

UPDATES TO BEACH MANAGEMENT PLAN: TOWN OF SOUTHERN SHORES, NC



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PRESENTATION OUTLINE:

1. *Background on Beach Management Plan*
2. *Scope of Addendum to Beach Management Plan*
3. *Revised Beach Management Plan Goals*
4. *Method for Determining Sufficient Useable Beach*
5. *Additional Options*

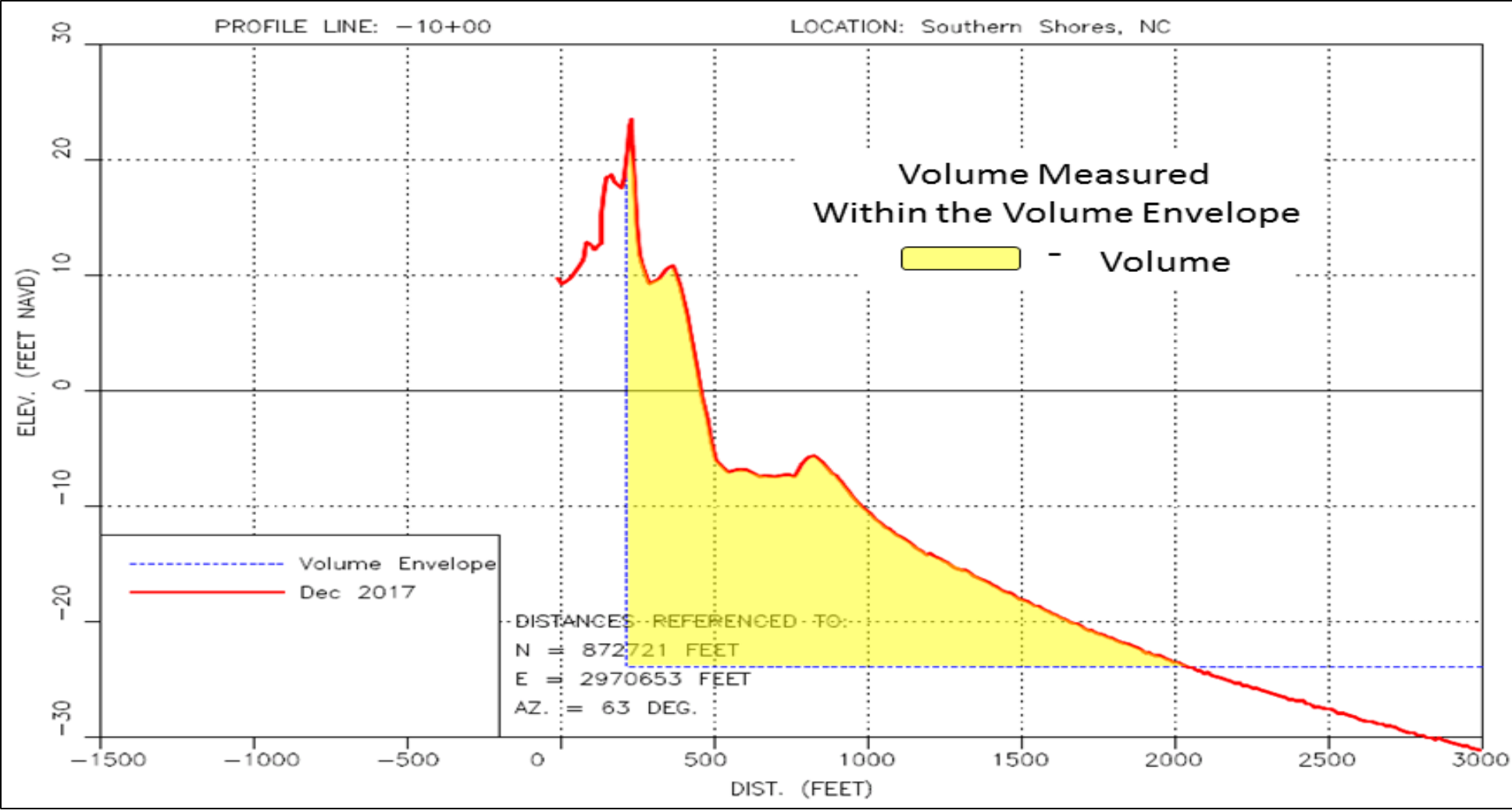


BACKGROUND:

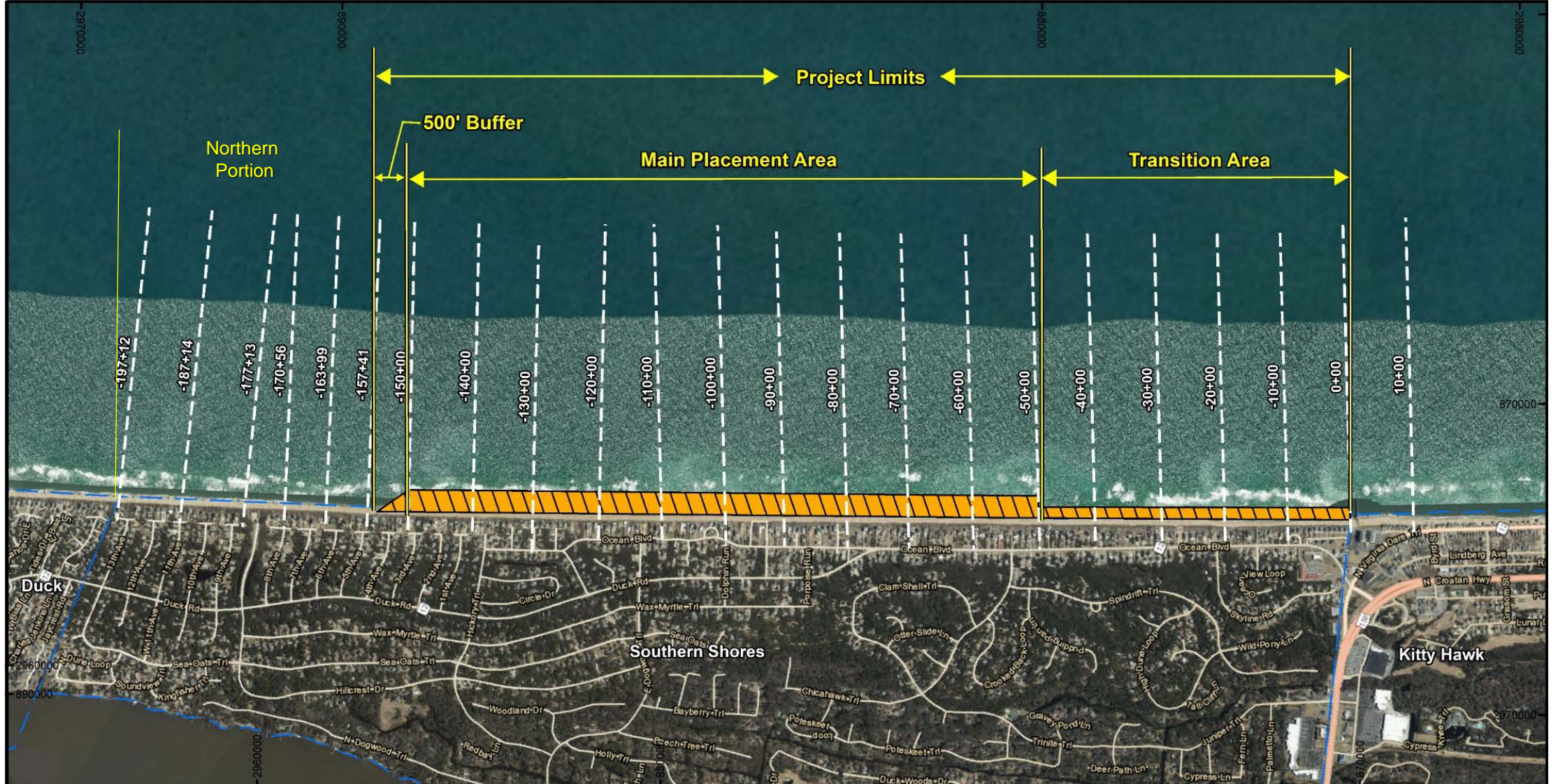
- ▶ Stated Goals of Beach Management Plan:
 - > provides a reasonable level of storm damage reduction to public and private development
 - > mitigates long-term erosion that could threaten public and private development, recreational opportunities, and biological resources
 - > maintains a healthy beach that supports valuable shorebird and sea turtle nesting habitat
- ▶ Original Beach Management Plan recommendations were based on December 2017 survey data (Dec. 2018)
- ▶ Updated beach profile surveys – May 2019
- ▶ Updated the Beach Management Plan using May 2019 data (September 2019).



