

Does Beach Nourishment = Resiliency?

Lessons from Hurricane Sandy for the South Atlantic Region



PROGRAM FOR
THE STUDY OF
DEVELOPED
SHORELINES

Dr. Rob Young, Director
Andy Coburn, Associate Director
Katie Peek, Coastal Research Scientist, P.G.



Our Mission

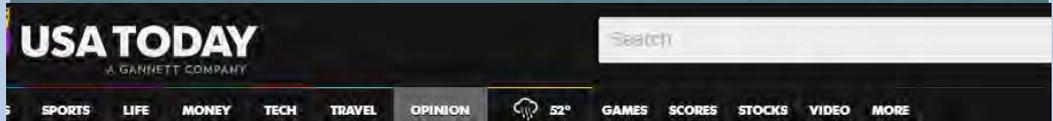
Coastal Science
&
Communicate
that science to
numerous public
and private
entities.



PROGRAM FOR
THE STUDY OF
DEVELOPED
SHORELINES



WCU Program for the Study of Developed Shorelines (PSDS)



Column: Sandy reminds us of coastal hazards

Rob Young and Andrew Coburn 5:14 p.m. EDT October 31, 2012

Our governments encourage rebuilding in vulnerable areas -- at a large cost to taxpayers.

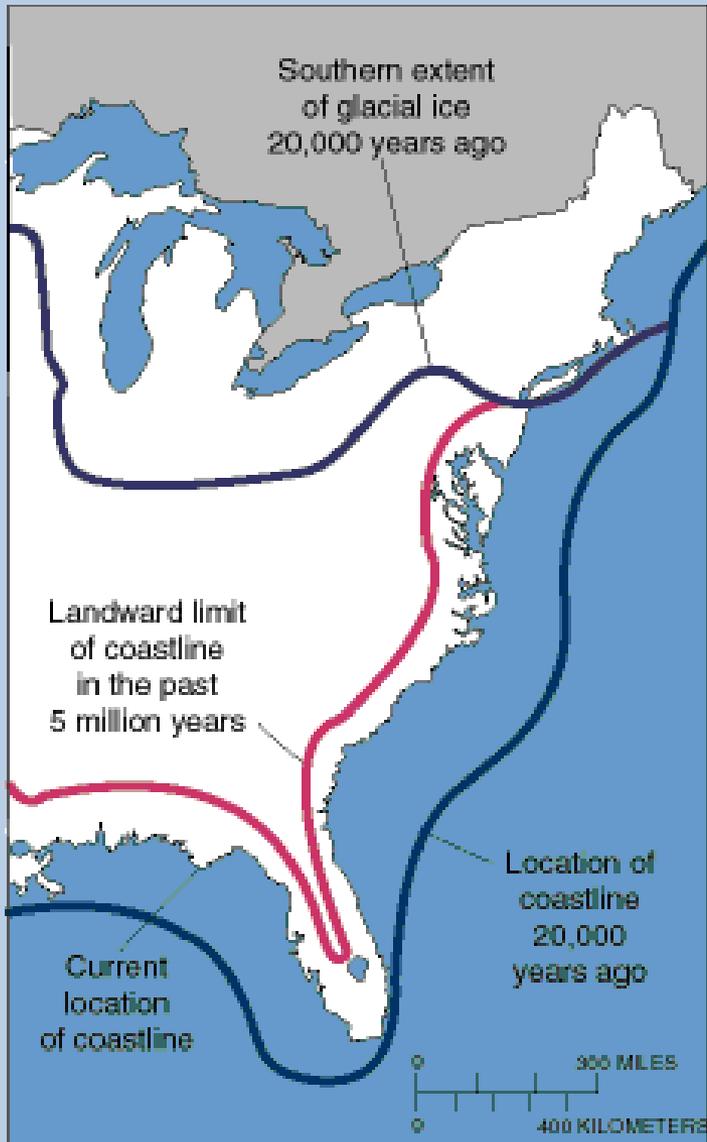


(Photo: Master Sgt. Mark Olsen, AP)

