2. Objectives of the present study

For the present study, it is proposed to investigate the linkage between past variations in the Indian monsoon system and its effect on the photic zone productivity, local hydrography, and fluvial input in the EAS utilizing a multi-proxy approach. The following causal relationships need to be explored to achieve that objective.

a) The past variations in the relative intensity of the Indian monsoons by tracking the relative changes in E-P and coastal circulation using planktonic foraminifera-$\delta^{18}$O and available alkenone-SST patterns from the region. Both the high-resolution Holocene-Glacial and low-resolution glacial-interglacial time slices would help in reconstruction of the past monsoon variations.

b) The fluvial silicate-detritus distribution in the sediment column deposited on the continental shelf, in the vicinity of any Western Ghat Rivers is expected to produce characteristic signals in concert with the summer monsoon intensity. Because, the Western Ghat Rivers are dependent upon the summer-monsoon and are exclusively seasonal. Therefore, the down-core variations of specific size detrital grain ratios may be able to provide important clues about the variations in summer monsoon rains.

c) There is a large volume of work on record showing strong relationship between upwelling, productivity, and the summer monsoon intensity particularly from the western Arabian Sea. If the summer monsoons were solely responsible for driving the productivity in the Arabian Sea, then the proxies such as biogenic-calcite, organic-matter, and scavenged-Al from the EAS also are expected to produce overlapping signals in concert with the past summer monsoons.
d) The high productivity and low oxygen characteristic intermediate water maintain intense modern-OMZ in the Arabian Sea. The past variation in the OMZ intensity could be evaluated through variation in water column denitrification recorded by the sedimentary nitrogen-isotopes. The past changes in denitrification intensity may be a useful tool to understand the variation in monsoon intensity (vis-à-vis productivity) and intermediate water hydrography.

Three gravity cores representing three different depositional environments in the EAS were selected for the present work from the collection of the National Institute of Oceanography (see Figure 1 & Table 1). Due to certain analytical constraints it was not possible to generate strictly paired data for the studied cores, and hence the interpolation technique was used to evolve common time-scale for different variables wherever required. The chronology for Holocene-LGP sections of the cores may contain certain uncertainty due to the non-availability of AMS-14C dates. I have rigorously assessed the structure of the oxygen isotope profiles while evolving age models; however, refrain from discussing several subtle fluctuations in view of the above chronological limitation particularly for the Holocene-LGM section.