Recent hydrological variability and flood events in Moroccan Middle-Atlas mountains: micro-scale investigation of lacustrine sediments


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Recent hydrological variability and flood events in Moroccan Middle-Atlas mountains: micro-scale investigation of lacustrine sediments

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Methods

1- Geochemistry (XRF) and mineralogy - X-ray fluorescence - X-Ray Core Scanner - Molybdenum tube - Resolution: 500 µm
- SEM and energy dispersive spectroscopy - Thin sections (acetone)
- X-ray fluorescence (XRF) and Thin sections (acetone)
- Itrax Core Scanner

2- Microsedimentology - Thin sections (acetone exchange technique) - Flattened transparency scanner - Optical microscopy - SEM and energy dispersive spectroscopy

Results

Lake levels changes during the past hundred years are recorded in the geochemistry and the microfacies of the sedimentary sequence. High lake level facies (Fig. 6a, Facies 1) is deposited when lake shorelines are closer to the vegetation line and steep slopes (Fig. 1). These facies is characterized by light brown sediments, less organics and more mineralogical changes since the 50s (Fig. 6a). Facies 2 is deposited during periods of lower precipitations (Fig. 5).

Discussion and perspectives

Lake level changes during the past hundred years are recorded in the geochemistry and the microfacies of the sedimentary sequence. High lake level facies (Fig. 6a, Facies 1) is deposited when lake shorelines are closer to the vegetation line and steep slopes (Fig. 1). These facies is characterized by light brown sediments, less organics and more mineralogical changes since the 50s (Fig. 6a). Facies 2 is deposited during periods of lower precipitations (Fig. 5).

These results demonstrate the high potential of Azigza lake to help understanding the past hydrological variability of the Middle-Atlas. Indeed, its water level and hydrochemical system is sensitive to rapid floods, as well as longer-term (dry and wet periods during several decades) changes in the precipitation regime. The two meters-long sedimentary sequence, recently retrieved from the deeper basin, would allow the reconstruction of the hydrological variability of Azigza lake for the past few hundred years.