Town of Southern Shores

5375 N. Virginia Dare Trail, Southern Shores, NC 27949
Phone 252-261-2394 / Fax 252-255-0876
www.southernshores-nc.go

March 6, 2018
COUNCIL MEETING-5:30 P.M.-PITTS CENTER

1. Opening
   A. Call Meeting to Order (all citizens interested in offering Public Comment are reminded to sign up.)
   B. Pledge of Allegiance
   C. Moment of Silence
   D. Amendments to / Approval of Agenda
   E. Consent Agenda TAB 1
      i. Council Meeting Minutes – February 6, 2018 & February 20, 2018
      ii. Surplus Resolution 2018-03-01
      iii. Government and Education Access Channels Committee 2018-2019 Proposed Budget Request

2. Staff Reports
   A. Town Planner
   B. Police Chief
   C. Fire Chief, Southern Shores Volunteer Fire Department
   D. Town Manager's Report
   E. Town Attorney's Report

3. Board Reports
   A. Report of Planning Board

4. General Public Comment (Limit: 3 minutes per speaker.)

   (Note: All matters heard or considered by the Council are subject to possible action by the Council.)

5. Old Business

6. New Business
   A. Beach Assessment Report -APTIM Coastal Planning & Engineering of NC, Inc-Ken Willson TAB 2
   B. Presentation of SSVFD Architectural Design Drawings TAB 3
   C. Public Hearing-The Public Hearing will be for ZTA-18-02, a Zoning Text Amendment application TAB 4 submitted by the Town of Southern Shores to amend the Southern Shores Town Code by amending Section 36-175, Wireless Telecommunications Sites and Towers.
      i. Planning Board Chairperson Report

7. General Public Comment (Limit: 3 minutes per speaker.)

8. Other Business
   A. Mayor's Comments & Responses
   B. Council Member's Comments & Responses

9. Adjourn

Town of Southern Shores
Regular Council Meeting
February 6, 2018

The Town of Southern Shores Town Council met in the Pitts Center located at 5377 N. Virginia Dare Trail at 5:30 p.m. on Tuesday, February 6, 2018.

COUNCIL MEMBERS PRESENT: Mayor Bennett, Mayor pro tem Chris Nason, and Council Members Fred Newberry, Jim Conners and Gary McDonald.

COUNCIL MEMBERS ABSENT: None

CALL TO ORDER / PLEDGE OF ALLEGIANCE / MOMENT OF SILENCE
Mayor Bennett called the meeting to order at 5:30 p.m., led the Pledge of Allegiance, and held a moment of silence.

AMENDMENTS / APPROVAL OF AGENDA
MOTION: Mayor pro tem Nason moved to approve the agenda as presented. The motion was seconded by Councilman Conners. The motion passed unanimously (5-0)

CONSENT AGENDA
The consent agenda consisted of the following items:

1. Council Meeting Minutes – January 9, 2018
2. For acknowledgement purposes only - Report of bid tabulation sheet for Town Manager's January 11, 2018 contract award to RPC Contracting, Inc. for capital improvements to portion of Clam Shell Trail.
3. Budget Amendment #9- Dare County reimbursement for training for School Resource Officer
4. Budget Amendment #10- The cost to replace a crosswalk light that was damaged on Ocean Blvd. This recognizes the revenue received from the insurance company of vehicle that did the damage and the cost to replace the light

Councilman Newberry stated the January 9th minutes should include his statement on trees under the Planning Board report.

The Town Manager asked Councilman Newberry to forward a statement he would like included in the minutes. Council agreed to allow the additional summary statement.

MOTION: Mayor pro tem Nason moved to approve the consent agenda as amended. The motion was seconded by Council Member Conners. The motion passed unanimously (5-0).

EMPLOYEE RECOGNITION
Police Chief David Kole recognized Sgt. Brad Eilert on his successful completion of the Traffic Enforcement and Investigation Certificate Program.

