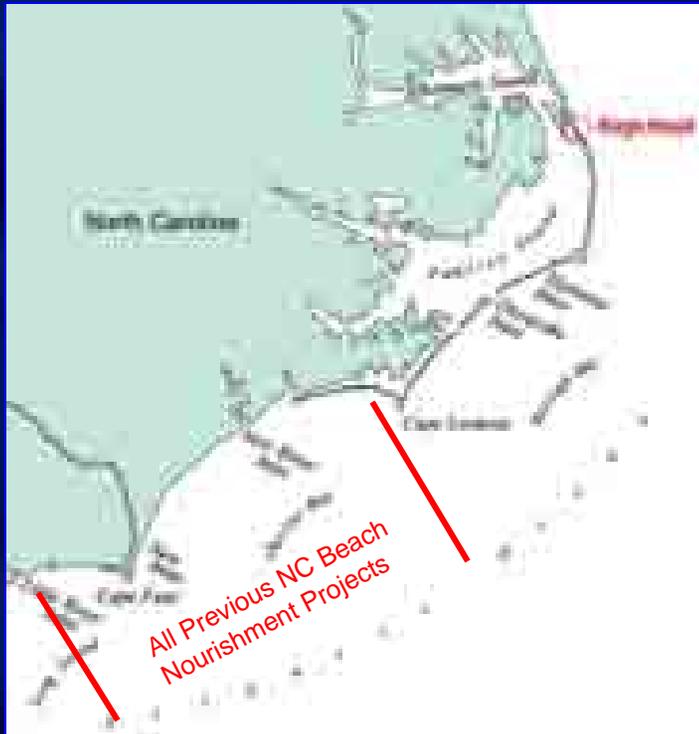


Nags Head Beach Nourishment Project



Wilmington District
Washington Regulatory Office



Nags Head Beach Nourishment Project



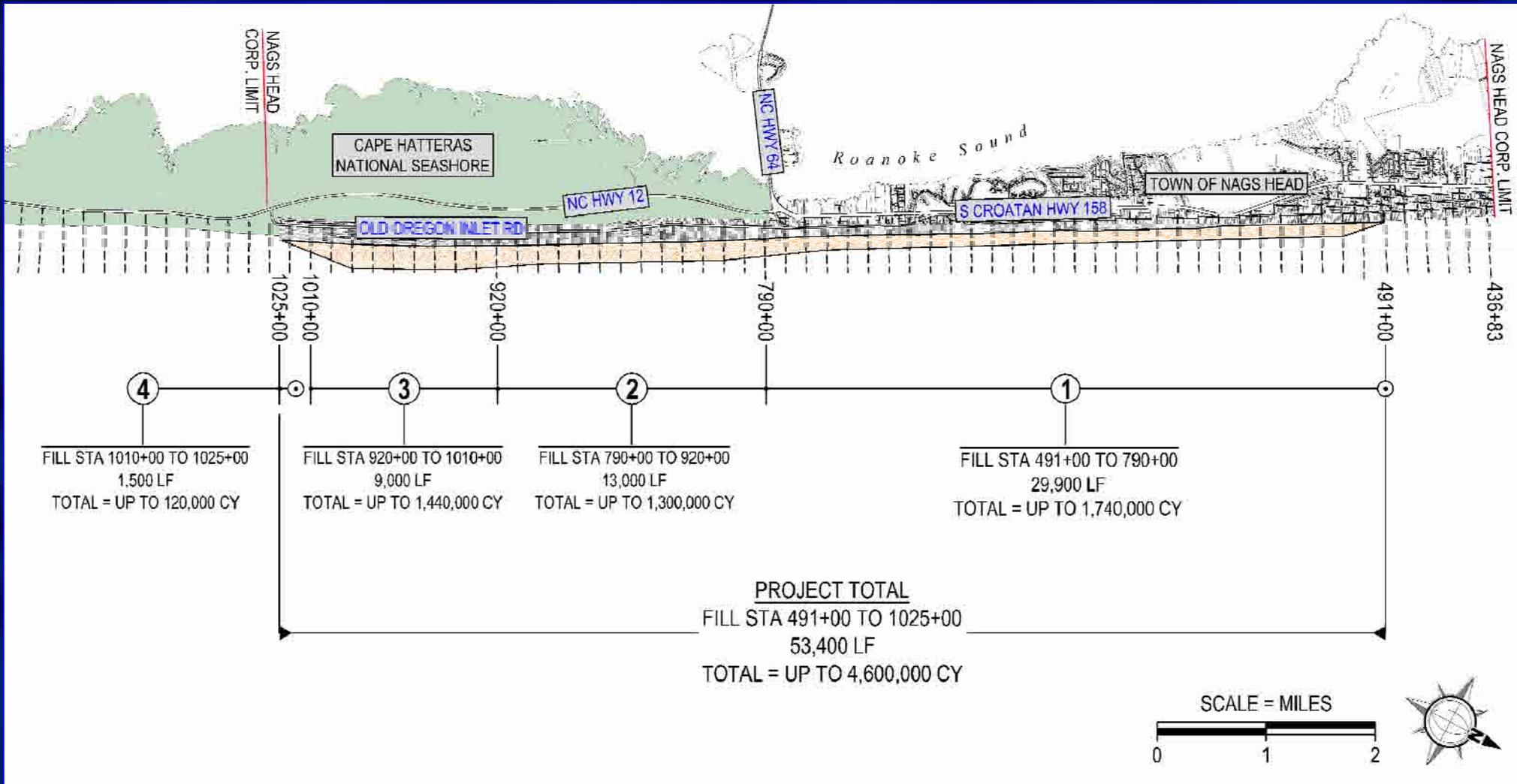
Proposed Borrow Areas

- Within USACE "S1" – 100 mil CY of Potential Borrow Sediment
- Subareas 1, 2 & 3 Contain ~ 13.5 mil CY
- Project Will Involve <4.6 mil CY
- Total Area Impacted Will Be ~575 acres (<50% of Areas 1, 2 & 3)
- Borrow Areas 1, 2 & 3 Meet NCCRC Sediment Criteria for Nourishment
- Cultural Resource Surveys (Jul '09) Identified 2 small areas (*) within Borrow Area 1 that should be avoided. Remaining Areas are clear for use.