BEACH MANAGEMENT PLAN: PROJECT EXTENT (BEACH VOLUMES)



BACKGROUND:



BACKGROUND:



VOLUME CHANGE (UPDATE):

- ▶ *Northern Portion - Gained sand between Dec. 2017 and May 2019 (5.5 cy/lf./yr.)*
- ▶ *Main Fill Area – Gained sand between Dec. 2017 and May 2019 (4.6 cy/lf./yr.)*
- ▶ *Transition Area – Lost sand between Dec. 2017 and May 2019 – average of -18.9 cy/lf./yr.)*



PROJECT OPTIONS:

Table 5. Project Option Cost Estimates

Option	Volume (cy)	Permitting / Design Soft Cost	Construction Cost	Pre-Construction/ Construction Admin.	Construction Env. Monitoring Costs	Contingency Cost (10%)	TOTAL COST
1	828,400	\$435,000	\$11,758,000	\$283,500.00	\$275,300.00	\$1,275,000	\$14,026,800
3	1,025,800	\$435,000	\$14,146,000	\$313,500.00	\$332,400.00	\$1,523,000	\$16,749,900



SCOPE OF ADDENDUM:

1. Review and assist the Town with revising the current goals and objectives of their Beach Management Plan, specifically to include the importance of maintaining sufficient useable beach;
2. Develop an additional alternative that provides sand along the entire oceanfront of the Town;
3. Develop an addendum to the Beach Management Plan that includes updated goals, the additional option including cost estimates, and updated recommendations; and
4. Present the updated goals, additional alternative, and additional recommendations at a Public Forum in Southern Shores



REVISED BEACH MANAGEMENT PLAN GOALS:

▶ Initial Goals of Beach Management Plan:

1. Provides a reasonable level of storm damage reduction to public and private development
2. Mitigates long-term erosion that could threaten public and private development, recreational opportunities, and biological resources
3. Maintains a healthy beach that supports valuable shorebird and sea turtle nesting habitat

▶ Revised Goal #3:

3. Maintains a healthy beach that **provides sufficient useable beach** and supports valuable shorebird and sea turtle nesting habitat

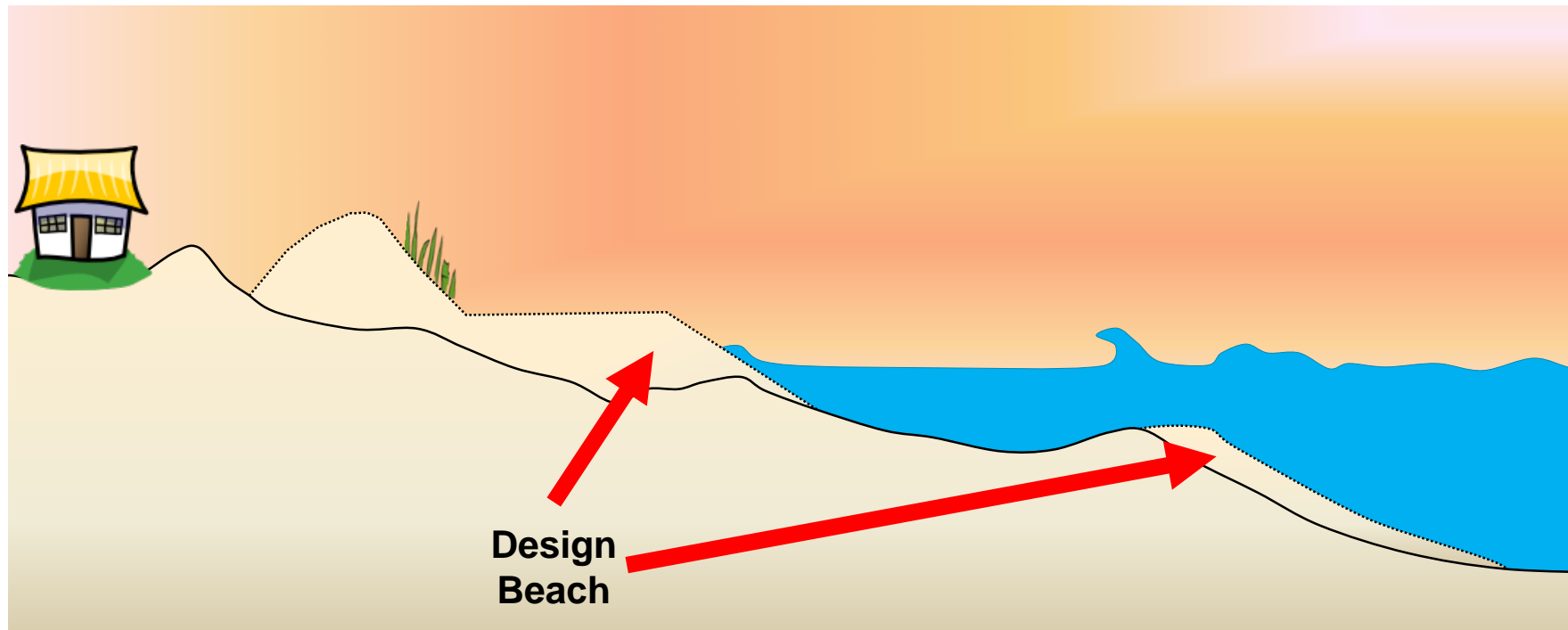


METHOD FOR DETERMINING “SUFFICIENT USEABLE BEACH”:



