

# iDiv Conference 2024



**Wednesday, 13 November 2024 - Friday, 15 November 2024**

**Leipziger KUBUS Helmholtz-Zentrum für Umweltforschung – UFZ**

## **Scientific Programme**

## Biodiversity Change

Summary: This session aims to promote the integration of biodiversity theory, applied conservation science, and biodiversity monitoring to answer the overarching questions: How are biological communities changing; at which spatial and temporal scales; and to what extent do different anthropogenic drivers contribute to this change?

Guiding questions:

- What are biodiversity patterns across spatial and temporal scales and realms (marine, freshwater, terrestrial)?
- What are drivers of biodiversity changes (including losses) – what is the role of anthropogenic drivers (including land use)?
- What are relationships between traits and patterns?
- How are patterns influenced by trait evolution?

Challenges:

- Role of scales for observed patterns
- How can theory contribute to quantification?
- How to link changes to the drivers of change
- Bridging (temporal and spatial) scales and realms

## Molecular Biodiversity and Evolution

Summary: This session is about understanding the links between molecular biodiversity (chemical diversity, the (holo)genome, regulators) and the mechanisms and elements of evolution (adaptation, individual fitness, speciation).

Guiding questions:

- How do molecular mechanisms of evolutionary change drive (local) adaptation and speciation?
- What are the links between chemical diversity, species interactions and community complexity?
- What is the role of the hologenome (the genome of all organisms associated to/with an individual organism) for fitness and adaptation?
- Which genes/genetic pathways are involved in the evolution of specific species? What is the role of transcriptional regulators?

Challenges:

- Increasing the spatial and temporal resolution of data on molecular biodiversity (e.g. through high throughput measures)
- Scaling up from molecular interactions to community and ecosystem levels
- Linking molecular biodiversity to health (e.g. pollen diversity, discovery of new medicine)
- Application of existing methods (including bioinformatics pipelines) to non-model organisms
- Moving from meta-barcoding to whole genome sequencing/functional genomics (of soil organisms)
- Quantifying the evolutionary potential of species

## Biodiversity Dynamics and Complexity

**Summary:** This session aims to uncover the processes that underlay the emergence of biodiversity. This includes analyzing the dynamics of networks (trophic and other), of functional trait compositions, processes like demography, movement or interactions, and other features of complex biological systems.

**Guiding questions:**

- What are the processes leading to biodiversity patterns across space and time?
- What is the interplay between species interactions and biodiversity?
- Are there tipping points in complex natural ecosystems?
- Which mechanisms generate and facilitate diversity as an emergent property and (how) are they nested? What is the role of traits?
- Which mechanisms stabilize i) ecological networks, ii) complex communities?
- How do alien species coexist with native species in novel ecosystems?

**Challenges:**

- Using functional traits to predict biodiversity dynamics and patterns
- Integration of theoretical frameworks with [individual based] models
- Integration of ecological and evolutionary processes in a community assembly framework

## **Biodiversity and Society**

**Summary:** This session explores a wide range of linkages between biodiversity and society, such as defining positive futures for biodiversity and ecosystem service provisioning, improving conservation using novel approaches (e.g. rewilding). Further topics are the analysis feedbacks between human activity and biodiversity, of elusive relationships like telecoupling or of the effects of biodiversity on health and well-being.

**Guiding questions:**

- What are feedback mechanisms between biodiversity and socio-economic systems?
- How to account and regulate remote responsibility on biodiversity and ecosystem service change?
- How to engage society in biodiversity and ecosystem services monitoring and assessments and to understand relational values?
- What are possible positive futures for biodiversity and ecosystem services and pathways to them in the post-2020 framework?
- How to improve biodiversity conservation, e.g. through novel approaches such as rewilding?
- How does biodiversity affect human health and well-being (including allergies remedies)?

## **Biodiversity and the functioning of Ecosystem**

**Summary:** The session on biodiversity and the functioning of ecosystems analyzes the temporal and spatial mechanisms that are underlying BEF relationships. A special focus lies on zooming in on biotic interactions as well as zooming out on the upscaling of BEF relationships to the landscape level.

**Guiding questions:**

- What are the most important spatial and temporal mechanisms underlying multi-trophic BEF relationships? How are these relationships modified through external drivers?
- What are the implications and applications of BEF relationships at the landscape level?
- How do community assembly and disassembly interact with EF across scales?

- Are increasing biodiversity–ecosystem functioning relationships with time caused by changing biotic interactions due to the interplay between multitrophic community assembly processes and eco-evolutionary dynamics?
- Which biodiversity facets and ecosystem functions can be extracted from remote sensing data?

## **Flexpool**

## **Workshop**

Workshops are planned for Friday afternoon. Please submit your workshop proposal [here](#).