Nags Head Beach Nourishment Project

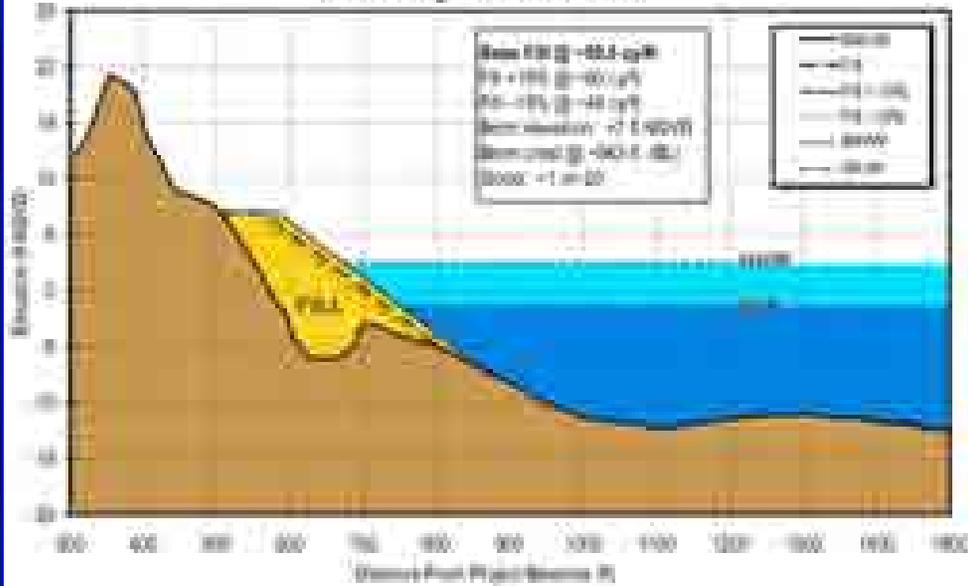


Project Plan – Same Boundaries As USACE 2000 Plan

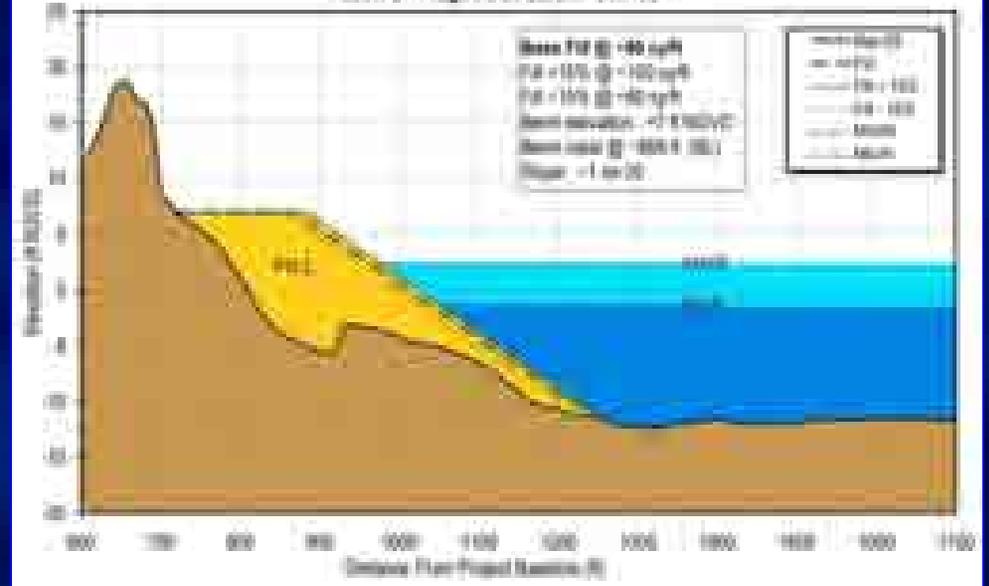


Nags Head Beach Nourishment Project

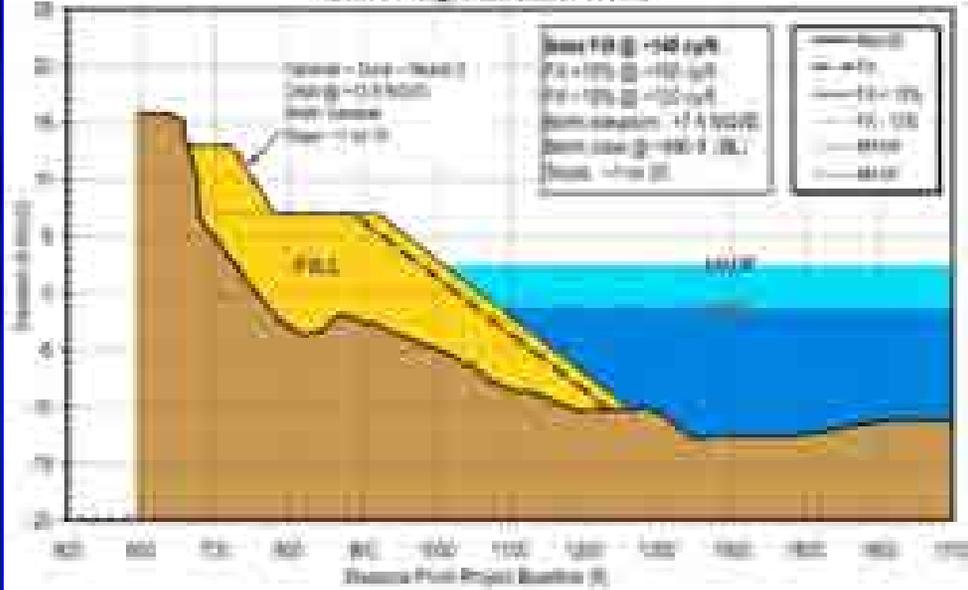
Reach 1 - Nags Head Station 000+00



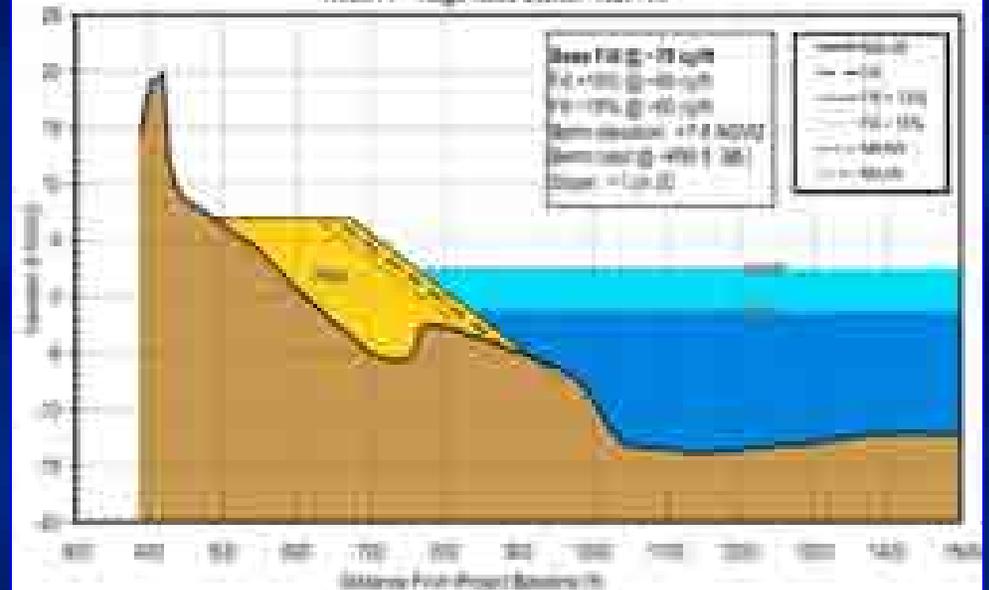
Reach 2 - Nags Head Station 000+00



Reach 3 - Nags Head Station 000+00

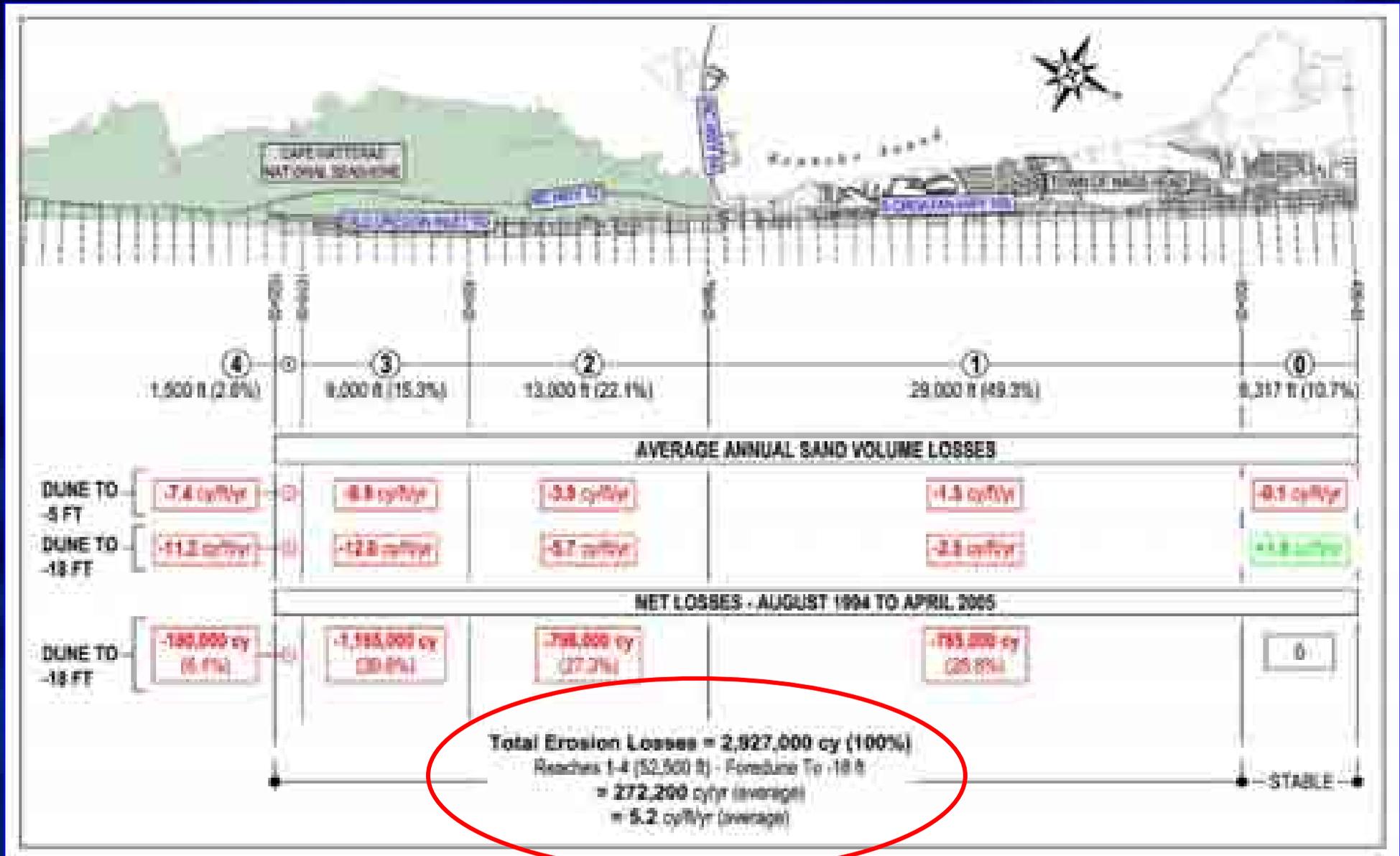


Reach 4 - Nags Head Station 1020+00



Beach Sand Volume Losses – 1994 to 2005

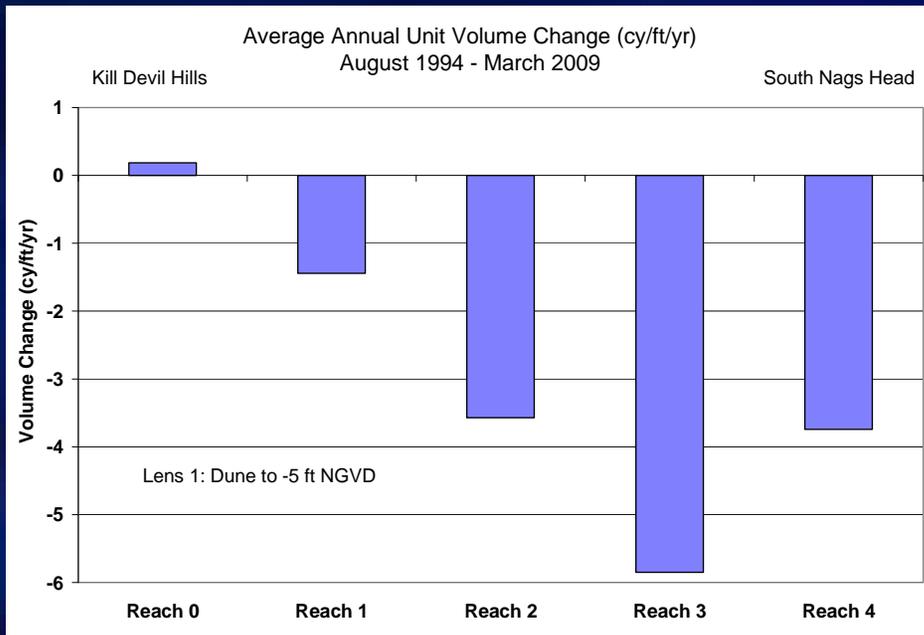
Sand Loss Rates: ~5.5 cy/ft/yr*



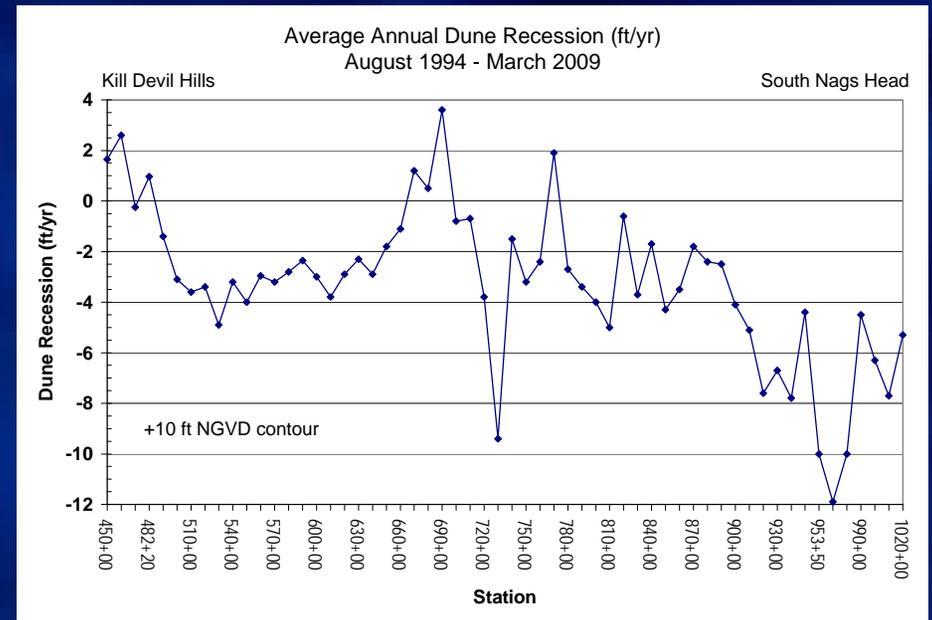
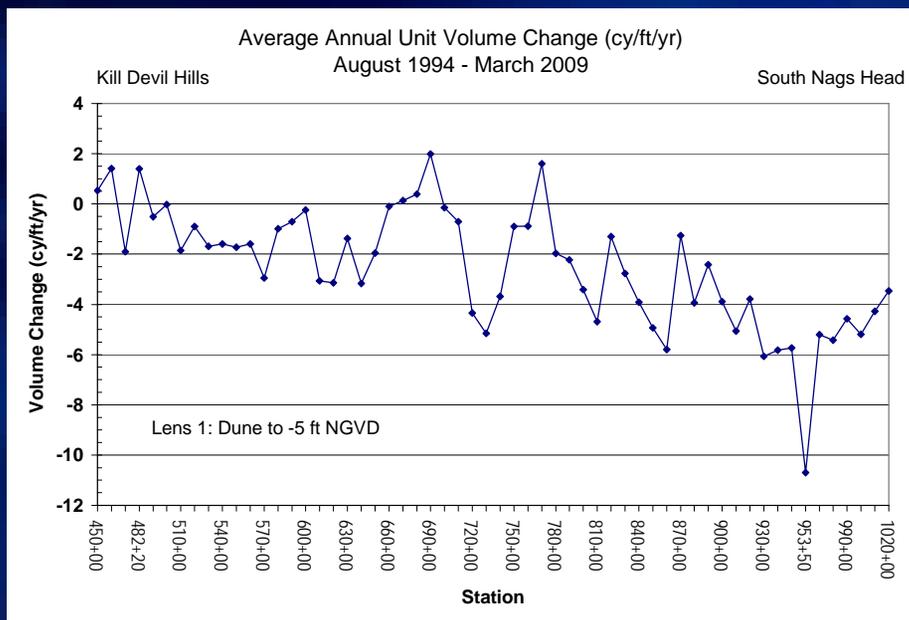
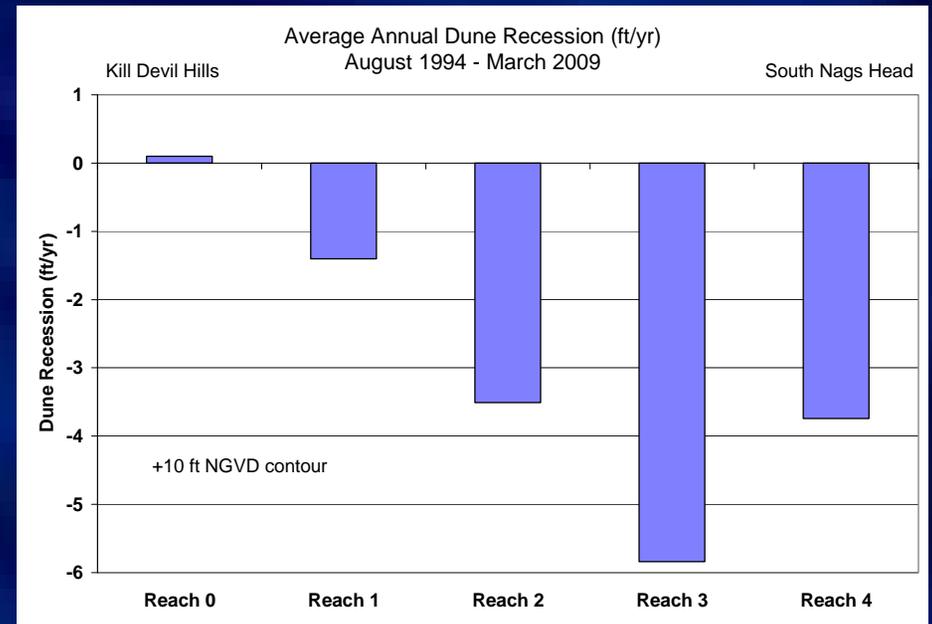
