US Army Corps
of Engineers ®
Wilmington District

General Re-evaluation Report and Environmental Assessment Surf City, Onslow and Pender Counties, North Carolina Coastal Storm Risk Management Project

Appendix G: Level 1 Economic Update

Final

April 2025

Table of Contents

List of Figures

List of Tables

1.0 BACKGROUND INFORMATION

The purpose of this Economic Update for the Surf City, North Carolina, Coastal Storm Risk Management (CSRM) Project is to provide an economic evaluation of the Recommended Plan based on current information.

1.1 Scope of Economic Update

According to EC 11-2-200, updated Benefit to Cost Ratios (BCRs) are required in support of funding requests for all Federal projects in the Preconstruction Engineering and Design (Investigations Account) or Construction phases. For new start construction projects, the fiscal year date of approval of the latest economic analysis must not precede the fiscal year of the Major Support Command (MSC) program submission by more than 3 years. In this case, the most recent economic analysis was completed in the 2010 Final Feasibility Report and Environmental Impact Statement. Therefore, a BCR update is required. Also, as documented in the Draft Validation Report and in this report, the scope of the study and project (and therefore the benefits) have changed.

1.2 Project Area

The project is located on Topsail Island in Pender County, North Carolina. Topsail Island is a 22-mile-long and 0.5-mile-wide barrier island approximately 40 miles northeast of the city of Wilmington, North Carolina (**Figure 1**). The island coastline faces the Atlantic Ocean to the southeast. Other waterbodies in the vicinity of the project include the New River and New River Inlet immediately to the northeast, Banks Channel and the Atlantic Intracoastal Waterway (AIWW) to the northwest, and New Topsail Inlet at the far southwestern end of the island.

Over the past 40 years, the study area has developed rapidly as a family ocean resort community with outdoor recreation. On summer weekends the population can be in the tens of thousands. The town's population falls to about 2,200 residents during the remaining months of the year. During the summer months, a large portion of the homes within the study area are available as summer rentals to vacationers primarily from inland North Carolina and other locations around the Eastern United States.

The study area is uniformly developed with a range of structures consisting of single-family dwellings, multi-unit apartments and condominiums, commercial buildings, and hotels. Most of the developable land in the town is already developed. Roadway access to the mainland is provided through North Carolina (N.C.) Highway 50 to Surf City and then by bridges on N.C. Highway 50/210 at Surf City and N.C. Highway 210 at North Topsail Beach. Public access to the beach is provided by numerous parking areas and dune walkovers.

