

Satellite and Surface Current Observations of River Mouth Dynamics

The dynamics of littoral regions (open coast, inlets, estuaries and rivers) is often manifested by feature rich ocean surface patterns suggesting far more complex hydrodynamic processes controlling flows in the volume below. Satellite SAR and time-averaged X-band radar image of the Mouth of the Connecticut River provide a new perspective of 3-D, tidally driven, frontal dynamics whose large spatial extent and variability over the tidal cycle is not well understood. The project will focus on 7 River Mouth environments with increasing complexity to understand the basic littoral processes and if fronts enhance mixing and water-mass exchange (e.g., through instabilities), or retard exchange (due to enhanced stratification and separation of streamlines)? The student working on this project will be involved in both sea-going, satellite and ship-based radar observations to analyze the littoral dynamics in these river mouth regions. Satellite data will be directly downlinked to University of Miami's ground station on the CSTARs (Center of Southeastern Tropical Advanced Remote Sensing) Campus (<http://www.cstars.miami.edu>) and processed.



Top: *R/V Armstrong*. **Top Right:** Polar image from a Marine X-band Radar showing salinity front (white line) off the Connecticut River. **Bottom:** This Radarsat-2 SAR image was collected 24 June 2017 in support of a project researching the salinity front that formed as the Connecticut River flows into the Long Island Sound. SAR imagery reveals details in the water (small changes of roughness) that would otherwise not be discernible in optical imagery at visible wavelengths.