

VULPES: VULnerability of Populations under Extreme Scenarios

Call:

Mountains as Sentinels of Change

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VULPES will evaluate the impact of past climate change on mountain ecosystems and their genetic diversity from around the world, and forecast potential impacts of future climate change. Employing primarily existing fossil records from Morocco, Cameroon, South Africa, China, Ecuador, Peru, Bolivia and Brazil, VULPES will carry out a multi-disciplinary integration of quantified climate variables from fossil records, ancient and modern DNA (aDNA and mDNA), vegetation modeling, agent-based modeling and statistics. Our goal is to answer the overall question: "Are microrefugia the key to ecosystem sustainability in montane ecosystems under projected climate change?". This project will consider variability in mountain ecosystems across the last 21,000 years; a period of extreme natural climate change (e.g. transition from the last glacial period) and the more recent, increasing impact of humans. VULPES will evaluate the migration capacity of species, their potential in situ adaptation/response, ecosystem turnover through time, the tipping points that could lead to population extinctions, the rate of change and, ultimately, define a vulnerability index/threshold. This investigation will determine a global perspective on the effect of different climate types and changes on montane ecosystems encompassing semi-arid, tropical and temperate humid zones. Also included will be socio-ecological analyses regarding land use, a key to establishing future food security. Combined, our assessments will enable optimised conservation policies for ecosystems, species and genetic resources. This product will be a valuable tool allowing local stakeholders to establish appropriate management strategies for the mitigation of climate and land use impacts on mountain ecosystems.