A 22 kyr record of an evolving mid-depth hiatus in sediments at the Peruvian margin.

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The Peruvian coastal region has long been in the focus of marine geological investigations because of its importance to understand high productivity areas and the oxygen minimum zones (OMZs) in today's and past oceans. The reconstruction of paleoenvironmental conditions for periods since the Last Glacial Maximum was hampered by a ubiquitous hiatus in sediment core records. We combined the stratigraphical information of 22 sediment cores from the literature and own results from 9 cores collected during R/V *Meteor* cruises M77/1 and M77/2 as a part of Sonderforschungsbereich 754. The cores were located between 3° and 18°S and water depths of 90 to 1300 m within and below the Peruvian OMZ. In general, Peruvian Margin sediments consisted of olive green to greyish green silty clays predominantly showing laminations within the OMZ. Diatomaceous oozes were occasionally found underneath the main upwelling areas. Homogenously bioturbated silty clays with planktonic foraminifera were found around the OMZ in particular in the northern part of the region. Cores obtained from south of 7°S showed slumping, erosional surfaces, phosphorite sands and unconformities. In order to investigate the distribution of the hiatus in space and time, we compared the lithologies of the cores of the corresponding time intervals; Late Holocene, Early Holocene, Bølling/Allerød, Heinrich-Stadial 1 and Last Glacial Maximum with the Recent conditions. Each time interval showed abundant unconformities successively progressing along the continental slope from south to north during the deglaciation. It has been suggested that the erosion and concomitant non-deposition was caused by the poleward undercurrent (PCUC: Peru Chile Undercurrent) (Reimers and Suess, 1983; Reinhardt et al., 2002 and the references therein) which today feeds the upwelling in the region. The PCUC originates around 5-7°S and is centred between 50 and 400 m water depth, with a well-defined core around 100 to 300 m. The undercurrent reaches its highest velocities around 10°S and leads to partial erosion along the shelf. In addition to the PCUC, breaking internal waves affect sedimentation and shape the slope at greater depths between 500 and 700 m around 11°S (Mosch et al., 2012). Both, undercurrent and internal waves created erosional surfaces, non-deposition and slumps, evolving and affecting a wider area with the onset of Termination I.

References

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