Recycling of Surplus Sand to Extend the Time Between Beach Fill Episodes

Cape May County, New Jersey

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Coastal Research Center
1795 Franklin Map Shows Inlets

Inlet Morphology has Remained Fairly Constant
The Wildwoods – An Island with Surplus Sand

1. 1911 Cold Springs Jetties Built
2. 1922 Turtle Gut Inlet Closed
3. Sand Accumulated over Time
4. Current Erosion Zone
ACOE Map of the Wildwoods Showing Zones of Sand Loss vs. Gain

Sediment imbalance between northern and southern portions of project area.
Ocean City, NJ has a Vast Deposit Centrally Located on the Island

20th Street Beach has Advanced 500 ft. Seaward

Since 1992 Over 8,000,000 cy of Sand has been Placed on This Island, Concentrating in The mid-Section
Brigantine, NJ has a Sand Repository

"Absecon Inlet’s North Jetty has built up a 6 million cy reserve"
Sandy Hook, By Far the Largest Deposit

Alternately an Island or a Spit, Sandy Hook has Gained over 3,000,000 cy of Monmouth County Beachfill Sand Since 1996
Sand Backpassing The Recycling Concept

- A chronic pattern of sand movement is required
- The supply beach must be accessible from the depositional beach area.
- Probably not the primary means of providing shoreline stability
- THE COST is very low in comparison to finding new sand
- Mobilization cost about 8% of that for a dredge in the inlet
- Sand moving cost about $6 - $7.00 per cubic yard up to 3 miles
- Excellent means to maintain a large Federal project to extend the time between major maintenance efforts
- The sand has been shown repeatedly over two decades to be arriving between 32nd and 70th Streets faster than it could be hauled back to the north AND it is guaranteed to return.
Sand Backpassing  The Recycling Concept

North Wildwood Used Sand Backpassing Following Hurricane Irene in 2012 using Wildwood Crest Beach as Source (93,000 cy) Thirteen High Capacity Trucks Made 1,700 Trips Between March and May 2012

North Wildwood Employed Sand Backpassing in 2016 to move 171,000 cy from the City of Wildwood following an Early 2016 Northeast Storm

The Army Corps of Engineers has this Concept as the Design Option for the Hereford Inlet to Cold Springs Inlet Shore Protection Project now in final Feasibility Review

Brigantine has Considered Moving Sand from Absecon Inlet back to the Northern Erosion Zone Between Corps Dredge Projects
2006 Back Pass

Loading 25 cy Trucks

53,000 cu yds. placed

Loading in the southern borrow area beach

21st Street Deposit
a. Southern & northern borrow areas
b. An exclusion zone between the borrow sites
c. Limit was between the mid-tide line and the toe of the dunes
d. Excavation to 1.5 feet below existing surface
e. Work complete by March 15, 2012
f. Deposition area between 14th & 25th Streets
2012 pre- to post fill Borrow Sites
North Wildwood Sand Piles Hauled in from Wildwood City
2016 Design Plan for North Wildwood
North Wildwood, NJ
Elevation Change Between
March 2016 to June 2016

The North Wildwood Elevation Change Map was created by comparing March 2016 post winter storm Nacie survey data and June 2016 post back passing survey data collected by the Stockton University Coastal Research Center.

Volume changes were calculated below 12 foot NAVD88.

Estimated gains in volume = 151,400 cubic yards

Elevation units are in NAVD88ft.

<table>
<thead>
<tr>
<th>Region</th>
<th>Volume (Yd³)</th>
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<tbody>
<tr>
<td>Areas of Gain</td>
<td>151,400</td>
</tr>
<tr>
<td>Areas of Loss</td>
<td>-15,900</td>
</tr>
<tr>
<td>Net Volume Change</td>
<td>135,500</td>
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</table>
No. Wildwood During Project 2\textsuperscript{nd} & Kennedy Blvd.
Critical Elements for Large Scale Backpass Projects

- Must have a substantial accretional zone that adds 100,000 cy/year
- Permit requirements limit excavation depths & add exclusion zones
- Recovery to pre-project sand volumes required prior to next project start
- Wildlife issues can include biological surveys of sand foraging responses
- Trucking on the beach much preferred to hauling over roads
- Sand placement can involve stockpiling if seasonal restrictions are in place
- Equipment and crew experience in New Jersey is growing
- Project expenses eligible for NJDEP 75% - 25% cost sharing
- The ACOE *might be amenable to project credit* within their Shore Protection efforts if recycling can extend time between hydraulic maintenance efforts.
Thank You