

Abstract

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Sustainable Solution for the Protection of Alexandria Coastline, Egypt

Alexandria city suffers from erosion problems along its coastline. These problems are mainly due to human activities (e.g. construction and development works along coastline), and natural factors (e.g. wind, wave, current and sea level rise). To reduce the erosion problems, submerged Artificial Reefs (SARs) are introduced to reduce the wave heights behind the structure. Alternative materials can be used such as the geo-textile tube technology. This technique is becoming one of the most effective, cheapest and most friendly options for developing countries. Integrated solution for reducing the erosion problems along Alexandria coastline is presented. The study was applied at Sidi-Bisher Beach, east of Alexandria city, Egypt with narrow beach width. To solve the erosion problems, submerged Artificial Reefs (SARs) are suggested to induce wave breaking and energy dissipation. A numerical model "MIKE 21 CAMS" of DHI Water & Environment Morphological Modelling System is applied to investigate the shoreline development behind a single shore-parallel- submerged breakwater. The numerical model "MIKE 21" was validated using other numerical models and experimental data. Comparative analysis study between the conventional submerged breakwater and the geo-containers sand filling submerged reef proposed is presented and discussed.