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Coastal Environmental Change
During Sea-Level Highstands:
A Global Synthesis with implications
for management of future coastal change

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Quaternary coastal morphology and sea level changes

**Project 437**

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# Quaternary Sea Level Changes along the East Coast of India

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***Keywords:*** *Tamilnadu, Indian peninsula, east coast, sea level, Quaternary*

## Abstract

The littoral low lands of east coast of India offers an excellent region.For the study of geomorphology, processes and sea level changes as the region has variety of landforms and sedimentation history right from cretaceous. Living and dead coral in two places along the coast is an added advantage for the study of Quaternary sea level changes.

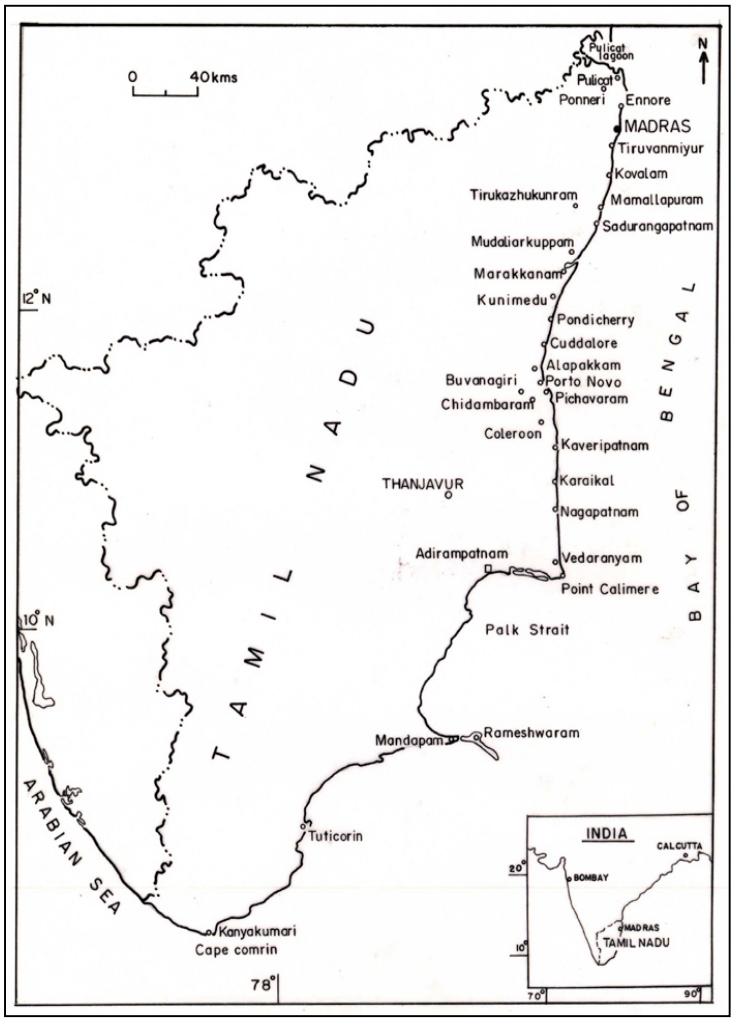


**Figure 1.** Map showing coast of Tamilnadu with some of the sites mentioned in the text.

Tamilnadu forming the southern part of east coast of India is ideal site for Quaternary sea level study as it has sedimentary records of Pliocene, Pleistocene and Holocene. The Holocene sea level history is also understood by the study of archaeological records. A beach ridges series of this region dated back to 1,25,000 years BP and an another dated back to 6000 years BP indicate last glacial maximum and mid Holocene high sea level (Bruckner 1988,1989).

Archaeological records observed around Kaveripatnam and Mamallapuram suggest that the sea had attained the regression minimum during BC 300 - 600 AD which is attested by the growth of cities and ports in the reclaimed shelf regions of the coast. The archaeological records also suggest that the sea has been in transgressive phase since 600 AD that is attested by the submergence of the ports and cities developed during the regressive minimum period (Rao 1991, Wheeler, 1946).

The study of coastal landforms especially the abandoned channels of rivers has brought to light the role of tectonism in the evolution of landforms of the region. The preferential migration of the rivers noticed in the region proves the process of cymatogenic downwarping taking place in the region (Anbarasu, 1994).

