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EFFECT OF DIFFERENT WAVE THEORIES ON RUN-UP PREDICTION

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INTRODUCTION

Swash zone is the oscillating interface between seawater and land. Wave runup on the beach results in swash oscillations that are believed to cause significant sediment transport [1]. On the other hand, predicting wave runup on an open coast is important in estimating the area affected by storm waves.

*Run-up, R, is defined as a local maximum or peak in the instantaneous water elevation, η, at the shoreline. (**Error! Reference source not found.**~~Figure 1~~) The upper limit of run-up is an important parameter for determining the active portion of the beach profile. [2]*

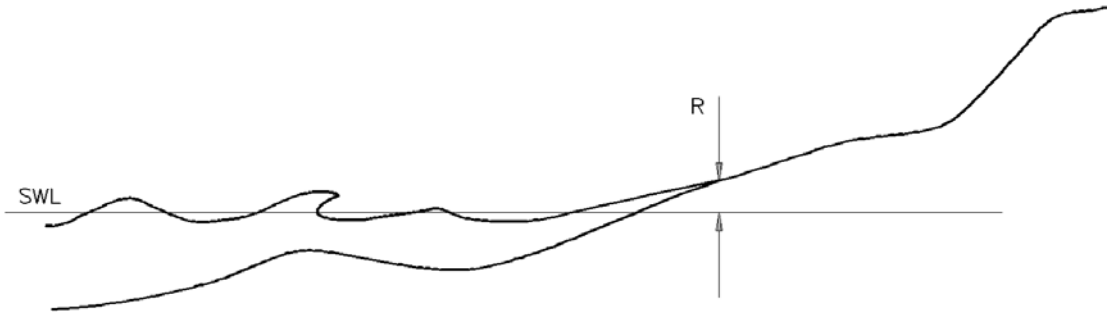

Fig. 1) Definition Sketch for Wave Run-Up

At present, theoretical approaches for calculating run-up on beaches are not viable for coastal design. Difficulties inherent in run-up prediction include nonlinear wave transformation, wave reflection, three-dimensional effects (bathymetry, infragravity waves), porosity, roughness, permeability, and groundwater elevation.

In the present paper, wave run-up has been predicted based on one-dimensional Boussinesq equations for different incoming regular wave models and the results are compared to each other and to the proposed emperical relations to determine which kind of wave models lead to closer results to the experimental studies.

MODEL DESCRIPTION:

Modeling of the wave run-up has been done using MIKE 21 BW module [3]. The 1DH module is selected for calculation of wave transformation from offshore to the beach for the study of surf zone and swash zone dynamics. Applications related to the 1DH module include:

- *Computation of wave transformation for nonlinear waves from deep water, through the surf zone and all the way up to the beach.*
- *Analysis of generation and release of low-frequency waves.*