



## **Geochemical and sedimentological characterisation of surface sediments from Ashtamudi Estuary, Southern India: Implications for paleo-environmental reconstruction**

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Geochemical analyses and end-member modelling algorithm (EMMA) of the grain-size distribution were conducted on modern surface sediments from Ashtamudi Estuary, Southern India to understand the hydrodynamic factors that influence modern depositional processes in the region. The complex interplay of natural (fluvial and marine) and anthropogenic influence on the Ashtamudi Estuary has been delineated based on the inter-relationship between geochemical elements and end members (EM) derived from grain size parameters. The high contribution of Al, Fe, Cr and Ni combined with the EM1 and EM2 indicates fine-grained sediment derived from the fluvial input into the basin. Sediments from the lower Ashtamudi Estuary are characterized by high concentration of Si, Ti, Ca and Sr and coarse end member (EM3) reveals evidence for strong marine/tidal influence. The elemental value of Cu, Pb, Zn and Co along with EM4 largely concentrated around the shore region, where dredging and construction activity has been active, suggests the anthropogenic influence in the basin. This integrated geochemical analyses and EMMA from Ashtamudi Estuary present detailed knowledge of the controlling transport mechanisms of the particle supply and provides proxies for understanding the paleo land-ocean interactions from the region.