



## **The Potential Cost/Benefits of Buyouts in Rodanthe, North Carolina**

### **Identifying and estimating the value of highly exposed, oceanfront properties**

The oceanfront shoreline of Rodanthe, North Carolina has one of the highest erosion rates on the U.S. East Coast (recently upwards of 20 feet per year). Many homes that were initially constructed well back from the beach are now at risk of constant flooding and imminent collapse. A typical response to this erosion in Dare County (and most coastal communities) would be the implementation of a beach nourishment project. It is unclear whether this is practical for Rodanthe, as the geologic setting is problematic. With such high erosion rates, episodes of renourishment would be frequent, driving up costs significantly. A recently released report entitled: *Rodanthe Sand Needs Assessment Dare County, North Carolina* (Coastal Science and Engineering, 2023) recommends an initial project at a cost of approximately \$40 million. Costs for long-term beach maintenance bring the total to about \$120 million over the next 15 years. This assumes that the sand from each nourishment placement will last around 5 years, which may be a bit of a stretch along this shoreline. The CSE study indicates there could be modest cost savings from the construction of groins along this shoreline. We did not consider this analysis since groins are not permitted by law on the North Carolina oceanfront due to the inevitable downdrift harm caused by the interruption of longshore sediment transport. Even with beach nourishment, there will be periods of time between sand placement episodes when the beach will narrow, and the most exposed homes will be in the waves.

On the other hand, doing nothing has resulted in numerous high-profile incidents of homes collapsing into the sea, while septic tanks are exhumed and broken open. These events cause both environmental harm and a risk to public safety and health (the intertidal beach in this area is a part of Cape Hatteras National Seashore). Clearly, doing nothing is the worst option.

One alternative solution to nourishment is to implement a buyout plan for highly exposed properties. Buyouts are rarely a first choice within coastal communities for a variety of reasons, both practical and emotional. Property owners must be interested in selling, and it can be difficult to negotiate a price. Unlike nourishment, buyouts provide a longer-term solution to erosion, allow for a continuous beach over many years, and eliminate the environmental and public safety hazards associated with collapsing homes. In some areas, the U.S. Army Corps of Engineers has carried out buyouts in conjunction with beach nourishment to allow for the construction of protective dunes.

To compare the costs of a possible buyout to the costs of beach nourishment in Rodanthe, we conducted a simple analysis to identify and estimate the value of highly exposed oceanfront properties. The criteria we used identified 80 oceanfront parcels with a structure within 300 feet of the high-tide shoreline, over an alongshore area that is roughly the same footprint as the potential nourishment project. Assessed tax value was used to represent the current value for these properties. Detailed methods for property selection and fiscal analysis are described in the following sections of this document.

Results from this analysis estimate that it will cost nearly \$43 million to buyout all selected properties (at currently assessed value), and by removing these properties Rodanthe will likely have a viable beach for 15-25 years. Only one of the properties appears to be a primary residence. A number of parcels have lots that are deep enough to move the structure back (outside our buffer), at lower cost than buying the property and removing it.

The loss of tax revenue is a common concern expressed about buyouts. The 80 selected properties generated \$171,068 of county property tax revenue in fiscal year 2023, which is only 0.25% of the Dare



County tax base. The total lost revenue over 30 years could be \$7 - \$10 million based on the very conservative scenarios outlined in the table below. For example, we assume all 80 properties will still be around in 30 years. This is unlikely. Some of this loss will likely be offset by the additional tax revenue resulting from the increase in value of the remaining properties (e.g., certain second-row homes become oceanfront).

In this simple analysis the beach nourishment costs are significantly higher (roughly 3 times higher) over the next 15 years than buying the properties at current tax value. Of course, predicting the costs for shoreline protection and/or property acquisition over the next couple of decades is not an exact science. The ultimate costs depend on factors such as sea-level rise, storms, and market forces for high-risk properties. An advantage of buyouts is that the process could be piecemealed. A buyout plan could happen gradually, targeting the highest exposure properties and willing sellers first (likely the most practical approach). The initial costs would be significantly smaller than beach nourishment which will require substantial expenditure up front. In addition, buyouts could be initiated immediately, whereas beach nourishment will require substantial planning and permitting.

