# An Assessment of Temporal Changes in Calcareous Nannofossil Productivity Observed from Pliocene-Oligocene Subsurface Sediments of the Niger Delta

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Quantitative analysis of sixteen (16) selected wells located across onshore and offshore depobelts of the Niger Delta, has been investigated for variations in abundance and diversity of calcareous nannoplankton with the aim of assessing any temporal changes in productivity and possible driving mechanisms responsible for the variability of their temporal and spatial distributions.

Fourteen traditional biozones (sensu Martini, 1971) were delineated based on the determination of key age-diagnostic calcareous nannofossils species encountered. Five Oligocene, seven Miocene and two Pliocene biozones were recognized based on the following index marker species: Reticulofenestra umbilica (NP22); Sphenoliths ciperoensis (NP23); Sphenoliths predistentus (NP24); Helicosphaera recta (NP25); Triquetrorhabdulus carinatus (NN1); Helicosphaera ampliaperta (NN4); Sphenolithus heteromorphus (NN5); Cyclicargolithus floridanus (NN6); Catinaster coalitus (NN8); Discoaster hamatus (NN9); Discoaster quinqueramus (NN11); Sphenoliths abies (NN15) and Reticulofenestra pseudoumbilica (NN16). The consistent recognition of some of the biozones and the absence of others implies certain over-riding conditions affecting their temporal distribution possibly linked to changes in water mass conditions, presuming other faunal and floral evidence point to continued sedimentation throughtout.

Productivity trends interpreted from total abundances of Coccoliths, Discoasterids, Helicoliths, Sphenoliths and Reticulofenestrids morpho-groups reflect varying dominance within the assemblages over time. Reticulofenestrids-Sphenoliths dominate during the Oligocene-Early Miocene, Sphenoliths - Helicoliths during Early-Middle Miocene, and dominance of Sphenoliths - Discoasterids assemblages observed are key to Late Miocene - Pliocene times especially noticeable in the deep-water wells studied, which overall reflected more abundances compared to the onshore wells. These variations are reviewed in context to influence of local conditional change influenced by extraneous factors such as nearby volcanism affecting water chemistry and climate change.