



Evidence for ENSO variability in the late Miocene

A. von der Heydt (1), S. Galeotti (2), M. Huber (3), D. Bice (4), H. A. Dijkstra (1), T. Jilbert (5), L. Lanci (2) and G.-J. Reichert (5)

(1) Institute for Marine and Atmospheric research Utrecht, Utrecht University, The Netherlands (A.S@vonderHeydt@phys.uu.nl); (2) Istituto di Scienze della Terra, Università degli Studi di Urbino 'Carlo Bo', Urbino, Italy; (3) Purdue Climate Change Research Center, Purdue University, USA; (4) Department of Geosciences, Penn State University, USA; (5) Faculty of Geosciences, Earth Science Department, Utrecht University, The Netherlands

In this presentation, we compare results of fully coupled climate model simulations for the Miocene against a record of primary evaporite laminites deposited during the Messinian (~5.6 Ma) in the Marche Region of central Italy. The late Miocene interval was characterised by elevated global mean surface temperatures and weaker than modern meridional temperature gradients. It has been hypothesized that ENSO variability could be absent in a climate state warmer than present and would collapse into a 'permanent' El Niño state. The laminite record indicates interannual variability in the Mediterranean area on periods resembling those of modern ENSO. Ocean-atmosphere climate model simulations demonstrate ENSO variability similar to present day and suggest a teleconnection between ENSO and proto-Mediterranean aridity during this time. Our results suggest that the warmer mean climatic state of the Late Miocene was capable of supporting ENSO variability similar to that observed today.