PRESENTATION- OUTER BANKS CHAMBER OF COMMERCE--COMMUNITY HOUSING INITIATIVE COMMITTEE

Karen Brown, President & CEO Outer Banks Chamber of Commerce and Bob Peele, Chairman of the Board to the Outer Banks Chamber of Commerce, conducted a presentation on the Chamber's Community Housing Initiative Committee.

STAFF REPORTS

The following Department Heads presented Department reports for the month of November:

- Town Planner Wes Haskett presented the Planning Department's monthly report containing permitting and inspections for the month of January. Mr. Haskett also gave notice of the February 20th Planning Board meeting which will consist of two variance requests and two zoning text amendments.
- Police Chief David Kole presented the Police Department's monthly report for January.
- Fire Chief Ed Limbacher presented the Fire Department's monthly report for January.
- The Town Manager presented the Manager's report and addressed several matters:
    - The SSVFD architect will report at the March 6 Council meeting.
    - The Yaupon Trail Major CAMA permit has been issued.
    - Staff has received several calls about the timing of the light at NC12 and East Dogwood. NCDOT is aware of the issue and a mechanism replacement is being designed to fix the issue.
    - The beach survey is almost complete.
    - The Town Manager formally recognized the new Public Works Director, David Bradley.

Councilman Conners welcomed Public Works Supervisor David Bradley as well.

Councilman Newberry inquired about the handout that Clair Sutton had distributed to Council at the November meeting in reference to her request for a Fairway Drive road improvement.

After discussion, Council agreed to send the request to the Capital Infrastructure Improvement CIIP committee for discussion and consideration.

PLANNING BOARD REPORT

Planning Board Chairman Williams presented the monthly planning Board report which covered side yard setbacks, parking requirements at rental homes, and relocation of ocean front houses. The Planning Board recommended no changes to the referenced ordinances.

Councilman McDonald stated that during construction and relocation of oceanfront homes the landward side of the dune is being cut into, damaging the dune, and eventually the homeowners are going to want beach nourishment. The oceanside setback might need to be increased.

Mayor Bennett stated he thought existing CAMA requirements addressed this.

Councilman McDonald stated no.

Councilman Newberry stated the dunes need to be preserved in order to protect flooding from storms.

Councilman Conners and Mayor pro tem Nason stated CAMA regulated the setback.

MOTION: Councilman McDonald moved to have the Planning Board look into the oceanside setback, landward side, and possibly increase it to protect the dune. The motion was

seconded by Councilman Newberry. The motion failed 2-3 with Councilman Newberry and McDonald voting YES; Mayor Bennett, Mayor pro tem Nason, and Councilman Conners voting NO.

GENERAL PUBLIC COMMENT

Mayor Bennett called for public comment and the following citizens offered comment:

1. Becky Whitehouse, Ocean Blvd.-would like to extend the allowed times on the beach for dogs May 15th-Sept. 15th by one hour in the morning and an additional hour in the afternoon. This would make the rule of no dogs on the beach from the hours of 10am-4pm, May 15th-Sept 15th.
2. Matt Neal-The ZTA for lot coverage should be looked at with a storm water management benefit to property owner. Need to preserve more flat top homes.
3. Lorelei DiBernardo-Supports Resolution 2018-02-01 which opposes off-shore drilling. She supports more public hearings to hear people's voices on the issue.

OLD BUSINESS

NONE

NEW BUSINESS

PUBLIC HEARING-HISTORIC LANDMARKS COMMISSION DESIGNATION OF 156 WAX MYRTLE TRL. AS A HISTORIC LANDMARK.

Chairperson Lee Whitley presented the Historic Landmarks Commission Report on 156 Wax Myrtle Trail and stated the committee unanimously recommended approval.

Town Attorney Gallop opened the public hearing and called for any member of the public to speak.

1. Steve Gudas-156 Wax Myrtle Trail-spoke in favor of the historic landmark designation and asked Council to approve the property.

Hearing no other citizen wishing to speak the Town Attorney closed the public hearing.

