

Evaluation of dredging impacts on sand excavation using geophysical techniques: case study from Colombo Port City development project

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Acoustic imaging can be employed to evaluate sea bottom morphological changes due to many marine development projects. Though, large scale development projects are in progress in Sri Lankan waters, current status has not been evaluated and sea bottom morphological impacts have not been assessed. To fulfill such gaps, the effectiveness of side scan sonar and single beam bathymetric survey results were evaluated. The investigations were carried out during the period of 14th November to 18th December, 2016 in off Negombo area. Two hundred meter (200 m) line spacing was maintained throughout the side scan sonar survey. The results indicated that the average depth of this area is around 25 m. Small elongated reef with approximately 80 m long, sand ripples, pits and boulders were recognized during this survey. Several dredging locations (about 2.5 km²) in the survey area were clearly identified. Faded and distorted dredging signs could be identified in some locations while dredging tracks were totally covered by background materials in some places. That indicates bottom surface may be affected by strong bottom currents and sediment transportation may occur in intense order to fill the dredging tracks. Single beam survey results indicated that the technique is effective to identify large scale topological changes. Reducing line spacing may increase its spatial resolution. Side scan sonar technique showed good potential to identify affected areas by dredging and present status of dredging sites. Periodic monitoring with side scan sonar is recommended for continuous impact monitoring for precautional planning to be taken to minimize dredging impacts.

Keywords: dredging, Port City, side scan sonar survey, single beam survey, topological changes

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