

Title: Use of remote sensing to improve regional/local rip current forecasts.

Author: Brian K. Haus

Large scale forecasts (eg. Wavewatch III, Global NCOM) form the basis of the rip-current warning system operated by the US National Weather Service. In regions with relatively simple topography and weak currents these wave and current model outputs can be used as input to nearshore wave models for the purposes of predicting rip current conditions. However when the local shoreline is complex or the offshore currents are strong the deepwater wave values may not be appropriate for direct use in nearshore wave models. The southeast Florida coast from Cape Canaveral to the Dry Tortugas is such a region, where the presence of the Florida Current can significantly modify the offshore wave climate. In order then to provide reliable rip current warnings in this region it is necessary to better understand the effect of the high current velocities and strong current shear on the shelf waves. The use of phased array High-Frequency radars to provide synoptic mapping of both waves and currents over the shelf has revealed the effects of the Florida Current on the local wave climate. These include both topographic and current-induced wave shoaling and dissipation as well as focusing of local waves on strong current gradients. The implementation of this information in coastal wave models offers significant promise for improving shallow water wave forecasts and the associated rip current warnings.