

## Morpho-Dynamic Modelling of the Western 14 Km of the Togolese Coast

**Authors :** Sawsan Eissa, Omnia Kabbany

**Abstract :** The coastline of Togo has been historically suffering from erosion for decades, which requires a solution to help control and reduce the erosion to allow for the development of the coastal area. A morpho-dynamic model using X-beach software was developed for the Western 14 Km of the Togolese coast. The model was coupled with the hydrodynamic module of DELFT 3D, flow, and the Wave module, SWAN. The data used as input included a recent bathymetric survey, a recent shoreline topographic survey, aerial photographs, ERA 5 water level and wave data, and recent test results of seabed samples. A number of scenarios were modeled: do nothing scenario, groynes, detached breakwaters system with different crest levels and alignments. The findings showed that groynes is not expected to be effective for protection against erosion, and that the best option is a system of detached breakwater, partially emerged-partially submerged couples with periodical maintenance.

**Keywords :** hydrodynamics, morphology, Togo, Delft3D, SWAN, XBeach, coastal erosion, detached breakwaters

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