# Source-to-sink system of the Nile since 70 Ma: linking anorogenic reliefs and sediment budget

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**Résumé**

Despite having been studied since the fifth century, the timing of origin of Nile's present-day drainage is still disputed. We hypothesize that the present-day Nile drainage system was previously consisted of two former endorheic systems (Sudanese and Albertine "Basins") and an exorheic system (Tethys Margin). Our objective is to reconstruct the paleo-routing system of the Nile since the uppermost Cretaceous from both source and sink perspectives. The main work in the source domain focuses on the geomorphological analysis where we constrain the timing of the uplifts and deformation wavelengths by dating them using their geometrical relationships with dated magmatic rocks. Digital Elevation Model (DEM) and satellite images were utilized to characterize and map several generations of stepped pediments which are proxies of uplifts. Additionally, stratigraphic records of the sedimentary basins were studied to complement the datings. Meanwhile in the sink domain, sediment volume of the Nile Delta was calculated by interpolating regional 2D seismic lines.
We propose the following source-to-sink model of the Nile where its catchment grew larger southwards. First, a major deformation occurred in the Cretaceous-Paleogene boundary (66 Ma) with the uplift of westernmost catchment limit, Darfur-Ennedi-Tibesti, followed by a major pediplanation. Second, this large pediplain was flooded by the Tethys Sea reaching a northernmost subtle high of the Sudanese endorheic "Basin". Consequently, only carbonate platforms were deposited in the Egypt to the former Hudi Lake from Paleocene to middle Eocene. Third, the first evidence of the Nile fluvial system was discovered during late Eocene (_˜37 Ma) characterised by large channel incisions on the carbonate platforms in Fayum. Fourth, the rifting of Red Sea during the Oligocene-early Miocene triggered an uplift of the Red Sea Hills which then supplying sediments along with the Uweinat Dome. Later, a major desiccation of the Mediterranean Sea (_˜5.3 Ma) caused a big drop in sedimentation rates. Fifth, the capture of the Sudanese endorheic during Early Pliocene (_˜4 Ma) caused a significant growth of the Nile catchment and peak in the sedimentation rates. Finally, the present-day Nile's drainage system was completed by the capture of Albertine endorheic during middle-late Pleistocene ($<$ 1 Ma).

**Mots-Clés:** source, to, sink, nile, pediment/pediplain, sediment volume

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