Source-to-sink processes in an active tectonic hypersaline basin: the anatomy of mass transport deposits in the Dead Sea

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Continental archives such as interplate endorheic lacustrine sedimentary basins provide an excellent source of data for studying regional climate, seismicity and environmental changes through time. Such is the case for the sediments that were deposited in the Dead Sea basin, a tectonically active pull-apart structure along the Dead Sea fault (DSF). This elongated basin is characterized by steep slopes and a deep and flat basin-floor, which are constantly shaped by seismicity and climate.

In this study, we present initial results on the sedimentology and internal structure of mass transport deposits in the Pleistocene Dead Sea. The database used for this study consists of a long core retrieved at ~300 m water depth in the deepest part of the Dead Sea as part of an international scientific effort under the auspice of the ICDP. Micro-facies analysis coupled by elemental scanning (μXRF), granulometry and petrophysical measurements (magnetic susceptibility) have been carried out on selected intervals in order to decipher and identify the source-to-sink processes and controlling mechanisms behind the formation of mass transport deposits.

The findings of this study allowed defining and characterizing the mass transport deposits into separate sedimentary facies according to the lake level and limnological conditions. Investigating sediments from the deep Dead Sea basin allowed better understanding and deciphering the depositional processes in relation with the tectonic forces shaping this basin.