



On the Messinian evolution of the western Alboran region

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Uplift of the Gibraltar region due to isostasy played a pivotal role in the development and maintenance of a desiccated Mediterranean basin during the Messinian salinity crisis; here, a relatively minor uplift of the oceanic gateways probably had a major impact on oceanographic and sediment circulation. I present new results from three-dimensional flexure models for the western Mediterranean to argue that a substantial part of the giant evaporite body was deposited before sea level lowering. After deposition of the Massive Halite, delamination of SE Alboran crust from the Gibraltar slab probably caused uplift and closure of the Rifian seaways. This event is partly documented in the volcanics of the region. When the Atlantic connection had been lost and sea level had dropped, a sizeable regional uplift of the Gibraltar strait developed which presented a formidable obstacle to re-flooding. The geodynamic evolution of the Gibraltar slab may also have played a key role at the end of the Miocene by lowering the sill region, thus reinstating the oceanic connection without much tectonic signatures. This dynamic subsidence is currently still observable in the gravity field of the westernmost Alboran Sea.