



Changes in hydrological patterns and climate variability for the past 1000 years in the southern Gulf of California

Ligia Pérez-Cruz (1), Alejandro Rodríguez (2), Priyadarsi Roy (3), and Jaime Urrutia-Fucugauchi (1)

(1) Universidad Nacional Autónoma de México, Instituto de Geofísica, Mexico D. F., Mexico (perezcruz@geofisica.unam.mx), (2) Universidad Nacional Autónoma de México, Instituto de Ciencias del Mar y Limnología, México, D.F., México, (3) Universidad Nacional Autónoma de México, Instituto de Geología, México D.F., México

This study aims to document changes in hydrological patterns, variations in oxygenation and bio-productivity associated with regional climate conditions (v. gr. such a precipitation, cyclonic gyre and North America Monsoon) in the southern Gulf of California.

A laminated sediment box core C36 was collected in Alfonso Basin, Bay of La Paz, southern Gulf of California, at 390 m depth. Total core length is 36.5 cm. The preliminary chronology for core C36 is based on ²¹⁰Pb and AMS radiocarbon dates. Samples were dried and grounded and bulk-sediment chemistry was measured using a Thermo Scientific Niton XL3t GOLDD X-ray fluorescence (XRF) analyzer. Major and trace elements were determined. The marine standard HISS-1 was used for calibration. The following elements and ratios are considered for the analysis: Al, Ba, Ca, Fe, K, Mo, Si, Ti, V and Zr and Zr/Al and Ba/Al, which are used as proxies of terrigenous input, oxygenation and bio-productivity.

A total of 122 continuous measurements along the whole core were obtained. Element chemical concentrations and their stratigraphic distribution are interpreted in terms of changes in hydrological cycle and paleoproductivity in the region. According to the radiocarbon date the core spans 909 cal yr BP (AD 1041). We also considered ²¹⁰Pb dates from a core collected nearby to the C36. Sedimentation rates estimated are 0.6 and 0.34 mm/yr. Further dating is in progress.

Magnetic susceptibility logging is used as indicator of mineral magnetic concentrations associated with diagenetic processes and terrigenous input. The Al, K, Si and Ti are used as proxies of terrigenous input, Zr/Al ratio is used as proxy of aeolian input, and Ba/Al ratio is a proxy of paleoproductivity.