



## **Source-to-Sink analysis the Suez rift (Egypt) since the Miocene: impact of tectonic versus climate on sediment supply.**

Delphine Rouby (1) and Sébastien Rohais (2)

(1) GET UMR CNRS 5563, Toulouse, France (delphine.rouby@get.omp.eu), (2) IFPEN, Direction Géosciences, Rueil-Malmaison, France

We present a source-to-sink (S2S) study of the Miocene to recent deposits in the Suez rift (Egypt) where a high-resolution database at basin-scale (~300 km x 100 km) was available including, digital elevation model, outcrop and subsurface data. We used the stratigraphic record and a quantitative geomorphology to constrain a high-resolution sedimentary budget and gain insights in the evolution of rift-relief evolution. We analysed the relationship between catchment and sediment supply for the Plio-Pleistocene (post-rift) and use these results to interpret the previous accumulation history from the rift initiation onward.

(i) The Suez rift initiated during the Oligo-Miocene with active volcanism and formed isolated depocenters (“rift initiation stage” during 1 to 4 Myr). (ii) The rifting then widened (“rift widening stage” during ca 3 Myr) by fault propagation and depositional systems recorded a progressive marine flooding. (iii) During the following “rift climax stage” (during ca. 5 Myr) characterized by maximum fault throws and subsidence rates, depositional systems recorded several major anoxic events. (iv) In the “late syn-rift stage” (during ca. 4 Myr), erosion of the rift shoulders was limited, the paleo-bathymetries reduced and the paleogeography was progressively smoothed out along the rift. (v) The following “quiescence phase” (during ca. 7 Myr) was associated with thick evaporite deposits. Over the same periods, the sediment supply dynamics showed (i, ii) a progressive increase corresponding to the growth (and erosion) of the rift-related relief to (iii) a maximum corresponding to the largest relief variations, (iv, v) followed by a rapid decay (in less than 1 Myr) and then more progressive decay corresponding to the relaxation of the rift-related reliefs.

Nonetheless, during the Plio-Pleistocene (ca. 5 Myr ago), the sediment supply was renewed suggesting either a renewed uplift and/or a major climate shift related to the “Pliocene revolution” allowing to reach the magnitude of accumulation observed.