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Recent climatic variability in the transition zone of the eastern tropical north pacific off Mexico reconstructed by geochemical proxies in corals

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The transition zone of the Eastern Tropical North Pacific is one of the regions less explored of the Pacific Ocean, despite the fact that the tropical Pacific off Mexico has been recognized as a key region modulating the climate in an important part of Mexico and of North America (Badán-Dangón, 1998; Hu and Feng, 2002). Coral cores containing up to 180 years of climate variability were collected from several sites in the Eastern North Tropical Pacific (off Mexico) in order to understand the historical characteristics of ENSO activity in the region. Sampling localities include Socorro and San Benedicto Islands, (19N, 111W), and Pulmo and El Cardonal reefs, at the entrance of the Gulf of California (23.5N, 109.5W). Coral skeletons were analyzed at seasonal to subseasonal resolution for trace- and minor-elemental ratios and stable isotopes. The spectral analysis of the geochemical records reveal frequencies typical of ENSO (between 2 and 7 years). The evolutionary spectrum, however, reveals that ENSO frequencies have increased, becoming more frequent but less intense, after the mid 1970's (I.e., from a 5-7 year period in the 1960's to 2.5 - 4 year period in the 1980's). There is also a very strong decadal-scale signal that significantly relates to the PDO. The paired analysis of Sr/Ca and the δ18O where used to reconstruct the historical variability of the isotopic composition of the seawater (δ18Ow) (Ren et al., 2002), and hence the hydrologic balance and the changes in the oceanic circulation in

the Eastern Pacific. The dynamic connections between these signals imply a regional response to Walker-type scale of circulation changes, as well as to thermal hemispheric forcing.