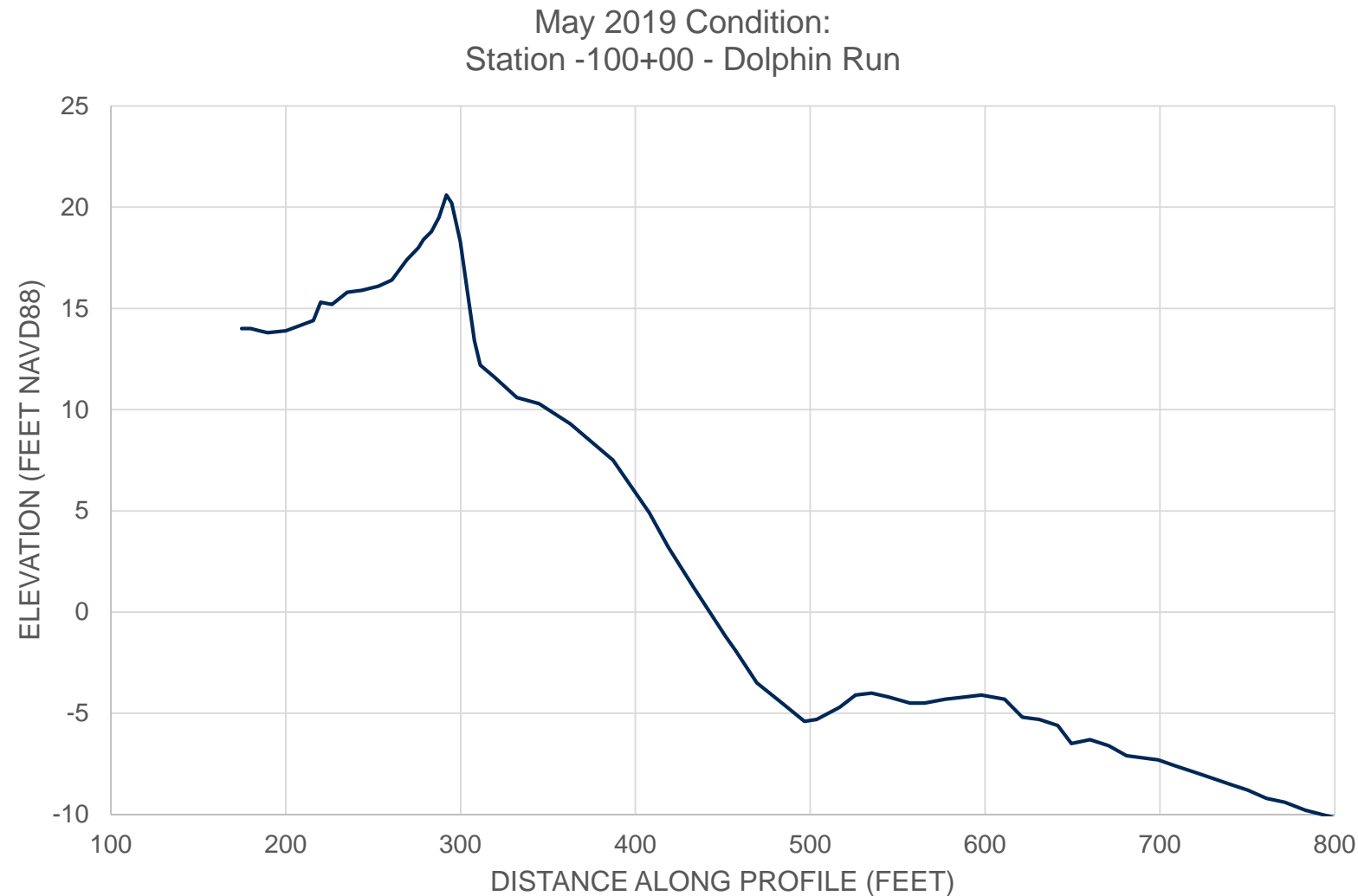
Hillcrest Access: November 20, 2019

STORM DAMAGE REDUCTION PROJECT

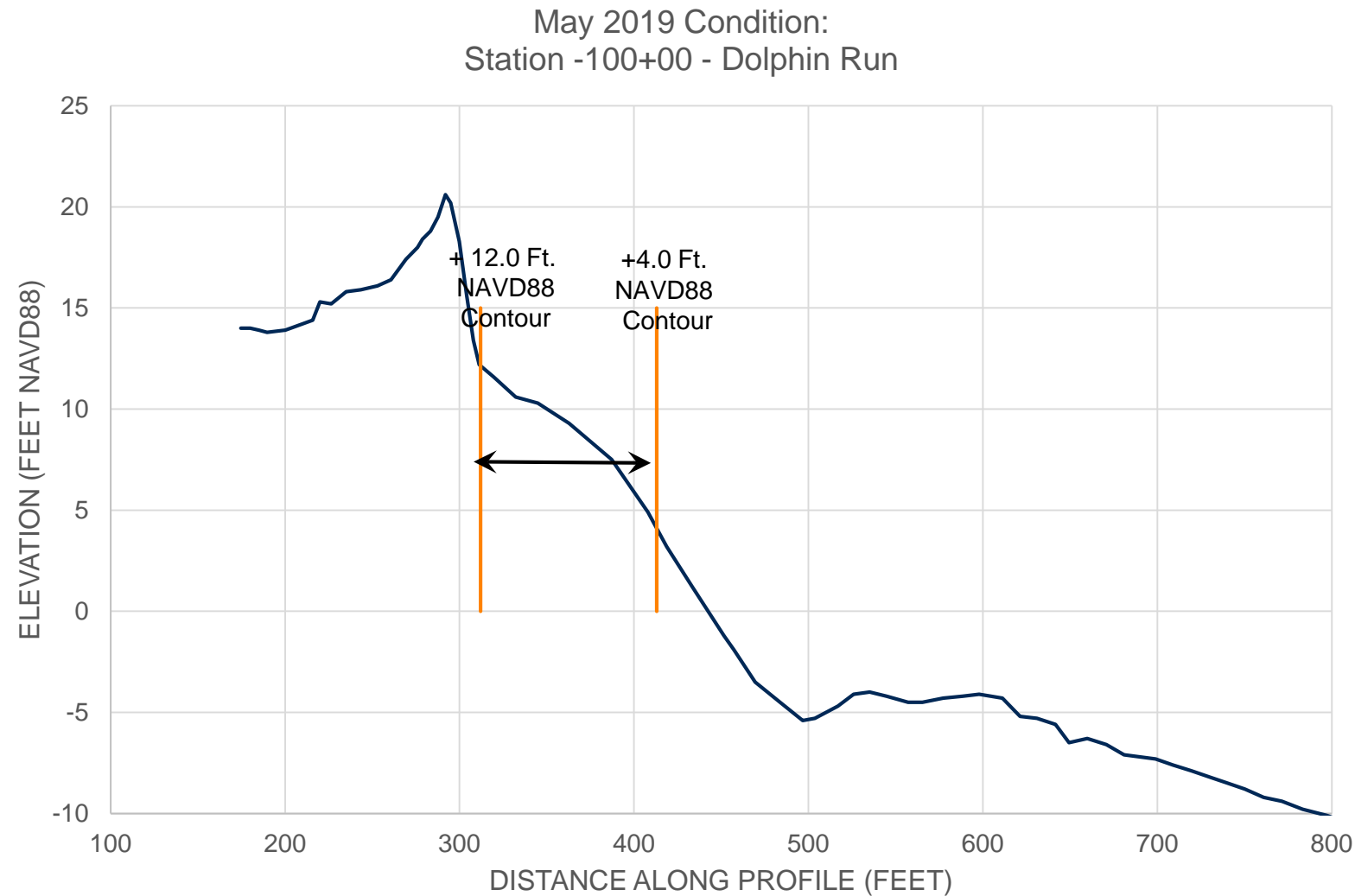


Design Beach

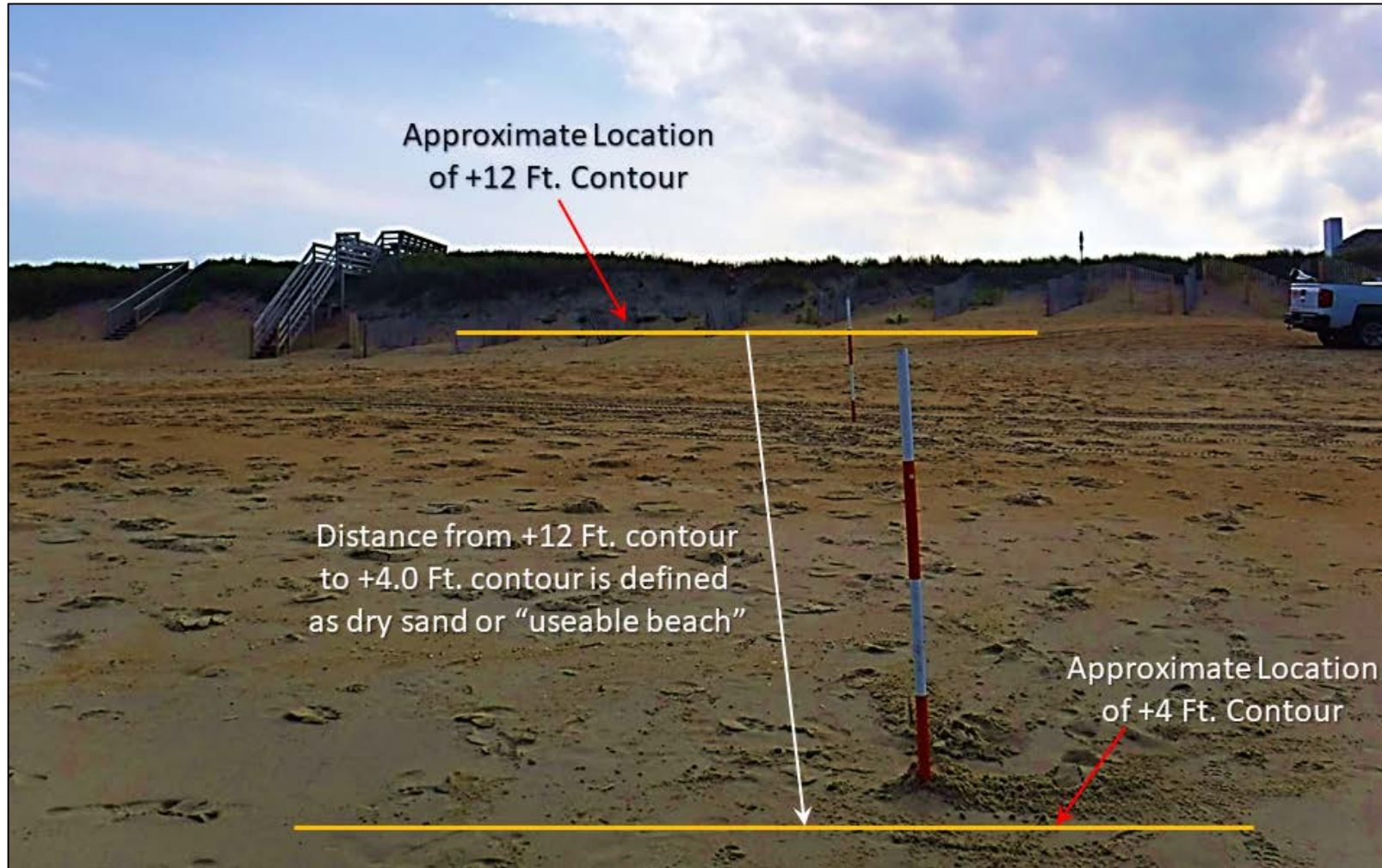
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