The Dababiya corehole, Upper Nile Valley, Egypt: Preliminary results

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Abstract:

The Dababiya corehole was drilled in the Dababiya Quarry (Upper Nile Valley, Egypt), adjacent to the GSSP for the Paleocene/ Eocene boundary, to a total depth of 140 m and bottomed in the lower Maastrichtian Globotruncana aegyptiaca Zone of the Dakhla Shale Formation. Preliminary integrated studies on calcareous plankton (foraminifera, nannoplankton), benthic foraminifera, dinoflagellates, ammonites, geochemistry, clay mineralogy and geophysical logging indicate that: 1) The K/P boundary lies between 80.4 and 80.2 m, the Danian/Selandian boundary between ~ 41 and 43 m, the Selandian/Thanetian boundary at ~ 30 m (within the mid-part of the Tarawan Chalk) and the Paleocene/Eocene boundary at 11.75 m (base [planktonic foraminifera] Zone E1 and [calcareous nannoplankton] Zone NP9b); 2) the Dababiya Quarry Member (=Paleocene/Eocene Thermal Maximum interval) extends from 11.75 to 9.5 m, which is ~1 m less than in the adjacent GSSP outcrop.; 3) the Late Cretaceous (Maastrichtian) depositional environment was nearshore, tropical-sub tropical and nutrient rich; the latest Maastrichtian somewhat more restricted (coastal); and the early Danian cooler, low(er) salinity with increasing warmth and depth of water (i.e., more open water); 4) the Paleocene is further characterized by outer shelf (~ 200 m), warm water environments as supported by foraminifera P/B ratios > 85% (~79-28 m), whereas benthic foraminifera dominate (>70%) from ~27-12 m (Tarawan Chalk and Hanadi Member) due, perhaps, in part to increased dissolution (as observed in nearby outcrop samples over this interval); 5) during the PETM, enhanced hydrodynamic conditions are inferred to have occurred on the sea-floor with increased river discharge (in agreement with sedimentologic evidence), itself a likely cause for very high enhanced biological productivity on the epicontinental shelf of Egypt; 6) correlation of in situ measured geophysical logs of Natural Gamma Ray (GR), Single-Point Resistance (PR), Self-Potential (SP), magnetic susceptibility (MS), and Resistivity, and Short Normal (SN) and Long Normal (LN) showed correspondence to the lithologic units. The Dababiya Quarry Member, in particular, is characterized by very high Gamma Ray and Resistivity Short Normal values.

Keywords:

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