

How do crop wild relatives adapt to extreme climates?

Background:

The impact of climate change on agriculture is a major threat to global food security, and is particularly evident in food crops that are sensitive to extreme weather events. To face this challenge, plant breeders are urged to adapt crops to better tolerate weather extremes associated with climate change. Originating from regions where climates are similar to future projections, crop landraces are a reservoir of genetic characteristics to adapt commercial crops to climate change. Characterizing these adaptive genetic characteristics is crucial for effective crop adaptation.

Project Overview:

In this project, we will study the genetic diversity of crop species exposed to extreme climatic pressures worldwide. We will first use earth observation technologies to characterize the climate of origin of different crop landraces—including information on temperature and precipitation profiles, soil types, landscape composition and topography. We will then compare genetic diversity with climate information on these landraces to uncover important genes for crop climate adaptation.

Skills Developed:

- Conducting spatial analysis and statistical inference in R.
- Handling environmental change data (e.g., Copernicus, BioClim).
- Applying exploratory analyses (e.g., PCA).
- Handling of next generation sequencing DNA data (bioinformatics)
- Scientific writing and reporting.

Interested?

We're excited to hear from you! If you're passionate about conservation, climate change, and data analysis, apply by contacting us at oliver.selmoni@geo.uzh.ch. The project will be conducted within the [Landscape and Climate Change Genomics](#) group.

Starting date: 2025