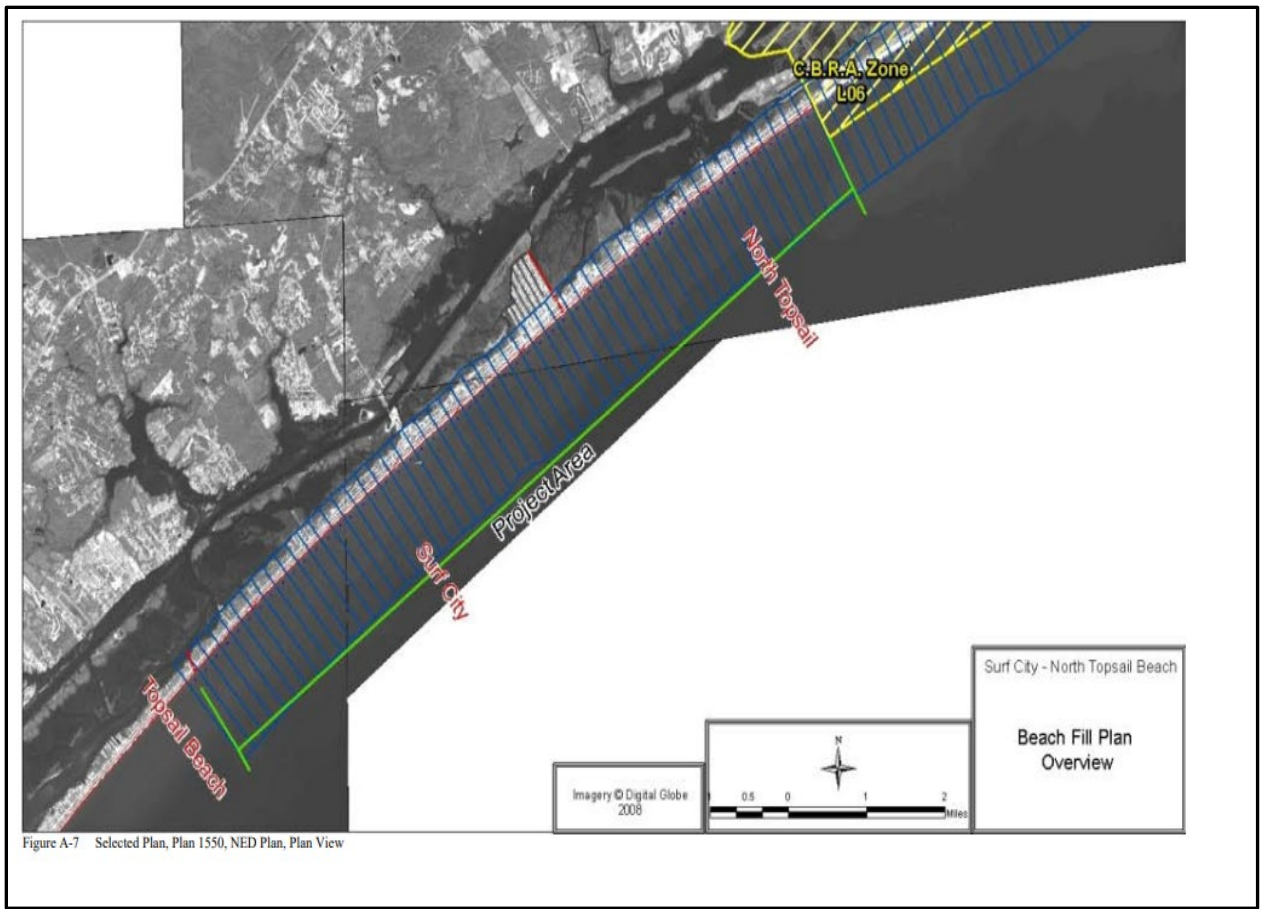

Figure 1:Surf City and North Topsail Beach, Project Location Map.

The revised study limits contain approximately 6 miles of shoreline extending from the Topsail Beach/Surf City town limits to the northern town limit of Surf City. From the shoreline, the study area extends landward approximately 500 feet (ft.). Seaward, the study area extends from the shoreline approximately 1 mile. The revised project limits also include offshore borrow areas lying 1 to 6 miles from the shoreline.

1.3 Project Authority

A feasibility study for North Topsail Beach and Surf City Beach was completed in 2010, and a Chief's Report for the feasibility study was signed on December 30, 2010. The report recommended authorization for a plan to reduce coastal storm damages by construction of a berm and dune along the Surf City and North Topsail Beach shorelines. The Recommended Plan included a 52,150-foot-long dune and berm system to be constructed to an elevation of 15 feet National Geodetic Vertical Datum 1929 (NGVD 1929) fronted by a seven-foot (50-foot wide) beach berm with a main fill length of 52,150 feet, extending from the boundary between Topsail Beach and Surf City to the southern edge of the Coastal Barrier Resources Act (CBRA) Zone in North Topsail Beach. The Recommended Plan also included renourishment at six-year intervals. Other associated features of the project were dune vegetation and construction of 60 dune walkover structures. Material for the dune and berm

construction and renourishment were to be dredged from borrow sites identified between off the coast of Topsail Island. The Recommended Plan also included post-construction monitoring over a 50-year period to ensure adequate project performance and adjust renourishment plans as needed. Since the Recommended Plan had no significant impact to the environment, no mitigation measures (beyond management practices and avoidance) or compensation measures were required. The Recommended Plan was the National Economic Development (NED) Plan for coastal storm damage reduction. Construction of the SCNTB-CSRM project was authorized by Section 7002(3)2 of the Water Resources Reform and Development Act of 2014.

The Recommended Plan for the Surf City, NC project was authorized by WRDA 2014. The initial construction costs were estimated to be $130,420,000, separated into $84,777,000 in federal funding and $45,650,000 coming from the non-federal sponsor. The renourishment costs were estimated to be $244,440,000, with $122,220,000 coming from federal and the non-Federal Sponsor.

Project construction was funded by Public Law 116-20, the Additional Supplemental Appropriations Disaster Relief Act, 2019 (DRA 19). DRA 19 provided $237,000,000 for initial construction which is the current working estimate for the project. Per ASA(CW) Policy Guidance on Implementation of Additional Supplemental Appropriations for Disaster Relief Act, 2019 memo dated 24 April 2020, para 4(m) the provisions of section 902 of WRDA 1986 do not apply to Public Law 116-20 funding.

1.4 Construction Activity Expenditures to Date

Initial construction has not yet occurred, so there are no construction expenditures to date.

2.0 VERIFICATION OF EXISTING CONDITIONS AND KEY ASSUMPTIONS

The purpose of this section is to evaluate the current conditions and previous assumptions made in the 2010 Feasibility Study to determine if the previously estimated benefits are still valid.

2.1 Scope of Project

The rescoped project for Surf City shortens the Authorized Plan length from 9.9 miles to approximately 6 miles (the portion of the project within Surf City town limits) but maintains the project design template and re-nourishment intervals of the authorized plan. North Topsail Beach will be removed from the project. The recommended plan will contain a transition of 1,000 ft. at the northern town limits of Surf City going into North Topsail Beach. Real Estate for the transition will need to be acquired. The transition at the southern end between the towns of Topsail Beach and Surf City will remain as defined in the authorized plan.

