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Evidences and provenances of Seismo-turbidites in the Northern Part of Narcondam-Barren Basin

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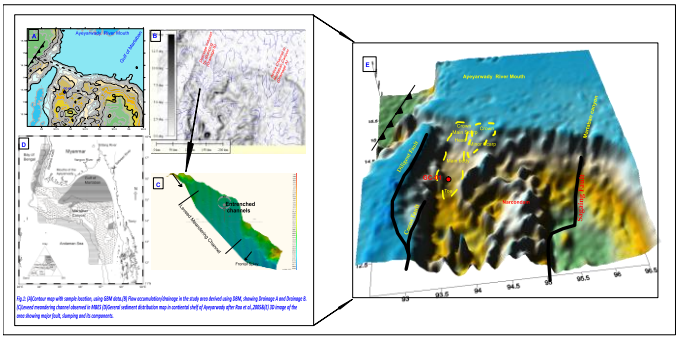
Detailed study of submarine active channels could reveal the prevailing channel system and its existence in the palaeo-environment. Turbidity currents are short lived, powerful, gravity driven currents consisting of dilute mixture of sediment and water. These deposits are known as turbidite deposits or turbidites. Seismo turidites are essential for studying submarine landslide caused due to ground shaking associated with great earthquake or in an area like active margins [1]. Evidences for turbidite and volcanic deposits were brought out from mineralogical studies of sub-surface sediments of a gravity core collected at a water depth of 1689m in the northern part of Narcondam-Barren Basin, Andaman Sea during the cruise SM-231. To rigorously constrain the mode of sediment transport, Global Bathymetric Model (GBM) data from http://topex.ucsd.edu/cgi-bin/get_data.cgi was used to generate Digital Bathymetric Model (DBM). Thus generated bathymetric model, shows two active channels; one in Martaban Canyon, along Sagaing fault (drainage A), second one in the western part (Drainage B). A few slumps are present in the study area (Fig. 1A, B & E). Moreover, this observation is validated with bathymetric model of Ayeyarwady continental shelf by Rao et al., [2]. Diligent Fault (DF) and Cocos Fault (CF) which are evident in the DBM (Fig. 1E), are closely associated with drainage B. The moderately sinuous nature with channel levee system of drainage B is also identified in high resolution MBES grid model (Fig. 1C). Coarse fraction (+230ASTM) studies of the core reveal the presence of multiple sand layers at different levels. SEM-EDAX and EPMA studies confirmed sub angular quartz rich layers at 114-116cm and 166-169cm with transparent nature and sub-rounded amphibole rich layer at 151-155cm. The source of these anomalous sand layers observed in the core is from the outer shelf relict sand. [2][3] suggested that the outer shelf relict sands are deposited probably during the Holocene regression. These relict sand brought to the Narcondam-Barren basin by drainage B, which formed by slumping/sliding material in the outer Ayeyarwady shelf induced by ground shaking/earthquake. Since the granules (Pumice?)(25-40cm) were soft and fragile, their composition was not determined by EPMA /EDAX. However, the partial analysis suggests they are iron rich. Moreover, high values of SiO_2, MgO, Al_2O_3, Fe_2O_3 and Mno are observed in the pumice(?) layer from 25 to 40cm. Geochemical studies shows a low Ca/Fe ratio and high Sr values in GC-01 where there is a high terrigenous percentage which imply a seismo-turbidite deposit and such a claim is corroborated by similar studies on Seismic [4] [5] [6]. The geochemical studies clearly show the granules (25-40cm)(pumice?) are volcanic derivatives, which suggest an volcanic eruption during Holocene. Since some of the mega scale slumps are tsunamigenic, such studies are significant to locate submarine slump/slides.



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