



# Recent Niger Delta shoreline response to Niger River hydrology: Conflict between forces of Nature and Humans

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## Abstract

The Niger River Delta is a prolific hydrocarbon province and a mega-delta of economic and environmental relevance. To understand patterns of its recent shoreline evolution (1923-2013) in response to the Niger River hydrology, and establish the role played by forces of Nature and Human, available topographic and satellite remote sensing data, combined with hydro-climatic (rainfall and runoff) data were analyzed.

Results indicate that the entire delta coastline dramatically receded: 82% of the > 400 km-long coast retreated, during the period 1950-1987; and 69% between 2007 and 2012. Prior to 1950, there was a continuation of seaward advancement along 53-74% of the delta coast. The 1950-1987 shoreline recession coincided with occurrences of two major events in the Niger River basin; these are downward trends in hydro-climatic conditions (the great droughts of the 1970s-1980s), and dam construction on the Lower Niger River at Kainji (1964-1968). The 2007-2012 event corresponded with the extensive channel dredging during 2009-2012 in the Lower Niger River from the coastal town of Warri in the south to Baro in the north. Remarkably, the largest net shoreline advancement recorded in 74% of the entire delta area occurred within a year (2012-2013), which we link to increased sediment supply to the coast caused by the '2012' floods, adjudged the

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