Geophysical Research Abstracts
Vol. 21, EGU2019-14585, 2019
EGU General Assembly 2019

Modeling abiotic controls on amphibian epidemics due to a chytrid fungus in mountain aquatic ecosystems

Marilen Haver (1), Gaël Le Roux (1), Dirk Schmeller (1), Sabine Sauvage (1), José Miguel Sánchez-Pérez (1), Laure Gandois (1), Roman Teisserenc (1), and Jan Friesen (2)

(1) Université de Toulouse, Toulouse, France, INPT, CNRS, UPS, ECOLAB, France (marilen.haver@ensat.fr), (2) Helmholtz Centre for Environmental Research – UFZ, Department of Catchment Hydrology, Permoserstrasse 15, 04318 Leipzig, Germany

Globally widespread amphibian extinctions in mountain aquatic ecosystems have been linked to the spread of the fungal pathogen Batrachochytrium dendrobatidis (Bd). Epidemics due to Bd can be seen as bioindicator for the impact of environmental stressors on freshwater habitats, threatening ecosystem functioning, wildlife- and human health. In order to conserve biodiversity and ecosystem services of mountain aquatic ecosystems, interdisciplinary research is crucial. The majority of existing studies focus on bioclimatic variables controlling the distribution of Bd. We further consider mountain-specific variables of the following categories: hydroclimate (e.g. snow cover, cloud cover, catchment runoff dynamics), landscape (e.g. relative topographic position of aquatic ecosystems, slope and land cover of catchments) and direct or indirect anthropogenic impact (e.g. land use, accessibility of lakes, micropollutant presence in water). Based on Bd records from lakes along 5 altitudinal gradients in the Pyrenees, we develop a model for abiotic controls on aquatic pathogen distribution. For our model, we rely on downscaled climate data, remote sensing and hydrological modeling tools in order to respond to data scarcity in mountains. First results on annual hydroclimate do not show a significant difference between catchments which could explain Bd prevalence along the mountain range. In our next steps, we will investigate hydroclimate on different monthly to daily time scales and aggregation levels, including periods of extreme conditions (e.g. drought). We will further include identified landscape and anthropogenic factors in our pathogen distribution model.