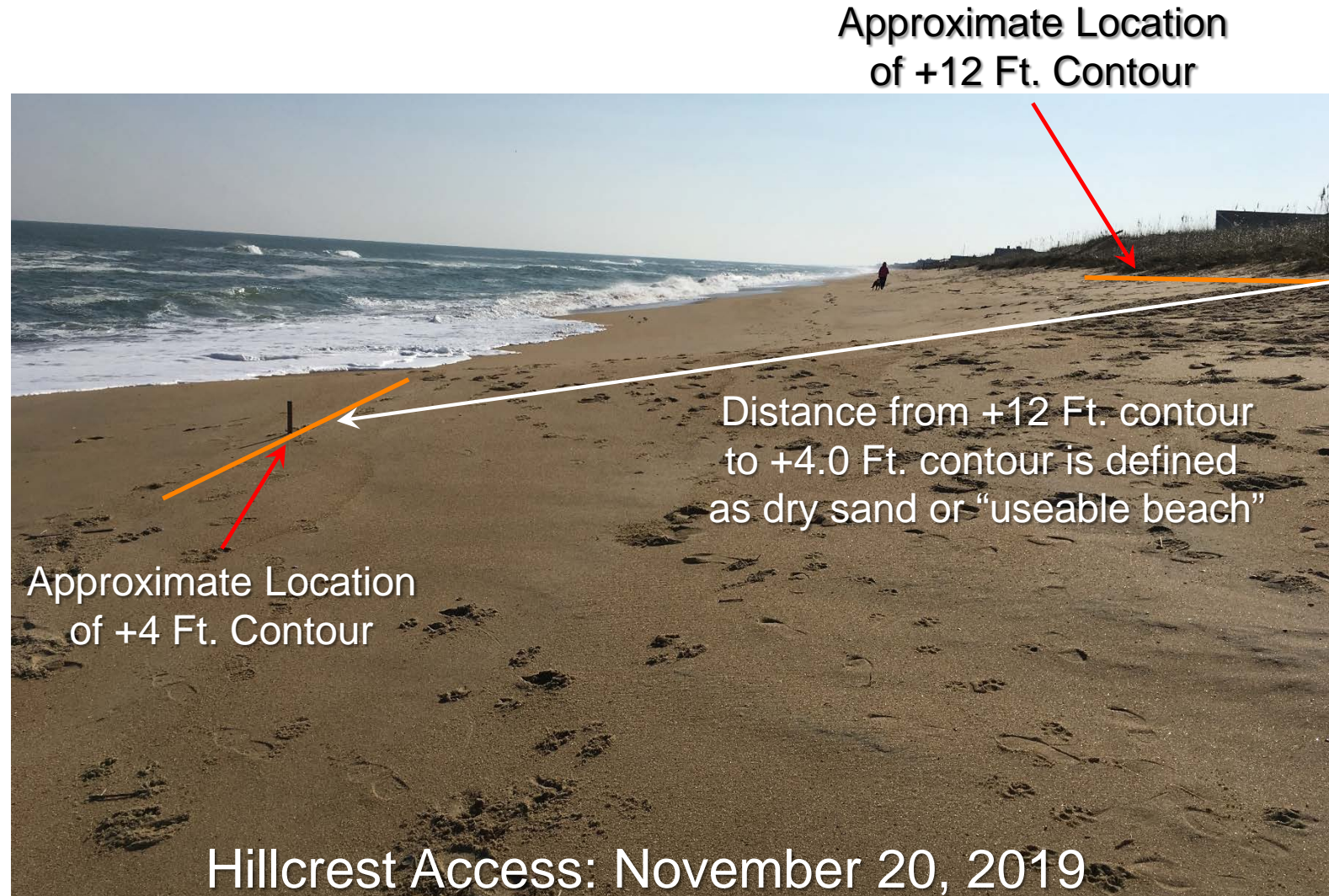
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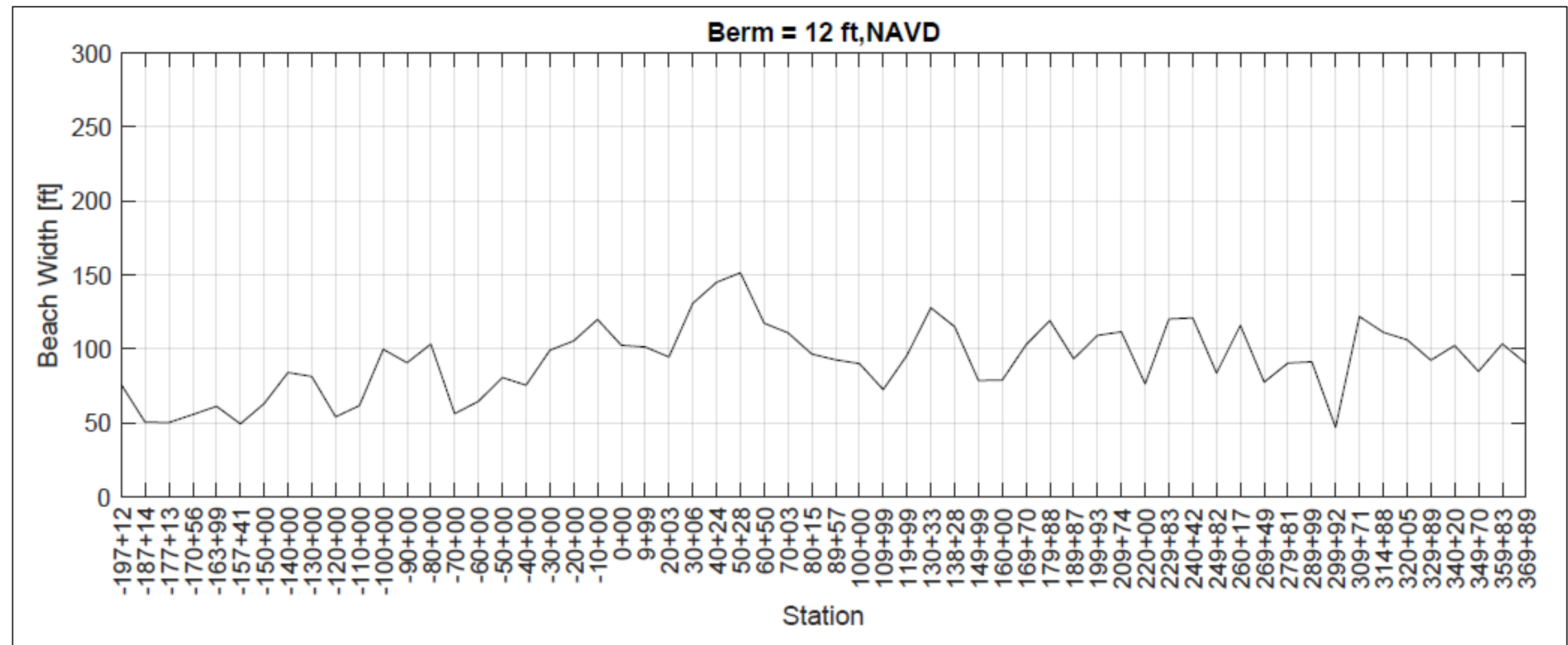
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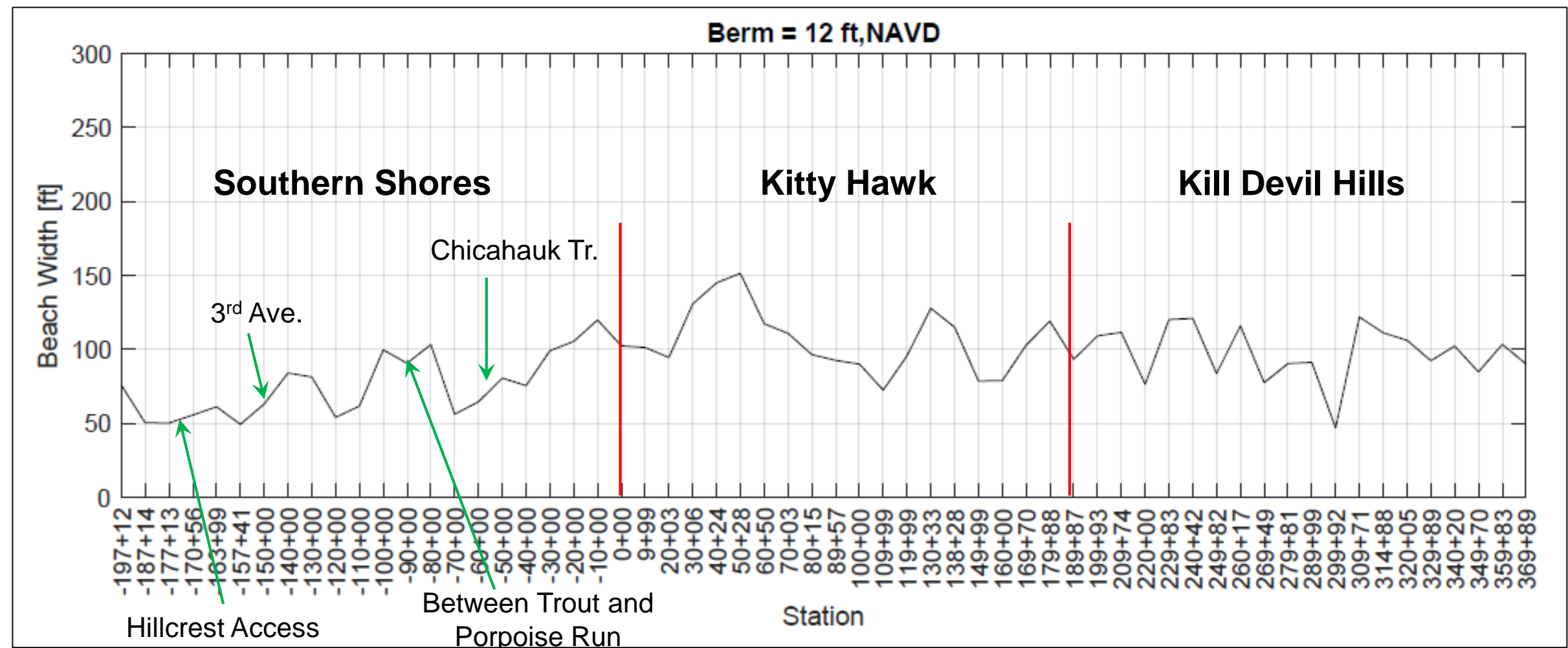
