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## Ensemble Water Level Prediction System: Improving the Representation of Model Uncertainty

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Concern over increased flooding and the need for earlier and more reliable risk forecasts motivate the continued development of operational forecasts of coastal water level. We report here on results from a year long ensemble of total water level forecasts calculated using a dynamical ocean model forced with ensemble atmospheric forcing and tidal boundary conditions. We focus on the east coast of Canada. The domain includes the Gulf of St. Lawrence, the Labrador Shelf, the Scotian Shelf, and the Gulf of Maine. The water level ensemble is made of a control and 20 perturbed members. Individual forecasts are produced twice daily for 16 days.

The novelty of the present study is in the exploration of perturbations of the ocean contributions. In addition to examining how uncertainty in atmospheric forcing maps into flood risk, we also explore the feasibility, and impact, of perturbing the ocean tides. We use a recent case study to demonstrate our findings.