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Climatic variability and human impact in Mesoamerica during the last 3,000 yr: the case of Lake Santa Maria Del Oro, Western Mexico

Margarita Caballero (1), Susana Sosa (1), Alejandro Rodríguez (1), Socorro Lozano (1), Gabriel Vázquez (2), Beatriz Ortega (3), and Gloria Vilaclara (4)

(1) Instituto de Geofísica, Universidad Nacional Autónoma de México (UNAM), Ciudad Universitaria, Del. Coyoacán, C.P. 04510, México D.F., México (maga@geofisica.unam.mx), (2) FES Iztacala,UNAM, (3) Posgrado en Ciencias de la Tierra, UNAM, (4) Instituto de Geología, UNAM

During the last decades a number of lacustrine records from Mesoamerica have documented climatic changes and episodes of intense human impact. These records are concentrated in the Maya region and the in high altitude basins of central and eastern Mexico, few studies have been undertaken in western Mexico. We believe that a regional perspective of the recorded changes can provide a better understanding of the climatic trends and mechanisms controlling these changes as well as of the regional extent, intensity and timing of the episodes of human impact.

For this reason we started a multidisciplinary project to study the lake sediments from Santa Maria del Oro (SMO), a crater lake in western-central Mexico (750 m asl). SMO is located in a region with tropical sub-humid climate(annual pp 1,250 mm/yr, mean annual temperature 21°C), with a short summer rainy season mainly related with the onset of the North American Monsoon (NAM) and the entrance of Pacific tropical storms and/or hurricanes. This site is therefore site sensitive to variations in the intensity of the NAM circulation.

Two master sequences are available from this lake. A ca. 9 m long core (ca. 2,500 yr BP, with 8 AMS 14-C dates) was recovered using a Usinger piston corer from a relatively shallow area of the lake (12 m). These sediments are laminated, mostly with alternation of brown silt and sand layers. It has been studied for: magnetic mineralogy, ostracodes, geochemistry, TIC and TOC. We are now including diatom and pollen data to improve previous paleolimnological interpretations.

The second sequence, also ca. 9 m long (ca. 4,500 yr BP, with 6 14-C AMS dates), was recovered using the Limnological Research Center (LRC at the U. of Minnesota) Kullemberg gravity corer (MOLE Mexico-USA-UK collaborative project). This sequence is also laminated, mostly between brown and black silts with finely laminated carbonate layers. High resolution ITRAX XRD elemental analysis data are available for this core.

The main changes recorded in the SMO are: a concentrated lake phase between ca. AD 600 to 1000 (end of Classic) which suggests drier climates. A period of more diluted lake waters is identified from AD 1000 to 1260 (Postclassic) which is marked by higher sedimentation rates and the presence of *Zea* pollen. The year AD 1000 is identified as a turning point in climatic conditions in most of Mesoamerica.