



September 29, 2011

**Memorandum**

TO: Cliff Ogburn, Town of Nags Head (NC)

FROM: HL Kaczowski, Project Engineer  
TW Kana, Project Director

RE: Nags Head Beach Nourishment [CSE 2203]  
**Updated Post-Hurricane *Irene* Erosion Assessment**

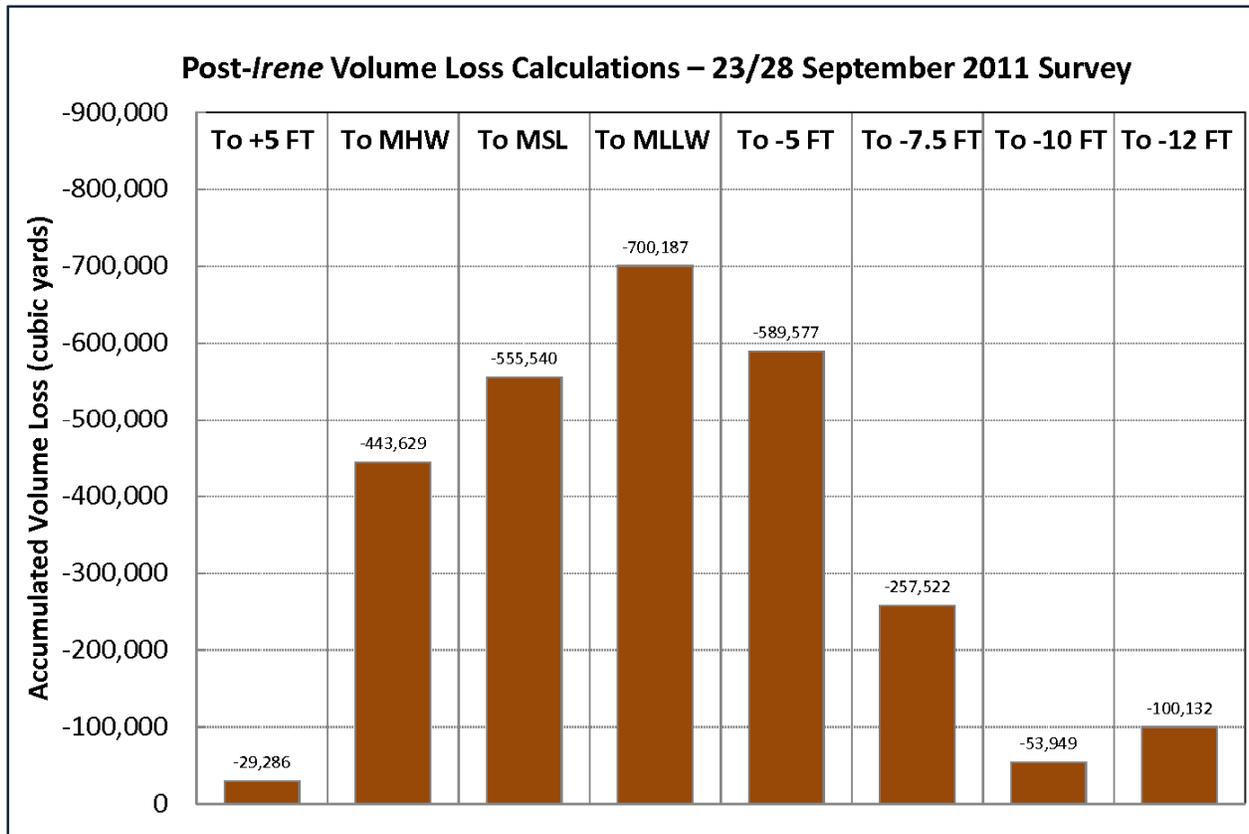
We have obtained additional profile data following Hurricane *Irene* and offer the following assessment of changes. Based on a limited number of profiles at ~2,500 foot (ft) spacing, we have documented net losses of ~100,000 cubic yards (cy) measured to the -12-ft NAVD contour as of 28 September. This is consistent with visual observations of bar development seaward of the low-tide mark. In other words, some nourishment sand shifted from the visible beach to the inshore breaker zone. The bar graph (Fig A) shows the total volumetric losses between station 500+00 and station 1025+00 to various reference contours. The net change to mean low water as of 28 September was ~700,000 cy, already indicating some recovery of the low-tide beach. [Note: The volume loss to mean low water we reported from our 28 August survey was ~930,00 cy.] The -12-ft NAVD contour is situated about 1,000 ft offshore.

The results to -12-ft NAVD are considered fairly reliable because we have CRAB data for comparison with our wading and boat data. However, the large spacing of the profiles introduces some error. We are still evaluating the results seaward of the -12-ft NAVD contour.

At the time of *Irene*'s landfall, ~3.8 million cubic yards had been placed in the project area. You will note the changes measured to -10 ft are of the same order of magnitude as the changes to -12 ft (~50,000-100,000 cy). Differences of this magnitude are considered to be within the normal error limits of the survey. For example, if the survey is accurate to  $\pm 2.5$  percent, we would expect to see 3.8 million cubic yards  $\pm 100,000$  cy more sand on the beach than in June (pre-nourishment).

Based on the relatively low volume of sand that was "lost" to the -12-ft NAVD contour and the similarity in magnitude of the loss to the expected errors of such surveys, we do not recommend the Town apply for post-storm FEMA restoration funds at this time. Should more comprehensive data, upon completion of the project, indicate there were large volume losses due to Hurricane *Irene*, we may revise our recommendation.

Thank you for your consideration.



**FIGURE A.** Total volumetric losses between stations 500+00 and 1025+00 to various reference contours.