

## sDiv Workshop summary

### sChange – Quantifying biodiversity change through time

22<sup>th</sup> – 26<sup>th</sup> February 2016

#### Summary

Biodiversity has changed at global, regional and local scales. Recent data syntheses have questioned whether local- scale communities have systematically lost species as was widely assumed. These findings highlight major and urgent research challenges for basic and conservation-relevant biodiversity science. Our main objective is to develop a quantitative and conceptual framework for detecting biodiversity change and attributing it to human-driven and natural processes. This objective was developed at the October sDiv workshop sChanges, where we articulated the following consensus on the scientific conflict: *"There is imperfect sampling in current meta-analyses of local biodiversity trends. There is disagreement about whether these sampling gaps cause large bias in the estimate of the overall local trends in biodiversity, leaving disagreement about the overall global average trend in local diversity."* To resolve this conflict, we will **1) develop conceptual and statistical approaches for detecting biodiversity trends in the presence of confounding effects of sampling biases and noise in the time-series**. We will also **2) synthesize theory for how diversity, diversity metrics, and diversity change vary with spatial scale and abundance** and **3) apply these approaches to quantify biodiversity change in a newly assembled global database**. Contributions include resolution of conflicts over biodiversity change by publishing guidelines on detection of diversity change along with a state-of-the-art estimate of recent change. We will publish R code for diversity analyses and simulations to support future research. These objectives will allow us to consider the relevance of biodiversity ecosystem functioning research in the context of biodiversity time series analyses.

#### Feedback of Applicants

##### *1. Focal areas of discussion + main results/conclusions and open questions*

We focused primarily on three items:

A) How can we understand empirical patterns of biodiversity change in recent decades, given what we know from theory about how diversity change is scale dependent in space, time and with regard to human drivers. Main results include a new empirical synthesis on biodiversity change across scales for a new paper on this topic.

B) How, practically and technically, can and should we synthesize the time-series across studies to produce a map and summary of biodiversity change. Main results

include a merged database, github repository, and at least two manuscripts (one on global patterns in biodiversity change drivers, and one on global patterns on biodiversity change).

C) How can we detect and attribute biodiversity change to human activities? We refined and developed the manuscript on this framework, a project initiated at a previous CIEE meeting.

## *2. Content of presentations*

We limited participant presentations to 3 minutes, no slides, on the first day. The only powerpoint presentations were from the group leaders to set the science and policy context for the meeting and the project.

## *3. Which outputs were discussed and which next steps were undertaken (articles, presentations, workshops...)*

Outputs include manuscripts underway:

- data paper to make the database public
- scale paper on the scale dependence of biodiversity change
- framework paper on detecting and attributing biodiversity change
- driver paper on global biodiversity drivers
- biogeography of biodiversity change paper(s)
- we are exploring opportunities for additional workshop meetings

## *4. Balance between work on outputs, general brainstorming/information exchange and participants presentations in %*

Work on outputs: 65%

General brainstorming and information exchange: 30%

Participant presentations: 5%

## *5. Inspiration for own work and or further cooperation*

We are inspired! We will continue to work together in this area.

6. General working atmosphere and feedback on idiv support

excellent, no suggestions

**Participant list**

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