

**Benedikt Spanier** (Georg-August-Universität Göttingen)

## 1,000 Years of Human Impact: Lake San Pablo, Ecuador

In Ecuador, the concept of "Rights of Nature" is constitutionally anchored, granting ecosystems legal personhood with the right to exist and regenerate. Following decades of untreated wastewater discharge and pollution, Lake San Pablo became the subject of a landmark legal case in 2025, resulting in the formal recognition of its rights and mandates for ecological restoration. Lake San Pablo, located in the Imbabura province at an altitude of 2,660 meters, is vital for the local population but has been under anthropogenic pressure over time. The main focus of this contribution is on how changes in land use and settlement expansion within the catchment have impacted the lake and its associated ecosystem services.

This study offers a temporal reconstruction of anthropogenic environmental change in Lake San Pablo over the past millennium, utilizing a sediment core collected in 2024 as a natural archive of the lake's history. The analysis of organic geochemical biomarkers, specifically n-alkanes and polycyclic aromatic hydrocarbons (PAHs), provides molecular fingerprints of past vegetation, land use and pollution sources. Preliminary results show a distinct trend toward increased aquatic primary production driven by recent eutrophication. Furthermore, the biomarker records reveal a clear transition from centennial-scale bio-mass burning to modern fossil-fuel-derived inputs, highlighting the intensifying anthropogenic pressure from regional urbanization, motorization, and agricultural mechanization.

Ultimately, this millennial-scale investigation provides a baseline of human-induced environmental change, linking molecular proxy records with regional anthropogenic activities and land-use changes (agricultural intensification, forest clearance, etc.). This long-term ecological and environmental perspective provides critical scientific evidence that could support the restoration strategies and helps the stakeholders in lake management and its restoration.