

## sDiv working group meeting summary

### “sCAFE - Community Assembly and the Functioning of Ecosystems in Open Systems”

The general objective of the first sCAFE workshop was to develop a framework for incorporating metacommunity theory, particularly the role of dispersal, in studies of ecosystem function. The study of community and ecosystem ecology has historically focused on a single community, but communities are often linked because organisms disperse between them. If dispersal changes the species composition and distribution of functional traits in a community it can alter the functioning of the ecosystem. In sCAFE, we are examining many different ecosystems and taxa to determine the importance of dispersal and species traits for determining how the composition of communities responds to environmental change and how this can have cascading impacts on ecosystem function. Our primary tool in developing the CAFE framework is the Price equation, which we rigorously tested prior to and during the first workshop meeting to investigate its utility for understanding the contribution of species richness versus species composition to ecosystem function in simulated communities, plankton communities, grassland communities, and small mammal communities.

sCAFE Workshop 1 was a very successful week of brainstorming, idea development and project planning. The participants contributed expertise on metacommunity theory, ecosystem function, aquatic ecology, and terrestrial ecology. Diverse career stages were represented, including post docs, senior scientists and professors. The group was gender-balanced and represented Europe, the US, and Canada. The presentations and discussions during the first workshop covered two broad areas:

1. The utility of the Price equation for understanding changes in ecosystem function with different community assembly scenarios
2. Contrasting the CAFE framework with the classical BEF framework

Additionally, Morgan Ernest gave a talk entitled “The Challenge of Time Scales in Ecology” to the entire iDiv community, based in part on one of the datasets we’re using in sCAFE – the Portal Project long-term rodent community dataset.

During workshop 1, we also had several breakout discussion groups centered on two research themes:

1. Design of a simulation of ecosystem function changes under several community assembly scenarios to test and compare Price partitions using either the CAFE framework or the BEF framework. During the first workshop the design of the simulation was set and coding in R began.

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## sDiv

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iDiv is a central facility of the Leipzig University within the meaning of Section 92 (1) of the Act on Academic Freedom in Higher Education in Saxony (Sächsisches Hochschulfreiheitsgesetz, SächsHSFG). It is run together with the Martin Luther University Halle-Wittenberg and the Friedrich Schiller University Jena, as well as in cooperation with the Helmholtz Centre for Environmental Research – UFZ.

The following non-university research institutions are involved as cooperation partners: the Helmholtz Centre for Environmental Research – UFZ, the Max Planck Institute for Biogeochemistry (MPI BGC), the Max Planck Institute for Chemical Ecology (MPI CE), the Max Planck Institute for Evolutionary Anthropology (MPI EVA), the Leibniz Institute DSMZ–German Collection of Micro-organisms and Cell Cultures, the Leibniz Institute of Plant Biochemistry (IPB), the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) and the Leibniz Institute Senckenberg Museum of Natural History Görlitz (SMNG).

2. Empirical testing of the Price equation and CAFE framework in open (dispersal was allowed) versus closed (no dispersal allowed) experimental grasslands. We started analysis of a Jena dataset (an iDiv platform), Harald Auge's German grassland experiment, and a Cedar Creek dataset. We also analyzed experimental plankton community data from Stephen Decklerk and Mathew Leibold.

Several possible outputs, mostly journal articles, were defined and several ideas for future collaborations and additional projects were discussed. Planned outputs include a concept paper on the CAFE framework (most likely submitted to Ecology Letters), and a data paper comparing Price partitions in open versus closed experimental grassland ecosystems. We have also submitted an abstract to present at the ESA Annual Meeting in Fort Lauderdale this August.

Workshop 2's schedule was planned to maximize time for group brainstorming and breakout groups. Consequently, we limited the majority of our presentations to 2 working days to increase the amount of time available for brainstorming, concept development and analysis. The balance between work on outputs/ brainstorming and information exchange / participant presentations was roughly 40%/40%/20%. sCAFE was very inspiring for all participants. The research ideas developed during the workshop were beyond what we had hoped for before the workshop and reflected the diverse expertise and perspectives inherent in the group. The general working atmosphere was exceptionally positive and constructive, and as a result we had a lot of fun. We have several remaining open questions that we will address in the second workshop, particularly regarding the contribution of specific traits to changes in ecosystem function in open versus closed systems. The support of sDiv was absolutely key for the success of the first workshop and we greatly look forward to Workshop 2 in June 2016.

#### Participant list

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