Abstract

Holocene sea-level change representing the recent most change in the sea curve post-LGM is a challenging task as besides the eustatic changes the estimates are affected by hydro-isostatic changes , modulations in ocean and land topography, tectonics and geoidal changes. Therefore local estimates and curves must be generated for a region which accounts for these factors. From the Gulf of Kachchh there are a few studies estimating early-late Holocene sea level changes. However, the estimates are varied and there is need for more robust data points to generate a regional picture.

The present study was made in this direction to understand the late-Holocene sea level changes from the relict mud-flats preserved at the distal end of Kori Creek and to also understand the relationship with climate variability. The 1m deep core section of a partially active mudflat from Lakhpat in the Kori creek region was investigated using geochemical and Carbon/Nitrogen elemental analysis. To chronologically restrain the core Pb-210, Cs-137 and AMS C-14 radiocarbon dating was employed. On the basis of selected geochemical proxies the study reveals three phases of sea-level change from bottom of the core. The first phase shows a high sea-level stand followed by relatively low stand and then marginally high stand with fluctuations. The higher tendency of the sea coincides with wetter climate in the region which seems to have dominating role in controlling the fluctuations. However, the phases could not be chronologically constrained. The Pb-210 and Cs-137 results show the sediments to be older than 150-200 years while the AMS ages were not consistent and could not be used.

The upliftment of the sediments after 1819 earthquake as it lies proximal to the Sunda high region is expected which explains the absence of modern sedimentation. However, the C-14 AMS ages are older than suspected and give an unrealistically low sedimentation rate (0.3 mm/yr) to the 1 m core. The incorporation of dead carbon from the catchment rocks is suspected. Hence, due to the lack of robust data on chronology the detailed correlation of the sea-level with the climate is not attempted. Nevertheless, the absence of mudflat sedimentation in the last 150-200 years suggest the low the sea-level in the recent times, while a relatively higher sea level during suspected late- Holocene period with fluctuations. The provenance of the sediments was suggested to be dominantly from Indus delta as the sediments are supplied via long shore current with some contribution from the proximal Thar desert. For future research it is hypothesised that the sea-level changes in the region are

dominantly controlled by the climate with tectonic over printing which needs to be corrected for. Also, an alternative chronological technique like optical stimulated dating technique may be explored to chronologically restrain the core.