



## **Run-up of long ocean waves in shallow water on the flat and non-reflecting bottom profiles taking into account wave breaking effects, hypothetical cases and the possible consequences**

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The analysis and comparison of the results of numerical experiments on the long waves run-up on a coast with a variety of bottom profiles in the framework of the nonlinear theory of shallow water have been performed in this work. Two types of one-dimensional problems are solved: in the first case the bottom profile is represented as a flat slope; in the second - the so-called non-reflecting profile. In both cases the run-up area in deep water is conjugated with a flat bottom, and on the beach - with a vertical wall. It is shown that for small amplitude waves the amplification of the incident wave's amplitude is higher on non-reflecting bottom profile, rather than on a flat bottom profile. With the increasing of the incident wave's amplitude, wave breaking near the coast occurs earlier on non-reflecting bottom profile, and therefore the amplitude decreases faster than on a plane beach. The behavior of breaking waves approaching and running-up the wall on non-reflecting and flat bottom profiles is demonstrated. The research was supported within the framework of the grant of the President of Russian Federation for state support of young Russian scientists (MK-1127.2017.5).