

Niger Delta dynamic phase in the Gulf of Guinea during the last 20 ka: Panacea for the sustainable development of the region

*Onema Christopher Adojoh¹, Marret-Davies Fabienne², Tetsuji Muto³

1. Missouri University of Science and Technology, Rolla, USA, Dept of Geoscience, Geological and Petroleum Engineering, 1400 North Bishop, Post Code 65401, 2. School of Environmental Sciences, University of Liverpool, L69 7ZT, UK, 3. Nagasaki University, Japan, Dept of Environmental Science and Fisheries, 1-14 Bunkyo-machi, Nagasaki, 8528521

The Niger Delta is ideally located in a region of great sensitivity to climate change and sea level fluctuations and offers the possibility to provide insights on Late Quaternary environmental change in Equatorial West Africa. In comparison with other major tropical deltas, this deltaic system's response to past climate change and sea level fluctuations during the last 20 ka is poorly understood due limited studies in the basin. This presentation documents the detailed analyses of a multi-proxy dataset collected from three gravity cores obtained from the shallow margin of the Niger Delta to fill this scientific knowledge gap. The dataset included sedimentology, grain size, geochemistry, calcareous nannoplankton, foraminifera, and palynomorphs. The study hypothesised that the dynamics of the Intertropical Convergence Zone (ITCZ) and sea level fluctuation played a major role in shaping the landscape in the Niger Basin and adjacent coastal regions.

The palynological sequences defined in the three gravity cores show very similar fluctuations; afro-montane forest (Podocarpaceae), freshwater swamp (Cyperaceae), savannah (Poaceae) and lowland rainforest (Polypodiaceae) dominated the late glacial and deglaciation periods, followed by the development of mangrove vegetation (Rhizophoraceae) during the interglacial in Early to mid-Holocene. These records suggest dry conditions and lower sea level during the late glacial and deglaciation periods, and warm conditions leading to the rise of the sea level during the interglacial.

The two stages of evolution at different periods has resulted in an improved understanding of the paleoenvironmental dynamics for the sustainable development of the region.

Keywords: Niger Delta, Deltaic Environment, Late Quaternary, Sustainable Development