

sDiv Newsletter

sDiv is the Synthesis Centre for Biodiversity Research of iDiv

Dear colleagues,

2019 has been a year of milestones, new and renewed collaborations for sDiv. We welcomed our 1000th working group visitor (counting participations, sDiv welcomed already 1700 guests!) and supported our 100th working group meeting (*sYNGEO*). We remain committed to offering the best possible support for these synthesis projects, for which there continues to be a huge demand. In the last seven years, we received ~300 working group, postdoc and sabbatical proposals and funded ~100 of them. Besides our core work, in 2020 sDiv will support its first externally funded synthesis working group - *FunProd*; funded by the pan-European funding scheme *BiodivERSA*. Supporting external partners (non-synthesis

centres) is a potential new and exciting route for us as scientific infrastructure. We also just closed a joint call with the French synthesis centre *CESAB* about "Coexistence and stability in high-diversity communities".

Unlike most similar centres, sDiv is embedded in iDiv, a lively research centre with >300 employees (~230 scientists, incl. nine full professors and four junior research groups). One of the visions we have with sDiv, is that the supported sDiv projects play an important role in iDiv's research themes. One of iDiv's main research themes is "Biodiversity Change". In the past seven years, we at sDiv have supported several projects directly or indirectly related to this topic (e.g. *sChange* - see feature below; *sReplot*; *sTwist*; *sUmmitDiv*;

New sDiv Call

for Working groups, Post-docs and Sabbaticals is open!

**Pre-proposal deadline:
11 December 2019**

All important information and application documents:
www.idiv.de/sdiv/calls

sTundra with Postdoc *Anne Bjorkman*; Postdoc *Roel van Klink* and Sabbatical Prof. *Rodolfo Dirzo*). These projects contribute greatly to the advancement of science in general, but also support iDiv's research goals, which is facilitated by the involvement of iDiv researchers in sDiv projects. We see this as a double benefit and hope to continue to create the synergy between sDiv with visitors from throughout the world and our own research at iDiv.

sMarten Winter

Biodiversity Change & sChange working group

The sCHANGE working group aimed to look at variation in biodiversity change across the planet. The working group was motivated by the controversy generated by two papers (*Vellend et al 2013*, *Dornelas et al 2014*) which showed no net change on average of species richness at local scales. These papers triggered several critiques and counter-critiques (e.g. *Gonzalez et al 2016* vs. *Vellend et al 2017*) as well as an acrimonious environment among some biodiversity scientists. Following a first sDiv working group meeting organised by Forest Isbell and Nico Eisenhauer, we (Mary O'Connor, Sarah Supp and Maria Dornelas) proposed a successor working group aiming to bring people from opposing viewpoints together, to find common ground as to what can and cannot be inferred about

biodiversity change in the last 50 years or so.

Finding consensus is a difficult process, and this working group was fairly challenging as there were disagreements as to the best approaches, and what specific issues to attempt to resolve. Ultimately, we focused successfully on three topics: spatial variation of anthropogenic threats across the marine and terrestrial realms (*Bowler et al 2018*), effects of scale on biodiversity trends (*Chase et al 2019*), and geographic variation in biodiversity trends (*Blowes, Supp et al 2019*). Collectively, these papers have moved the field forward by helping unravel the nuanced and complex ways in which biodiversity is changing in a time of intense human pressures.

In addition to support from sDiv,

the *Canadian Synthesis Centre (CIEE)* and the *Quebec Centre for Biodiversity science (QCBS)* supported satellite meetings for some members of the group, which greatly facilitated moving the discussions forward. A great way and successful cross-centre collaboration!

Maria Dornelas, Mary O'Connor, Sarah Supp

→ *sChange* - www.idiv.de/schange



sChange working group

The EU Common Agricultural Policy - A Fitness Check



Guy Pe'er (Photo: André Künzelmann/UFZ)

With 38% of the EU budget (circa €59 billion/year), the Common Agricultural Policy (CAP) has fundamental impacts on agricultural landscapes in Europe – yet beyond biodiversity and climate goals, it keeps failing on socioeconomic challenges such as employment in rural areas.

