

District Initiatives to Overcome Research and Development Needs

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The number of cost shared coastal projects underway has required the Wilmington District to conduct it's own research and development efforts.

The Wilmington District has four constructed storm damage reduction beach nourishment projects at Ocean Isle Beach, Kure Beach, Carolina Beach and Wrightsville Beach, plus 3 authorized projects Dare County Beaches, Brunswick County Beaches and West Onslow Beach (Dare County Beaches is in PED and Brunswick County Beaches and West Onslow Beach are being re-evaluated). The District is currently conducting 3 storm damage reduction studies at North Topsail, Bogue Banks and Dare County South. In addition to storm damage reduction studies the District has constructed a turtle habitat project under section 1135 authority and three 933 projects. Presently there is 933 project being studied at Bogue Banks.

As Mr. Thomas Smith pointed out in the previous presentation, there is a need for a Corps sanctioned model to evaluate storm damage reduction projects and a need to collect storm damage data for the development of erosion, inundation and wave damage function. It is required by the ER 1105-2-100 to use a risk and uncertainty model with a life cycle approach but no tools were provided to perform this analysis. The Wilmington District developed it's own risk and uncertainty model that uses a life-cycle approach called GRANDUC (Generalized Risk AND Uncertainty Coastal). The risk and uncertainty approach partially mitigates the lack of storm damage data by displaying the uncertainty the lack of data causes in the model's results. Another benefit of using the risk and uncertainty approach is ability to communicate risk to the customer. If the customer is considering going with a locally preferred plan that is cheaper than the National Economic Development (NED) plan, the risk of each plan can be past on to the customer. For example, with the NED plan there may be a 5 percent chance that there will not be a positive economic return on the construction cost while with the locally preferred plan this risk may rise to 40 percent.

In the area of storm damage relationship, the District has been working with Mr. Spencer Rodgers to develop erosion damage relationships. Spencer is with the North Carolina Sea Grant and has done extensive work with the Federal Emergency Management Agency on storm damage assessment. Based on his experience and the experiences of District personnel (between 1996 and 1999 four hurricanes hit the North Carolina coast within 45 miles of each other) damage responses for six classes of structures are

being developed. Two conclusions are readily apparent from this work. First is that existing damage functions for structures constructed under North Carolina's newer building codes (16-ft pilings) need to be revised. Secondly, more than one erosion indicator will have to be used. The one-half ft of vertical erosion damage indicator, that is presently used, will have to be supplemented with a 4 ft of vertical erosion damage indicator for structures on piles where the piling extends at least 8 ft below NGVD.