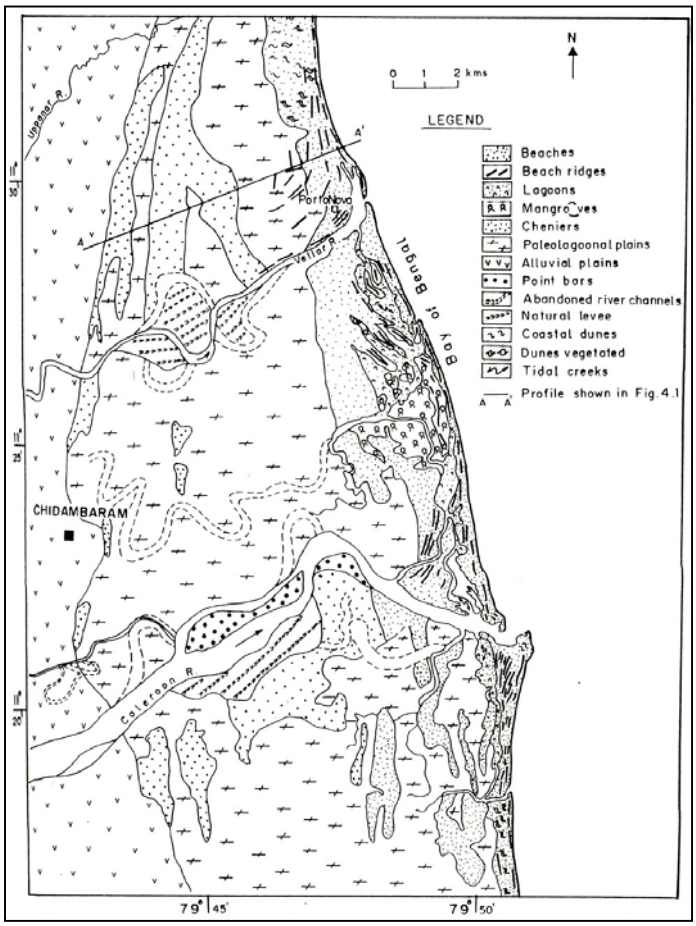


**Figure 2.** Coastal geomorphology around Chidambaram.

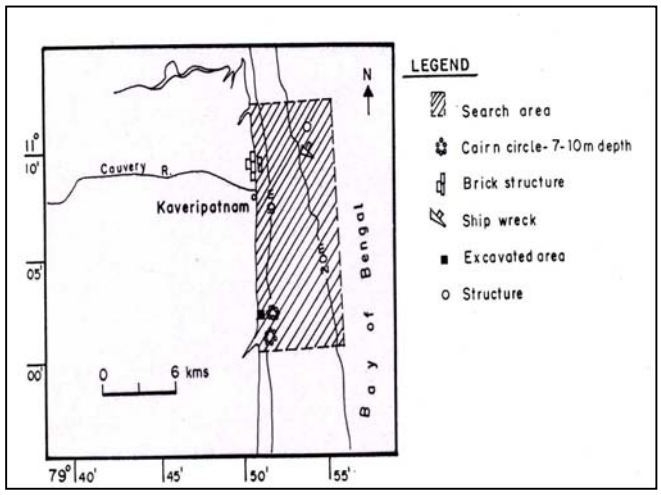


**Figure 3.** Sketch showing submerged Kaveripatnam

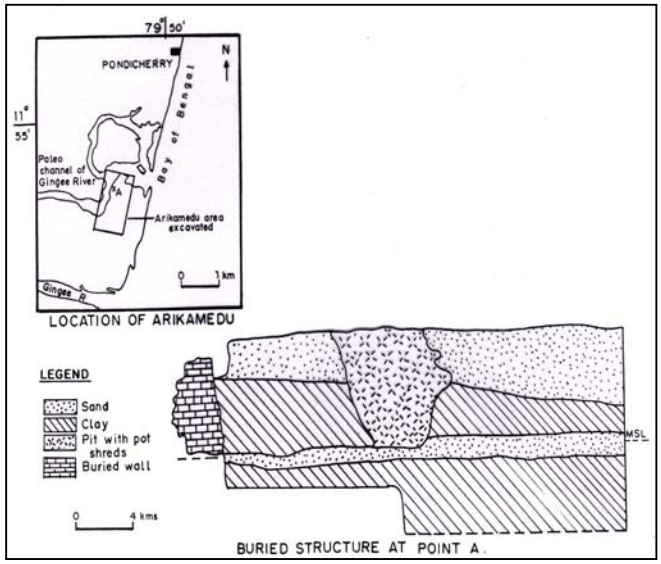


**Figure 4.** Arikamedu – A buried port

**Sea level indicators:**

| | | |
|---|---|---|
| Geomorphic - | Beach ridge plains around Vedaranyam | **1,25,000** years BP (TL Date) |
| | Beach ridge plains around Chidambaram<br>Marine terraces around Pondicherry<br>Raised corals in Rameshwaram island<br>Barrier ridges around Marakkanam | **6,000** years BP ($C^{14}$ Date) |
| Archealogic - | Submerged Roman fort in Arikamedu | |
| | Submerged town of Kaveripatnam | **2,300** - **1,700** years BP |

**Quaternary sea level history:**

| Events | Age | Indicator |
|---|---|---|
| Transgression I maximum | **1,25,000** years BP | Older beach ridges and Cheniers around Chidambaram |
| Transgression II maximum | **6,000** years BP | Younger beach ridges |
| Regression minimum | **2,300** – **1,400** BP | Development of ancient cities and ports in reclaimed land area. |
| On going transgression | From **1400** years BP | submergence of the developed cities and ports under water |

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