Although the project will be shortened to six miles, the project design template and re-nourishment intervals of the Authorized Plan will be maintained for Surf City. The

recommended plan reduces the quantity of material required for both the initial construction and re-nourishment intervals due to the reduction in its overall length. The reduction in project length will result in fewer walkover structure re-designs, dune plantings, and beach tilling areas being required as the North Topsail section will no longer require these features. All the slopes and widths will remain the same as the authorized project.

The Authorized Plan called for adherence to environmental windows for the initial construction resulting in four separate dredging events over a four-year period. However, the Recommend Plan removes these windows and completes the initial construction during a single dredging event lasting 13-months. This alteration results in a slight change to the interest during construction accrued during the project.

2.2 Economic Benefit Assumptions

2.2.1 Inventory of Structures

The primary National Economic Development (NED) benefits come in the form of storm damage reduction benefits, which were estimated and documented in the 2010 feasibility report. The 2010 analysis included 1,817 individual properties subject to damage with a total value of more than $146 million (including content values).

Confirming the validity of the structural inventory for Surf City, NC involved a comprehensive methodology that relied on an examination of available data, satellite imagery, and an in-person site visit conducted on April 16th and 17th, 2024. The first step in this process was to assess the changes in property inventory since 2010, which was accomplished using aerial imagery from Google Earth and ARC GIS. Google Earth photos were used to compare October 2010 aerials to March 2024. The aerial images confirmed that significant new development has not taken place on the first row of structures abutting the beach.

The original analysis identified 450 vacant lots that could potentially be developed by the time construction on the project began. The analysis assumed that these vacant lots would be developed and included them in the structure inventory used to calculate project benefits. This assumption was confirmed to be accurate by comparing satellite imagery from 2010 and 2024 and engaging in an in-person site visit. Observations by PDT members during the site visit confirmed the presence of structures across the study area that have been developed since the original 2010 analysis. These new structures have all been erected interior to the first row of structures across from the road closest to the beach (S Shore Drive) and further away on the north side of S Topsail Drive. The original analysis assumed that these structures would be developed, so the presence of new construction within the project is assumed to have been considered and included in the benefit calculations.

2.2.2 Recreation

The 2010 feasibility report also included a detailed study of recreation demand and potential recreation benefits. The average annual equivalent recreation benefits for the NED plan were computed to be $12.7 million for Surf City and $7.9 million for North Topsail Beach for a total of $20.5 million.

2.2.3 GRANDUC Benefits

Between 2010 and 2024 the US Army Corps underwent a change from GRANDUC to Beach-fx. The underlying logic and assumptions used in the two models were found to be either fully consistent or at least similar. These included factors such as first-floor elevations, depreciated replacement values, damage functions, and contents values. Technical documentation for the GRANDUC model can be found in the economic appendix of the 2010 feasibility report. By evaluating and confirming these key elements, it was possible to confirm the validity of the previous benefit estimations without the need to recalculate them.

2.2.4 Removing North Topsail Benefits

While this report assumes that the benefits estimated in the 2010 study are still valid, adjustments were made to remove the North Topsail benefits and update the costs to reflect the most up-to-date information. By demonstrating that the property inventory has not significantly changed and that the fundamental logic and assumptions remained applicable, the Corps may rely on the previously estimated benefits, while ensuring necessary updates are made to reflect changes in projected costs. The total estimated average annual damage reduction benefits were $16,820,000 in 2010 dollars, with Surf City accumulating $10,747,000, and Top Sail $6,073,000.

2.3 Engineering: Hydraulics and Hydrology

City erosion rates have remained consistent with historic FWOP erosion rates, but there has been a slight change (on the order of inches) in the sea-level change (SLC) projections over 50 years. The current project remains viable but the contingency for volumes related to SLC reflect these changes.

The project design template and re-nourishment intervals of the Authorized Plan will be maintained for recommended plan, which reduces the quantity of material required for both the initial construction and re-nourishment intervals due its reduced length. The recommended plan does not change any design template cross-section dimensions. All the slopes and widths will remain the same as the Authorized Plan.

3.0 BENEFIT-COST RATIO UPDATE

3.1 Previously Approved Benefits

Storm-damage reduction benefits and incidental recreation benefits from the 2010 feasibility report are presented in **Table 1** at the discount rate of 4.125% based on FY2010 price levels.

Table 1. Summary of Average Annual Benefits.

	Surf City	North Topsail Beach	Total
AAEQ Damage Reduction Benefits	**$10,746,890**	$6,072,942	$16,819,832
AAEQ Recreation Benefits	**$12,700,000**	$7,850,000	$20,550,000
AAEQ Benefits During Construction	**$1,759,423**	$1,044,256	$2,803,680
AAEQ Total Benefits	**$25,206,314**	$14,967,198	$40,173,511

3.2 Changes in Benefits due to changes in project scope

The 2010 Economics Appendix calculated benefits based on model reach, as outlined in **Figure 2**. The current construction plan includes a single uninterrupted initial nourishment period, so any benefits during construction calculated for the original study will no longer apply to the project.

