

## Messinian event : seismic evidence

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Résumé : Une carte basée sur de nombreux profils sismiques et des données terrestres montre la distribution des évaporites du Messinien en Méditerranée. Basée sur l'étude du bassin nord-baléare une interprétation de l'évènement Messinien est proposée : existence d'un bassin Miocène relativement profond avant le dépôt des évaporites, remplissage des dépressions importantes par une épaisse couche de sel accompagné d'une régression majeure marquée par une surface d'érosion sur les marges, dépôt des évaporites supérieures en mer peu profonde transgressives sur les marges par rapport au dépôt de sel, poursuite de la subsidence durant le Plio-Quaternaire.

A map based on numerous seismic reflection profiles, land data and results of DSDP holes shows the distribution of the Messinian evaporites in the Mediterranean area. The Messinian event is superimposed on a geodynamic evolution that is very different according to the areas : relatively stable or active areas, Cenozoic or Mesozoic basins. Generally one observe an infilling of the depressions by a relatively homogenous salt layer which can be more than 1500 m thick, overlain by "Upper evaporites" made of interbedded evaporites and marls several hundred meters thick. The map shows that during late Miocene the Mediterranean was made up of a succession of more or less separate basins with straits and thresholds.

A model is proposed based on the study of a stable area : the North Balearic basin. Before the salinity crisis a deep Miocene basin already existed as demonstrated by results of Leg 42 A (hole 372), by the existence of pre-Messinian escarpments on the margins with associated sedimentary wedges thinning out towards the basin. The depth could have been around 1000-1500 m. Depressions are filled up by a thick sequence of mainly salt pinching out on the margins. At the same time, linked to lowering of the sea level, subaerial processes created an important erosional surface and canyons on the margins. The upper evaporites deposited in shallow waters rest on this erosion surface and extend much

farther than the salt on the margins. Thus the erosion corresponded to a short event included in the Messinian period.

Subsidence history of the margins and of the basin, due to cooling of oceanic lithosphere and loading by sediments began after opening of the deep basin after the Oligocene rifting phase. Subsidence continued during Pliocene-Pleistocene times bringing the Messinian evaporites at their present depth. On the shelf break of the Gulf of Lion or Gulf of Valencia the amount of Pliocene-Pleistocene subsidence is around 1500-2500 m.