When joining sDiv as Postdoc I started to lead a comprehensive Fitness Check of the CAP with an interdisciplinary group of authors and over 450 publications to be assessed (*Pe'er et al. 2017*). We could analyse and show that the proposal made by the European Commission for the CAP post-2020 is unlikely to adequately address environmental and sustainability problems also in the future. In fact, our analyses indicated a significant step backwards compared to the current CAP. Our results were published in Science this August (*Pe'er et al 2019*).

A key example of the problem relates to 'direct payments' under the so-called Pillar 1 of the CAP. Farmers receive around 40 billion Euros (approx. 70 % of the CAP budget) on the basis of cultivated area alone. This leads to unequal support where 1.8 % of farmers

receive 32 % of direct payments. Pillar 2 (Rural Development Programmes) can promote environmental and climate protection measures and address rural challenges. Yet in light of Brexit, the European Commission proposed to cut 11 % on direct payments compared to 26% on Pillar 2 in the next funding period – meaning a relative expansion of ineffective payments (or in other words: Science, evidence and public interests were not taken into account enough).

Our work shows clearly that the CAP fails in supporting most Sustainable Development Goals. In addition, the so-called "green architecture" of the proposed CAP is unconvincing: some environmental measures were removed (e.g. limitations on unsustainable irrigation), "greening" and vagueness was introduced which is known to help Member States choosing on easiest and least effective measures. Moreover, Member States can declare a large proportion of the CAP expenditure as "climate-friendly" without justification. We could show that reluctance to change, rather than lack of knowledge, are key drivers of policy stagnation.

Our publications, shortly after the elections of the new EU Parliament and before the next steps in the upcoming reform process, might hopefully help re-orientating the CAP reform. Yet more specific actions are still needed. That's why, a group of iDiv researchers and others have prepared a *Position Paper*, proposing what the EU and Member States could still do to improve. Thereby, we hope to promote stronger science-policy interactions, and help supporting evidence-based policy.

Guy Pe'er

[Fitness Check for CAP project](#)

[CAP Scientist Statement](#)

Upcoming working group meetings

sBIOMAPS

Exploring BIOgeographic and MAcroevolutionary Patterns in organismal Stoichiometric diversity

1st meeting: 25.-29.11.2019

PIs: [Angelica Gonzalez](#) , [Olivier Dézerald](#)

sCaleWebs

Unifying environmental and spatial determinants of food web structure across spatial scales

2nd meeting: 2.-6.12.2019

PIs: [Gustavo Q Romero](#), [Diane S Srivastava](#)

sCoRRe – Assessing functional consequences of community changes with global change using trait-based and phylogenetic approaches

1st meeting: 9.-13.12.2019

PIs: [Meghan Avolio](#), [Kimberly Komatsu](#)

sSUCCESS

Pantropical forest succession

1st meeting: 16.-20.12.2019

PIs: [Lourens Poorter](#), [Nadja Rueger](#), [Michiel van Breugel](#)

sANDES

Tree Diversity, Composition and Carbon Storage in Andean Tropical Montane Forests

2nd date: 22.-25.1.2019

PIs: [Luis Cayuela](#), [Manuel J. Macía](#)

sROOT

Root Trait functionality in a Whole-Plant Context

3rd date: 27.-31.1.2020

PIs: [Liesje Mommer](#); [Alexandra Weigelt](#)

My experiences with sDiv and the sWorm working group

In November 2016 I moved to Leipzig, having freshly submitted my PhD thesis. A few months later we held the first sWorm working group meeting. Earthworms, and more generally soil ecology, were new subjects to me, so it was an amazing experience to be surrounded by some of the leading experts in the field. Over the course of the week, we all got to know each other and swap some great ideas. By the end we had formed a workplan for the coming two years of the project.

