Recent COAMPS-TC Development and Future Plans

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The Coupled Ocean/Atmosphere Mesoscale Prediction System for Tropical Cyclones (COAMPS-TC) has been developed for forecasting tropical cyclone track, structure, and intensity over the past several years and has been run in Navy operations at the Fleet Numerical Meteorology and Oceanography Center since 2013. In this presentation, we will provide an update on the latest advancements to the COAMPS-TC system in 2016 and 2017 including: i) two-way air-sea coupling with the ocean model NCOM, ii) advancements to the surface flux and boundary layer parameterizations, and iii) improvements to the vortex initialization. An evaluation of a large sample of the real-time forecasts for 2015-2016 in the Atlantic, E. Pacific and W. Pacific basins reveals much improved COAMPS-TC track and intensity predictions, and in many regards on par or in some aspects superior to other established operational dynamical forecast models. Progress on further improvements based on advancements to the data assimilation (4D-Var) will be discussed. In addition, results for a high-resolution (3 km) 11-member COAMPS-TC ensemble that was run over the W. Atlantic, E. Pacific, and W. Pacific basins will be briefly presented. The COAMPS-TC ensemble was performed in collaboration with the HFIP program, which included high-resolution HWRF and GFDL ensembles. The results continue to show considerable promise for probabilistic intensity and track prediction using a multi-agency, multi-model tropical cyclone ensemble approach.