1125-VM-789 **William Patrick Noland*** (wpnoland@noctrl.edu), 3741 Evensong Drive, Union, KY 41091, **Dylan Matthew Smith** (dylan.m.smith@uconn.edu), 74 East Avenue, Glen Cove, NY 11542, and **Seth Selken** (sselken@iastate.edu), **Monica Swartz** (mswartz@smith.edu), **Marcus Battraw** (marcusbattraw@gmail.com) and **Sergei Fomin** (sfomin@csuchico.edu). *Modeling Tsunami Run-Up and Draw-Down on the Beach.*

Previous literature has investigated the run-up and draw-down of tsunami waves on a one-dimensional, constant-sloped beach, but existing solutions are complex and computationally unwieldy. Our research aims to establish a simpler model while still obtaining accurate results. We do so by using a quasi-linear theory derived from the nonlinear shallow-water wave equations. The main difficulty in solving this problem is the moving boundary associated with the shoreline motion, which we eliminate by applying a substitution to the spatial variable. A key feature of any tsunami problem is the presence of the small parameter $\varepsilon = \eta_0/h_0$, where η_0 is the characteristic amplitude of the wave and h_0 is the characteristic depth of the ocean. Due to the presence of this small parameter, the problem can be essentially linearized using the method of perturbations and then solved analytically via an integral transformation. The resulting explicit solution enables us to swiftly predict the behavior of the wave using an essentially linear model. Testing the accuracy of our model against the numerical solution obtained using Mathematica reveals minimal discrepancy. This project supported by the NSF award DMS – 1559788. (Received September 11, 2016)