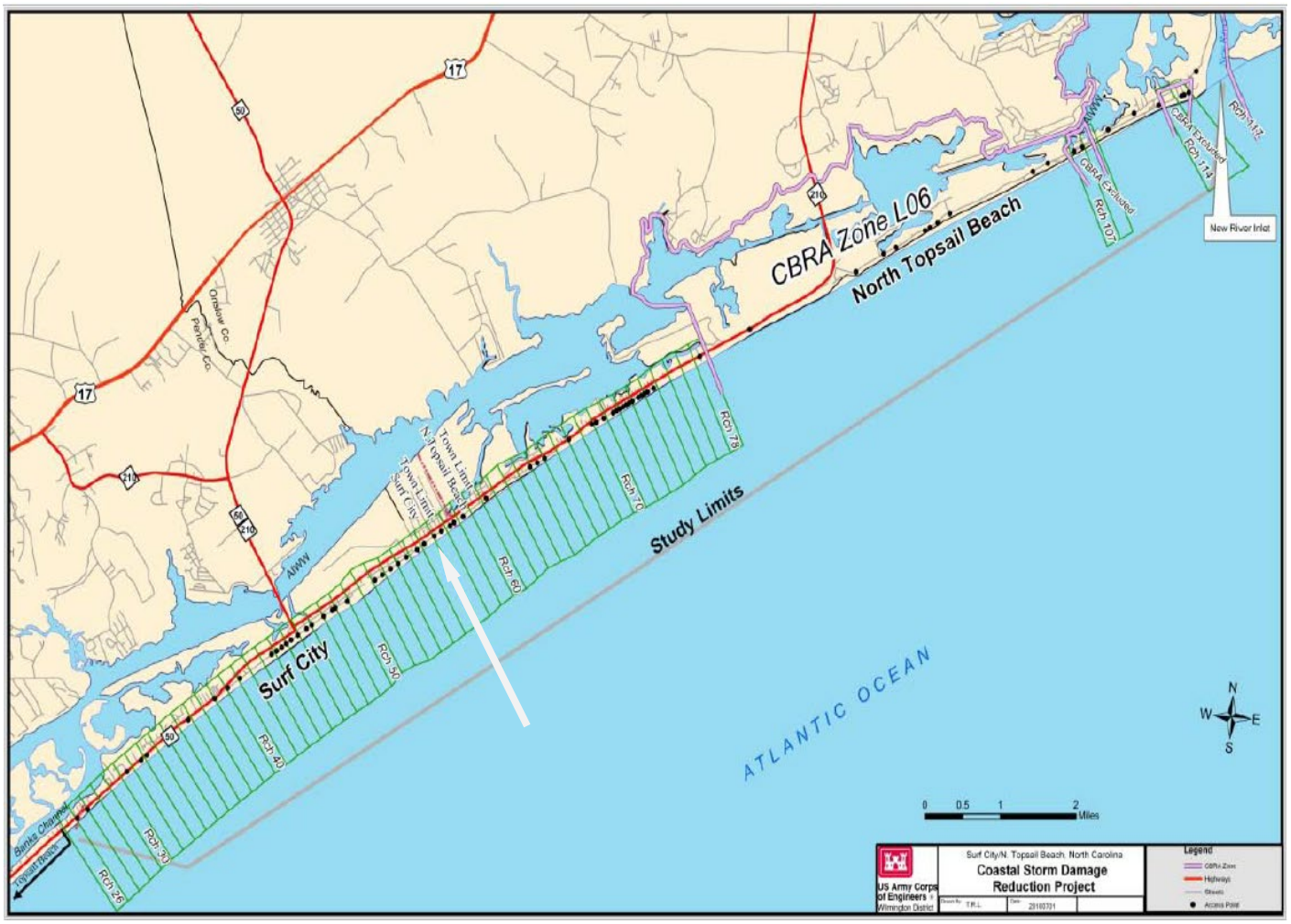

Figure 2. SCNTB Feasibility Study Economic Model Reach.

The break point between Surf City and North Topsail Beach is Reach 58 (see **Figure 2**). The **Appendix G** reports damage reduction benefits by model reach, as outlined in **Table 2**.

