

## Field studies of seabed, ocean and water quality parameters in remote locations

Oleg Makarynskyy

Australian Institute of Marine Science, Australia

**Statement of the Problem:** Remote area monitoring campaigns, which may provide data for detailed analyses ambient conditions and, if necessary, for model validations, are expensive and thus rare. This study was an exception; it aimed at assessing seabed sediment properties and monitoring oceanographic and sediment transport conditions using acoustic and optical instrumentation in a tropical, semi-enclosed, meso-tidal harbor in North Australia. **Methodology:** The first stage of the campaign was focused on the sediment properties; several sediment cores and acoustic sediment thickness surveys of the area revealed a layer of fine, soft sediment of variable thickness covering the seabed. The second stage comprised collection and processing of wind and rainfall data, sea level, wind wave and water current measurements and observations of sediment dynamics using four acoustic Doppler current profilers and optical turbidity sensors. Water column profiling was performed to assess water temperature, salinity and turbidity using a Seabird CTD profiler, and suspended sediment

concentrations and particle size distributions using a LISST. The observation period covered several neap-spring tidal cycles during both wet and dry seasons, thus representing a significant range of met-ocean condition variability in North Australia. **Finding:** An analysis of particle size distribution from the collected sediment cores suggested significant variability of the sediment material vertically, within the cores and among the coring sites. The magnitudes of echo intensity and depth from the bottom track suggested that the upper most part of the sea bed was mobile and fluid. The profiling of suspended sediment concentrations indicated higher concentrations during the wet season and lower concentrations during the dry season; there generally was an increase of concentration with water depth. **Conclusion:** Based on the conducted comparative analysis of the met-ocean data and sediment concentrations, most favorable conditions for sediment re-suspension and transport were identified.