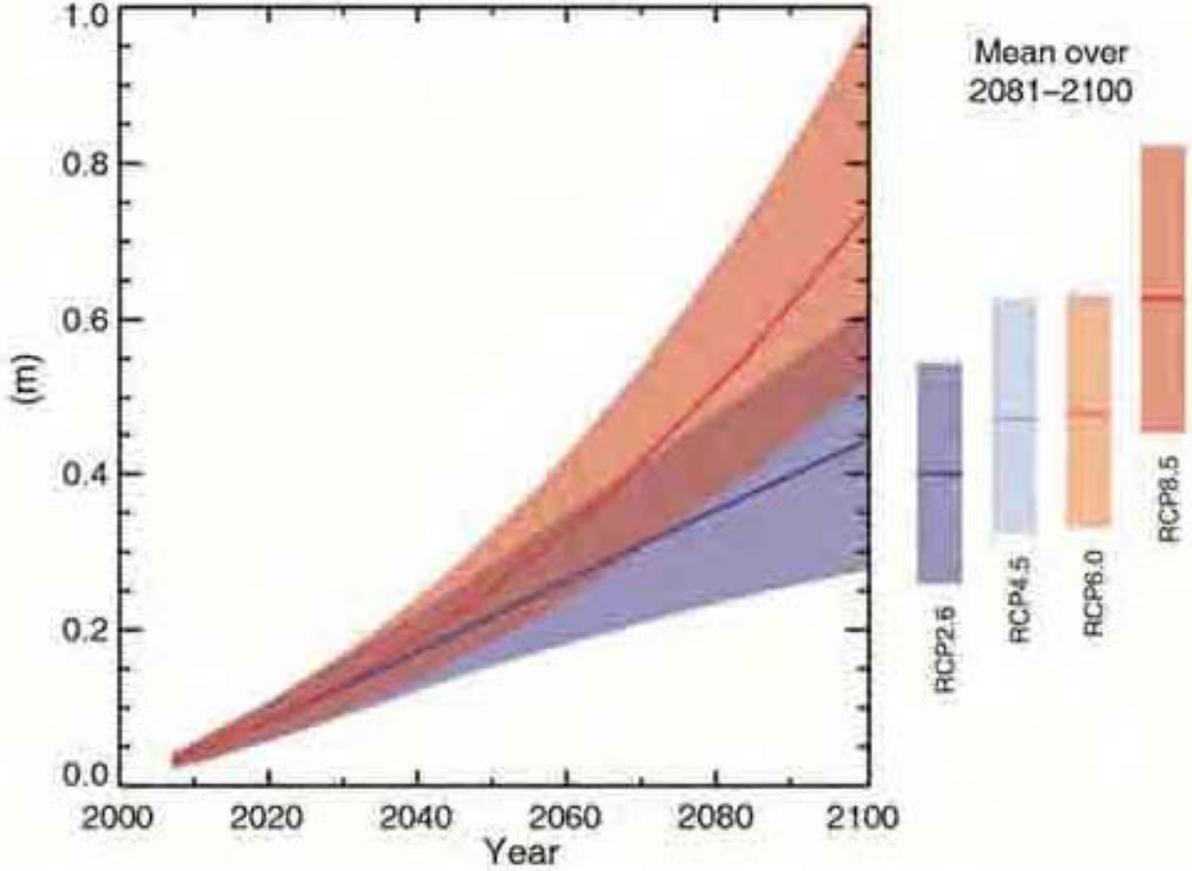
SHARE f 175 CONNECT TWEET 3 COMMENT 7 EMAIL MORE

Superstorm Sandy will almost certainly join the pantheon of "costliest storms in history." The impact of the storm has been felt from South Carolina to southern Massachusetts. There has been massive damage to significant segments of the New Jersey and New York coastline.





Global mean sea level rise





VIEWIMAGES™



The Disappointing News

Since Hurricane Sandy, federal, state, and local governments have made an important “de facto” policy decision without any debate, discussion, or national plan.

It is this: we will attempt to hold the nation’s shorelines in place using whatever means possible and whatever the cost. We will do this despite the undisputed scientific fact that sea level is rising and coastal erosion along these shores will only increase in the future. We will do this even though it will be environmentally damaging and the costs will be extremely high with never-ending expenditures.



PROGRAM FOR
THE STUDY OF
DEVELOPED
SHORELINES

President's Sandy Task Force

- 1) Align federal funding with local rebuilding visions.
- 2) Cut red tape and get assistance to families, businesses, and communities efficiently and effectively, with maximum accountability.
- 3) Coordinate the efforts of the Federal, State, and local governments, with a region-wide approach to rebuilding.
- 4) Ensure the region is rebuilt in a way that makes it more **resilient** – that is, better able to withstand future storms and other risks posed by a changing climate.





YOUR ENTERTAINMENT.
TRY ONE MONTH FREE

THE APPRAISAL

Going Up a Few Feet, and Hoping to Avoid a Storm's Path



Christopher Caccchiello for The New York Times

Jim and Leah Hogan outside their home in Rowayton, Conn. After the house was hit hard during Hurricane Sandy, the couple has decided to elevate it to protect it from future storms.

