EVALUATION OF COAMPS-DERIVED RADAR PROPAGATION PREDICTIONS

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Having the capability to operationally predict atmospheric effects on sensors and weapons systems for any region of interest would improve the U.S. Navy's tactical decision making. For example, commanders could position their assets to optimize force protection or strike effectiveness based on the future propagation conditions in the tactical battlespace. In this study propagation predictions derived from the Navy's Coupled Ocean-Atmosphere Mesoscale Prediction System (COAMPS) are evaluated against actual propagation measurements to investigate the current state of such propagation forecasts.

The Roughness and Evaporation Duct (RED) Experiment was conducted off the windward coast of Oahu in 2001. Radar propagation measurements were obtained during RED over a 26 km path between a moored platform and a shore station. Concurrent meteorological measurements were obtained from the NPS "Flux" buoy. These buoy data were input into the Naval Postgraduate School's (NPS) bulk evaporation duct model to compute a refractivity profile, which was then used to run the Advanced Propagation Model (APM) to obtain propagation loss values. COAMPS-predicted surface values of wind speed, air and sea temperature, humidity and pressure were averaged over several grid points in the RED propagation path area and were then input into the NPS model and APM to compute propagation loss predictions. These COAMPS-derived propagation loss predictions where then compared with the flux buoy-derived values and the actual propagation measurements. A time series of the propagation loss values from these three sources is shown below. The black diamonds indicate the initial COAMPS model run value and the green dots are the hourly COAMPS predictions out to 12 hours. This figure indicates that COAMPS shows promise as a tool for predicting propagation conditions over a mesoscale region.