

SHORELINES – November 2006
As presented to the *Island Review* magazine

***Ophelia* Sand Replenishment Project**

The Federal Emergency Management Agency's (FEMA's) Public Assistance Program and the N.C. Division of Emergency Management will reimburse communities for the replacement of sand lost during a Federally-declared disaster event provided the original beach nourishment project was predominantly non-Federally funded, and project sponsors have developed and adhered to a beach maintenance and monitoring program. This general formula was applied to hurricane *Ophelia* that impacted Carteret County in September 2005, particular the 14th of that month, and as explained in more detail below, FEMA has approved a reimbursement package to replace the 1,107,560 cubic yards (cy) of sand lost during the *Ophelia* storm event across Pine Knoll Shores (PKS), Indian Beach (IB), and Emerald Isle (EI) - 239,796 cy, 298,604 cy, and 569,160 cy, respectively. As a mental picture, a conventional dump truck holds roughly 15 cubic yards of dry sand. The *Ophelia* Sand Replenishment Project is scheduled to be constructed this upcoming winter/spring of 2007.

Each of the communities that participated in the Bogue Banks Beach Restoration Project, including EI, IB, and PKS, has a FEMA monitoring and maintenance plan in place and the County Beach Commission's beach monitoring program provides repetitive surveys intended to track coastal changes, trace the fate of beachfills, and create a "pre-storm" benchmark that can be utilized to document the losses attributed to individual or a collection of storms. As a quick reminder, the Bogue Banks Beach Restoration Project was a predominantly locally-funded beach nourishment effort completed in three distinct phases; Phase I in 2001-02 along the shorelines of PKS and IB, Phase II in 2003 along eastern EI, and Phase III in 2005 along western EI that also entailed the realignment of Bogue Inlet.

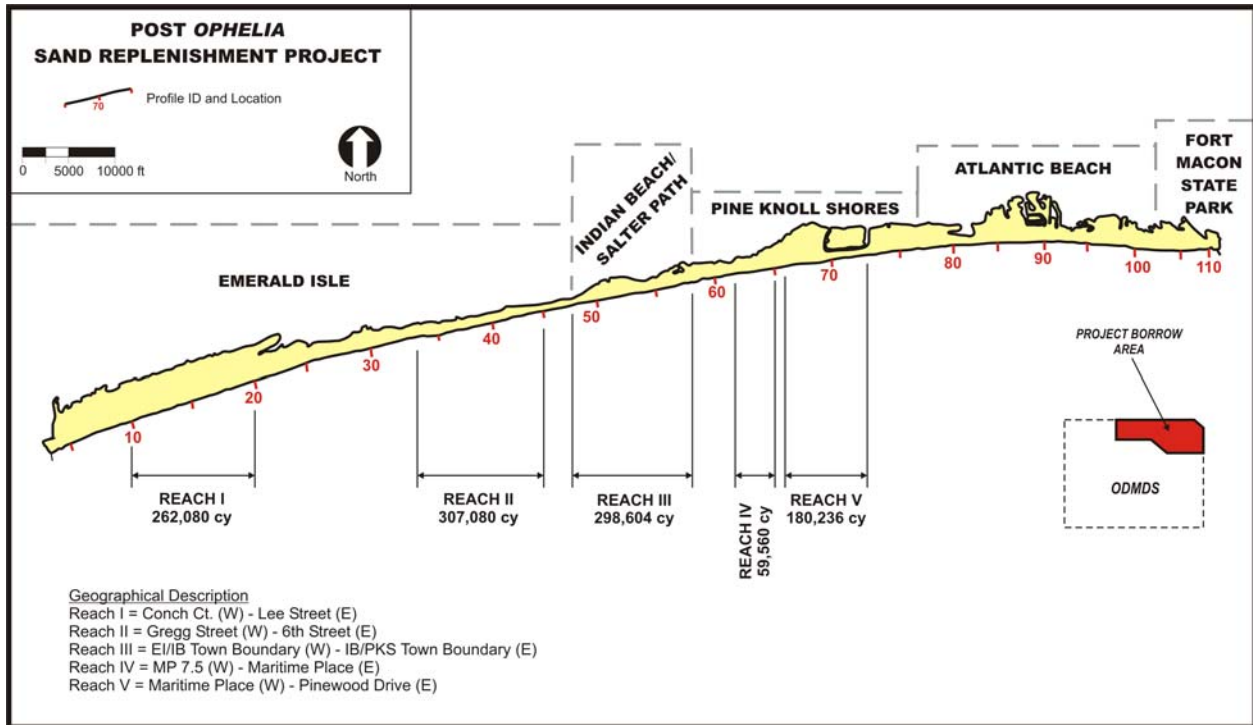
Last year, a post-*Ophelia* beach survey was conducted days after the Hurricane departed Bogue Banks and quantified the beach losses attributed to *Ophelia*, satisfying FEMA's requirements to apply for reimbursement and yielding the cumulative 1,107,560 cy figure mentioned above.

The geographical extent and basic geometry of the *Ophelia* Sand Replenishment Project is included in the accompanying map. The Bogue Banks Beach Restoration Project was originally subdivided into 6 planning reaches and the nourishment zones scheduled for the upcoming FEMA Project are positioned to correlate to the exact volume of sand lost in each particular reach. In other words, if reach 1 and 2 in EI lost 134,965 cy and 309,395 cy during *Ophelia*, then reach 1 and 2 will receive 134,965 cy and 309,395 cy, respectively in the planned FEMA Replenishment Project. In general, the Replenishment Project design targeted the erosion "hotspot" in each of the planning reaches, and extended the cubic yardage east and west from the center of the hotspot at a fill rate of roughly 20 cy per linear foot (in the shore parallel direction). Twenty cy per linear foot was utilized as the minimum fill template based upon construction limitations associated with capturing and progressing the pumped sand down the beach utilizing conventional diking and bulldozing (grading) methods employed by the dredging industry. Some of the fill zones overlapped the planning reaches resulting in a total of **five** discrete nourishment reaches developed for the FEMA Sand Replenishment Project.

The borrow source for this nourishment effort is the Offshore Dredged Material Disposal Site (ODMDS) associated with Morehead City Federal Navigation Project. This dump site is essentially a repository for dredged material historically extracted from the Outer Harbor reach of the navigation channel and based upon experiences with a 2004 Section 933 Project that utilized channel material for beach nourishment and a 2004 EI FEMA Project that actually utilized the ODMDS, we expect the sand quality to be excellent.

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This also makes intuitive sense, because for the most part, the shoal material that enters the navigation channel at Beaufort Inlet is sand that has traveled from adjacent beaches. Construction, or deepening material that resides in the ODMDS should be avoided. To this effect, the firm of Coastal Science & Engineering, who has been retained by the Bogue Banks communities as the engineering consultant for the FEMA Project, has performed additional sediment sampling and analyses in the ODMDS to hone the areas of beach quality sand, which basically corresponds to the northeast corner of the ODMDS.



The bid solicitation for the FEMA Replenishment Project was issued on September 20th and the opening is dependent upon the amount of bids received and N.C. procurement laws, which will likely result in an October 13th bid opening date. The Notice to Proceed is tentatively scheduled to be issued by November 1st, but the construction window is limited to the January 1 – March 31, 2007 timeframe to coincide with environmental restrictions. EI is scheduled to be nourished first, followed by IB, and PKS last. This sequence was developed based upon the construction window instituted for the project and the fact that PKS will very likely receive sand from a second Section 933 Project also scheduled for this winter/spring of 2007. Thus by working “west to east” during the FEMA Replenishment Project, we should be able to ensure that each community receives sand this upcoming winter/spring.