



## The fate of salt in the Cyprus subduction zone

Sönke Reiche (1), Christian Hübscher (1), Axel Ehrhardt (2), and Jennifer Klimke (2)

(1) Institute of Geophysics, University of Hamburg, Germany (soenke.reiche@zmaw.de), (2) Federal Institute for Geosciences and Natural Resources, Hannover, Germany

The area between Cyprus and Hecataeus Rise to the north and Eratosthenes Seamount (ESM) further south is presently accommodating plate tectonic convergence between Africa and Anatolia. A number of studies have focused on the convergence history, especially after drilling close to the plate boundary in the course of ODP Leg 160. Even though drilling at Site 968 has reached late Messinian Lago Mare deposits, little information on deeper trench strata exist, owing to limited penetration of previously published seismic data. Here we show results from bathymetric data and a dense grid of seismic lines collected during research cruises MSM14/2 and MSM14/3 in 2010 across the Cyprus trench, shedding new light on the tectonostratigraphic evolution of the plate boundary.

Evaporites of locally more than 1.5 km thickness occupy the northern trench area. Between Cyprus and ESM evaporites are heavily deformed and appear to be thrust southward over Pliocene-Quaternary strata. Thus significant post-Messinian tectonic shortening at the plate boundary was accommodated by allochthonous salt advance towards the ESM which is currently being thrust beneath the island of Cyprus. Such observations may provide an example of how salt efficiently escapes the subduction cycle.

In contrast, evaporites between ESM and Hecataeus Rise have not experienced sufficient shortening for initiating allochthonous salt advance, even though compression-related thickening is clearly evident. The observed pattern of intensively deformed salt between Cyprus and ESM and moderately deformed evaporites in the eastern trench area is believed to reflect a predominately N-S-oriented post-Messinian convergence direction. Such implications raise the question about a fairly recent coupling between the motion of Cyprus and Anatolia.

Along the entire study area, the southward salt limit coincides with the seafloor stepping down towards the ESM, suggesting thickening and ESM-directed advance of the evaporites to have caused at least the northern part of the circum-ESM depression. Evaporites are locally covered by up to 600 m thick Late Messinian Lago Mare deposits. This spatially limited sediment package is only observed directly south of Cyprus, pointing towards Cyprus-derived sediment delivery into the trench area during the final stages of the Messinian Salinity Crisis. Forming an intact, fairly undeformed roof above underlying mobile evaporites, large parts of the Lago Mare unit and overlying sediments of Pliocene-Quaternary age have apparently been rafted south during allochthonous salt advance.