Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09086, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09086
EGU General Assembly 2008

Denitrification intensification during the last deglaciation in the eastern tropical north pacific off Mexico

J.D. Carriquiry (1,2), and A. Rosell-Melé (2)

(1) Universidad Autónoma de Baja California, Instituto de Investigaciones Oceanológicas, A.P. 453, Ensenada, Baja California, México 22800, (2) Instituto de Ciencia y Tecnología Ambiental (ICTA), Universidad Autónoma de Barcelona, 08193 Bellaterra, Spain

(jose_carriquiry@uabc.mx)

The close relationship between climate change and the North Pacific Oxygen Minimum Zone (OMZ) has been related to both intermediate water ventilation and productivity [Behl and Kennett, 1996; Ortiz et al., 2004]. It has been commonly accepted that intermediate water formation in the Western North Pacific (i.e. Sea of Okhotsk) increased during cool intervals of the Last Glacial [Keigwin, 1998], ventilating intermediate water depths in the North Pacific. Concurrently, it has been hypothesized that during this period the California Undercurrent diminished, reducing the flow of low O2 water northwards along the margin from the Eastern Tropical North Pacific (ETNP) [Kienast et al., 2002]. In this study, we present a high-resolution sedimentary δ^{15}N and alkenone data from a gravity-core/piston-core couplet GC31/PC08 (the same core used by Marchitto et al., 2007), raised from 705 m water depth, on the open margin off the western coast of southern Baja California (23.5˚N, 111.6˚W) (van Geen et al., 2003). The site is today situated within the regional OMZ that exists due to a combination of high export production and poor intermediate and is ideally located to document past variations of ocean/atmosphere interactions responding to glacial-interglacial changes (Ortiz et al., 2004). Our results show that during deglaciation, particularly at the start of Heinrich event 1 (H1), the sedimentary d15N show a sharp and sudden increase to values as high as ∼11 o/oo, characterizing the arrival

of a strongly oxygen-depleted water mass at intermediate depths. The timing of this change coincides with the low-14C water pulse (vey old water). As deglaciation grades into the Holocene, there are several millenial-scale oscillations in denitrification that fluctuate in synchrony with the 14C content of the intermediate water mass.