Abstract

Akram S Soliman

Artificial Submerged Reefs: A solution for Erosion Problems along Alexandria Coastline, Egypt?

In this paper we examine the flood and erosion risks facing the city of Alexandria, Egypt's primary Mediterranean port. Alexandria city is one of the oldest cities on the Mediterranean coast, and is an important tourist, historical, industrial and economic centre. Alexandria suffers from many erosion problems along its coastline, particularly in its beach areas and low-lying newer suburbs. Finding an adequate but cost-effective means of protecting the city is a matter of urgent concern to the city planners. A Reynolds-Averaged Navier-Stokes (RANS) numerical model is employed to investigate the storm wave run-up and overtopping characteristics of existing defences, which are demonstrated to be inadequate for providing the required level of service. The option of raising the level of the defences is not feasible, both from the reduction in amenity and also the costs, as existing infrastructure would have to be sacrificed to accommodate larger defences. This leads to the proposed deployment of submerged offshore artificial reefs, to induce wave breaking and energy dissipation, to limit the wave heights reaching the beach. Preliminary results have shown that such a system will provide the required protection.