By ELIZABETH A. HARRIS

Published: April 15, 2013

Jim and Leah Hogan are doing some work on their house. The ground floor is stripped down to the bones, the lawn is all dug up, and sunlight is streaming inside from unusual places, like up through gaps in the floorboard and right in through the fireplace.

 FACEBOOK

 TWITTER

 GOOGLE+

An Entire New Jersey Town Considers Elevating Itself To Escape Future Storms

BY JEFF SPROSS  ON AUGUST 10, 2013 AT 10:45 AM

137

 Tweet

 1k

 Like



(35)

After being smacked by Hurricane Sandy, the seaside town of Highlands, New Jersey is considering a dramatic solution to the problem of future floods: raise the entire downtown area at least 10 feet.

The working-class community of roughly 5,000 sits at the tip of a small peninsula that juts out into the Atlantic just southeast of Staten Island. Belying its name, the downtown area of Highlands is at or below sea level, squeezed into a small sliver between the peninsula's northern shore and the hills in its center. When Hurricane Sandy arrived, the eastern half of the town flooded with about ten feet of water, destroying or badly damaging 1,250 homes and businesses. And for the moment, Highlands remains painfully vulnerable to further flooding.



CREDIT: HIGHLANDS, NEW JERSEY.

City officials estimate the cost of elevating the town 8 to 11 feet would range from \$150 to \$200 million — in comparison to the \$574 million the real estate is valued



News Archive

2013 (158)

2012 (355)

2011 (8)

Engineer Update

THE OFFICIAL NEWSLETTER OF THE U.S. ARMY CORPS OF ENGINEERS

USACE to place more than 26 million cubic yards of sand to restore Sandy-damaged projects

Posted 6/26/2013



SHARE



Email Print

USACE

BROOKLYN, N.Y. -- The U.S. Army Corps of Engineers is in the process of placing more than 26 million cubic yards of sand along the coastline throughout the northeastern United States to repair and restore coastal storm risk reduction projects previously built by the Corps that were severely

Photos

◀ 1 of 2 ▶



During Construction - The U.S. Army Corps of Engineers Philadelphia District pumped 667,000 cubic yards of sand onto the beach at Brigantine, NJ. Work was completed in February of 2013. (Photo by USACE photo)



HOME PSDS WEBSITE PSDS IMAGES ABOUT



BEACH NOURISHMENT VIEWER

PROGRAM FOR THE STUDY OF DEVELOPED SHORELINES @ WESTERN CAROLINA UNIVERSITY



CLICK ON THE STATE OF INTEREST OR SELECT IT FROM THE LIST:

Select a state



Nourishment in GSAA States:

- **Total Nourishment (1939-present):**
 - 425 million cubic yards of sand, costing > \$3.1 billion
 - 800 episodes of nourishment
 - 310 Empire State Buildings
 - 160 GA Domes



425 million cubic yards of sand at a cost of > \$3.1 billion



Cover GSAA beaches
2 feet thick in sand

*1760 miles, 600 ft beach width

Gulf of Mexico

The Bahamas

Beach Nourishment Issues

- Never-ending commitment-- \$\$\$
- Repeated continuously
- Costs only going to rise
- Who benefits, who should pay?
- Short term solution