Typically, large-scale patterns of biodiversity, such as the latitudinal diversity gradient or species-area relationships, have been explored and tested using data from above-ground organisms. This means that we don't know whether, at large-scales, such theories hold true for below-ground organisms. And thus, our abilities to make predictions of biodiversity patterns has been hindered. It is crucial that we understand how soil biodiversity is distributed across the globe, as they provide a number of vital ecosystem services, for example, climate regulation, water regulation, and crop production. The aim of the sWorm working group was to reduce this knowledge gap, and

investigate large-scale patterns of soil biodiversity.

In the last few weeks, we have seen the products of the sWorm workshops. The first was an article detailing the global patterns of earthworm biodiversity, and the drivers of those patterns (*Philippis et al., 2019*). Not only was the paper published in *Science*, but it was also the cover of the issue. Given that earthworms have been understudied at such a broad scale despite their importance to many ecosystem services, it was great to see them getting coverage in such a high-impact journal. The article contains the first global maps of earthworm diversity and abundance, and confirms some previous theories (such as lower local diversity in tropical regions), whilst also providing insights into what shapes these patterns – climate. We hope this manuscript opens to the door to a lot of future work, both from the sWorm group, and others interested in the macro-ecology of earthworms.

The second article is hot-off the press, a literature review and perspectives piece (*Thakur et al., 2019*). The article quantifies the



Helen Philipps

knowledge of five biodiversity theories (species–energy relationship, theory of island biogeography, metacommunity theory, niche theory and neutral theory) in respect to soil organisms. Not only showing where the acknowledge gaps are, but also creating an integrative conceptual framework that can be used for understanding the patterns and mechanisms driving soil biodiversity by acknowledging the scale dependent nature of soil biodiversity.

Overall the sWorm project has been a huge success. Bringing together a huge group of ecologists to produce novel research. And we are all very excited to see what happens next...

Helen Philipps

sWorm - www.idiv.de/sworm

Evolution of interdisciplinarity in biodiversity science

As evidenced by iDiv itself, biodiversity science has expanded greatly in size and breadth over the past decades. One explanation for this growth is that biodiversity science addresses an array of complex scientific problems that are both basic and applied. While there have been numerous calls for greater interdisciplinary approaches to meet scientific, political, and societal challenges, numerous barriers may prevent the adoption of interdisciplinary approaches. Using 97,945 published articles from 1990 to 2012 and a Bayesian topic model, we examined whether biodiversity science has responded to these challenges by bridging traditional gaps among its subdisciplines via an increase in interdisciplinarity,

defined as the diversity of concepts and subdisciplines. Terms and subdisciplines associated with each concept can be examined *interactively online*; which we think is in general a nice idea to play with published data and methods. We found that concept and subdiscipline diversity in biodiversity science were either stable or declining, patterns which were driven by the persistence of rare concepts and subdisciplines and a decline in the diversity of common concepts and subdisciplines, respectively. Moreover, our results provide evidence that conceptual homogenization, i.e. subdisciplines becoming conceptually similar, underlies the observed trends in interdisciplinarity. Together, our results reveal

that biodiversity science is undergoing a dynamic phase as a scientific discipline that is consolidating around a core set of concepts. As an