*Federal Dare County Project Assumed Sand Loss Rates @ ~18.5 cy/ft/yr

Dune Erosion & Sand Volume Losses 1994 to 2009

Average Sand Volume Losses



Average Dune Recession Rates



Nags Head Beach Nourishment Project



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Sep 2000 – USACE – FEIS – Dare County Beaches

Sep 2003 – Hurricane ISABEL

Winter 2004/5 – FEMA Emergency Dune Restoration

Apr 2006 – Town Submits Its Own DEIS for Beach Nourishment

Mar 2007 – Town Submits Biological Assessment

Jul 2008 – Town Submits Revised DEIS – NMFS Issues EFH Assessment

Aug 2008 – USFWS Issues Biological Opinion – Sec 7

Feb 2009 – NCDENR Issues Record of Decision

Apr 2009 – USACE – Issues Fed DEIS for Town Project

May 2009 – Receive Nat Park Service Comments-National Seashore – to be addressed in Final EIS

Jun 2009 – Receive USEPA Comments – 10 items to answer/add in Final EIS

Nags Head Beach Nourishment Project

18 August 2008 – USFWS BO received. Concludes:
“...the ..project, as proposed, is not likely to jeopardize the continued existence of the loggerhead, green and leatherback sea turtles and is not likely to destroy or adversely modify designated critical habitat.” pg 25.

Recommends prudent measures which are reasonable and achievable.

Nags Head Beach Nourishment Project



Wilmington District
Washington Regulatory Office



Jun 2009 – NCDENR – Requests Full Cultural Resources Surveys

Jun 2009 – CSE Subcontracts w/ Tidewater Atlantic Research for Cultural Resource Surveys – Field Work Accomplished in July 2009

Aug 2009 – Receive TAR Report – Add to DEIS

Aug 2009 – Submit Revised DEIS to USACE – w/ answers & additions to satisfy USEPA & NPS

Sep 2009 – USACE Reviewing Revised DEIS for Completeness

Sep 2009 – NCDENR Reviewing Cultural Resources Surveys for Completeness

Nov 2009 – Submittal of Major CAMA Permit Application to State. Final EIS (USACE) Complete for the Federal Permit Review & Approval



Nags Head Beach Nourishment Project



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Jan 2010 – Receive Comments from USDOJ, NMFS, USEPA & NCDENR

Feb 2010 – NCDENR Interagency Meeting – Discuss Remaining Requirements for Summer Dredging – Biological Surveys & Environmental Mitigation.

