

Hydrology of marginal evaporitic basins during the Messinian Salinity Crisis

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The deposition of gypsum in marginal basins during the Mediterranean Messinian Salinity Crisis (MSC) is controlled by basin restriction and by the local hydrological cycle: evaporation, precipitation, continental runoff and exchange with the Mediterranean Sea. We are using the oxygen and hydrogen stable isotopic composition of gypsum deposited in the Caltanissetta (Sicily) and Piedmont (N. Italy) marginal basins of the Mediterranean to investigate the hydrological cycle that dominated at the moment of gypsum deposition. Water isotopes provide snapshots of the hydrological and evaporative conditions integrated over several thousand years. Coupled to a hydrological box-model of marginal basins, this work highlights 1) a marginal basin dominated by freshwaters input in the Piedmont Basin and by high evaporation in the Caltanissetta Basin and 2) a latitudinal relative humidity and temperature gradients similar to modern ones, providing evidence for the existence of a Mediterranean-like climate in the region 5.96 million years ago.