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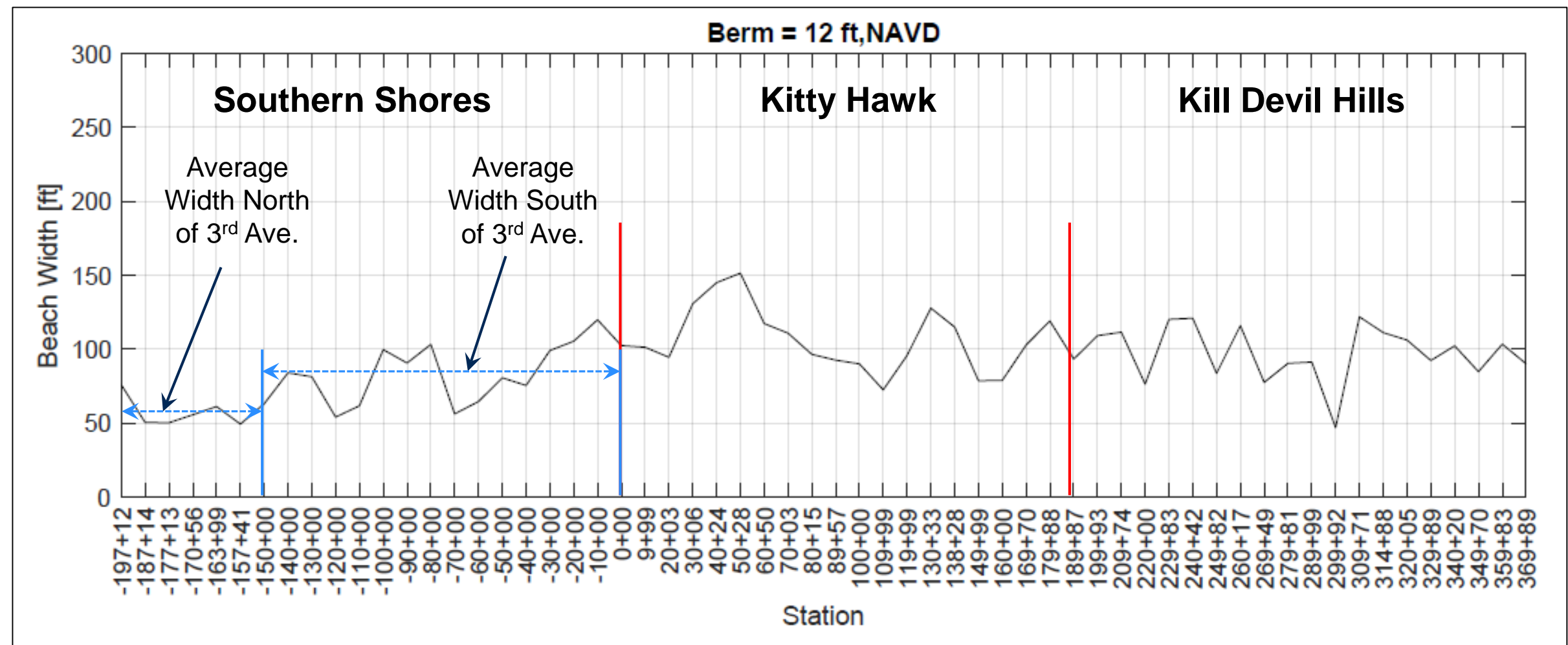
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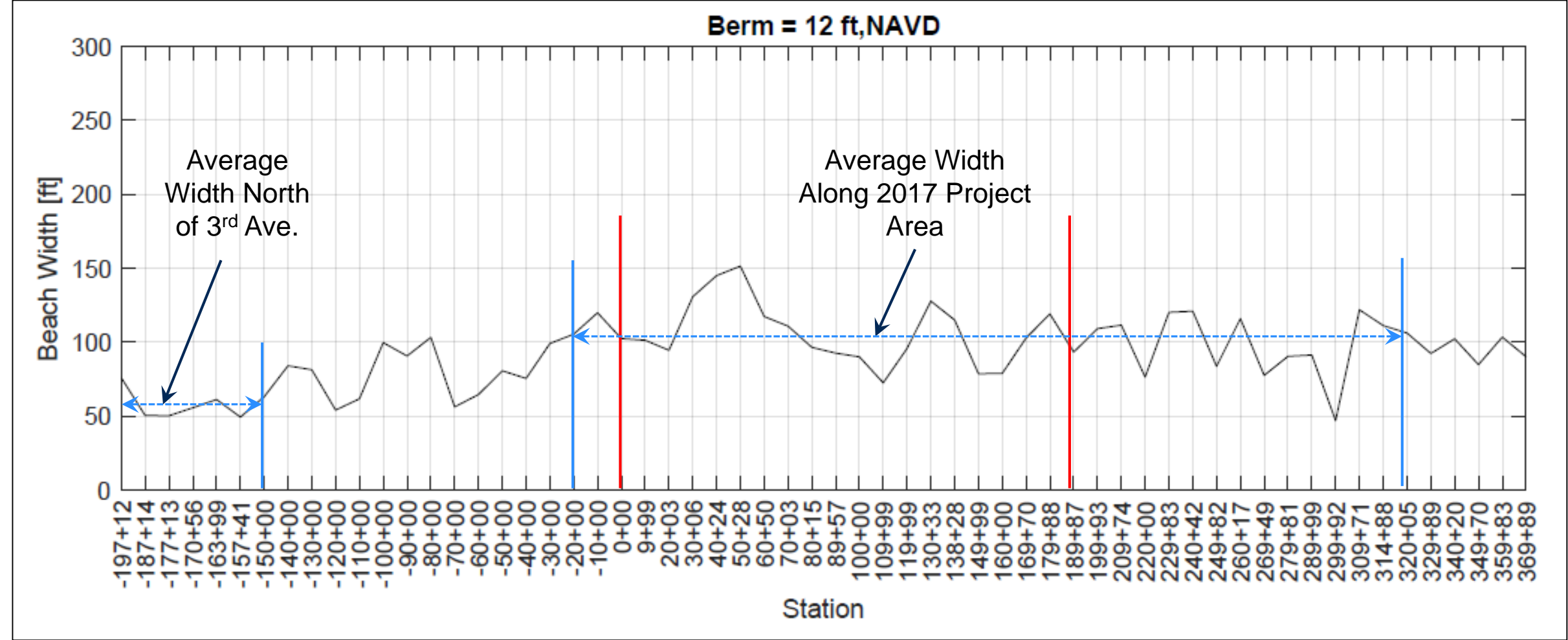
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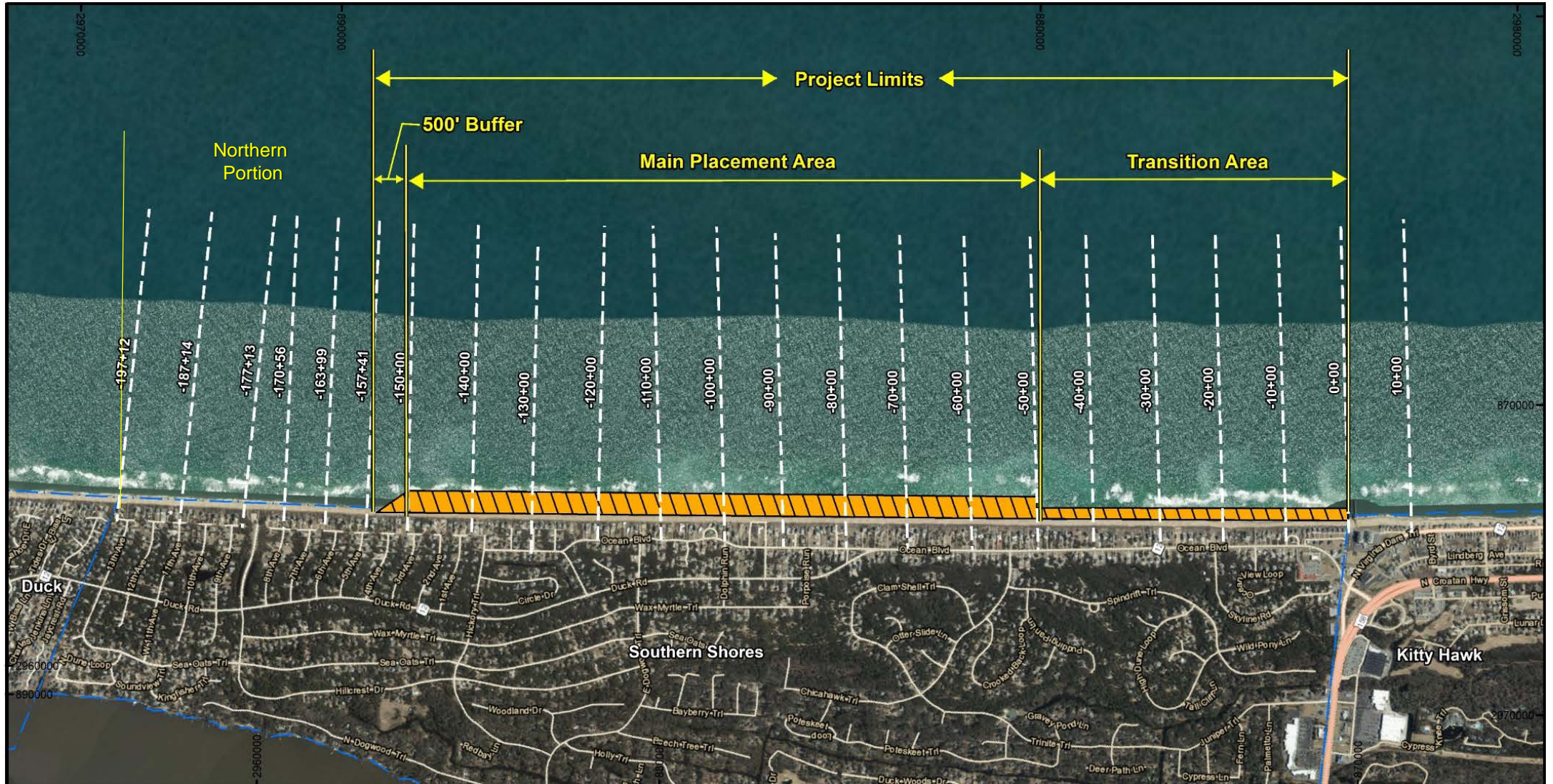




