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Sediment transfer in deep sea carbonate environment (Little Bahama Bank, Bahamas)

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The Carambar cruises 1, 1.5 and 2 were conducted between November 2010 and December 2016 (Chabaud et al., 2016; Mulder et al., 2012, 2014, 2017a, 2017b, Tournadour et al., 2015, 2017) in order to understand the sediment transfers between the platform and the deep basin in a modern carbonate environment. The large acoustic data set acquired during the Carambar cruises covers more than 20,000 km^2 of high resolution bathymetry and backscatter data and 5,400 km of very high resolution seismic lines along the northeastern slope of the Little Bahama Bank (LBB). The LBB upper slope is dissected by numerous regularly spaced canyons. The lower slope corresponds to the valley feeding two giant canyons, the Great Abaco Canyon (GAC) and the Little Abaco canyon (LAC), running parallel to the platform and with mouths fall within the Blake Bahama Escarpment (BEE). Surficial distribution of the acoustic facies and echo-facies clearly shows a wide variety of sedimentary processes along the slope. Its western part shows more evidence of deposits, such as sediment waves, and the eastern part, which is incised in the lower slope by the GAC and the LAC, is more affected by erosion. Currents like the Antilles Current (AC), flowing northward trough the LBB, and the Western Boundary Under Current (WBUC), a deep current flowing southward along the BEE, seem to impact sediment transfer in the study area. In the upper and lower part of the slope, the AC could affect the material transiting through the canyons and in the deep basin; the WBUC seems to influence deposits at the mouths of both giant canyons. The variety in the physiography of the platform, bordered in the western part by a marine sand belt, and in the eastern part by tidal deltas and Islands, could influence the sediment export. In addition, the westward tectonic tilt of the bank (Austin et al., 1988; Mulder et al., 2012) seem to contribute to this gradient.