



Evolution of the North American Monsoon from the middle Holocene to the present recorded in marine sediments from low Gulf of California

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New results of a reconstruction of the summer precipitation in the North American Monsoon area, which is the largest atmospheric circulation feature over much of northwest Mexico, and the southwest the USA. This regime results from the interplay between sea surface temperatures (SSTs) in the northeast tropical Pacific, solar variability, continental topography, land snow cover and soil moisture over the western North America as well as patterns of atmospheric pressure. The links between these factors and the monsoonal variability appear to be of variable importance during the short instrumental record. This hampers any prediction on the future evolution of the climatic regime in a warming climate.

We produce an X-Ray Fluorescence record of the relative abundances of Si and Al in high resolution laminated sediments obtained from the Pescadero basin (24N, 108W) as semi-quantitative index of terrigenous input. This record links the transport of terrigenous materials by summer precipitation in the North American Monsoon region, in mountain range Sierra Madre NW Mexico. The record was constructed from XRF scan measurements of a composite core (260cm long) based on several box and Kasten cores, the age model is based on 8 ¹⁴C AMS ages, producing a record with a mean temporal resolution of 0.5 yr.

The variability of the NAM shows a decreasing trend between the middle Holocene to the present. This general trend is parallel to many other records like speleothems, ice cores, pollen fossil, and elemental content in marine and lake sediments. Spectral and cross-spectral analysis were made in order to search for some similarities with other climatic features on global scale, and thus evaluate possible links between the low and high latitudes climate variability. In addition, we compare the last century precipitation with the past few thousand years and explore some possible effect of climate change in the North American Monsoon behaviour.