

sDiv working group meeting summary

"sPRED - Synthesizing Predictability Research of Ecological Dynamics"

The meeting was opened by a quick round of introductions, to welcome the new group member Hao Ye, postdoctoral researcher from the University of Florida. The group otherwise consisted of a subset of the invitees for the first meeting. Workshop PIs Alison Iles and Frank Pennekamp then gave a quick update on the status of the conceptual manuscript resulting from the first meeting, synthesizing ecological predictability using a measure of intrinsic predictability called permutation entropy.

The first day the group brainstormed about how to expand our work on univariate time series predictability. Ideas included general relationships between the complexity of a system (e.g. diversity) and its predictability, and how different scales affect predictability. The group also explored possible connections between previous work and prediction of critical transitions and regime shifts, as well as prediction of transient dynamics. Finally, the group discussed predictability from a practitioner's point of view: what are the general constraints around predictability? How can we identify predictable measures that are also useful?

After discussing potential ways how to address each question and where to find relevant data to test our hypotheses, the group converged on two major topics for the workshop:

1. How does scale (e.g. spatial, temporal, taxonomic, functional) and its aggregation affect predictability?
2. What is the relationship between diversity (complexity) and predictability?

These questions were explored by small breakout groups, which identified and got hold of relevant datasets for testing hypotheses, setting up simulations and running experiments on available datasets provided by working group participants. Findings were shared with the group in short update sessions before lunch and at the end of the day. Additional work addressed improvements on the permutation entropy metric, to better deal with time series that have considerable gaps (common for ecological data) and explore multidimensional time series (e.g. systems where multiple time series are available, e.g. predator-prey interactions).

Owen Petchey, working group participant and Professor at the University of Zurich gave the public seminar at iDiv with the title: "Is ecology predictable? Lessons from experimental microbial ecosystems". No further presentations were delivered as the workshop focused on implementing and testing ideas rather than discussion.

The group discussed outputs, mostly in form of articles, and an R package implementing the proposed methodology. These included the conceptual paper (first meeting), and manuscripts resulting from the second meeting (methods and synthesis). We also discussed about organizing a special session on ecological forecasting for 2018, potentially at the ESA or BES meetings.

Overall, iDiv again was a great host institute and created a pleasant work atmosphere.