



## **Spatial Interpolation Methods in bathymetry mapping to aid seabed classification decision making for Marine Park Management at Kuruman Island, Labuan, Malaysia**

Azizi Ali (1), Khaira Ismail (2), M.Fadzil Akhir (1), and Aidy M.Muslim (1)

(1) University Malaysia Terengganu, Institute Oceanography and Environment, Physical Oceanography and Geology, Malaysia (azizi@umt.edu.my), (2) School of Science Marine, University Malaysia Terengganu

Coral reefs are one of the critical habitats because they are exposed to various natural threats or human activities. Awareness of the shrinkage and reduction of fishery resources from the sea has made the Marine Parks management very important for sustainability of marine resources. Marine Parks will be responsible in providing special protection to aquatic flora and fauna, and protect, preserve and manage natural breeding sites and aquatic habitat and providing the particular attention to unique, inaccessible ecosystem which is also a home to numbers of endangered species. Therefore, research on the growth and effectiveness of a marine park is important in understanding the status of health and the surrounding area. It includes the study of seabed classification, coral reefs, algae and sediment types. For that purpose, bathymetry mapping is one of the most important data in developing seabed classification model for future analysis. In this study, we assessed, evaluated and analysed the performance of three different deterministic interpolation method and one geostatistical interpolation algorithms to map the bathymetry of Marine Park areas at Kuruman Island, Sabah, Malaysia. The performance of the algorithms was assessed through cross-validation and Monte Carlo Simulation. Finally, operational information was derived from the bathymetric grid with the best performance. The results showed that all interpolation methods were able to map important bathymetric features. The best performance was obtained with the geostatistical method (RMSE = 0.83 m). The information derived from the bathymetric map (e.g., the level-area and level-volume diagram and the three-dimensional grid) will allow for optimization that finally derived the seabed classification of the Marine Park, Kuruman Island, Labuan as well as the development of habitat mapping modelling studies.

Keywords: single beam, mapping, seabed classification; environmental management