

Summary

- Accurate initialization of the ocean model is critical in the coupling to an atmospheric model to forecast hurricane intensity. Upwelling is a **3-D** process due to upper ocean wind- driven current divergence.
- Uncertainties in the momentum and enthalpy fluxes and ocean mixing parameterizations directly affect the SST and hence hurricane intensity prediction.
- Waves on the boundary between the two fluids are important in the coupling to the atmosphere and **near-surface wave-induced mixing** in the upper ocean.
- **Wind driven current shear** across the base of the ocean mixed layer significantly impacts the OHC, SST and the fluxes that impact the hurricane core structure.
- Ocean state variables (T, S, u, v, p, wave heights, directional wave spectrum) need to be measured for the model initialization and evaluation of coupled model responses with concurrent atmospheric fields.
- Air-deployable instruments (AXCPs/AXCTDs, Alamo, APEX-EM) and drifters have been shown to be effective approaches to acquire the measurement of state variables in a storm including ocean current and shear that are directly related to the momentum flux.
- Measurements of from gliders and moorings are useful for observing coastal ocean and marginal sea variability during hurricanes.
- Remote sensors provide the **larger scale** context of SST, SSHA, OHC, mixed layer depths.

Recommendations

- Require XCPs, XCTDs be deployed in the storm from the NOAA WP-3D in an unpressurized mode for measurements in a storm-coordinate system with concurrent atmospheric measurements (Combinations).
- Optimize glider and mooring networks in coastal ocean/marginal seas.
- Transmit both T and S back to the operational centers in near-real time for DA from various instrumentation platforms.
- WSRA or other wave type sensors must be part of the ocean observing suite to measure the evolving wind-wave field.
- Stream 1,2 coupled model coupling fields (enthalpy fluxes, wind speed, wind stress, upper ocean t,s,u,v, wave direction, wave spectrum, and Hs) needs to be accessible by the community to assess the fields carefully on a centralized (password protected) web site.
- Scientist must be on the aircraft to keep track of the ocean data sets when expendables are deployed with concurrent GPS and IR sondes.
- **Lack of funding** has *slowed* progress in this area of coupling between the two fluids including **instrument procurement** for aircraft sampling.
- Experimentalists and modelers must work together.