

sDiv working group meeting summary

“sYNGEO – The geography of synchrony in dendritic networks: understanding the causes, dynamics, and consequences across multiple scales”

Second meeting in Leipzig from 29 July to 1 August 2019

The second meeting of sYNGEO saw freshwater ecologists from around the world converge to continue our quest to understand the patterns and drivers of biotic synchrony in dendritic networks. It was again a great success!

We kicked off the meeting by a short introduction by the PIs presenting the working agenda for the week. The first two days of the meeting were then organized in short sessions in which the leaders of the different ongoing projects presented their most recent advances to the entire group. These short presentations were followed by discussions in which we identified the next steps and assigned tasks. The following two days were organized in sub-working groups working in parallel on the different projects (and personal assignments). Note that most participants were actively participating to more than one sub-group and were thus moving freely between rooms as they feel they could best contribute. Overall, our time was divided as follows: 20% presentations, 40% brainstorming in small groups, and 40% large group exchange and task assignment.

Functional perspective on biotic synchrony: This paper highlights how traits-based theory and approaches can support novel advances in the investigation of biotic synchrony was accepted. During the meeting we completed the manuscript and submitted it to a peer-reviewed journal.

Effect of nonnative species on temporal variability and synchrony: This study assessed the effects of nonnative species on temporal variability and synchrony in fish species abundance at different organizational levels and spatial scales. During the meeting we actively worked on the manuscript, including the finalization of the analysis and writing most of the text. This paper was submitted to a peer-reviewed journal.

Synchrony across dendritic networks – part I empirical patterns: The goal of this project is to understand how species dispersal interplay with habitat structure to drive synchrony patterns across dendritic networks. We discussed the new results performed on the empirical dataset of riverine fish abundance at the European scale and identified alternative methods and potential datasets to conduct additional analyses.

Synchrony across dendritic networks – part II simulations: This study complements the analyses described above by using a food-chain model to simulate different scenarios of dendritic complexity and species dispersal

ability to estimate their influence on biotic synchrony. The discussions focused on how the model could be modified to include more 'realistic' parameters to allow for a more direct comparison to empirical datasets. We ran new simulations and worked on the manuscript outline.

Temporal changes in functional synchrony: This project aims to examine how synchrony in functional trait space respond to environmental changes (temperature and flow alteration). During the meeting, we outlined the research questions, and developed a workflow for the analyses.

Range size, body size, synchrony and extinction risk: This project aims to understand the linkage between range size, body size, and synchrony in order to identify the populations and species that may be least resilient to environmental changes. We had detailed conversations about the macroecological theories behind the expected relationships and the required data to perform the analyses.

Additional projects. We outlined a plan to publish the global dataset of fish community abundances collected as part of the working group after getting the authorization from all the data contributors. We also planned to use the food-chain model to test the influence of disturbance duration and intensity (drought) on spatial synchrony across riverine networks.

In summary. The week was extremely productive and very enjoyable thanks to the support provided by sDiv and the personal relationships foraged among the participants.