

Abstract

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A proposed design guidance for random wave flooding

Global climate has changed during recent years and mean water levels have increased all over the world. Sea level rises will have a number of important impacts on humans. Sea level rise impacts include increased beach erosion and flooding of coastal habitats. The existing coastal structures, which were designed for certain water level, are now likely to be attacked by greater amounts of wave overtopping. It is important to be able to predict flood water volumes in this case (small positive and zero freeboards). New formulae for predicting the case of wave flooding will be useful for planning and engineering response. A two-dimension breaking wave numerical model has been used to introduce proposed design guidance for random wave flooding for small positive and zero freeboards. The two-dimensional breaking wave numerical model, (2-D BWNM) is based on the Reynolds Averaged Navier-Stokes equations for mean flow and equations for turbulent kinetic energy, k , and the turbulence dissipation rate, ϵ . The two-dimensional breaking wave numerical model has been developed by Liu and Lin (1997). Based on the numerical model results, empirical prediction curves for some specific cases of simple sloping seawalls are presented. A simple approximate relationship is also derived which holds for breaking and non-breaking waves, and is valid for very small freeboard until zero freeboard.