Apr 2010 – Submit Revised EIS to USACE with Responses to Comments – For Finalization by USACE

Summer 2010 – Anticipated Final Reviews of CAMA permit application and Federal permit

Fall 2010 – Anticipated Receipt of Permits

Fall/Winter 2010-11 – Final, Design, Plans & Specifications, Request for Bids

April 2011 – Anticipated Initiation of Construction

Fall 2011 – Anticipated Completion of Construction



Nags Head Beach Nourishment Project

Principal Remaining Environmental Issues:

Monitoring & Mitigation Requirements

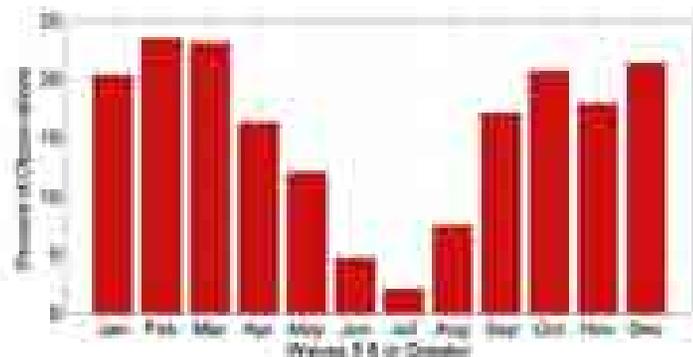
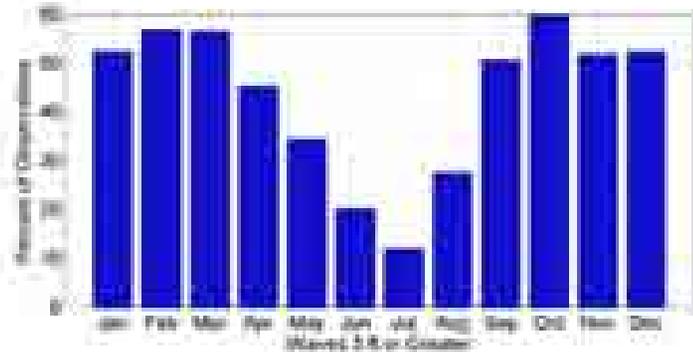
On 24 February 2010, Nags Head Received Tentative Approval for Summer Hopper Dredging from NC State Resource Agencies, Subject to:

- 1) NCDMF-Approved Biological Monitoring Plan - Before and After Dredging
- 2) NCWRC-Approved Turtle Monitoring Plan

Note: State and Federal Resource Agencies Have Acknowledged that Dredging Safety is a Legitimate Concern for the Nags Head Project and that Summer Dredging May Be Allowed. However, This Should Not Be Considered Precedent Setting For Other NC Projects

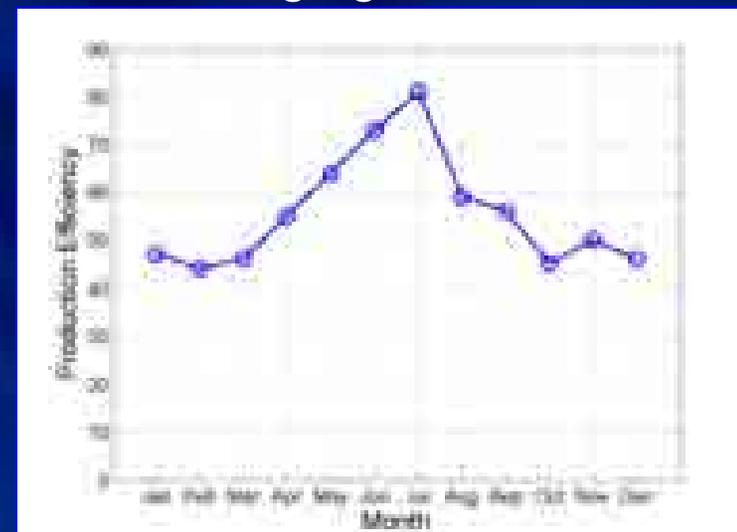
Nags Head Beach Nourishment Project

Wave Height Frequencies



Dredging Efficiencies in northern Dare County are prohibitively low in winter because of the frequency of high waves

