness on mountain summits is linked to warming.
Nature.

sDiv call decisions

Following our *sixth sDiv call*, we received many proposals of very high scientific quality. After discussion of the internal and external reviews, the sDiv Board decided to fund the projects given below:

Funded working groups projects

sANDES – Tree Diversity, Composition and Carbon Storage in Andean Tropical Montane Forests
main PIs: [Luis Cayuela](#), [Manuel J. Macía](#)

sScaleWebs – Unifying environmental and spatial determinants of food web structure across spatial scales
main PIs: [Gustavo Q Romero](#), [Diane S Srivastava](#)

sTraitChange – How do trait responses to climate change translate into demographic rates and population dynamics?
main PIs: [Viktoriiia Radchuk](#), [Marcel E. Visser](#)

sTreelines – Spatial pattern emergence from ecological processes at alpine treelines: model-supported hypothesis tests against globally-distributed field data
main PIs: [Maaïke Bader](#), [Bradley Case](#)

sTWIST – Theory and Workflows for Alien and Invasive Species Tracking
main PIs: [Melodie McGeoch](#), [Marten Winter](#)

sUrBio2050 – Assessing globally important areas for biodiversity preservation and human well-being
main PIs: [Thomas Elmqvist](#), [Henrique Pereira](#)
associated postdoc: TBA

sYNGEO – The geography of synchrony in dendritic networks: understanding the causes, dynamics, and consequences across multiple scales
main PIs: [Julian D Olden](#), [Lise Comte](#)

Funded individual postdoc projects

Stephanie Jurburg

Microbial community assembly: establishing general ecological principles responsible for turnover in microbial communities

Alexander Zizka

Reaching for the sky: Unravelling global patterns and processes to explain convergent evolution of woodiness in angiosperms

Funded sabbaticals projects

Priyanga Amarasekare (University of California Los Angeles)
A framework for biodiversity maintenance: scaling up from modules to communities

Stephanie Bohlman (University of Florida)
Linking biodiversity and demography through remote sensing of trait tradeoffs

Douglas Chesters (Chinese Academy of Sciences)
Phylogenetic integration of insect community data

Rodolfo Dirzo (Stanford University)
Research on plant-herbivore interactions under climate change and collaborations on biodiversity science

Christopher Klausmeier (Michigan State University)
Synthesizing Trait-Based Ecological Theory

Jeremy Lichstein (University of Florida)
Plant functional diversity and forest ecosystem stability: insights from dynamic vegetation models

Elena Litchman (Michigan State University)
Trait-based community patterns in microbes

Fernando T. Maestre (Universidad Rey Juan Carlos)
Climate change impacts on dryland soil biodiversity and associated ecosystem functions from local to global scales

Pati Vitt (Chicago Botanic Garden)
Phylogenetic Endemism, Functional Trait Diversity and Conservation Status in the Orchidaceae: a Global Synthesis

Examples of great sDiv papers

sDiv scientists and guests work very hard to move science forward. Here we present two sDiv working group efforts about or using meta-analysis, a common method in synthesis research.

GlobTherm, a global database on thermal tolerances for aquatic and terrestrial organisms

Joanne Bennett and sWEEP working group

Thermal tolerance limits are fundamental to understand the geographic distribution of species and to predict range shifts under climate change. Typical inferences on such limits come from models that characterize the realized climatic niche but are highly contingent on non-climatic factors such as biotic interactions. The sWEEP working group, led by Dr. Morales-Castilla and Prof. Olalla-Tarraga, has published the largest database on experimentally-derived species' thermal tolerances for multicellular algae, plants, fungi and animals. The GlobTherm database includes a compilation of thermal tolerance metrics for 2,133 species in 43 classes, 203 orders and 525 families from marine, intertidal, freshwater, and terrestrial realms. GlobTherm has a wide global spatial coverage, though data gaps exist in those parts of the globe most difficult to be accessed by researchers. Taxonomically, Chordata are overrepresented, while algae, plants, and, to a greater extent, invertebrates, are underrepresented in terms of currently described species numbers. iDiv Postdoc Joanne Bennett gathered the data from a total of 567 peer-reviewed scientific studies and is the first author of the paper in *Nature Scientific Data*. GlobTherm is receiving worldwide attention among the scientific community according to its Altmetric score and is expected to be a central reference in the development of unified theories and methodologies on the influence of fundamental thermal niches on the global geographic distribution of biodiversity on land and in the sea.



sWEEP working group

➔ *Bennett J.M., Calosi P et al. (2018) GlobTherm, a global database on thermal tolerances for aquatic and terrestrial organisms, Scientific Data.*

Community assembly and the functioning of ecosystems: how metacommunity processes alter ecosystems attributes

Katherine Bannar-Martin and sCAFE working group

It has long been recognized that the number and identity of species in a community affects how well an ecosystem functions. Research centered on biodiversity and ecosystem functioning (BEF) is typically concerned with isolating the effect of species richness on ecosystem functioning. However, in natural systems biodiversity changes occur as part of metacommunity assembly processes (the CAFE perspective), changing community composition. Consequently, we developed an approach to integrating the BEF and CAFE perspectives into examinations of ecosystem function changes. We adapted the ecological version of the Price equation to account for the separate and combined contributions of changes in species richness, identity, abundance, and context-dependent effects on ecosystem function. We developed a graphical method for illustrating changes in ecosystem function across space and/or time using Price components and demonstrated the merits of the CAFE perspective with three empirical examples of environmental perturbations across community types. We found that changes in richness and composition driven by environmental change can either work in concert or antagonistically to influence ecosystem function. Using such an integrative approach to understand ecosystem function moves us beyond focusing on a single aspect of community structure at a time, bridges knowledge derived from experimental and naturally-occurring communities, and ultimately improves our ability to anticipate changes to ecosystem function in naturally occurring communities.