A more gradual buyout process may cost less than the estimated \$43 million, as the market value of properties will likely decrease as erosion begins to threaten homes. While this study does not prioritize the order of acquisition, further analysis could certainly provide the data to do so.

The primary advantage of beach nourishment is that it may preserve the existing oceanfront properties for the next decade or so, along with their tax revenues. In addition, Dare County has experience implementing beach nourishment projects in a professional way. A disadvantage is that there will be multiple episodes of nourishment required over this interval, separated by periods of time when the beach is narrow, and homes are once again highly exposed. Buyouts would allow for a continuous, wide beach for a longer period of time.

We understand that there are obstacles to both buyouts and beach nourishment. This study is not intended to recommend either approach, but provides additional data that could inform the discussion of possible solutions. Looking at this narrowly, from a cost perspective, it is clear that buyouts are not a crazy idea. A main reason that we conduct an analysis like this is because no one else does. We feel very strongly that, whatever is ultimately decided, projects funded with public funds must examine the costs/benefits of managed retreat through buyouts as one viable option. This is abundantly clear: the status quo (taking no action) is the least favorable and most environmentally damaging option.

## Methods & Results

### Exposure Analysis: Identifying High-Exposure Properties

The following steps were used to select properties with a high exposure to shoreline change in Rodanthe (analysis completed in ESRI ArcMap 10.8). Tax parcel data (in geospatial format) were obtained from staff at Dare County, North Carolina.

1. A wet/dry shoreline was digitized using 2021 aerial imagery in ArcGIS (ESRI streaming layer).
2. A 300-foot buffer was created landward from the wet/dry shoreline.
3. Parcels with a primary use listed as residential and with a building value > \$0 were selected using the *select by attribute* tool. This subset of parcels was used as a baseline in step 4.
4. Parcels determined to be front row and containing a house or pool within the 300-foot buffer were selected manually and exported as a new file.



The final high exposure properties in this analysis represent improved front row parcels with a house or pool within 300 feet of the shoreline. Results show that 80 properties in Rodanthe meet these specifications (see the map and table at end of document); these properties have a total assessed tax value of \$42,713,600. Only one of these properties is likely a primary residence.

**Fiscal Assessment: Calculating Property Tax Revenue**

The primary fiscal and economic issues of concern resulting from migrating shorelines (beach erosion) vary by stakeholder group. Owners of coastal property vulnerable to storms, flooding, and erosion, for example, are typically focused on extending the functional life and protecting the value of their property. Coastal communities and counties, on the other hand, are primarily concerned with a potential loss of the local tax base and associated reduction in ad valorem property tax revenue, the expenditure of public funds to protect vulnerable private property, and the return on an investment of public funds to protect private property.

In this assessment, we evaluated the potential long-term fiscal impacts of shoreline migration in Rodanthe by calculating the estimated present value of county ad valorem property tax revenue generated by a selection of properties over the next 30 years. To account for economic uncertainty, we use three reasonable combinations of price appreciation and discount/inflation rates to estimate the present value of county ad valorem property tax revenue generated over 30 years. The following data sources were used in the economic analysis:

- [Dare County FY 2023 Assessed Property Value \(Tax Base\): \\$17,085,000,000](#)
- FY 2023 Dare County Tax Rate (in cents for \$100 value): 40.05
- Dare County estimated FY 2023 property tax revenue: \$68,425,425

Results of this fiscal analysis show that the 80 selected high exposure parcels have a total assessed value of \$42,713,600. These properties generated \$171,068 of county property tax revenue in fiscal year 2023, which is 0.25% of the Dare County tax base. Over the next 30 years, these properties may generate \$7-10 million in county property tax revenue (see table below).

