

EINLADUNG

Kolloquium
Sommersemester 2022

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hält am **Mittwoch**, den **08.06.2022**, um 16:15 Uhr, im **Hörsaal 2** des **Otto-Stern-Zentrums**, einen Vortrag über

„The Biodiversity Time Machine“



Ecosystem services are declining at an alarming rate. Future generations may not be able to enjoy nature's services if we fail to protect biodiversity. Biodiversity is directly linked to healthy ecosystems which provide provisioning (e.g. food), regulating (e.g. climate), supporting (e.g. nutrient cycling, primary production), and cultural (e.g. aesthetic and recreational) services. At the global level, rapid and severe biodiversity loss has been identified as the main cause of deterioration of more than 60% of ecosystem services, affected by various factors. Chemical pollution, habitat loss, unsustainable use of resources, invasive species and climate change are among the main acknowledged threats to biodiversity.

Biodiversity loss happens over many years and is often caused by the cumulative effect of multiple environmental threats. Only by quantifying biodiversity before, during and after pollution events, can the causes of biodiversity and ecosystem service loss be identified. We propose a 'Time Machine' framework that establishes spatiotemporal correlations among biotic, abiotic and ecosystem functional changes using multidecadal to millennial continuous data from biological archives, which preserve environmental and biological signals. By 'learning' from past correlations, the Time Machine Framework is tested iteratively against long-term empirical data and refined to predict future biotic, abiotic and functional associations. This framework offers a way to prioritize conservation approaches and mitigation interventions.

We show the application of this framework to the sedimentary archive of a lake with a well-characterized history of human impact. In this proof-of-concept study we apply the framework to discover the taxonomic groups affected by the combined effect of multiple threats and rank the environmental factors with the most adverse effect on biodiversity. The Time Machine Framework enables the prioritization of interventions that accelerate ecological restoration, and mitigate environmental factors that cause harm to biological groups associated with key ecosystem functions and services.

Einladender: Prof. Dr. Henner Hollert