

sDiv working group meeting report

“sBIOMAPS – Exploring BIOgeographic and MAcroevolutionary Patterns in organismal Stoichiometric diversity”

Focal areas of discussion + main results/conclusions + open questions

For this third hybrid meeting at sDiv, we mainly focused on moving forward our first manuscript about the biogeographical drivers of animal and plant stoichiometry across terrestrial and aquatic habitats. In this sense, we have achieved very important agreements regarding model structure, the datasets to be used, focus on N and P content (e.g., leaving C content and marine data for another paper) and our theoretical expectations (i.e., theoretical evidence in the literature). In our first meeting we spent significant amount of time discussing many ideas, potential papers with the data at hand, and building and cleaning the database. In our second meeting, we went back and forth between theory, statistical approaches, and data. Since the second meeting and during the third meeting in particular, we have made substantial progresses on the theoretical background (writing the introduction), the statistical approach (writing the materials and methods section), and data visualization (producing plots, tables). In parallel, we have also made progresses on another manuscript, using the sBIOMAPS database, and led by Mark Nessel - a former PhD student of Angélica González. This very advanced manuscript deals with a global synthesis of the scaling relationships between body size and elemental content of animals. A full draft was presented, and edited/commented by all co-authors (sBIOMAPS participants and others).

Content of presentations

Compared to our other previous meetings, we did not have formal presentations in this third meeting but rather group discussions on various topics related to our two main objectives/manuscripts.

General research ideas, questions & directions discussed (incl. potential data to be used etc.)

Our discussions were focused on the results of a GLMM modelling approach seeking to evaluate the direction and magnitude of the relationships between elemental content (N, P, and N:P ratio) and main global environmental drivers (temperature, solar radiation on Earth surface, environmental N and P) across freshwater and terrestrial habitats. The whole sBIOMAPS team agreed to target first ‘Science’ as a high-profile journal for the first manuscript. We will attempt ‘Nature Ecology and Evolution’ for the second manuscript, which is the scaling paper.

General structure of the week (break out groups, presentations, sessions with remote participants etc.)

The working group meeting was again a great scientific experience with a creative and collaborative atmosphere among all participants. Brainstorming during the working group led to important decisions and progresses on our understanding of the global stoichiometry of organisms. During the first and second meeting, we used a combined approach of breaking out groups with specific tasks followed by a full group discussion to distil the main results. Compared to our previous meetings, we had more full-group discussion times in the third meeting and less break out groups. As in other meetings, every day, we also organized wrap up summaries about progresses at the end and beginning of each day. In the third meeting we have also opted for a more flexible approach regarding Zoom meetings with remote sBIOMAPS participants: a zoom session remained open for the entire day and people were free to join whenever they could (more flexible for busy-during-day schedule of many remote participants). Small summaries of ongoing discussions were provided. We last discussed potential ways (e.g. funding opportunities) to collectively advance projects and bridge knowledge gaps following ideas mentioned during those brainstorming.

Next steps & upcoming deliverables:

- Finalize and submit the article focused on the environmental mechanisms underlying animal and plant stoichiometry. This manuscript is quite advanced, but we need time to wrap up the results and discussion and produce the final figures.
- Finalize and submit the article on the body size scaling of animal stoichiometry. This manuscript has a full draft, which will be submitted to our co-authors for comments (this will be the second round of revisions on a full draft). We think this manuscript should be ready for submission in less than a month, however, to make sure our main paper on environmental drivers of animal and plant stoichiometry does not lose novelty, we might delay the submission of the scaling paper until we submit the former.
- Since our third meeting we have also initiated writing a data paper, which supports/explains the data used in the two main manuscripts. This data paper is almost complete, and soon (in a week or so) will be ready to circulate among co-authors. Because, some datasets in the sBIOMAPS database have not been through our data validation procedure, only checked parts of the database will be published as a data paper.
- We aim to add more evolutionary aspects in future sBIOMAPS manuscripts. We have been discussing ideas on how to move forward with these manuscripts.

General working atmosphere and feedback on sDiv support (What kind of support? How helpful was it?)

Again, the general working atmosphere at iDiv was amazing. As always, the sDiv team provided a great technical support (e.g., smooth videoconferencing connections, efficient computer speakers with microphone, whiteboard) allowing for a wonderful working experience for both in-person and remote participants. Particular thanks to Doreen Bruckner and Marten Winter for their help. The productive and friendly atmosphere we had in this meeting, fostered valuable collaborations and the sharing of ideas among the sBIOMAPS participants.