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sDiv working group meeting report

”sMars”

The major goal of sMars is to develop a unified movement-based concept of spatial scale that respects trait-based processes and differences in how species experience their spatial environment. In the first meeting, we focused on (1) establishing a general and comprehensive movement database and (2) developing a concept of trait-based scale that can be applied to improve our predictions of species interactions, distributions, and biodiversity patterns.

General atmosphere and sDiv support

The meeting was a mixed in-person and remote format, with the majority of participants attending in-person. The atmosphere was relaxed, open-minded, and highly productive. Speaking time was equally divided between the participants, and the conversations were all at eye level. In the first two days, we mainly discussed the database. This gave us some time to get to grips with the subject matter and also get to know each other and feel comfortable around each other. From Wednesday we started brainstorming about the concept, which led to a lot of general enthusiasm. In the course of the week, we were able to develop many new ideas and in the end we were able to bring the concept into a very concrete form and even produce the first graphics for our paper.
We got excellent support all-round by sDiv and all went well (there were no major problems with the technology either).

Project 1: Compiling a movement database

General aim: To compile a general database on species movement capacities for different movement processes (e.g. exploratory/foraging movement, dispersal and migration).

Progress: We discussed relevant definitions and compiled a list of traits and covariates to be included in the database. Furthermore, we agreed on a tidy structure for the database and the physical units (e.g. speed, distance and area) we want to include. In advance and during the meeting we have compiled a list of meta-studies and have decided to decompose them into the original studies to ensure traceability of data origin.

Balance between activities: 50% brainstorming, 45% work on output, 5% presentation by the PIs (Remo Ryser & Myriam Hirt).

Next steps: The PhD student associated with the working group has now started putting the database together under our supervision. The integration of the

database into a website to allow data entry by externals remains an open challenge. We plan to finalize the database before the start of the next meeting.

Project 2: Concept of trait-based scale

General aim: Developing a unified concept of spatial scale that is rooted in trait-based movement processes and allows considering a species-specific and comparable perspective on scale.

Progress: After brainstorming, we decided to illustrate the concept by "movement-process-kernels" along a spatial axis. Thereby, we created first plots with a trait-based scale using empirical data or allometries. Furthermore, we developed an approach on how to standardize this trait-based scale according to allometrically-informed and trait-specific expected lifetime movement distance. Following this, we agreed upon dividing the concept paper into the approaches of trait-based and standardized scale as they offer uniquely different insights into spatial scale and how it is perceived by organisms. We have identified the applicational potential of the two concepts for several major ecological fields (e.g. metafoodwebs or meta-communities, conservation, experimental design and eco-evolutionary processes). We have designed two distinct working examples for the concept, produced several preliminary figures for the concept paper, designed the storyline of the concept paper and started writing some first paragraphs.

Balance between activities: 35% brainstorming, 60% work on output, 5% presentation by the PIs (Remo Ryser & Myriam Hirt).

Next steps: We have agreed to launch regular zoom meetings to finetune further output, continue writing the concept paper and to prepare the next meeting. We plan to have written the first draft of the concept paper before the start of the next meeting.