Table 2. Damage by Model Reach. (FY10 Price Levels)

Reach	Damages					
	Present Value					Annual Total
	Erosion	Flood	Wave	Land	Total Damage	
27	$5,952,000	$2,000	0	$220,000	$6,174,000	$294,000
28	$282,000	0	0	$110,000	$392,000	$19,000
29	$6,688,000	$2,000	0	$134,000	$6,823,000	$324,000
30	$4,531,000	$6,000	0	$223,000	$4,760,000	$226,000
31	$2,627,000	$1,000	0	$410,000	$3,038,000	$144,000
32	$1,827,000	$28,000	0	$671,000	$2,526,000	$120,000
33	$3,539,000	$25,000	0	$315,000	$3,880,000	$184,000
34	$1,473,000	$32,000	0	$118,000	$1,624,000	$77,000
35	$4,431,000	$58,000	0	$118,000	$4,607,000	$219,000
36	$2,784,000	$28,000	$1,000	$118,000	$2,931,000	$139,000
37	$5,341,000	$22,000	0	$126,000	$5,489,000	$261,000
38	$8,291,000	$27,000	$83,000	$137,000	$8,539,000	$406,000
39	$7,195,000	$74,000	$32,000	$402,000	$7,703,000	$366,000
40	$9,579,000	$64,000	$196,000	$581,000	$10,419,000	$495,000
41	$8,679,000	$18,000	$10,000	$402,000	$9,109,000	$433,000
42	$6,479,000	$7,000	$4,000	$406,000	$6,896,000	$328,000
43	$11,281,000	$16,000	$39,000	$477,000	$11,814,000	$562,000
44	$10,592,000	$112,000	$225,000	$1,181,000	$12,110,000	$576,000
45	$9,217,000	$171,000	$1,000	$1,065,000	$10,454,000	$497,000
46	$6,893,000	$154,000	$5,000	$1,071,000	$8,124,000	$386,000
47	$12,860,000	$179,000	$129,000	$1,411,000	$14,578,000	$693,000
48	$14,691,000	$170,000	$78,000	$1,785,000	$16,724,000	$795,000
49	$17,408,000	$51,000	$18,000	$1,995,000	$19,472,000	$926,000
50	$11,500,000	$41,000	0	$1,142,000	$12,683,000	$603,000
51	$2,563,000	$144,000	$260,000	$848,000	$3,815,000	$181,000
52	$13,934,000	$73,000	$1,632,000	$1,007,000	$16,646,000	$792,000
53	$12,409,000	$38,000	$1,250,000	$1,461,000	$15,157,000	$721,000
54	$7,088,000	$11,000	$858,000	$1,421,000	$9,377,000	$446,000
55	$3,554,000	$65,000	$170,000	$913,000	$4,702,000	$224,000
56	$669,000	$50,000	$216,000	$626,000	$1,561,000	$74,000
57	$4,216,000	$46,000	$266,000	$1,556,000	$6,083,000	$289,000

58-SC	$4,230,800	$37,800	$197,400	$1,225,000	$5,691,700	$270,900
58-TS	$1,813,200	$16,200	$84,600	$525,000	$2,439,300	$116,100
59	$5,261,000	$41,000	$542,000	$1,511,000	$7,355,000	$350,000
60	$7,129,000	$28,000	$723,000	$1,327,000	$9,207,000	$438,000
61	$3,374,000	$70,000	$710,000	$673,000	$4,827,000	$230,000
62	$7,823,000	$13,000	$34,000	$1,254,000	$9,123,000	$434,000
63	$6,000,000	$72,000	$131,000	$939,000	$7,141,000	$340,000
64	$5,880,000	$108,000	$1,115,000	$1,425,000	$8,528,000	$406,000
65	$5,728,000	$97,000	$596,000	$1,080,000	$7,501,000	$357,000
66	$5,092,000	$46,000	$241,000	$884,000	$6,262,000	$298,000
67	$7,372,000	$9,000	$218,000	$1,482,000	$9,082,000	$432,000
68	$4,133,000	$138,000	$685,000	$854,000	$5,811,000	$276,000
69	$4,181,000	$343,000	$544,000	$645,000	$5,714,000	$272,000
70	$3,384,000	$136,000	$893,000	$565,000	$4,978,000	$237,000
71	$3,826,000	$15,000	$816,000	$914,000	$5,570,000	$265,000
72	$11,061,000	$1,000	$769,000	$1,640,000	$13,470,000	$641,000
73	$10,119,000	$1,000	$757,000	$1,522,000	$12,398,000	$590,000
74	$8,862,000	$4,000	$705,000	$1,141,000	$10,712,000	$509,000
75	$3,145,000	$76,000	$307,000	$987,000	$4,514,000	$215,000
76	$2,626,000	$36,000	$144,000	$962,000	$3,767,000	$179,000
77	$3,418,000	$119,000	$223,000	$922,000	$4,682,000	$223,000
78	$3,031,000	$38,000	$267,000	$531,000	$3,867,000	$184,000
Subtotal	$336,062,000	$3,160,000	$16,175,000	$45,458,000	$400,850,000	$19,061,000

Surf City generates about **63.3%** of total project benefits and North Topsail Beach generates approximately **36.7%** of total benefits. The split that occurs in reach 58 between Surf City and North Topsail is noted within **Table 3** for reference. The benefits from North Topsail (reaches 58-NT to 78) were excluded from the new analysis. According to page 40 of the Economics Appendix, Surf City generates $12.7 million in average annual recreation benefits, while North Topsail generates $7.6 million. Based on these data, an incremental breakdown of project benefits is provided below.