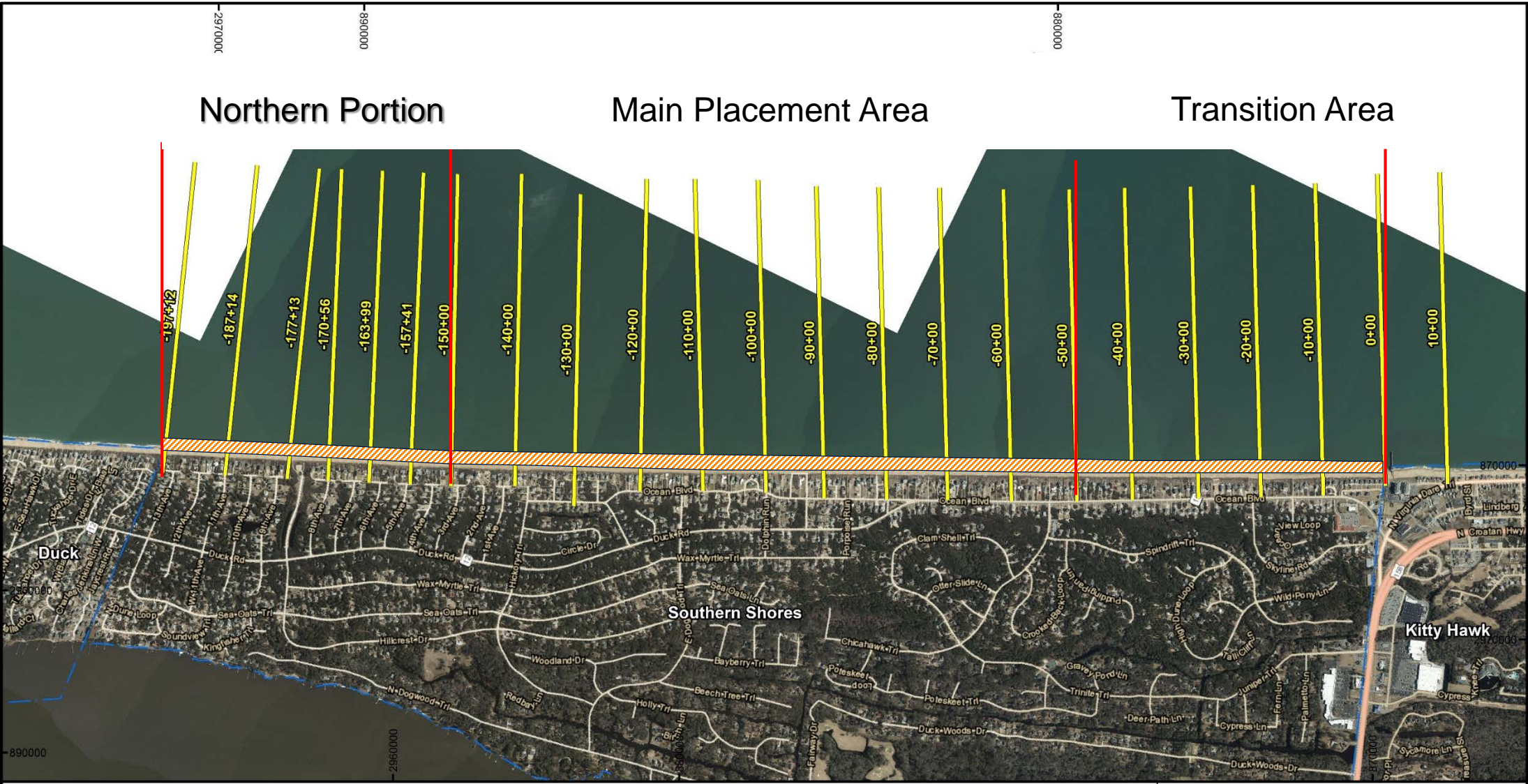
ADDITIONAL OPTIONS:



