

Real-Time Forecasting of Winds, Waves and Surge in Tropical Cyclones

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The long-term goal of this project is to establish an operational forecasting system of the wind field and resulting waves and surge impacting the coastline during the approach and landfall of tropical cyclones. The results of this forecasting system would provide real-time information and predictions several days in advance to the National Hurricane Center (NHC) during the tropical cyclone season in the Atlantic for establishing improved advisories for the general public and federal agencies including military and civil emergency response teams. The forecasts of waves and surge along an ensemble of track and intensity predictions provided by the NHC will be both of deterministic and stochastic nature. In particular, this approach seeks to determine the maximum and average conditions of the ensemble tracks and provide statistical parameters and measures of risk for waves and surge to exceed threshold value as a function of coastline. The feasibility of such a forecast system has been demonstrated with a test case of "Hurricane Georges". Over the past decade individual modules comprising the forecasting system have been developed and independently tested for years and are now ready to be coupled in a complete forecasting system.