Table 3. Benefits by Study Reach. (FY10 Price Levels)

Reach	Benefits By Damage Type				Total Damage	Annual Total
	Erosion	Flood	Wave	Land		
27	$5,674,000	($22,000)	$0	$220,000	$5,872,000	$279,219.42
28	$245,000	$0	$0	$110,000	$354,000	$16,833.05
29	$6,154,000	$0	$0	$134,000	$6,287,000	$298,953.08
30	$2,985,000	($1,000)	$0	$223,000	$3,208,000	$152,543.58
31	$895,000	($1,000)	$0	$410,000	$1,304,000	$62,006.49

32	$1,287,000	($6,000)	$0	$671,000	$1,952,000	$92,819.53
33	$2,541,000	($2,000)	$0	$315,000	$2,855,000	$135,758.08
34	$510,000	($4,000)	$0	$118,000	$626,000	$29,766.92
35	$4,052,000	($19,000)	$0	$118,000	$4,151,000	$197,384.16
36	$2,473,000	($9,000)	$1,000	$118,000	$2,583,000	$122,824.21
37	$4,840,000	($3,000)	$0	$126,000	$4,962,000	$235,948.02
38	$7,671,000	($23,000)	$69,000	$137,000	$7,854,000	$373,465.48
39	$6,637,000	($30,000)	$23,000	$402,000	$7,033,000	$334,426.12
40	$9,125,000	($44,000)	$142,000	$581,000	$9,803,000	$466,142.36
41	$7,732,000	($8,000)	$5,000	$402,000	$8,130,000	$386,589.56
42	$5,150,000	($4,000)	$0	$406,000	$5,551,000	$263,955.55
43	$9,953,000	($8,000)	$21,000	$477,000	$10,444,000	$496,622.55
44	$9,636,000	($83,000)	$219,000	$1,181,000	$10,952,000	$520,778.45
45	$8,977,000	($12,000)	$1,000	$1,065,000	$10,031,000	$476,983.99
46	$6,727,000	($50,000)	$5,000	$1,071,000	$7,754,000	$368,710.38
47	$12,159,000	($56,000)	$125,000	$1,411,000	$13,639,000	$648,547.96
48	$13,717,000	($44,000)	$63,000	$1,785,000	$15,522,000	$738,086.48
49	$16,562,000	($61,000)	$16,000	$1,995,000	$18,512,000	$880,263.94
50	$11,305,000	($23,000)	$0	$1,142,000	$12,424,000	$590,773.51
51	$2,197,000	($67,000)	$176,000	$848,000	$3,153,000	$149,928.27
52	$11,826,000	($49,000)	$808,000	$1,007,000	$13,592,000	$646,313.07
53	$11,598,000	($84,000)	$314,000	$1,461,000	$13,288,000	$631,857.57
54	$6,598,000	($84,000)	$281,000	$1,421,000	$8,216,000	$390,678.94
55	$3,236,000	($61,000)	$143,000	$913,000	$4,232,000	$201,235.79
56	$494,000	($27,000)	$173,000	$626,000	$1,267,000	$60,247.11
57	$3,611,000	($31,000)	$191,000	$1,556,000	$5,325,000	$253,209.03
58-SC	$3,828,300	($61,600)	$139,300	$1,225,000	$5,131,700	$244,017.42
58-TS	$1,640,700	($26,400)	$59,700	$525,000	$2,199,300	$104,578.89
59	$4,829,000	($65,000)	$335,000	$1,511,000	$6,610,000	$314,312.05
60	$6,343,000	($20,000)	$401,000	$1,327,000	$8,052,000	$382,880.58
61	$3,009,000	($5,000)	$485,000	$673,000	$4,162,000	$197,907.22
62	$6,716,000	($17,000)	$29,000	$1,254,000	$7,982,000	$379,552.01
63	$5,675,000	($54,000)	$98,000	$939,000	$6,657,000	$316,546.95
64	$5,416,000	($82,000)	$777,000	$1,425,000	$7,536,000	$358,344.27
65	$5,238,000	($93,000)	$261,000	$1,080,000	$6,486,000	$308,415.73
66	$4,520,000	($9,000)	$76,000	$884,000	$5,470,000	$260,103.92
67	$5,629,000	($10,000)	$114,000	$1,482,000	$7,215,000	$343,080.40
68	$3,737,000	($97,000)	$426,000	$854,000	$4,922,000	$234,045.98
69	$3,593,000	($156,000)	$152,000	$645,000	$4,235,000	$201,378.45