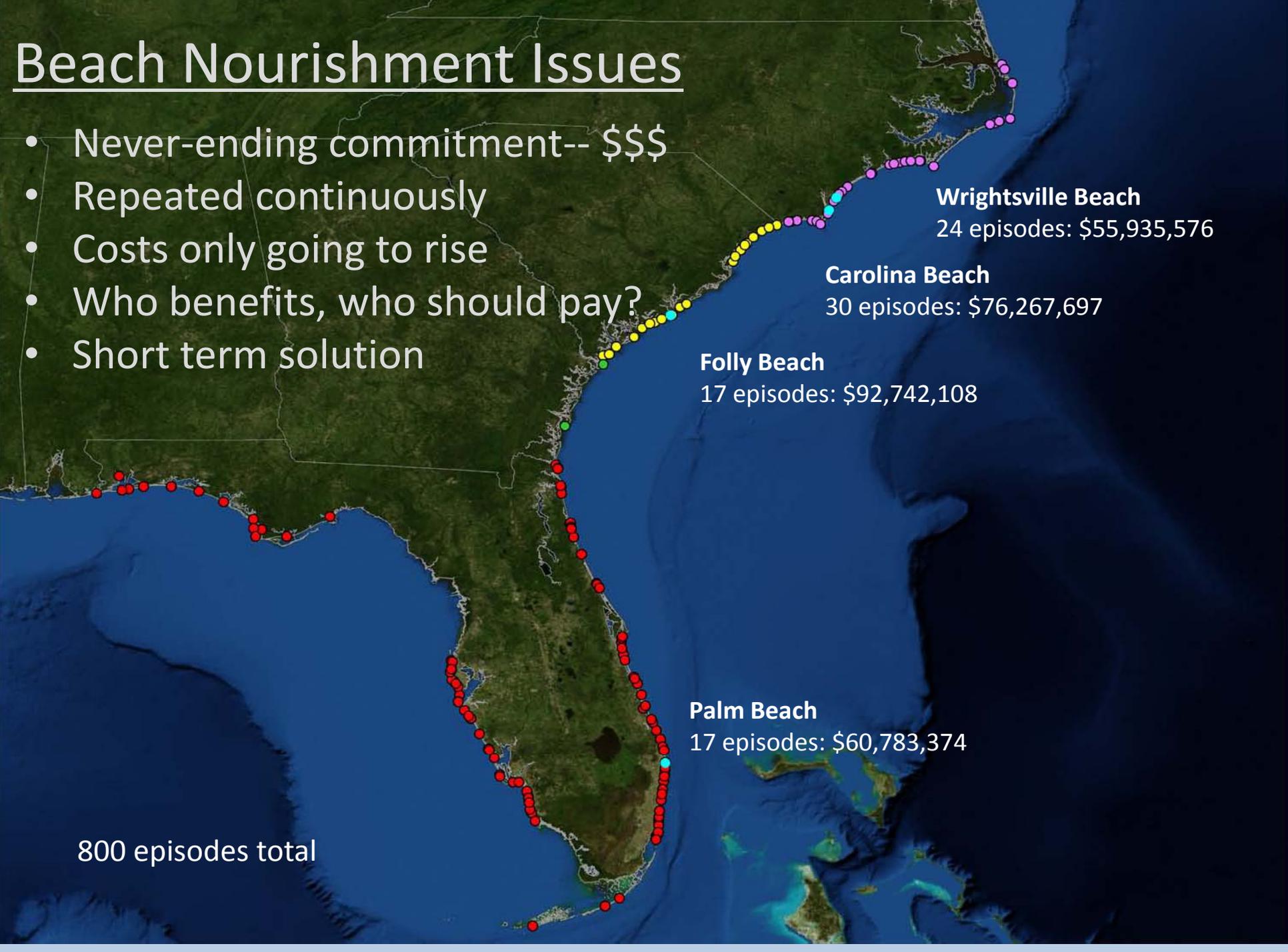
Wrightsville Beach
24 episodes: \$55,935,576

Carolina Beach
30 episodes: \$76,267,697

Folly Beach
17 episodes: \$92,742,108

Palm Beach
17 episodes: \$60,783,374

800 episodes total

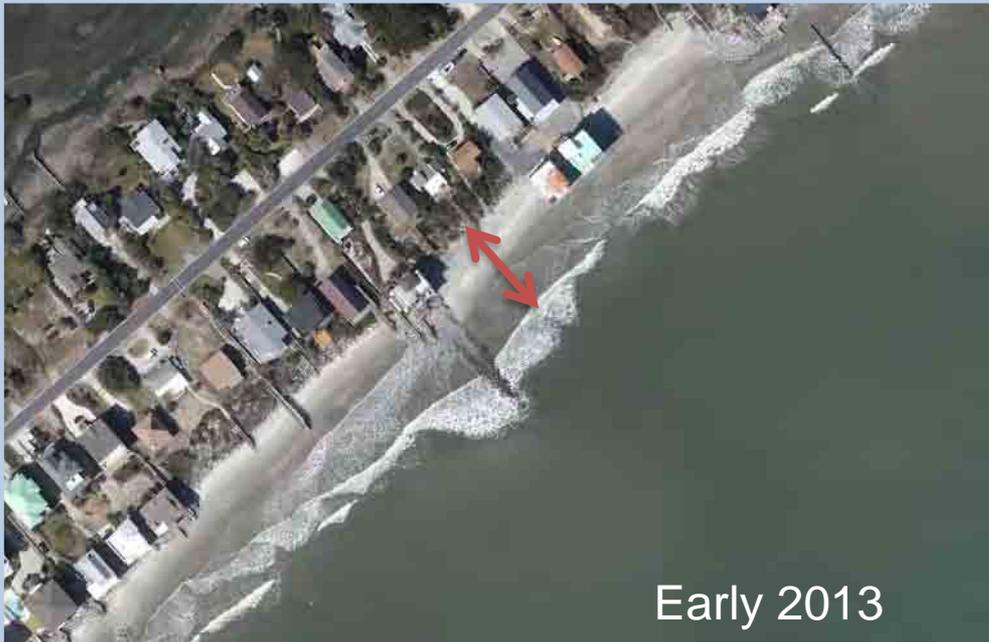


Beach Nourishment Issues

- Temporary wide beach can give a false sense of stability
- Federally funded beach & dune building projects encourage development & rebuilding