MOTION: Councilman McDonald moved to approved Ordinance 2018-02-01 designating 156 Wax Myrtle as a historic landmark. The motion was seconded by Councilman Newberry. The motion passed unanimously (5-0).

NEXT AGENDA ITEM

RE-REFER TO PLANNING BOARD (WITH PROPOSED AMENDMENT) FOR COUNCIL RECONSIDERATION (SEC. 17 COUNCIL RULES OF PROCEDURE), ZONING TEXT AMENDMENT (ZTA-17-03) ORIGINALLY RECOMMENDED BY THE PLANNING BOARD ON SEPTEMBER 5, 2017 AS AMENDMENT TO SEC. 36-202, (D) OF THE TOWN CODE OF ORDINANCES TO ESTABLISH NEW LOT COVERAGE REQUIREMENTS

MOTION: Mayor pro tem Nason moved the following motion, seconded by Councilman Jim Conners:

Refer the September 5th, 2017 Planning Board recommendation {ZTA-17-03) regarding lot coverage, back to the Planning Board for its reconsideration - with the following new sub-sections h. and i. added to sub-paragraph (6) in Part I of Article 111 of the recommended ZTA:

h. Open-slatted decks constructed over pervious material, not exceeding a total of 25% of the total foot print area of the adjacent single-family dwelling, shall not contribute to lot coverage.

i. Those allowances and/or exemptions listed in sub-sections g. and h. of this sub-paragraph (6) shall be available only to an applicant for a building/zoning permit for a single-family dwelling, or adjacent swimming pool, or adjacent open-slotted deck over pervious material, upon presentation of a survey with all applicable requirements including plan certification, for a Lot Disturbance and Storm water Management Permit as described in Sec. 36-171 (3) of the Town Code of Ordinances.

Councilman McDonald stated this item, per the Council's Rules of Procedure, cannot be brought back up due to the word "reconsideration" used in the request.

Town Attorney Gallop stated Mr. Nason's motion is valid and is only requesting it be sent back to the Planning Board with an amendment for consideration.

Mayor pro tem Nason's motion was seconded by Councilman Conners. The motion passed 3-2 with Mayor pro tem Nason, Mayor Bennett and Councilman Conners voting YES; Councilman McDonald and Newberry voting NO.

NEXT AGENDA ITEM
CONSIDERATION OF RESOLUTION 2018-02-01-A RESOLUTION IN OPPOSITION OF THE PROPOSED "2019-2024 NATIONAL OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROGRAM" RELEASED JANUARY 4, 2018 BY THE U.S. DEPARTMENT OF ENERGY'S BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM).

MOTION: Mayor Bennett moved to adopt resolution 2018-02-01 A Resolution in Opposition of the Proposed "2019-2024 National Outer Continental Shelf Oil and Gas Leasing Program". The motion was seconded by Councilman McDonald and passed unanimously (5-0).

GENERAL PUBLIC COMMENT
Mayor Bennett again called for public comment and the following citizens spoke:

1. Debbie Newberry-267 N Dogwood-Auxiliary buildings, she didn't think it was meant to be separate living quarters. Dogs on the beach extended hours, ticket if owner does not do right thing. This evening's ordinance issues both are complicated issue, always a 3-2 vote. Send to Planning Board, that is their job.

MAYOR COMMENTS & RESPONSES
Mayor Bennett welcomed Public Works Director David Bradley and also recognized former SSCA President Ross Mitchell for his service to the community.

COUNCIL COMMENTS & RESPONSE:
Councilman Conners stated the Capital Infrastructure Improvement Planning Committee meets next week and this is a good time to offer input as the road projects are prioritized. There is a pattern of emails from members of the Council that come the day after a meeting, often trying to rehash items already discussed and settled. He stated more important is Council needs to establish firm policy when the Town Attorney can embark to provide legal work on a single Council Member's request and if such a request needs Council consensus because Town just received a $2,000 bill in attorney fees on such a request. The Rules of Procedure need to be looked at to address this issue.

