

Parte 9

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1

**The last 250 years lake level record of Laguna Mar Chiquita, Central Argentina**

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Laguna Mar Chiquita is a highly variable terminal saline lake located in the Pampean plains of central Argentina (30°S-62°W). It is presently the largest saline lake in South America (ca. 5,000 km<sup>2</sup>). Recent variations in the hydrological budget of the region have defined dry and wet intervals and significant, well-documented fluctuations in the lake level. A multi-proxy study of sedimentary cores indicate that the system has recorded these hydrological variations.

High lake level intervals are characterized by comparatively low sedimentation rates, high percentages of TOC and diatoms, and low contents of calcium carbonate. Conversely, low lake levels display high sedimentation rates and are recorded as evaporite-rich and organic matter-poor sediments.

The oxygen and carbon isotopic compositions of authigenic carbonates can be related with the evaporation/precipitation balance and changes in the primary productivity of the system, respectively. The observed isotopic variations are consistent with the historical record of lake level fluctuations. More negative isotopic compositions characterize the most recent high lake levels (1972 AD until present) whereas comparatively more positive isotopic values coincide with dryer intervals. Analogously, a significant drought can be inferred from the oxygen isotopic composition of the basal evaporite-rich sediments corresponding to 1762 AD that is well described in the Jesuit cartography.

The long dry intervals during the first 3/4 of the XX century as well as a recent upward trend in streamflows observed in Laguna Mar Chiquita have been also reported in southern Brazil and central-eastern Argentina. Moreover, the variations in the hydrological balance of Laguna Mar Chiquita are synchronic with documented changes in several rivers within the Río de la Plata basin suggesting a mutual trigger mechanism

The sedimentary, mineralogical and geochemical record of Laguna Mar Chiquita has been combined with a robust chronology and an unusually rich historical dataset for this latitude. Thus, it provides a unique archive of recent fluctuations

8104

in the water balance of southeastern South America and point towards the potential of this lacustrine basin to reconstruct lake level changes in prehistorical times.