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Combination of 2D numerical simulations of long waves in a basin of variable depth with 1D analytical runup formulae

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We propose a method to compute the runup heights that is based on an integration of numerical, 2D shallow-water modelling and analytical, 1D long-wave runup theory. This approach provides a faster forecast of runup heights than a complicated coastal inundation model. We tested the model by simulating the historical tsunami event in the East (Japan) Sea and found that the estimates of runup heights agreed well with the available observations.