

## Depositional environment at IODP Site U1445 in the northeastern Indian Ocean based on the litho- and isotope-stratigraphy

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International Ocean Discovery Program (IODP) Site U1445 is located near the southern end of the Mahanadi basin, on the eastern margin of India, ~94 km from the Indian coastline, and 2502 m water depth in a flat-lying region of the upper continental rise. The summer monsoon is the primary control on present-day suspended sediment discharge from the Mahanadi River. The narrow continental shelf promotes rapid transit of particulates to the continental slope and rise. Therefore, U1445 could provide an ideal sediment archive to reconstruct the past summer monsoon variability using various proxies for vegetation, detrital flux and sea surface salinity. However, this location on the upper rise is not protected from turbidite deposition although the seismic profile around Site U1445 is characterized by parallel, flat-lying reflectors minimally interrupted by small-scale dewatering faults.

Three holes were drilled at U1445 and cores have been spliced down to 284.834 m CCSF-A (composite depth) with appended cores down to 707.278 m CCSF-A. This nearly continuous sediment sequence covers the past 6 million years based on shipboard bio- and magneto-stratigraphy. Sediments are principally composed of hemipelagic clays with a significant biogenic component, as well as occasional thin turbidites. Detailed examination of shipboard stratigraphy revealed that inconsistent datum were recognized at 110 m, 250m, 350-420 m, 630 m, and 650 m CCSF-A, which suggest the reworking of diatom and foraminifers.

In order to establish an orbitally tuned age model for the whole sequence of U1445, we started to measure stable oxygen and carbon isotopes of benthic foraminifers. The oxygen isotope for the top 50 m CCSF-A ranges from 1 to 5.5 permil VPDB and shows spiky profile. Spiky data seems to be always lower by 2.5 permil from the baseline profile with normal oxygen isotope curve down to MIS 7, which suggests the rework of benthic foraminifer tests from upper slope. Carbon isotope does not show a spiky feature. Considering the depth profile of temperature and phosphate in this region, abnormally light oxygen isotope foraminifer tests were formed around 250 m water depth where temperature was 10 °C higher than and phosphate (or carbon isotope of DIC) was similar to the water depth of Site U1445.

Therefore, it is necessary to distinguish reworked sediments and to know their thickness for calibration of the age model. Although turbidite layers observed on the core section surface are sometimes very faint, color enhancement of section photographs and examination of compositional changes by XRF scanner data might enable us to identify reworked sediments and measure their thickness.

Keywords: IODP Site U1445, Indian Ocean, Sediment facies, Benthic foraminifer, Isotope stratigraphy