

Lithospheric Isostatic Rebound during the Messinian Salinity Crisis in Mediterranean

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The Messinian Salinity Crisis that occurred between 5.96 Ma and 5.32 Ma in Mediterranean is one of the most spectacular geological events of desiccation of an enclosed sea with a drop of the base-level that reached at least 1500m as well as a massive deposition of evaporites. Surprisingly, despite the enormous mass of sediment and water displayed (charge or discharge) during this period, no evidence of lithospheric rebound has been reported with geological data. However, some lithospheric flexure models (e.g. Norman and Chase, 1986) show that a massive unload of water implies necessarily an isostatic rebound in the basin and an associated uplift of the mediterranean shores. Here, we examine this paradox by using a new model that encompasses a lithospheric flexure model (due to unload of sea-water), and a sedimentation model (due to deposition of evaporites in the desiccating basin). We show that the concordance or not of the evaporites layers can bring some constraints about the pertinence of a preserved messinian rebound in Mediterranean.

Keywords: Messinian Salinity Crisis, isostatic rebound, lithospheric flexure model, evaporites deposition