

## **Environmental niche sharing in the Alps depends on whether species arose through immigration or speciation**

**Speaker's name:** Luiz Jardim de Queiroz

**Affiliation:** Department of Fish Ecology and Evolution, Eawag | Institute of Ecology and Evolution, University of Bern

### **List of authors**

Luiz Jardim de Queiroz

Conor Waldock

Niklaus Zimmermann

Ole Seehausen

The extent of niche conservatism and niche divergence between related taxa can be strongly influenced by ecological and evolutionary processes, such as immigration and speciation. However, the relative role of these processes on species niche sharing and whether they differ across taxonomic groups is little known. We addressed this issue by focusing on the Alps' biodiversity. We tested if the degree of environmental niche overlap depends on the process by which species arose in the regional pool (immigration or speciation). We reconstructed the environmental niche for 123 species of butterflies, 119 fishes, 26 amphibians, and 76 flowering plants. Then we estimated the degree of niche overlap between all within-taxa species pairs. To test whether closely related species have more similar environmental niches than unrelated ones, we correlated niche overlap with genetic distance (as a proxy for species relatedness). We found that species that have immigrated into the Alps, rather than speciated *in situ*, show a higher degree of niche overlap, independent of their relatedness. When we considered genetic distance, lacustrine fish that speciated *in situ* were the only group in which closer relatives had more divergent niches. We associate this pattern with adaptive radiation being more important in generating biodiversity in lacustrine fish than in the remaining taxa. Our findings reveal that despite shared biogeographic histories in the Alps, ecological and evolutionary processes contributed differently to the extent of niche conservatism and niche divergence between different taxonomic groups and habitats.