**Potential property tax revenue generated by the selected properties over 30 years.**

Scenario	Discount rate	Annual property appreciation	Total county tax revenue
1	0.75%	5.00%	\$10,364,503
2	2.00%	5.00%	\$8,293,588
3	4.75%	7.00%	\$7,251,934

***For additional information and questions, please contact:***

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### Selected Parcels in Rodanthe



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



**Selected Parcels in Rodanthe**

<b>#</b>	<b>Pin #</b>	<b>Total Assessed Value</b>	<b>Year Built</b>
1	65805174969	\$807,800	2009
2	65805175592	\$576,200	2007
3	65805175599	\$407,100	1986
4	65805175693	\$660,600	2007
5	65805175707	\$410,500	1984
6	65805175807	\$481,200	2000
7	65805180629	\$1,075,100	2007
8	65805183180	\$323,400	1976
9	65805183596	\$343,200	1988
10	65805185334	\$258,300	1978
11	65805192092	\$866,000	2007
12	65805192182	\$609,500	2004
13	65809156719	\$328,200	1980
14	65809157023	\$938,900	2001
15	65809157371	\$477,300	2004
16	65809158416	\$384,200	2002
17	65809158610	\$83,700	1986
18	65809158617	\$241,100	1985
19	65809158828	\$294,500	1992
20	65809158925	\$256,800	1985
21	65809166241	\$429,300	1989
22	65809166794	\$1,474,200	2016
23	65809166970	\$1,427,300	2016
24	65809167312	\$304,400	1965
25	65809167329	\$575,800	2007
26	65809168022	\$404,800	1989
27	65809168130	\$185,400	1970
28	65809175080	\$1,278,400	2008



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May 2023

29	65809175185	\$643,400	2005
30	65809175293	\$629,700	2004
31	65809175376	\$355,600	1978
32	65809175481	\$651,600	2007
33	65809175487	\$654,700	2007
34	65813147555	\$736,900	1991
35	65813147643	\$711,100	1999
36	65813147761	\$754,200	1996
37	65813147870	\$579,000	1994
38	65813147878	\$545,000	1990
39	65813147976	\$526,900	1993
40	65913026896	\$328,800	1974
41	65913027584	\$626,400	1975
42	65913027664	\$356,400	1973
43	65913027938	\$587,400	1999
44	65913036493	\$744,200	2004
45	65913036588	\$456,600	1999
46	65913036591	\$377,300	1991
47	65913036675	\$884,400	2004
48	65913036773	\$443,100	2002
49	65913036860	\$306,700	1990
50	65913037046	\$578,400	1999
51	65913037133	\$636,500	2002
52	65913037218	\$431,700	1994
53	65913037221	\$545,700	1990
54	65913037306	\$423,900	1994
55	65913042163	\$367,100	2002
56	65913042446	\$321,300	1989
57	65913045245	\$318,000	1987
58	65917008292	\$921,300	2003





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59	65917008393	\$903,600	2003
60	65917016829	\$806,500	1988
61	65917018843	\$658,100	1989
62	65917019624	\$332,300	1984
63	65917026369	\$642,200	1987
64	65917027076	\$914,100	1988
65	65917027137	\$765,500	2002
66	65917027233	\$636,200	2005
67	65917027487	\$657,200	1995
68	65917028305	\$666,700	1987
69	65917101765	\$326,800	1983
70	65917101930	\$450,200	1991
71	65917110061	\$299,000	1975
72	65917110459	\$173,400	1976
73	65917110976	\$225,300	1985
74	65917111101	\$385,000	1986
75	65917111387	\$191,800	1981
76	65917111392	\$242,800	1986
77	65917111482	\$280,600	1992
78	65917112117	\$270,100	1998
79	65917112202	\$316,600	1998
80	65917120071	\$223,100	1980

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