Dredging Efficiencies

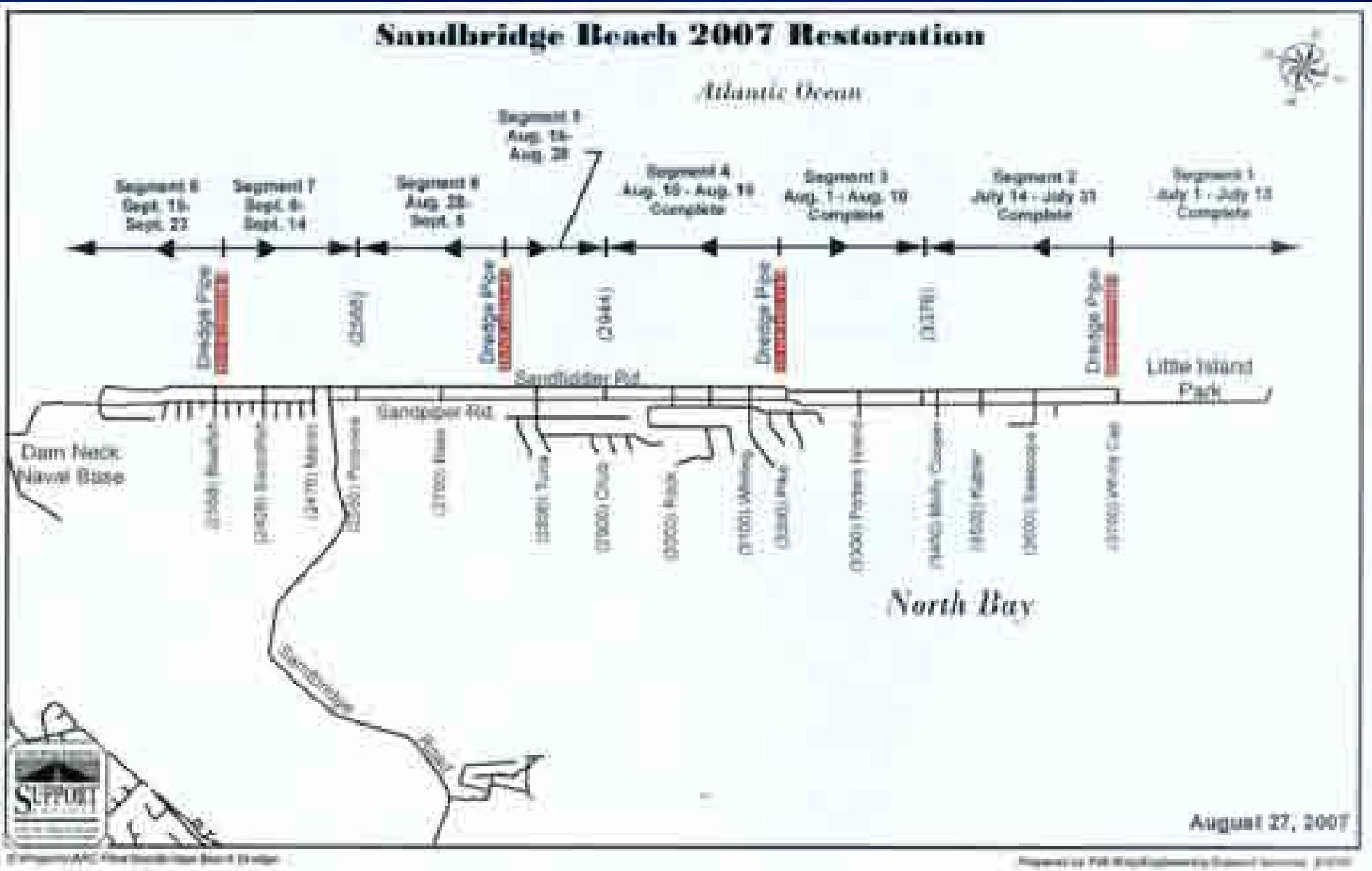


Hopper Dredges Can Operate in Higher Waves Than Suction-Cutterhead Dredges

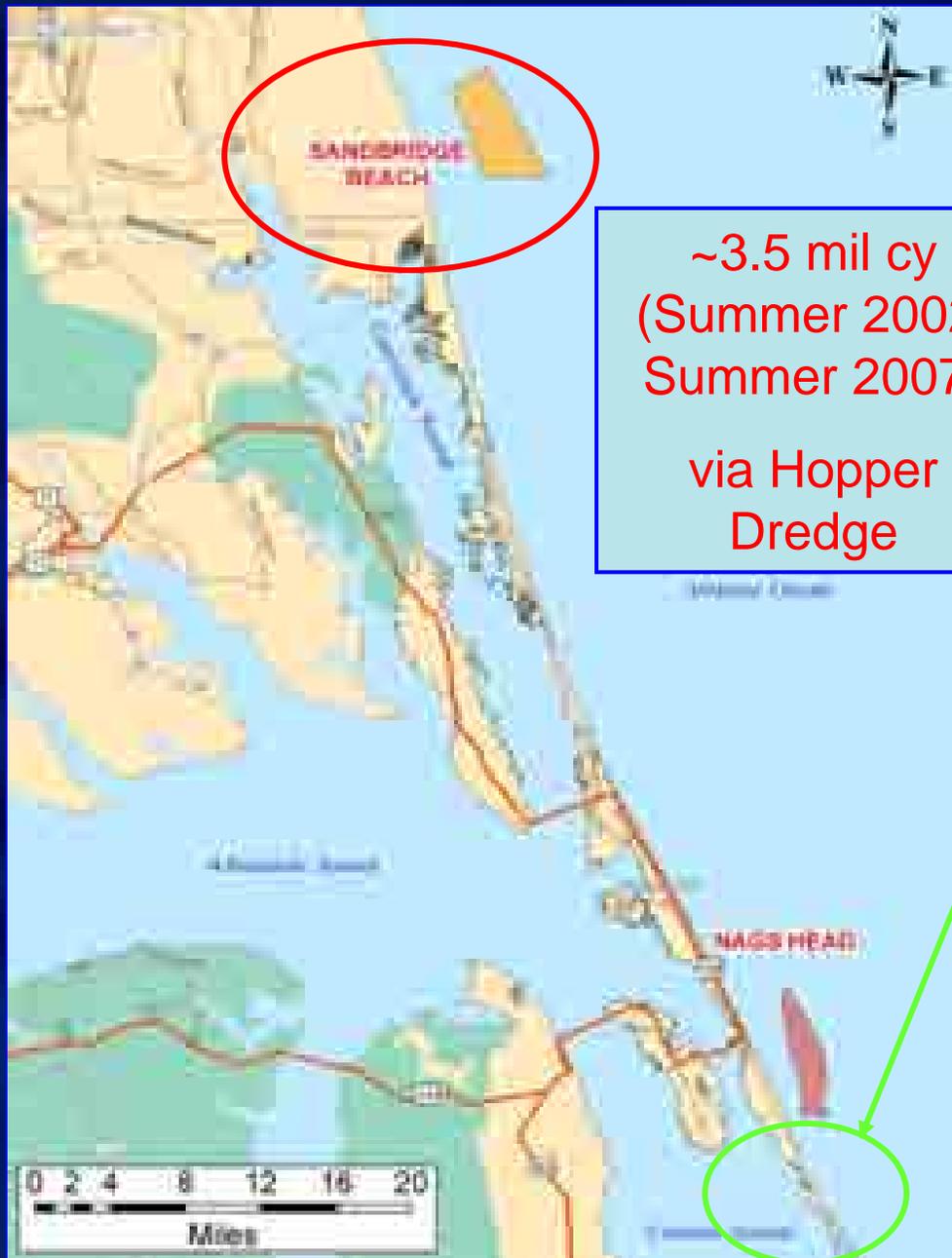


Similar Beach Nourishment Project

Sandbridge Beach 2007 Restoration



Nags Head Beach Nourishment Project



~3.5 mil cy
(Summer 2002;
Summer 2007)
via Hopper
Dredge

Nags Head Requests Permits for work which is similar in scope, schedule and equipment as the Sandbridge VA Beach Nourishment Project
And similar in Schedule and Equipment as USACE Oregon Inlet Maintenance Dredging

Oregon Inlet Hopper Dredging

TABLE 1-11
Summary of Oregon Inlet Hopper Dredging Operations

| Year | Project ID | Number of Oregon Inlet | Length of Dredging | Total Project | Total Project |
|-------|------------|------------------------|--------------------|---------------|---------------|
| | | | | Cubic Yards | Hours |
| 2001 | 01-01 | 1 | 0.1 | 10,000 | 100 |
| 2002 | 02-01 | 1 | 0.1 | 10,000 | 100 |
| 2003 | 03-01 | 1 | 0.1 | 10,000 | 100 |
| 2004 | 04-01 | 1 | 0.1 | 10,000 | 100 |
| 2005 | 05-01 | 1 | 0.1 | 10,000 | 100 |
| 2006 | 06-01 | 1 | 0.1 | 10,000 | 100 |
| 2007 | 07-01 | 1 | 0.1 | 10,000 | 100 |
| 2008 | 08-01 | 1 | 0.1 | 10,000 | 100 |
| 2009 | 09-01 | 1 | 0.1 | 10,000 | 100 |
| 2010 | 10-01 | 1 | 0.1 | 10,000 | 100 |
| 2011 | 11-01 | 1 | 0.1 | 10,000 | 100 |
| 2012 | 12-01 | 1 | 0.1 | 10,000 | 100 |
| 2013 | 13-01 | 1 | 0.1 | 10,000 | 100 |
| 2014 | 14-01 | 1 | 0.1 | 10,000 | 100 |
| 2015 | 15-01 | 1 | 0.1 | 10,000 | 100 |
| 2016 | 16-01 | 1 | 0.1 | 10,000 | 100 |
| 2017 | 17-01 | 1 | 0.1 | 10,000 | 100 |
| 2018 | 18-01 | 1 | 0.1 | 10,000 | 100 |
| 2019 | 19-01 | 1 | 0.1 | 10,000 | 100 |
| 2020 | 20-01 | 1 | 0.1 | 10,000 | 100 |
| 2021 | 21-01 | 1 | 0.1 | 10,000 | 100 |
| 2022 | 22-01 | 1 | 0.1 | 10,000 | 100 |