Dylan Craven

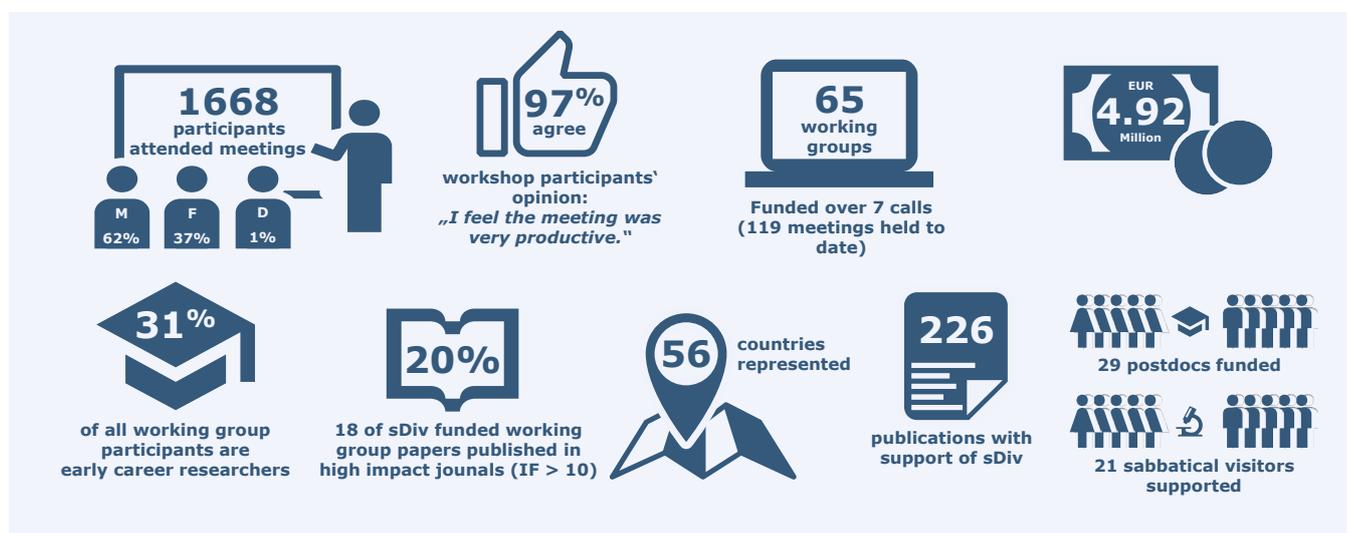
interdisciplinary team, we experienced firsthand the agony and ecstasy of interdisciplinary research (and unexpected results) and hope that our article is as thought provoking for readers as was the process of writing it.

Craven et al. (2019): Evolution of interdisciplinarity in biodiversity science. Ecology and Evolution

Some recent publications

- Clark, A.T. [...] Schmid, B. (2019) *Predicting species abundances in a grassland biodiversity experiment: Trade-offs between model complexity and generality*. *Journal of Ecology*, (online early)
- Chase, J. M. [...] Mary O'Connor (2019) *Species richness change across spatial scales*. *OIKOS* (sChange group)
- Thomas Koellner [...] Matthias Schröter (2019) *Guidance for assessing interregional ecosystem service flows*. *Ecological Indicators* (sTelebes group)
- Tucker, C.M. [...] A.O. Mooers (2019) *Assessing the utility of conserving evolutionary history*. *Biological Reviews*. Early View, Open Access. (sCAP group)
- Cantalapiedra J. L. [...] A.O. Mooers (2019) *Conserving evolutionary history does not result in greater diversity over geological time scales*. *Proceedings of the Royal Society B* 286. (sCAP group)
- Sunday, J. [...] Morales-Castilla, I. (2019) *Thermal tolerance patterns across latitude and elevation*. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 374, 20190036. (sWEEP group)
- Chapman, A.S.A.[...] Bates, A.E. (2019) *sFDvent: A global trait database for deep-sea hydrothermal-vent fauna*. *Global Ecology and Biogeography*, 28, 1538-1551. (sFDVent group)
- Beckmann, M. [...] Seppelt, R. (2019) *Conventional land-use intensification reduces species richness and increases production: A global meta-analysis*. *Global Change Biology*, 0, 1941-1956. (LU-BD-ES group)
- Shoemaker, L.G. [...] Abbott, K.C. (2019) *Integrating the underlying structure of stochasticity into community ecology*. *Ecology*, online early (sNiche 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 administration team](#).

With our best regards from Leipzig

sMarten Winter & team




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Photos: iDiv and partners