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EXTENDED ABSTRACT

Estimation of Swash Zone Slope in Noor Beach during Cold Season

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1. Introduction

The high demand for more exploitation of coastal areas has increased the need for extensive and varied studies and research in these areas. The study of different parts of the coasts is not only important as an independent research (Alizadeh et al., 2012), but can also be used to advance other research on the hydraulic and hydrodynamic issues of the sea such as depth change, bed characteristics, wave breaking (Azarmsa and Yasuda, 1997), marine sedimentation pattern (Vaselali and Azarmsa, 2009), alongshore coastal sediment transport (Sadeghifar et al. 2013), and shoreline positioning (Azarmsa and Razmkhah, 2006; 2010) will be effective. The results of these studies are applicable even in practical and economic contexts. The purpose of this research is to study the slope of the swash zone of waves in the Noor beach in the cold season.

2. Methodology

The slope of the wave swash zone was measured by the Emery method at five stations at different months. The median diameter of sediments considered as the characteristic size of beach sediments and the significant wave height or breaking wave heights are considered as the appropriate indicators for characteristic wave height. Then the impact of these parameters on the wave swash zone slope has been studied.

The deep water significant wave height data in the study area were obtained from the Maritime Characteristics Database of the Ports and Maritime Organization for the studied days (Table 1).

Table 1. Wave characteristics.

Month	Wave height (m)
October	0.69
November	0.70
December	0.75
January	0.60
February	0.71
March	0.76

3. Results and discussion

By examining the trend curve of the data in the correlation graph of the measured slope of wave swash zone with the significant wave height in deep water as well as with the breaking wave height, it is determined that by increasing the depth of deep water wave (or increasing the height of the breaking waves), the slope decreases. That is, there is a reverse relationship between the slope of the swash zone of waves and the wave height.

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On the other hand, by examining the trend curve of the data in the correlation graph of the measured slope of wave swash zone with the median diameter of sediments, it is determined that by increasing the median diameter of sediments, the slope increases. That is, there is a straight relationship between the slope of the swash zone of waves and the median diameter of sediments.

4. Conclusions

The slope of the wave swash zone is a function of the deep water wave height and the median diameter of sediments. Using the presented linear equation in this research, it is possible to estimate relatively accurately the value of this slope in the coastal area of Noor during the months of October to March. To obtain more accurate estimates of the slope of the wave swash zone, it is recommended to conduct similar research in different years and different coastal areas.

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