US Army Corps of Engineers®
Engineer Research and Development Center

Coastal Inlets Research Program

Coastal Modeling System:

Investigation of Surface Wind Input for Coastal Zone Applications

Need

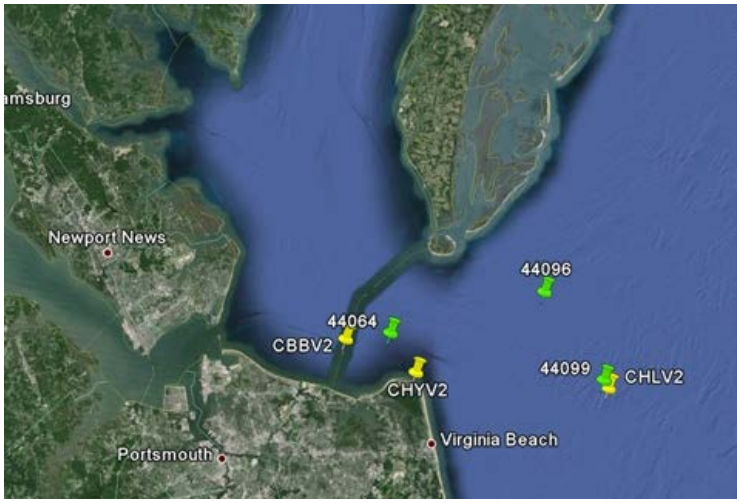
A simple formulation is available in the Coastal Engineer Manual (CEM) for wind speed conversion from land station to over water surface. For wave modeling in practice, this simple formulation has been shown consistently to be inadequate. This is because wind conversion in the real world is more complicated as it is affected by factors like the wind speed and direction, the position of station and the terrain around it, and the geometry of water body of the modeling domain. A better and more consistent procedure for land-to-water wind conversion can provide accurate wind input for coastal wave and flow modeling.

Approach

Develop and test a methodology for converting wind data from a limited number of buoys and land-based stations to over water surface locations. Investigate spatial mapping and distance-based interpolation methods for providing the most appropriate wind input to wave and flow models on coastal and bay waters. Investigate a new wind conversion formulation for land to water surface relation and evaluate merits of the new formula for wind input to coastal wave and flow modeling.

Technical Advancements

Accurate wind input for coastal wave and flow models is required for generating reliable engineering estimates in coastal zone studies. The end product will also be useful to other works which depend on the wind data in complicated bays, estuaries and Aeolian (wind-blown) studies over beach. The wind conversion routine from land-based station to over water surface location will help USACE to produce more reliable engineering estimates in coastal and bay regions. The advances will be provided as improvements and upgrades to the CEM.



Leveraging Opportunities

Federal and State agencies and academic institutes collect wind data for their mission and research needs. Leveraging opportunities with these organizations will be sought to provide data for multiple sources in air, water, and land.

Point of Contact

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Community of Practice (CoP)

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