

Climate, Relative Sea-Level, and Sedimentation Dynamics in Relation to Ancient Urban Change in the Lower Central Plain of Thailand: A GIS-Archaeological Synthesis

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Abstract

This article synthesizes and reformulates a GIS-based study of the relationships among climate variability, relative sea level, sediment accumulation, and transformations of ancient polities in Thailand. The analysis integrates digital elevation data, bathymetric information, the depth to the base of Bangkok soft clay, the locations of major ancient cities, and published scholarship on Holocene geomorphology, palynology, sedimentology, and Dvaravati archaeology. The synthesis indicates that the original model is useful for visualizing broad patterns of marine transgression and regression in the Lower Central Plain, particularly the Mid-Holocene highstand and subsequent deltaic progradation. Nevertheless, comparison with palaeo-shoreline studies based on geomorphology, pollen evidence, and radiocarbon dating suggests that interpreting U-Thong and Ancient Nakhon Pathom as direct coastal ports during the Dvaravati period requires caution. Archaeological research instead indicates that U-Thong flourished in the middle Dvaravati period through riverine-maritime exchange networks, Mahayana Buddhist influences, and long-distance trade rather than through climate or sea-level change alone. This article therefore argues for a multi-causal interpretation in which climate, sea level, and sedimentary processes provide environmental constraints and opportunities, while urban development and decline must also be evaluated through archaeological, economic, religious, and political evidence.

Keywords

Palaeoclimate, relative sea level, Holocene sedimentation, Dvaravati, U-Thong, GIS, Lower Central Plain.