70	$2,891,000	($49,000)	$501,000	$565,000	$3,909,000	$185,876.82
71	$3,324,000	($47,000)	$355,000	$914,000	$4,546,000	$216,166.80
72	$10,318,000	($61,000)	$233,000	$1,640,000	$12,129,000	$576,745.97
73	$9,394,000	($50,000)	$335,000	$1,522,000	$11,200,000	$532,571.10
74	$8,323,000	($43,000)	$305,000	$1,141,000	$9,726,000	$462,480.94
75	$2,957,000	($62,000)	$269,000	$987,000	$4,150,000	$197,336.61
76	$2,427,000	($19,000)	$33,000	$962,000	$3,403,000	$161,816.02
77	$3,040,000	($61,000)	$171,000	$922,000	$4,071,000	$193,580.08
78	$2,404,000	($53,000)	$172,000	$531,000	$3,054,000	$145,220.73
	$301,819,000	($2,057,000)	$8,503,000	$45,458,000	$353,722,000	$16,819,831.59

3.3 Current Project Cost Estimates

Total project cost estimates projected for FY2025 were used for the following calculations. **Table 4** displays the cost of periodic nourishments normalized to the FY2010 price levels of the last approved report. These costs were normalized to FY2010 price levels using the Civil Works Construction Cost Index System (CWCCIS) composite factors.

Table 4. Cost Summary (FY25).

Description	Year	Project Year	Base Cost	FY2025 Price Level and 2025 Present Worth
Initial Construction	2026	0	$198,613	$198,613
First Renourishment	2032	6	$45,699	$38,272
Second Renourishment	2038	12	$47,329	$33,196
Third Renourishment	2044	18	$51,146	$30,043
Fourth Renourishment	2050	24	$47,765	$23,497
Fifth Renourishment	2056	30	$56,362	$23,220
Sixth Renourishment	2062	36	$50,262	$17,342
Final Renourishment	2068	42	$63,741	$18,419

Table 5 summarizes the remaining project costs with a present worth for FY25, the year federal funds are reported in.

The total project costs in FY25 dollars are projected to be approximately $527,846,000 split between initial construction and 7 renourishment events. Initial construction is projected to begin in FY26, and the project is expected to be completed after the FY68 renourishment event.

Interest During Construction (IDC) was calculated using a 16-month period for initial construction, the FY25 discount rate of 3%, and an initial construction cost of $184,536,000.

Table 5. Updated Costs (FY25).

Rate:	3%
First Cost	$560,917,000
IDC	$2,719,000
Total Economic Cost	$563,636,000
Annualized	$14,976,000
Annual O&M	$30,000
Total AAEQ Cost	$15,006,000

3.4 Updated Benefit-Cost Ratio (BCR) and RBRCR

At this stage, it is not necessary to calculate a Remaining Benefit Remaining Cost Ratio (RBRCR) because Surf City has not yet entered the initial construction phase, and therefore, the focus remains on evaluating the feasibility of the project rather than assessing the remaining benefits and costs. The primary objective of the analysis at this point is to determine the Benefit Cost Ratio (BCR), which provides an essential measure of the project's potential benefits in relation to its costs. The BCR helps assess the overall viability and economic justification of the project without delving into the specific details of the remaining benefits and costs, which become more relevant in later stages of the project's lifecycle. Given the current phase of the project, the BCR adequately serves as the appropriate ratio for evaluating its feasibility and determining the next steps in the planning process.

Based on the estimated benefits (adjusted for rescoping) and the updated costs, the BCR has been updated (**Table 6**). The costs are scaled to FY2010 levels by applying the CWCIIS adjustment.

Table 6. Updated Costs and Benefits (FY25 to FY10).

Discount Rate:	3%
Annualized Cost (FY25)	$14,976,000
FY25 to FY10 Ratio	0.61
Annualized Cost (FY10)	$9,179,000
Annual O&M	$30,000
Total AAEQ Cost (FY10)	$9,209,000
AAEQ Benefits (FY10)	$23,447,000
AANB (FY10)	$14,238,000
Benefit-Cost Ratio	2.5

To assess the cost-effectiveness of the total project, several BCRs are computed during this economic update. The computation employed the total project cost estimates obtained from the FY25 TPCS (Total Project Cost Summary) tables. To ensure consistency with the benefits outlined in the last approved report, the costs utilized to calculate the average annual cost were normalized to FY2010 price levels

using the CWCCIS (Construction and Water Control Cost Index System) tables. By harmonizing the cost estimates with the benefits from the previous report, a comprehensive and reliable BCR comparison was created, facilitating an accurate evaluation of the project's economic feasibility and efficiency.