OPTIONS: OPTION 1 – PREVIOUSLY PRESENTED



ADDITIONAL OPTIONS: #4 – 30 CY/FT DESIGN THROUGHOUT



The map shows a proposed road alignment through the Duck, Kitty Hawk, and Southern Shores area. The alignment is marked with stationing from -197+12 to 10+00. The map is divided into three sections: Northern Portion, Main Placement Area, and Transition Area. The alignment is shown as a yellow line with stationing. The map includes labels for various streets and landmarks.

Northern Portion

Main Placement Area

Transition Area

Duck

Southern Shores

Kitty Hawk

Streets shown include: Duck Rd, Ocean Blvd, Wax+Myrtle Trl, Sea Gals Trl, Hillcrest Dr, Woodland Dr, Bayberry Trl, Beech+Tree Trl, Holly Trl, Birch Trl, Fairway Dr, Duck Woods Dr, Chicahawk Trl, Poleskeet Trl, Duck Woods Dr, Deer Path Ln, Cypress Ln, Palmetto Ln, Juniper Trl, Trinitie Trl, Graveyard Ln, Crooked Creek Loop, Spindrift Trl, View Loop, Skyline Rd, Wild Pony Ln, N Croatan Hwy, N Carolina Hwy, and Duck Woods Dr.

Stationing labels: -197+12, -187+14, -177+13, -170+56, -163+99, -157+41, -150+00, -140+00, -130+00, -120+00, -110+00, -100+00, -90+00, -80+00, -70+00, -60+00, -50+00, -40+00, -30+00, -20+00, -10+00, 0+00, 10+00.

ADDITIONAL OPTIONS: SUMMARY TABLE 2

Table 2. Comparison of volumes calculated for each of the beach fill options

Design	Design Volume ⁽¹⁾	Diffusion Loss Volume ⁽²⁾	Advanced Fill Volume ⁽³⁾	Taper Volume ⁽⁴⁾	Total Volume	Avg. Fill Density ⁽⁵⁾
Option 1 ⁽⁶⁾	540,000	54,400	225,000	9,000	828,400	36
Option 2	N/A - Design Volumes and Transition Area Volumes are the Same as Option 1.					
Option 3 ⁽⁶⁾	720,000	68,800	225,000	12,000	1,025,800	48
Option 4	591,400	54,400	225,000	7,500	878,300	30
Option 5	681,400	54,400	225,000	7,500	968,300	35

⁽¹⁾ Volume (CY) necessary to achieve the design goal of each option. This number excludes diffusion loss, advanced fill, and tapers.