Long Branch, NJ



Early 2013



Late 2013/Early 2014

The Post and Courier

Search Articles

sponsored by R

Home > News

Folly Beach renourishment sand disappears in storm

Bo Petersen

Posted: Tuesday, April 22, 2014 10:00 p.m.

[g+](#) 0
 [Tweet](#) 1
 [Recommend](#) 52

[Print](#)
[Mail](#)
[A A](#)



David Nerjes Staff Friday's storm waves ravaged the newly renourished areas on the east end of Folly Beach near the Morris Island Lighthouse. [Buy this photo.](#)

FOLLY BEACH – Huge waves kicked up by Friday's storm scoured and swept away newly poured sands on the east end of this island.

Homeowners who had worried whether the renourishment project would come quickly enough to save their homes now have lost much of the sand in little more than a month.

Photo Gallery



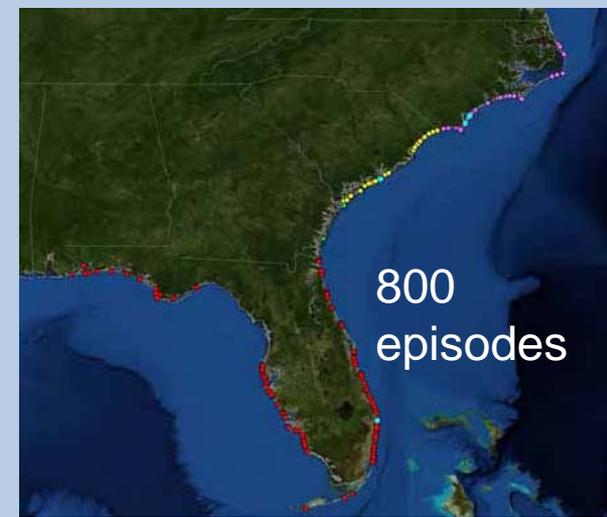
Folly Beach Erosion

It's another kick in the gut to property owners, the city and taxpayers who have squabbled over the handling of the controversial, delayed \$30 million project.

Army Corps of Engineers staffers say the sand did its job: protected homes.

Storm waves – gauged at more than 12 feet by offshore buoys – flattened the sand berm poured

Beach Nourishment Environmental Impacts



- Borrow area impacts
- Disposal area (burial, turbidity, redistribution)
- Cascade up from intertidal invertebrates to foraging shorebirds, fisheries, etc.
- **Cumulative impacts (temporal and spatial)!!!**
 - NEPA requirements are being ignored

300 more times





800 episodes

800 episodes





HOME PSDS WEBSITE PSDS IMAGES ABOUT



BEACH NOURISHMENT VIEWER

PROGRAM FOR THE STUDY OF DEVELOPED SHORELINES @ WESTERN CAROLINA UNIVERSITY



CLICK ON THE STATE OF INTEREST OR SELECT IT FROM THE LIST:

Select a state



Research Needs

- Map all projects: add more complete geospatial component to database
- Map remaining natural, un-engineered beaches
- Document physical habitat difference
- Comparative ecological studies



Planning Needs & Questions

- **Address resiliency**
 - By holding the shoreline in place forever?
- **Discuss & make a plan for GSAA states**
 - Are we going to nourish every beach, indefinitely?
 - Are we going to preserve any remaining non-nourished beaches?
 - How do we continue to pay for these projects (as costs rise)?
 - How do we manage this (limited) sand resource?
 - Other ways to be more resilient?



“Considering all proposed and existing disposal and nourishment impacts throughout the ocean beaches of North Carolina, a significant portion of the shoreline will have beach placement activities in the foreseeable future, likely resulting in time and space crowded perturbations. However, recognizing the funding constraints to complete all authorized and/or permitted activities, the availability of dredging equipment, etc.; it is very unlikely that all of these proposed projects would ever be constructed all at once. Therefore, though time and space crowded perturbations are expected in the reasonably foreseeable future, assuming each project adheres to project related impact avoidance measures, it is likely that adjacent unimpacted and/or recovered portions of beach will be available to support dependent species (i.e. surf zone fish, shore birds, etc.) and facilitate recovery of individual project sites to pre-project conditions”