

NECOFS: a FVCOM-based regional coastal and local inundation forecast tool

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NECOFS (Northeast Coastal Ocean Forecast System) is an integrated atmosphere-ocean model system which covers the northeast US coastal region from New York to the Scotian shelf. The system features three core models: the atmospheric mesoscale model WRF; FVCOM; and the unstructured-grid surface wave model FVCOM-SWAVE. The system became quasi-operational in 2009 and produces 3-day forecasts of the regional atmospheric surface forcing and ocean response. NECOFS is presently being extended to predict inundation at two pilot sites - Scituate (MA) and Saco (ME) – that experience significant local coastal flooding during strong “nor-easters”. A high-resolution subdomain Scituate FVCOM inundation forecast model system has been developed and is in testing. This application required full dynamic coupling the wave and ocean models and ability to incorporate structures (e.g. coastal walls and dikes) into FVCOM. The Scituate FVCOM system is driven by one-way nesting with the regional NECOFS forecast.

The NOAA IOOS program recently funded SURA (Southeastern University Research Association) to conduct a “super-regional testbed” study of FVCOM and other unstructured-grid models for inundation and water quality prediction. The inundation component will focus on tropical storms in the northern Gulf of Mexico and extratropical storms in the northeast. With the NECOFS Scituate FVCOM inundation forecast system already in advanced development, Scituate has been picked as the site for the extratropical storm study. Inundation during two storms will be hindcast and compared with in situ water elevation measurements to assess model performance. The combined focus of NECOFS and SURA on Scituate should lead to a tested optimal inundation forecast system with quantified performance that can be readily applied to other northeast sites. An update of NECOFS and the Scituate inundation study will be presented.

We would like to present a talk, so that we can include animations.