CLOSED SESSION - NCGS § 143-318.11. (A)(6) - CONSIDER A PERSONNEL MATTER REGARDING AN INDIVIDUAL PUBLIC OFFICER/EMPLOYEE OF THE TOWN.
MOTION: Mayor Bennett moved to go into closed session pursuit NCGS § 143-318.11. (a)(6) to consider a personnel matter regarding an individual public officer/employee of the Town. The motion was seconded by Councilman McDonald. The motion passed unanimously (5-0)

MOTION: Upon returning to open session, Councilman McDonald moved to create a position of Deputy Town Manager-Planner / Code Enforcement Officer-Department Head, with a pay scale of grade 27-hiring rate $63741, minimum $66927, maximum $95607. The motion was seconded by Mayor pro tem Nason. The motion passed unanimously (5-0).

ADJOURN

MOTION: Hearing no other business, Councilman McDonald moved to adjourn. The motion was seconded by Mayor pro tem Nason. The motion passed unanimously (5-0). The time was 7:58p.m.

ATTEST:

Respectfully submitted,

_____

Thomas G. Bennett, Mayor

_____

Sheila Kane, Town Clerk

Town of Southern Shores

5375 N. Virginia Dare Trail, Southern Shores, NC 27949
Phone 252-261-2394 / Fax 252-255-0876
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RESOLUTION 2018-03-01

A RESOLUTION DECLARING CERTAIN PROPERTY OF THE TOWN TO BE SURPLUS AND AUTHORIZING THE DISPOSITION OF SAID PROPERTY

WHEREAS, the Town Council of the Town of Southern Shores, North Carolina, has determined that the Town owns certain personal property that is no longer needed or usable by the Town; and

WHEREAS, the property is described below:

DEPT.	MAKE	MODEL	V.I.N./DESCRIPTION
PUBLIC WORKS	BUSH HOG	SQ720	BUSH HOG
PUBLIC WORKS	SWEEPSTER		ROTARY BROOM
PUBLIC WORKS	BRIGGS & STRATTON	1650	TRAC-VAC VACUUM TRAILER
PUBLIC WORKS	SHINDALWA	BLOWER	INOPERABLE-NO VALUE
PUBLIC WORKS	BRINLY	AERATOR	INOPERABLE-NO VALUE
PUBLIC WORKS	CAMPBELL	WRENCH	INOPERABLE-NO VALUE
PUBLIC WORKS	TRADES	PRO CREEPER	INOPERABLE-NO VALUE
PUBLIC WORKS	BRINLY	DETHATCHER	INOPERABLE-NO VALUE
PUBLIC WORKS	STA-RITE	WELL PUMP	INOPERABLE-NO VALUE
PUBLIC WORKS	STREET-SIGN	NO PARKING	INOPERABLE-NO VALUE

NOW, THEREFORE, BE IT RESOLVED by the Southern Shores Town Council that the Town Manager or his designee are hereby authorized to dispose of the aforementioned property by any means allowable to include offering for sale at public auction, donation to a nonprofit organization, internet on-line offering, private negotiation and sale, upset bid process, or destruction.

AND BE IT FURTHER RESOLVED that property described in this resolution is surplus as of March 6, 2018.

ATTEST:

Thomas G. Bennett, Mayor

Sheila Kane, Town Clerk

Government Education Access Channels Committee

2018-2019 Proposed Budget

The following items are presented to the Town of Southern Shores Town Council for their review and approval.

Specific Action Requested:

Approve the proposed 2018-2019 GEACC Budget

Budget Summary

The Government Education Access Channels (GEAC) Committee has reviewed and approved the proposed 2018-2019 budget for the operation of the Government and Education Channels. The proposed budget, which would take effect July 1, 2018, must be approved by every participating member entity of the Channels, which includes the towns of Duck, Southern Shores, Kitty Hawk, Kill Devil Hills, Nags Head, Manteo, and Dare County, Dare County Schools, College of The Albemarle, and UNC Coastal Studies Institute.

