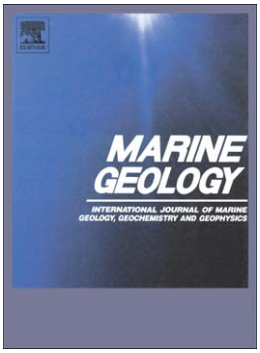

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A contourite depositional system along the Uruguayan continental margin: sedimentary, oceanographic and paleoceanographic implications

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ABSTRACT

For the first time, a multidisciplinary approach to evaluate the influence of bottom currents in the Uruguayan continental margin is presented. Bathymetric data and multichannel 2D and 3D seismic reflection profiles were used to construct a morphosedimentary map to interpret and decode sedimentary and oceanographic processes along the Uruguayan continental margin. Based on these results an extensive contourite depositional system on the margin is described, which contains an impressive array of large erosive, depositional (drifts) and mixed (terrace) features, which have been generated primarily by the near-bottom flows associated with water masses of Antarctic and subantarctic origin. From the Eocene-Oligocene boundary up to present time, the long-term influence of water masses from higher southern latitudes, in combination with down-slope sedimentary processes have strongly controlled the overall margin morphology. Most of the features described here, were formed during the middle/late Miocene epoch due to paleoceanographic shifts that include the arrival of Antarctic Intermediate Water along the margin, which in combination with deeper Antarctic Bottom Water are fundamental in the margin evolution. In combination with Quaternary climatic and eustatic changes in sea level, fluctuations of the Brazil–Malvinas Confluence influenced subsequently glacial and interglacial stages as recognized in sedimentary features defined here. These paleoceanographic changes controlled the sedimentary stacking pattern and the locations of high amplitude reflections along the contourite terraces, which could be associated with sandy deposits. A more detailed understanding of the margin will improve interpretations of variations in the South Atlantic subtropical gyre and further constrain general climatic and ocean circulation models.

Key words: Contourites, sedimentary processes, seismic stratigraphy, high amplitude reflections (HARs), paleoceanography, Uruguayan margin

1. INTRODUCTION

Over the last decade, numerous bottom current-controlled depositional, erosional and mixed features have been recognized along continental margins and within abyssal plain regions of the world oceans (e.g., Rebesco et al., 2014). These features provide strong diagnostic evidence for both modern and ancient bottom water circulation patterns and associated sedimentary processes. Moreover, different recent works have demonstrated that bottom current circulation around continental margins is shaping their morphology and affecting their sedimentary evolution (e.g.;