sDiv working group meeting summary

"sWORM: A global soil biodiversity database and its application to data synthesis and theory development"

During the workshop we had many breakout sessions focussing on three main questions:

1. Can biodiversity theories, typically developed for aboveground organisms, be applied to belowground organisms?

2. How can we spatially predict earthworm diversity and what variables are important to do so? And why might any changes in local diversity of earthworms be important in terms of Nature's Contributions to People (NCPs)?

3. What are the next steps that are needed to create a Global Soil Biodiversity?

As this was the second sWorm meeting there were many aspects of the work that we had make progress on between meetings, therefore a lot of time (~80%) was spent in discussions and brainstorming, which would lead to completing manuscripts and other outputs.

Following on from the previous workshop in March 2017, where it was decided that a literature review would be the basis of the investigation into question 1, the literature review and the draft manuscript was discussed heavily. Time was also spent creating a conceptual diagram that would help explain the scale dependence of many of the biodiversity theories when applied to soil biodiversity. The manuscript writing is now underway, and will be submitted for peer-review in the coming months.

Between the two workshops a large dataset (much larger than anticipated) of local earthworm diversity was collated in order to answer question 2. Preliminary analysis was conducted prior to the second workshop, with discussions during the second workshop focussing on what had been done and how it could be improved. A lot of time was spent deciding on which climate and soil variables would be important for predicting earthworm diversity patterns, and which variables are available globally at an appropriate resolution. Given the large concentration of earthworm experts within the sWorm group, we also dedicated a large amount of time classifying, based on functional group, the earthworms within our collated dataset. Given the importance of earthworms to services which are relied upon for human well-being (such as nutrient cycling, and increased crop production), we spent an afternoon brainstorming how earthworms fit into the Nature's Contributions to People (NCP) framework, and finding evidence to support these claims. Following all the discussions regarding the models, and the framing of the first manuscript, it was possible for the

preliminary results to be presented the Ecology Across Borders (joint meeting of the BES and GfÖ) Conference in Ghent in December 2017.

Given the time that was put into collating the earthworm diversity dataset, we believed it important to spend time during to the workshop brainstorming ideas on how the could be used in future analysis. However, we also want the earthworm data to feed into analysis done by researchers not part of the sWorm working group. Therefore, the earthworm dataset that has been collated will form the basis of the Global Soil Biodiversity database. This workshop was spent making final decisions on where exactly data would be hosted, how new data would be uploaded, and most importantly, ways to ensure that those who contributed data were clear on what they were contributing to and were acknowledged for their contribution.

During the second sWorm workshop, we opted to have few presentations to maximise the time we could devote to brainstorming. However, Rob Dunn (Professor at North Carolina State University, currently on sabbatical at sDiv) gave a presentation highlighting the potential of collaboration networks for acquiring biodiversity data, and the possibilities of citizen science for collecting data in new regions. Michel Loreau also gave a seminar (as part of the EIE lab group seminar series) on biodiversity and ecosystem stability for people at iDiv.

Although this was the last formal meeting of the sWorm group, we have many aspirations going forward. Not only do we have multiple manuscripts underway, we want the Global Soil Biodiversity Database to continue and expand past the work of sWorm, and we continue to investigate ways to ensure this.

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