

An evolutionary algorithm optimizes boundary condition and parameter in an ocean tide model

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An evolutionary algorithm (EA) is applied to a regional ocean tide model to optimize a boundary condition and a physical parameter in the model. The bathymetry is one of the boundary conditions in ocean models and is frequently given by global sea depth data based on estimation derived from the satellite gravity observation. Accuracy of the satellite-derived depth data is often insufficient for accurate ocean tide simulations. We apply the EA to modify the mean depth in specific regions in the Alaska Panhandle, U.S. The mean depth in those regions is optimized to be close to the multibeam-derived depth data which is generally accurate further more than the satellite-derived data but its spatial coverage is sparse. Also, a region with large errors of the satellite-derived data is successfully found through the optimization. The EA has a prospect of correction of erroneous boundary conditions for accurate ocean modeling.