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Messinian Erosional Surface in the Levantin margins: geodynamic implications.

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During the Messinian salinity crisis (5.96–5.33 Ma), the Mediterranean Sea was disconnected from the Atlantic Ocean. As a consequence, a dramatic sea-level fall occurred during part of the crisis and deep erosion has been observed on the Mediterranean margins as well as on the continent. The origin and evolution of the Messinian Salinity Crisis (MSC) and associated deposits beneath the Mediterranean seafloor is still subject of considerable debate, mainly focused on their depositional environment, age and correlation from the basinal to marginal series. One of the key problems concerns the lack of biostratigraphy data and 3D geometrical control of main stratigraphic surfaces. Recent studies in three areas in the Eastern Mediterranean basins, Hatay (Turkey), Lattakie (Syria), and Psematismenos (Cyprus) basins confirm the presence of the Messinian Erosional Surface which separates the uppermost Miocene deposits from the Pliocene, clearly encased in incises valleys. Systematic cartography of this unconformity shows fluvial erosion in relation with the peak of the Messinian Salinity Crisis. On the edges of the Psematismenos incised valleys or subareal canyons, the Messinian Erosional Surface impacts the previously deposited Messinian marginal evaporites linked to a first step of the Messinian Salinity Crisis. Huge Mass Transport Deposits are often locally preserved along the canyons edges and made of breccias with blocks of variable size and nature, gypsum and other pre-Messinian rocks. Fan delta complexes infilled the Messinian canyons flooded during the Zanclean. The most spectacular is described in the Nahr El Khabir Valley in northern Syria. These observations consists in distinct steps of the Messinian Salinity Crisis: 1- circum-Mediterranean deposition of marginal evaporite between 5.96 and 5.6 Ma in suspended basins, and 2- the downcutting of the Messinian fluvial canyons between 5.6 and 5.32Ma ending with the complex Pliocene marine reflooding, caracterised by a catastrophic sea level rise.