1135-76-356 **Sergei A Fomin*** (sfomin@csuchico.edu), Department of Mathematics and Statistics, California State University, Chico, Chico, CA 95929, **Vladimir A Chugunov**, Moscow City University, Moscow, Russia, **William Noland**, Department of Mathematics, Pennsylvania State University, University Park, PA 16802, and **Marcus Battraw**, Department of Mathematics and Statistics, California State University, Chico, Chico, CA 95929. *Mathematical modeling of the tsunami run-up on a beach with complex seafloor geometry.*

The quasi-linear theory of tsunami run-up on beach profiles of varying complexity is proposed. We begin with the nonlinear shallow-water wave equations, which we consider over a piecewise-linear beach of various geometries. We replace the moving boundary associated with the shoreline motion by a stationary boundary applying a transformation to the spatial variable of our computational domain. A characteristic feature of any tsunami problem is the smallness of the parameter, which represents the ratio of the characteristic amplitude of the wave and the characteristic depth of the ocean. The presence of this small parameter enables us to use the method of perturbations, which leads to an analytical solution via integral transformations. For this solution we introduce the wave no-breaking criterion and determine bounds for the applicability of our theory. Our solution is then shown to predict the shoreline motion analytically with good accuracy. Finally, we can repeat our process to investigate run-up and draw-down for different sea bottom profiles, and test the accuracy of our approximate analytic solution over several beach geometries against exact numerical solutions from a fully nonlinear model. (Received August 27, 2017)