Table 7 presents the Benefit to Cost comparison with recreation for the Surf City project, considering different discount rates including the OMB rate of 7%, the FY25 rate of 3%, and the discount rate of 4.125% from the last approved report. At the OMB rate of 7%, the project's Average Annual Net Benefits experience a reduction to $10,421,000. Despite this, the project's benefits remain well above parity, indicating favorable outcomes. The FY25 rate yields greater average annual net benefits of $14,238,000, with a Benefit Cost Ratio (BCR) of 2.5, while the last approved report's discount rate of 4.125% results in average annual net benefits of $13,244,000 and a BCR of 2.3. These findings align with expectations and demonstrate the project's positive economic viability across different discount rates.

Table 7. Total Project Benefit to Cost Ratio With Recreation Benefits.

	OMB	FY2025	Last Approved Report
	Discount Rate	Discount Rate	Discount Rate
Price Level	FY2010	FY2010	FY2010
Discount Rate	7%	3%	4.13%
Year of Discount Rate	OMB	FY2025	FY2010
Average Annual Costs	$13,026,000	$9,209,000	$10,203,000
Average Annual Benefits	$23,447,000	$23,447,000	$23,447,000
Average Annual Net Benefits	$10,421,000	$14,238,000	$13,244,000
Benefit to Cost Ratio (BCR)	1.8	2.5	2.3

Table 8 presents the same information for the various discount rates while excluding potential recreation benefits, solely considering structural damages. The BCRs for the FY25 rate and the last approved report rate remain above unity, indicating favorable outcomes while the BCR for the OMB rate falls just below. At the OMB rate, the project exhibits a BCR of 0.8, while the FY25 rate yields a BCR of 1.2. Similarly, the last approved report rate presents a BCR of 1.1. These results suggest that without considering the potential benefits from recreation, the Surf City project demonstrates cost-effectiveness and justifies continued investment, as it surpasses the threshold of a BCR of 1.0 for the FY25 and achieves unity when using the Last Approved Report discount rates. The BCR for OMB's 7% discount rate is close to unity as well, indicating that the project may be a good investment even without considering the benefits of recreation.

Table 8. Total Project Benefit to Cost Ratio Without Recreation Benefits.

	OMB Discount Rate	FY2025 Discount Rate	Last Approved Report Discount Rate
Price Level	FY2010	FY2010	FY2010
Discount Rate	7%	3%	4.13%
Year of Discount Rate	OMB	FY2025	FY2010
Average Annual Costs	$13,026,000	$9,209,000	$10,203,000
Average Annual Benefits	$10,747,000	$10,747,000	$10,747,000
Average Annual Net Benefits	($2,280,000)	$1,538,000	$543,000
Benefit to Cost Ratio (BCR)	0.8	1.2	1.1

3.5 Section 902 Limit Calculation

The CSRM Project was authorized after 1986 and would normally be subject to Section 902 of WRDA 86. However, Project construction was recently funded by Public Law 116-20, the Additional Supplemental Appropriations Disaster Relief Act, 2019 (DRA 19). DRA 19 provided $237,000,000 for initial construction which is the current working estimate for the project. Per ASA(CW) Policy Guidance on Implementation of Additional Supplemental Appropriations for Disaster Relief Act, 2019 memo dated 24 April 2020, para 4(m) the provisions of section 902 of WRDA 1986 do not apply to Public Law 116-20 funding. Therefore, FY19 Supplemental Construction funds are not included in calculating the total project cost to be compared to the section 902 limit for the project.

Considering the ongoing status of the project for Surf City, NC, where it has not yet entered the initial construction phase and is still in the process of finalizing project costs, it has been determined that a 902 update will be provided in subsequent phases of the project. This update will be conducted to ensure accurate and up-to-date information is available regarding the project's financial aspects. In the event of a new appropriations request, a 902 update can be promptly furnished upon request. By adopting this approach, the project management team aims to maintain transparency and provide stakeholders with the most relevant and reliable information to make informed decisions moving forward.

4.0 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this level 1 economic update provides important information for assessing the feasibility of the project and contributes to the General Reevaluation Report (GRR) for Surf City. The primary objective of this update was to evaluate the project's viability and economic justification, focusing on the Surf City portion while separating the North

Topsail benefits. By analyzing the Surf City portion separately, the update provides a detailed examination of the benefits, costs, and potential impacts.

Several Benefit Cost Ratios (BCRs) were highlighted, showcasing the project's economic potential. The NED plan for Surf City, NC exhibited Annual Average Net Benefits (AANB) of $14,238,000 with a BCR of 2.5. Additionally, considering different discount rates, BCRs for the project remain above unity, indicating favorable outcomes. By utilizing available data, conducting comprehensive assessments, and ensuring consistency in cost estimates and benefits, this update serves as a valuable contribution to the Surf City CSRM GRR.

5.0 REFERENCES

USACE 2010. Final Integrated Feasibility Report and Environmental Impact Statement, Coastal Storm Damage Reduction, Surf City and North Topsail Beach, North Carolina. December 2010.

USACE April 2024 Site Visit Report
Surf.City.Site.Visit.4.15.24.docx