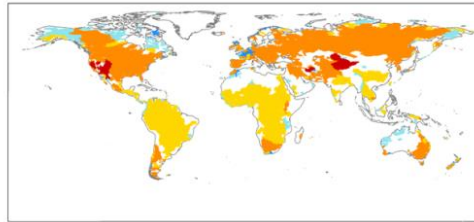




Species distribution models and impacts of global changes on species assemblages

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Scientific objectives

- Identifying large scale patterns and determinants of biodiversity

The aim is to understand the factors responsible from the spatial and temporal variability of the two main facets of biodiversity (alpha- and beta-diversity). Taxonomic and functional aspects of biodiversity will be considered to subsequently investigate the relationship between biological diversity and ecosystem functioning. The investigations will focus on the entire community and on particular components of species assemblages (e.g. endemic and non-native species). One potential outcome of this research is to quantify extinction risks and help drawing conservation plans.

- Predicting how global changes will impact species distributions

Predictive models will be used to set up scenarios of future spatial distribution of species under global changes. Three global change components associated to anthropogenic perturbations will be included in the predictive models (i.e. climate change, habitat fragmentation and biological invasions) since these stressors currently affect almost all ecosystems. We hence aim at developing predictive models able to provide predictions on the future distribution of invasive species under climate change and/or habitat degradation effects. This will provide practical tools for the management of ecosystems facing global changes.

- Understanding how biotic interactions will be affected by global changes

Global changes, by disturbing the structure of communities, also modify the biotic interactions occurring between species and also within species. This can in turn affect the structure of communities and the functioning of ecosystems. The aim here is to disentangle the relative effect of each stressor on the observed changes in species interactions in a global changes context. The role of predation, competition and parasitism will be considered using both observational and experimental approaches to subsequently investigate the relationship between biological diversity and ecosystem functioning.

Here, freshwater fish will be used as model species. Indeed, freshwater ecosystems provide countless economical and ecological services to humans while supporting a rich biodiversity. However, freshwater organisms are among the most imperilled faunas worldwide and fish are amongst the most widely introduced organisms in fresh waters. Therefore, freshwater fish are excellent candidate to investigate these objectives.

TULIP MTR

This central project is part of the MTR '*Interactions within populations and communities*', as we consider here interactions in populations and communities. It also account for the environmental context as the descriptive variables that will be used in the models are the descriptors of the physical environment (climate, geography, boundaries between distribution ranges, ...). The global change descriptors affecting species interactions are both abiotic (climate, physical habitat, hydrology) and biotic (non-native species).

ETPs involved in the project

Researchers: 5 ETP

Technicians: 3.6 ETP

Students and Post-docs: 5.5 ETP