



## **Response of present lacustrine ecosystems to climate variability associated with the North Atlantic Oscillation: A case study of lakes Sidi Ali and Azigza (Middle Atlas - Morocco).**

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The present study aims at reconstructing the recent hydrological and climatic fluctuations in Morocco and mainly in the Middle Atlas, at the junction of regional and global atmospheric influences.

The studied material consists of sediment from two lacustrine systems: Aguelmam Azigza ( $32^{\circ} 58' 25''$  N -  $5^{\circ} 26' 40''$  W) and Aguelmam Sidi Ali ( $33^{\circ} 04' 31''$  N -  $4^{\circ} 59' 43''$  W). Several bio- and geo-chemical elements have been analysed to evaluate the links between climate, landscape, and ecosystem changes.

The results show that the subactual sedimentation is significantly influenced by climate variability and human disturbance. The persistence of drought and rising temperatures in recent decades have been reflected by a predominance of carbonate fraction resulting from an increase in precipitation of carbonates. Short wet phases were recorded by a periodic increase in aluminosilicate and ferromagnesian elements. The sedimentation rate in Lake Azigza is considerably lower than that of Lake Sidi Ali. The decrease in sedimentation rates in the first lake is due to the reduction of surface runoff and drainage of tributaries; while the recent sedimentation depends mainly on wind action that redistributes materials in soils and dewatered terraces. The high rate of sedimentation of Lake Sidi Ali is a direct consequence of deforestation of the catchment. This change in the hydrological and climatic behavior is attributed to the major rupture observed in 1970 and represented by the persistence of the positive phase of the North Atlantic Oscillation (NAO).