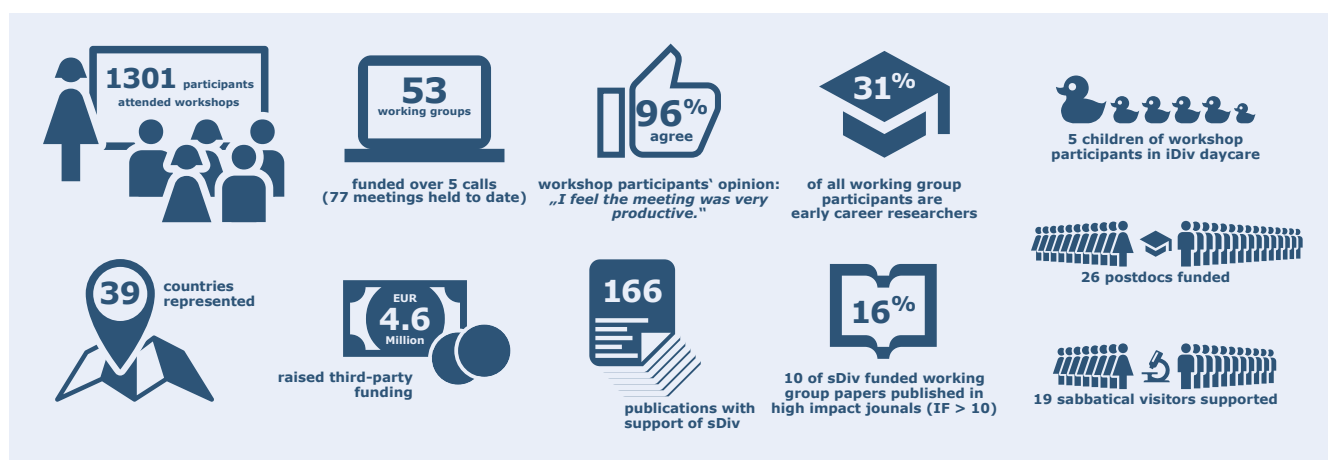
sCAFE working group

➔ *Leibold, M. A., Chase, J. M. and Ernest, S. K. M. et al. (2017) Community assembly and the functioning of ecosystems: how metacommunity processes alter ecosystems attributes, Ecology.*

Some recent publications

- Baron, J.S., Specht, A. [...] Winter, M. (2017) *Synthesis Centers as Critical Research Infrastructure*, BioScience. From *Synthesis Centre Consortium*
 - Keil, P., MacDonald, A.A.M. [...] Meyer, C. (2018) *Macroecological and macroevolutionary patterns emerge in the universe of GNU/Linux operating systems*, Ecography. From sDiv-CESAB as cross synthesis centre postdoc project
 - Keil, P., Pereira, H.M. [...] Winter, M. (2018) *Spatial scaling of extinction rates: Theory and data reveal nonlinearity and a major upscaling and downscaling challenge*, Global Ecology and Biogeography. From individual postdoc *Petr Keil*
 - Larsen, S., Chase, J.M. [...] Ormerod, S.J. (2018) *Lifting the veil: richness measurements fail to detect systematic biodiversity change over three decades*, Ecology. From individual postdoc *Stefano Larsen*
 - Prevey, J., Vellend, M. [...] Rixen, C. (2017) *Greater temperature sensitivity of plant phenology at colder sites: implications for convergence across northern latitudes*, Glob Chang Biol. From *sTUNDRA working group*
 - Rieb, J.T., Chaplin-Kramer, R. [...] Bennett, E.M. (2017) *When, where, and how nature matters for ecosystem services: Challenges for the next generation of ecosystem service models*, BioScience. From *sESMOD working group*
 - Schröter, M., Koellner, T. [...] Bonn, A. (2018) *Inter-regional flows of ecosystem services: Concepts, typology and four cases*, Ecosystem Services. From *sTELEBES working group*
- ➔ [see all iDiv publications here](#)

sDiv in a nutshell



Since your feedback is always welcome, please do not hesitate to contact *sMarten Winter*, the scientific coordinator, or the sDiv administrative assistant *Franziska Hübner*.

With our best regards from Leipzig

sMarten Winter & team




Publisher

German Centre for Integrative Biodiversity Research (iDiv)
 Halle-Jena-Leipzig
 Deutscher Platz 5e
 04103 Leipzig
 Phone +49 341 9733130
 sdiv@idiv.de | www.idiv.de/sdiv
 V.i.S.d.P.: Dr. Marten Winter
 Photos: iDiv and partners