Accepted Manuscript

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PII: S0012-8252(17)30217-9
DOI: doi:10.1016/j.earscirev.2018.02.017
Reference: EARTH 2595

To appear in: *Earth-Science Reviews*

Received date: 23 April 2017
Revised date: 4 February 2018
Accepted date: 12 February 2018

Please cite this article as: W. Capella, N. Barhoun, R. Flecker, F.J. Hilgen, T. Kouwenhoven, L.C. Matenco, F.J. Sierro, M.A. Tulbure, M.Z. Yousfi, W. Krijgsman , Palaeogeographic evolution of the late Miocene Rifian Corridor (Morocco): Reconstructions from surface and subsurface data. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Earth(2017), doi:10.1016/j.earscirev.2018.02.017

Palaeogeographic evolution of the late Miocene Rifian Corridor (Morocco): reconstructions from surface and subsurface data

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Abstract

The Rifian Corridor was one of the Mediterranean–Atlantic seaways that progressively restricted and caused the Messinian Salinity Crisis (MSC). Many key questions concerning the controls on the onset, progression and termination of the MSC remain unanswered mainly because the evolution of these seaways is poorly constrained. Uncertainties about the age of restriction and closure of the Rifian Corridor hamper full understanding of the hydrological exchange through the MSC gateways: required connections to sustain transport of salt into the Mediterranean for the primary-lower gypsum and halite stages.

Here we present integrated surface-subsurface palaeogeographic reconstructions of the Rifian Corridor with improved age-control. Information about age and timing of the closure have been derived from high-resolution biostratigraphy, palaeoenvironmental indicators, sediment transport directions, and the analysis of published onshore subsurface (core and seismic) datasets. We applied modern taxonomic concepts to revise the biostratigraphy of the Rifian Corridor and propose astronomically-tuned, minimum-