⁽²⁾ Volume (CY) included to account for diffusion losses and background erosion (APTIM, 2018).

⁽³⁾ Volume (CY) included to account for background erosion expected to occur throughout the nourishment interval. Re-nourishment interval assumed to be 5 years.

⁽⁴⁾ Volume (CY) to construct a 500-foot taper on the northern end of the beach fill. Taper is dependent on the fill density at the northern extent of the project.

⁽⁵⁾ Total Volume included in the Design Volume divided by the length of the beach fill (CY/FT).

⁽⁶⁾ Options that only include placement of beach fill south of 3rd Avenue.



ADDITIONAL OPTIONS: SUMMARY TABLE 3

Table 3. Project Option Cost Estimates

Option	Permitting/ Design Soft Cost ⁽¹⁾	Volume (cy) ⁽²⁾	Construction Cost ⁽³⁾	Construction Soft Cost ⁽⁴⁾	Construction Env. Monitoring Costs ⁽⁵⁾	Contingency Cost (10%)	TOTAL COST
1	\$435,000	828,400	\$11,758,000	\$235,500 ⁽⁶⁾	\$275,300	\$1,270,400	\$13,974,200
3	\$435,000	1,025,800	\$14,146,000	\$255,500	\$332,400	\$1,516,900	\$16,685,800
4	\$435,000	878,300	\$12,505,000	\$241,500	\$232,700	\$1,341,400	\$14,755,600
5	\$435,000	968,300	\$13,783,000	\$249,500	\$256,600	\$1,472,400	\$16,196,500

⁽¹⁾ Professional services costs associated with the permitting and design of the beach fill project. These costs include design surveys of the beach and offshore sand investigations.

⁽²⁾ Total volume (CY) estimated for the Option including design volume, diffusion losses, advanced fill, and tapers.

⁽³⁾ Costs associated with mobilization/demobilization, sand placement, and other costs paid directly to the dredge contractor.

⁽⁴⁾ Costs associated with development of construction bid package, bidding assistance, and construction administration.

⁽⁵⁾ Costs anticipated for estimated environmental monitoring that may be required by permit condition.

⁽⁶⁾ Updated Construction Soft Costs from those included in the September 2019 update. The updating of these cost estimates resulted in a slight decrease in the Total Cost estimate.



QUESTIONS

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EXAMPLES OF SAND FENCING IN KITTY HAWK



EXAMPLES OF SAND FENCING IN KITTY HAWK



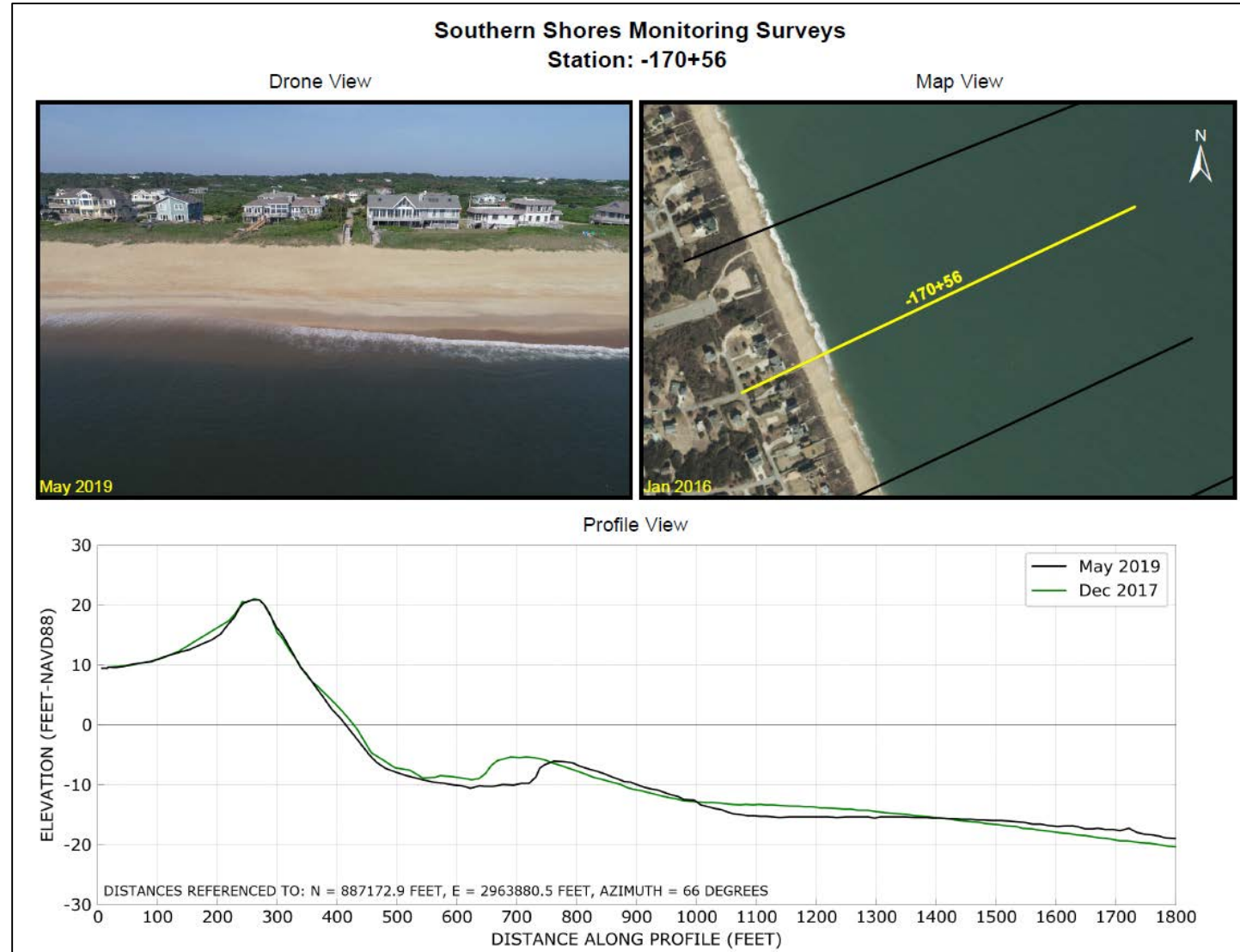
EXAMPLES OF SAND FENCING & VEGETATION IN KDH



EXAMPLES OF SAND FENCING & VEGETATION IN KDH



PROFILE STATION 170+56: (8TH AVE.)



PROFILE STATION 170+56: (8TH AVE.)



SCHEDULE:

Table 12. Proposed Project Schedule for Southern Shores Beach Nourishment Project

Milestone	Start Date	Completion Date	Number of Months
Project Initiations (Interagency Kickoff Meeting)	February-2020	February-2020	1
Borrow Area Development/Refinement	April-2020	February-2021	10
Final Design Work	July-2020	January-2021	6
Federal Permitting	February-2020	June-2021	16
State Permitting	November-2020	June-2021	7
Obtaining Easements for Construction	January-2021	January-2022	12
Development of Construction Plans and Specifications	December-2020	June-2021	6
Solicitation of Bids	June-2021	August-2021	1.5
Award Construction Contract	August-2021	September-2021	1.5
Construction	May-2022	October-2022	5





Expect the Extraordinary.