

Constructing a Terminal Groin on Holden Beach at Lockwoods Folly Inlet: A Fiscal Perspective



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Program for the Study of Developed Shorelines (PSDS):

- Applied coastal environmental management/science research center
- Established in 1985 at Duke University/Moved to WCU in 2006
- Identify and develop responsible science-based coastal management strategies that promote the long-term sustainability of our nation's developed shorelines









So, why a terminal groin in Holden Beach?



The Town of Holden Beach (Town) is seeking federal and state permits to allow the construction of a 30-year shoreline protection project that would serve to mitigate chronic erosion experienced along the eastern portion on the Town's oceanfront shoreline so as to **protect and secure public infrastructure, roads, homes, businesses, beaches, recreational assets, and protective dunes.**

-- HOLDEN BEACH EAST END SHORE PROTECTION ENVIRONMENTAL IMPACT STATEMENT



Cost of Intermediate Groin (Preferred Alternative) w/ Periodic Nourishment

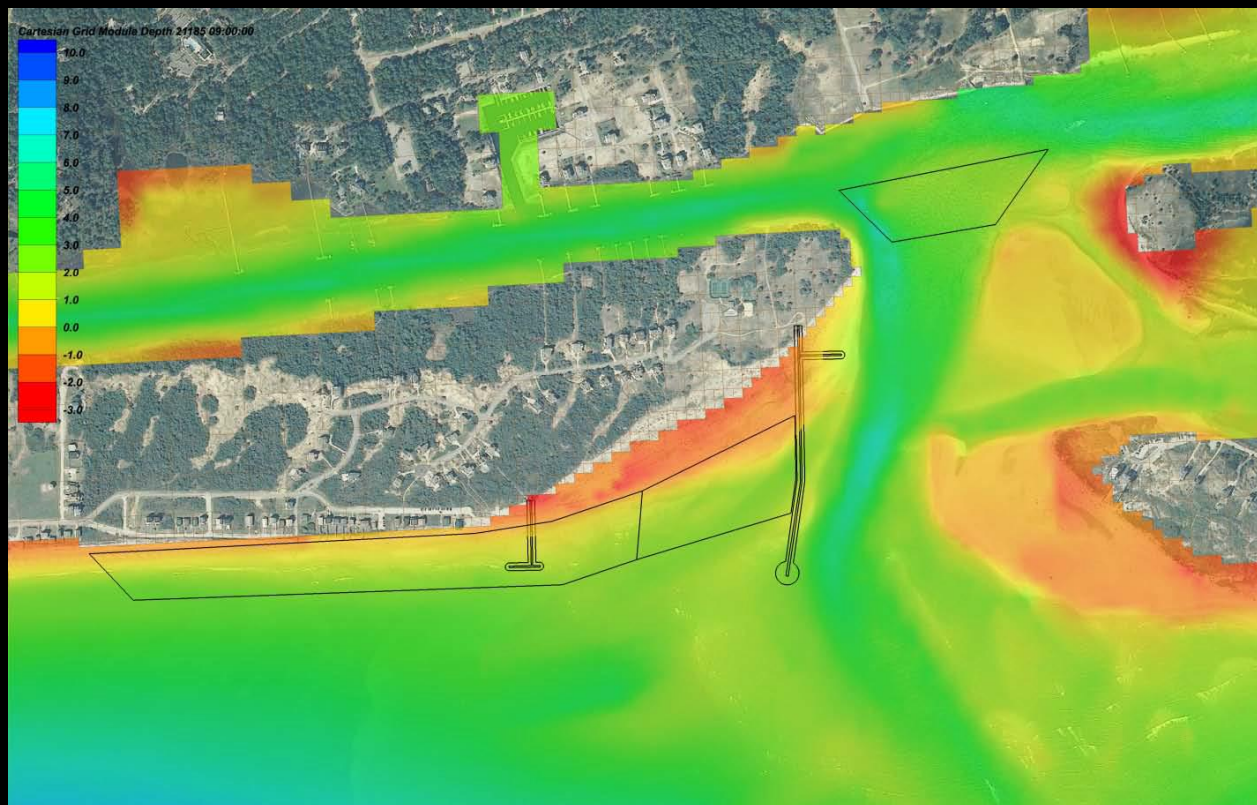
Discount Rate: 0.03

Price Appreciation Rate: 0.05

Initial Sand Volume: ~150,000 cy

Groin Construction + Fillet Cost: \$5,000,000

Periodic Nourishment: ~150,000 cy/4 years



Year	Annual Flow	NPV
0	\$5,000,000	\$5,000,000
1	\$0	\$0
2	\$0	\$0
3	\$0	\$0
4	\$5,000,000	\$4,442,435
5	0	\$0
6	\$0	\$0
7	\$0	\$0
8	\$5,000,000	\$3,947,046
9	\$0	\$0
10	\$0	\$0
11	\$0	\$0
12	\$5,000,000	\$3,506,899
13	\$0	\$0
14	\$0	\$0
15	\$0	\$0
16	\$5,000,000	\$3,115,835
17	\$0	\$0
18	\$0	\$0
19	\$0	\$0
20	\$5,000,000	\$2,768,379
21	\$0	\$0
22	\$0	\$0
23	\$0	\$0
24	\$5,000,000	\$2,459,669
25	\$0	\$0
26	\$0	\$0
27	\$0	\$0
28	\$5,000,000	\$2,185,384
29	\$0	\$0
30	\$0	\$0
	NPV =	\$27,425,647

So...What's That Gonna' Get You?

Coastal ecosystems provide a variety of goods and services that create real economic value via contributions to human well-being.

These include the protection of coastal real estate and tourism as well as services that impact non-market goods and services such as aesthetics, habitat provision and opportunities for recreation.

