

1. Physical Processes



Evolution of shelf currents inducing sediment erosion-impacts on pipelines/structures.

Oceanic boundary condition/initialization for real-time forecasting for mapping (i.e. Loop Current/WCR/CCR). SST and OHC is needed for accurate forecasting of intensity

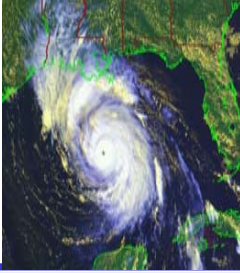
SHA (Sea Surface Height Anomaly) /SST assimilation for forecast models.: can we improve this through Targeted Obs-storm pathways/tracks of storms (ensemble)-initial conditions.

Vertical mixing impacting surface heat fluxes in the inner core heat losses $\sim 0.2\text{C}$ underneath eyewall (R_{max})-surface parameterization and intensity change.

Temperature structure/current shears underneath eyewall (leap in our knowledge if we can understand impact on air-sea fluxes).

Wave directional spectra at 50 m/s winds- alignment of wind/wind stress/waves-quadrant dependence.

2. Physical Processes:



Estimate heat/momentum fluxes from profiles and models-hypotheses (important handle on intensity question). Turbulence data for TKE closure (technology to do this).

Orbital velocity/SRA-long period of waves –spatial distribution of velocity/wave structures-deep ocean.

Bottom boundary layers/observational and numerical models (barotropic / baroclinic flows)-shallow water

Wave measurements in shallow water (irrotational surface waves-rotational part in budgets).

Wave-current interactions-using HF radar technology through COOS (GCOOS/SEA-COOS)

Hypothesis Testing/Research Priorities:



Estimate heat/momentum fluxes from profiles and models-hypotheses (important handle on intensity question-transfer of heat, etc).

SST / OHC is a better indicator for the ocean's potential influence on hurricanes-It is integrated thermal structure (i.e. oceanic heat content variability-negative/positive).

Current measurement-rectilinear patterns in shallow water -how do forced near-inertial currents affect shallow water momentum changes.

Current/wave interaction from deep water in shallow water needs to be understood for surge/wave models to improve parameterizations-(Coastal Ocean Observing Systems).

Continental shelf interaction between bottom and surface boundary layers impact on storm by decreasing the heat fluxes.

4. Experimental Considerations for Physical Processes



In-situ measurements will require a good-track forecast-track dependent ocean features (Cold and Warm Rings).

Wave directional spectra measurements (not fully developed) at 50 m/s winds.

Bottom line: Models (coupled/oceanic) need 3-D Ocean Data (currents/temperatures) to evaluate response.

Coastal Ocean Observing Systems-on the horizon.

Oil platform measurements-more than adcp/met sensors.