PARIS LODRON UNIVERSITÄT SALZBURG

Environment & Biodiversity

SEMINAR SERIES ENVIRONMENT & BIODIVERSITY

# Guest Lecture


**Assoc. Prof. Sean F. Gallen, Ph.D.**
**Colorado State University**
**Department of Geosciences**
Host: Univ.-Prof. Dr. Christoph von Hagke


## Landscapes and life: Connections between long-term landscape evolution and freshwater biodiversity in post-orogenic mountains


High mountain biodiversity suggests a link between tectonics, topography, and the evolution of life. Indeed, a growing number of studies indicate that mountain biodiversity cannot be explained by climate alone. Globally, vertebrate species richness is elevated in tectonically active mountains, leading to conceptual models where mountain-building is a biodiversity generator; however, not all species adhere to this trend.

Freshwater biodiversity is highest in tectonically inactive settings, leading to the question of why and how tectonically inactive settings elevate aquatic species richness. In this seminar, we explore possible links between elevated freshwater biodiversity and landscape dynamics in the southern Appalachians, southeastern United States, a region with the highest temperate climate freshwater species richness on the planet. Relying on quantitative analysis of digital topography, erosion rates derived from cosmogenic radionuclides, and the distribution and phylogenies inferred from the DNA of freshwater species, we present results from two case studies of the Tennessee River system.

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In the first part of the talk, we discuss the drivers and timing of large-scale drainage reorganizations in the southern Appalachians and their implications for aquatic species distributions and vicariance and dispersal events. In the second part, we investigate geomorphic and geologic drivers of endemism and allopatric speciation in the Upper Tennessee Drainage Basin. In both cases, we demonstrate the essential role of rock type as a driver of transient landscape dynamics and aquatic species evolution. We conclude that geologic drivers facilitate landscape change that can simultaneously isolate and disperse species through time, acting to elevate freshwater biodiversity long after tectonism ends.

Vortragssprache: Englisch

**Monday, May 5, 2 PM**

**NLW-Faculty, Room 436, 3rd floor**

SCAN ME