

INTERANNUAL CLIMATE VARIABILITY RECORDED IN EARLY PLIOCENE MOLLUSC SHELLS FROM COASTAL PERU

Lars Reuning¹ and Thomas J. DeVries²

¹ Institute of Geology, RWTH Aachen University, D-52056 Aachen, Germany; reuning@geol.rwth-aachen.de

² Burke Museum of Natural History and Culture, Seattle 98195, USA

The interaction between the El Niño–Southern Oscillation (ENSO) and long-term future global warming is uncertain. Some models link past and future “hothouse” climates to a shallowing of the east Pacific thermocline and a shift towards a permanent “El Niño-like state” in the east Pacific. This is in contrast to other models indicating little change in the ENSO system under “hothouse” conditions. The early Pliocene, characterized by prolonged global warmth, provides a good testing ground for these conflictive theories. Since ENSO events are tightly coupled to the annual cycle it is essential to use paleoclimate-archives with seasonal resolution to resolve individual ENSO events. The stable oxygen isotopes of mollusc

shells could provide the first proxy-record for ENSO events during the early Pliocene. We will evaluate the potential of the mollusc species *Dosinia ponderosa*, from several Pliocene exposures in coastal Peru, as climate archives. A range of analytical methods (scanning electron microscopy, X-ray diffraction, cathodoluminescence) were applied to develop a screening procedure for diagenetic modifications. Replacement of shell calcite by gypsum was identified as the main diagenetic process active in the arid environment of coastal Peru. However, several diagenetically unaltered mollusc shells were identified and selected for stable isotope analysis of seasonal the temperature variability.