



Shifting Sediment Sources in the Quaternary Nile

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Invited Paper

The Nile basin contains the longest river channel system in the world and drains about one tenth of the African continent. A dominant characteristic of the modern Nile is the marked spatial and temporal variability in the flux of water and sediment. Because the major headwater basins of the Nile are linked to key elements of the global climate system, the sedimentary records in the basin have attracted good deal of attention from the Quaternary palaeoclimate and palaeohydrology communities. Various approaches (from heavy minerals to strontium isotopes) have been employed to examine present and past patterns of sediment yield in the basin. A good deal of work has been carried out on the long sediment records in the delta and offshore which provide high resolution archives of hydrological changes in the upstream basin as well fluctuations in the input of dust from the desert. The sediment load of the modern desert Nile (downstream of Khartoum) is dominated by sediment inputs from the Blue Nile (61 +/- 5%) and Atbara (35 +/- 4%), whilst the White Nile contribution is meagre (3 +/- 2%) (Padoan et al. 2011). Recent work has shown that these values were very different during humid phases of the Quaternary when stronger Northern Hemisphere summer insolation produced wetter conditions across North Africa. In the early Holocene, for example, the Nile floodplain in Northern Sudan shows a tributary wadi input of 40–50%. This paper will review three decades of work on the sediment delivery dynamics of the Quaternary Nile and explore their palaeoclimatic implications.

Padoan, M., Garzanti, E., Harlavan, Y., Villa, I.M. (2011) Tracing Nile sediment sources by Sr and Nd isotope signatures (Uganda, Ethiopia, Sudan). *Geochim. Cosmochim. Acta* 75 (12), 3627-3644.