| 2023 | 23-01 | 1 | 0.1 | 10,000 | 100 |
| 2024 | 24-01 | 1 | 0.1 | 10,000 | 100 |
| 2025 | 25-01 | 1 | 0.1 | 10,000 | 100 |
| 2026 | 26-01 | 1 | 0.1 | 10,000 | 100 |
| 2027 | 27-01 | 1 | 0.1 | 10,000 | 100 |
| 2028 | 28-01 | 1 | 0.1 | 10,000 | 100 |
| 2029 | 29-01 | 1 | 0.1 | 10,000 | 100 |
| 2030 | 30-01 | 1 | 0.1 | 10,000 | 100 |
| TOTAL | | 30 | 3.0 | 300,000 | 3,000 |

Nags Head Beach Nourishment Project

Implications For Other OBX Communities:

Nags Head Was Able to Utilize Some Important Elements of the Federal Dare County Plan (2000) – *Borrow Areas, Pre-project Environmental Monitoring, 1994 Condition Survey*

Necessary Modifications of the Federal Plan:

- Construction Period – Summer for Safety
- Project Scale – Smaller, yet viable 10+ years
- Project Formulation (w/res to Measured Erosion Rates)
- Most Feasible Dredging Equipment – Hopper Dredges

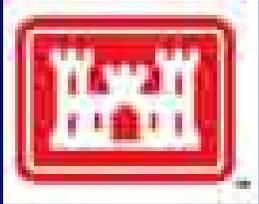
Nags Head Beach Nourishment Project

Recommendations For Other OBX Communities

- Determine Actual Volumetric Sand Loss Rates for Your Area via Comparative Surveys
- Formulate A Realistic 10-yr or 20-yr Nourishment Requirement Based On A Minimum Target Profile Volume
- Utilize The Federal EIS (2000) and Nags Head EIS (2009) As a Basis (Start) For Environmental Documents
- Utilize Key Decision Documents Like the USFWS BO
- Draw On the Nags Head Experience To Facilitate Planning and Permitting
- Recognize that Project Longevity Increases Geometrically with Project Length (*Nat. Acad. Science 1995*)
- Remember That A Single Storm Will Not Permanently Remove All Nourishment Sand – FEMA Provides Assistance Including Renourishment Funds Where There Is A Declared Disaster

Nags Head Beach Nourishment Project

Discussion



Wilmington District
Washington Regulatory Office



Pine Knoll Shores 2007



Nags Head Oct 2006