



Magmatic effects of the Messinian salinity crisis and the potential implications for the Tyrrhenian geodynamics

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For more than four decades, large controversies about the causes, effects and timing of the Mediterranean Messinian Salinity Crisis (MSC) have evolved in the light of a continuously growing body of evidence. The igneous response to such extreme event, however, has remained largely unexplored despite known relationships between surface load variations and the production, transfer and eruption of magma. Recently, we recognized a two-fold increase in the number of volcanic eruptions from pan-Mediterranean magmatic provinces during the proposed acme of the MSC, which we ascribed to increased magma production and transfer by lithospheric unloading due to a kilometer-scale sea-level drop. Numerical models of coupled extensional tectonics and surface processes further suggest that the MSC also facilitated the onset of oceanization in the Tyrrhenian basin by boosting the extensional magmatism. Thus, the MSC seems to have had far bigger effects on the Mediterranean magmatism and geodynamics than previously proposed.