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Development and validation of a coastal ocean forecasting system for Puerto Rico and the U.S. Virgin Islands

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Highlights

- An ocean forecasting system (PRO-ROMS), based on the Regional Ocean Modeling System, has been developed for the coastal area of Puerto Rico and the U.S. Virgin Islands providing a 3-day forecast of ocean currents, sea surface height, temperature and salinity.
- Modeled currents are validated at shallow depths (-100m) on top of the shelf. Surface currents from PRO-ROMS are validated with a High Frequency Radar (HFR), and sub-surface currents are validated with 4 Acoustic Doppler Current Profilers, showing a good agreement in the spatial and temporal distributions with observed quantities.
- A Taylor diagram is used to summarize PRO-ROMS model performance which shows a reduction in the root mean square error compared to the AmSeas NCOM regional model.
- 12 floating drifters were deployed in the coastal area of Puerto Rico and tracked for several days. A simple advection algorithm in which the drifters are assumed to be passive tracers shows that PRO-ROMS on average predicts the trajectory of the drifters better than AmSeas during the initial 60 hours after deployment.

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