

## Impact of human activities and natural hazards recorded in a subtropical mountain lake, northeastern Taiwan

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Alpine and subalpine lakes are sensitive to hydroclimate change in the catchment, making sediments from those lakes an ideal material to reconstruct terrestrial paleoclimate and paleoenvironment alteration. In addition to long-term climate change, natural hazards (e.g. forest fire and landslide) and human activities (e.g. logging, cultivation, and construction) also cause environmental changes recorded in the lake sediment. It is therefore important to differentiate between sediment geochemical signals induced by climate change, natural hazards, and human activity. Here we compare signals from a sediment core with historical records to understand how natural and artificial events affect the mountain environment and are recorded in the lake sediment. We used the most recent 300 years of record from a sediment core taken in Cueifong Lake, a mountain lake in northeastern Taiwan. The age model based on  $^{210}\text{Pb}$  and  $^{137}\text{Cs}$  indicates that the sediment environment in Cueifong Lake remained stable during the past 300 years. We use different parameters to make a multi-proxy reconstruction of environmental conditions in the sediment core, including TOC, C/N,  $\delta^{13}\text{C}$ , charcoal, and element abundancy reconstructed from XRF core scanning. Historical documents and aerial photos were reviewed to assess forestry, constructions, and events in the catchment. Variations of organic matter and element abundancy indicate the sediment source changes before and after deforestation. Aerial photos can be used to capture the time and degree of deforestation surrounding the lake catchment. Our result could help to understand how human development might affect a mountainous closed-lake environment.

Keywords: deforestation, forest fire, aerial photo, XRF core scanning, mountain lake