Quantifying the associated benefits to people from these goods and services is the domain of economic valuation.

Economic Valuation: The Damage Avoidance Approach

- **Ascribes estimates of costs to notions of value**
- **The cost of replacing coastal property is used to estimate the benefits derived from activities that protect that property**

While this approach may seem logical from a property owner's perspective, value does not provide an accurate means of understanding derived benefits

Economic Valuation Doesn't Work Isn't Really Fair Because...

- **The value of a property accrues almost exclusively to the property owner**
- **Coastal property values are often inflated by public policies and prior public actions such as subsidized property/flood insurance, beach nourishment and the construction of terminal groins**

Economic Valuation Leads To...

- 1) An overvaluation of vulnerable coastal development**
- 2) An exaggeration of potential economic impacts to coastal municipalities and counties resulting from property damage and/or property loss**
- 3) An overstatement of potential negative economic impacts associated with property loss**
- 4) An inflated perception of the economic benefits of shoreline protection efforts**

As a Result...

Using the value of coastal property as an estimate for the benefits of a shoreline stabilization project often leads to the conclusion that highly developed beaches are worth more than undeveloped beaches, or that the benefits of protecting development exceed the cost.

From a public/societal (HA, community, county or state) perspective, however, the opposite is almost always true.

We Believe...

A more accurate measure of how much coastal development at-risk to shifting inlets is worth to society (the public) is the contribution this development makes to municipal, county and state economies measured by the ad valorem (property), occupancy and sales tax revenue they generate.

Subsequently, from a public policy perspective, measuring changes in tax revenue generation resulting from actions that seek to protect or remove at-risk coastal development represents a pragmatic tool for assessing the public costs and potential public benefits of shoreline “protection”/management strategies.



