



Lacustrine magnetic mineralogy records for the last 2000 yr. from tropical Mexico.

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Combined magnetic mineral, microfossil content and geochemical analysis were conducted on two crater lakes sequences located on the continental extremes in tropical central Mexico: Santa Maria del Oro (SMO) on the western, Pacific margin, and Lago Verde (LV) on the eastern, Gulf of Mexico rim. Both sites witnessed the transformation of the environment since the early pre-Columbian societies until forest clearance in the last century. Through these multiproxy analyses we build up a model of past environmental changes for the last 2000 years for each site, compare these models with the archeological record and infer climatic changes in the northern hemisphere of tropical America. We also point the role that regional and seasonal moisture balance can have in the central Mexico region. Volcanic activity has played a major influence on sediment magnetic properties of both lakes, as a purveyor of Ti-magnetites/Ti-maghemites, and as a factor of instability in the environment. In both lakes, increased erosion, higher evaporation rates, lower lake levels, anoxia and reductive diagenesis in non-sulphidic conditions are inferred between ca. A.D. 300-600 to ca. A.D. 1000. These characteristics are interpreted as warmer and dryer periods, and match the period of historical crisis and multiyear droughts that contributed to the collapse of the Maya civilization. On contrast, while the Little Ice Age (A.D. 1400 – 1800) is recorded as a dry period on the western site (SMO), on the eastern site (LV) the higher lake levels and the moister conditions are inferred for this period. Higher erosion rates are recorded over the last 40 years.