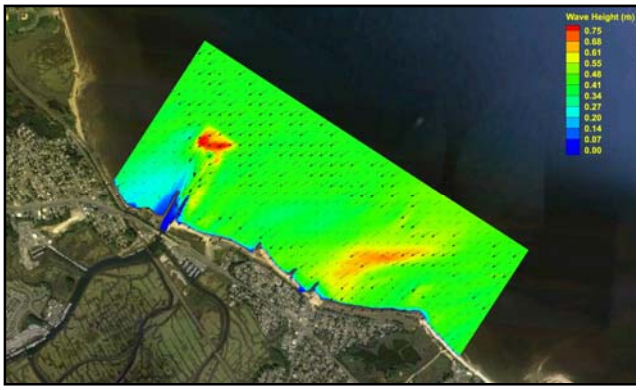
Currents and Sediment Dynamics Studies, Raritan Bay Slag Superfund Site

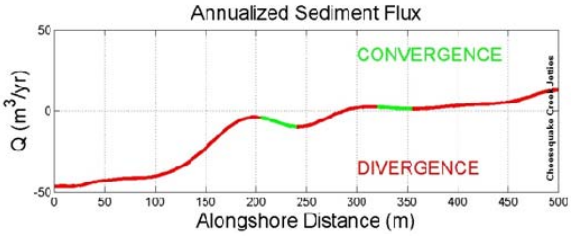
Project Characteristics:

- *Wave and Current Data Collection*
- *Coupled Current and Wave Transformation Model*
- *Physics-based Sediment Transport Modeling*
- *Hydrodynamic and Sediment Transport Characterization*
- *Development of Conceptual Site Model for contamination mitigation*

Woods Hole Group was contracted by CDM Smith to analyze the coastal dynamics at the Raritan Bay Slag Superfund Site to support their RIFS process. The project contained two objectives: 1) characterize hydrodynamics and sediment dynamics in four (4) study areas, and 2) to quantify the sediment exchange with the Cheesequake Creek Inlet. The Site is contaminated with heavy metals in the nearshore zone, which was derived from the slag material used to construct a seawall along Raritan Bay, and the western jetty marking the entrance to Cheesequake Creek inlet.

Three current profilers, including one with waves, and one single point current meter with waves were deployed to identify the dominant wave and current patterns within the four critical study areas. To quantify flux with Cheesequake Creek, a horizontal profiling current meter was deployed over a full lunar tide cycle and two current mapping surveys were performed.





These data were used to develop and calibrate a coupled wave, current, and sediment transport model that characterized the overall hydrodynamic and sediment transport regime for the 4 study areas. From the results, a conceptual site model (CSM) was developed. Directions and rates of transport were presented, along with possible areas of convergence and divergence. Implications on contaminant transport were considered as well, including relevant findings that informed the CSM. Key elements of the CSM that were the focus of hydrodynamic and sediment transport analysis included the sources of sediment and contamination and transport pathways. This information helped formulate remediation alternatives.

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