North Carolina Coastal Resources Commission



FINAL REPORT TERMINAL GROIN STUDY

March 1, 2010



Photo Courtesy of Carteret County Shore Protection Office

2010

*** DRAFT ***
CONCEPT ONLY

Holden Beach

30-yr Risk Line



2016

30-yr Risk Line



Municipality: Holden Beach

Inlet: Lockwoods Folly

County: Brunswick

FY 2015-16 Holden Beach Tax Base: \$1,186,384,884

FY 2015-16 Holden Beach Tax Rate: 0.150
(State Municipal Average = 0.4345)

FY 2015-16 Holden Beach Property Tax Revenue: \$1,731,885

FY 2015-16 Brunswick County Tax Base: \$22,920,451,666

FY 2015-16 Brunswick County Tax Rate: 0.4850
(State Ave: .6554 Coastal Ave: .7003)

FY 2015-16 Brunswick County Property Tax Revenue: \$109,348,481

FY 2015-16 Holden Beach Accommodation Tax Revenue: \$1,712,878

FY 2015-16 Brunswick County Accommodation Tax Revenue: \$1,275,000

FY 2015-16 Holden Beach Sales Tax Revenue: \$131,081

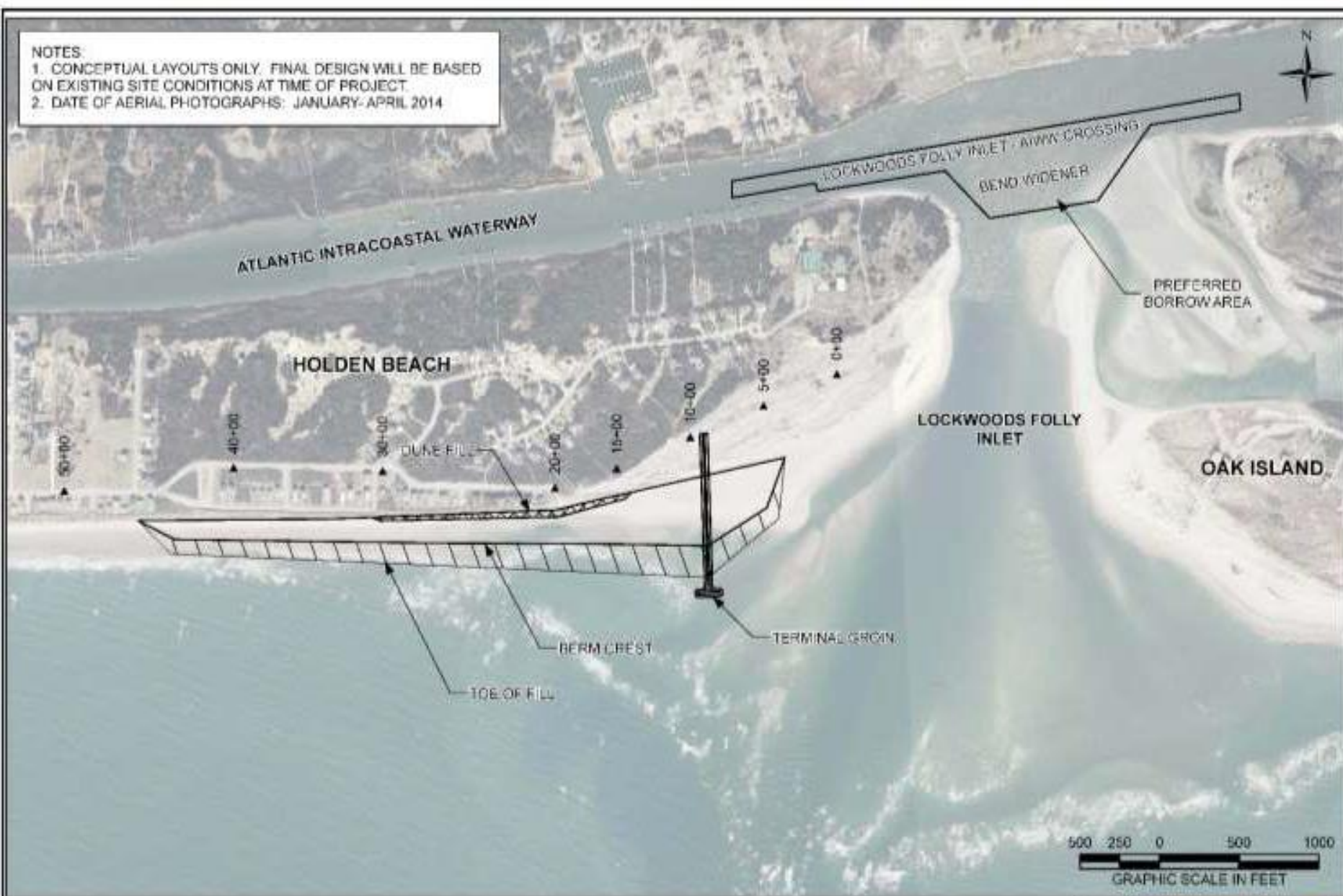
FY 2015-16 Brunswick County Sales Tax Revenue: \$18,823,443

2016



At-Risk Properties:	150
Total Assessed Value:	\$14,627,880
% of Municipal Tax Base:	1.23%
% of County Tax Base:	0.06%
Total Annual Tax Revenue*:	\$128,450
NPV Tax Revenue Over 30 Years**:	\$5,261,446
* Estimate includes municipal and county ad valorem, occupancy and sales tax	
** Using a discount rate of 3% and price appreciation rate of 5%	

- NOTES:
 1. CONCEPTUAL LAYOUTS ONLY. FINAL DESIGN WILL BE BASED ON EXISTING SITE CONDITIONS AT TIME OF PROJECT.
 2. DATE OF AERIAL PHOTOGRAPHS: JANUARY-APRIL 2014



It is highly unlikely that an intermediate terminal groin structure will benefit all 150 properties.



*** DRAFT ***
CONCEPT ONLY



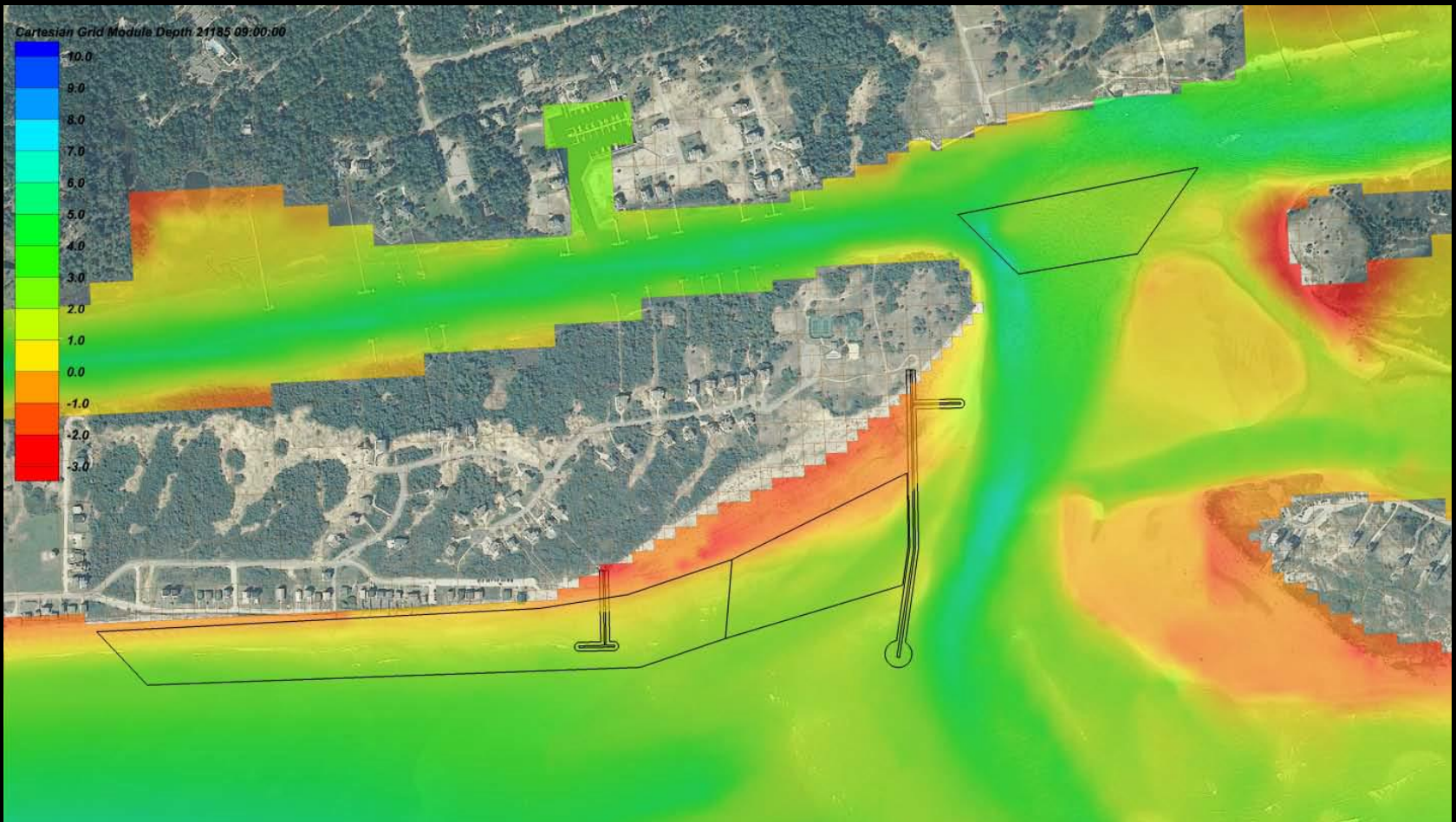
Imminent Risk Properties:	32
Total Assessed Value:	\$3,120,614
% of Municipal Tax Base:	0.26%
% of County Tax Base:	0.014%
Total Annual Tax Revenue*:	\$27,403
NPV Tax Revenue Over 30 Years**:	\$1,159,868

* Estimate includes municipal and county ad valorem, occupancy and sales tax

** Using a discount rate of 3% and price appreciation rate of 5%



	All	IRPs
Properties:	150	32
Total Assessed Value:	\$14,627,880	\$3,120,614
% of Municipal Tax Base:	1.23%	0.26%
% of County Tax Base:	0.06%	0.014%
Total Annual Tax Revenue Loss*:	\$128,450	\$27,403
NPV Tax Revenue Loss Over 30 Years*:	\$5,261,446	\$1,159,868
* Estimate includes municipal and county ad valorem, occupancy and sales tax		
** Using a discount rate of 3% and price appreciation rate of 5%		



NPV Cost of Building a Terminal Groin: \$27,425,647

NPV IRP Tax Revenue Protected: \$1,159,868

NPV All Tax Revenue Protected: \$5,261,446

A fiscal analysis of fifteen North Carolina coastal counties and communities indicates that:

- 1) The contribution at-risk coastal development makes to North Carolina's coastal economy is minor**
- 2) The impact of losing properties at-risk to shifting inlets is much less than perceived (inconsequential)**
- 3) A strategic and equitable policy that proactively removes vulnerable development is likely to be the most economically and environmentally sustainable**

Public policies and management strategies that can overcome common economic misperceptions will provide property owners, state and local policy makers and coastal managers with a sustainable and equitable strategy that concurrently addresses the economic, environmental, legal and political problems/issues facing the nation's developed shorelines.

Summary:

In order to assess the fairness and efficacy of a publicly-funded shore protection project - such as a terminal groin - it is critical to identify the societal benefits, as well as the primary beneficiaries of that project.

Only then can the following questions be answered:

- 1. Is this project really worth doing?**
- 2. Is there something else that will work better?**
- 3. Who should pay?**