The budget as proposed requires no additional funding from the participating entities other than the current annual $1000 membership fee. Our budget is funded from the North Carolina Video Programming Distribution proceeds, which are dispersed quarterly by the State to certified members of the GEACC. These funds must be used for the operation of the two channels and no other purpose. Additionally, the legislation that originally established the video distribution funding required that the proceeds not supplant current funding. Accordingly, the annual $1000 membership fee that was in place when the program began must remain, or the Channels would lose all video distribution funding from the state.

The GEAC committee recommends the budget, which includes, in part, the following: funding for two full-time staff positions and a Local Programming Development Initiative to assist members in the development of programming for the Government and Education Channels. The funding also includes the continued funding of two regular news magazine shows that highlight each of the participating members of the GEAC on the Education Channel and the Government Channel.

Government Education Access Channels Committee
2018-2019
Proposed Budget

Executive Summary

Funding comes from the state of North Carolina use tax on cable and satellite fees. Our revenue from this source in 2018-2019 is projected to be $270,270.40. In addition, each of the 10 entities pay a $1000 membership fee annually to participate in the channel's operations. This $1000 fee is unchanged and is the only impact on each entity's budget. This money that is received from the entities in support of the Government and Education Access Channels must remain in the budget in order for each entity to continue to receive PEG Supplements from the state of North Carolina. This budget is requesting a total of $55,254.60 be allocated from the fund balance. The fund balance is projected to be $333,218.41 on June 30, 2018. The proposed total budget for the Government and Education Access Channels Committee for 2018-2019 is $336,525.00.

INCOME	
Member Fees (annual fee paid by participating entities)[1]	10,000.00
NC PEG Supplemental Video Disbursement (from the state NCDOR)[2]	270,270.40
Interest Income (interest from fund balance)[3]	1,000.00
TOTAL INCOME	**336,525.00**
APPROPRIATED FUND BALANCE[4]	**55,254.00**
TOTAL REVENUE	**336,525.00**
EXPENDITURES	
Salaries (2 Full time employees)[5]	(110,639.00)
PT Salary (Internships)	(2,000.00)
Merit Pay	(1,383.00)
FICA	(8,892.00)
Retirement	(7,610.00)
Health Insurance	(15,905.00)
Life Insurance	(210.00)
Retiree Health	(186.00)
Contractual Services (Production of Destination Dare/Ed Awareness)[6]	(50,000.00)
Channel Operations[7]	(10,200.00)
Streaming/Video On Demand Reflect[8]	(2,500.00)
Equipment - Repair, Replacement, Purchase	(2,500.00)
Office Computer Lease	(500.00)
Supplies[9]	(5,000.00)
Marketing[10]	(4,000.00)
Capital Outlay[11]	0.00)
Music Library	(1,500.00)
Training	(2,500.00)
Travel	(2,500.00)
Professional memberships (SEATOA NATOA, NC3C)[12]	(500.00)
Miscellaneous	(500.00)
Contingency (Reserve for unexpected expenses)[13]	(5,000.00)
Emergency Contingency (Storm related overtime during activations)[14]	(2,500.00)
TOTAL OPERATING EXPENDITURES	**(236,525.00)**

Local Program Development Initiative	
This is money set aside in the budget to foster development of program content by the member entities. Money is awarded on an application and grant basis to participating entities by the Government and Education Access Channel Committee. The money can be used to produce programs, improve the quality of existing programs, or purchase equipment to provide for increased production and/or quality of programs.	
LPDI 1 - Coastal Studies Institute	(10,000.00)
LPDI 2 - College of The Albemarle	(10,000.00)
LPDI 3 - Dare County Government	(10,000.00)
LPDI 4 - Dare County Schools	(10,000.00)
LPDI 5 - Duck	(10,000.00)
LPDI 6 - Kill Devil Hills	(10,000.00)
LPDI 7 - Kitty Hawk	(10,000.00)
LPDI 8 - Manteo	(10,000.00)
LPDI 9 - Nags Head	(10,000.00)
LPDI 10 - Southern Shores	(10,000.00)
TOTAL LPDI	**(100,000.00)**
TOTAL LPDI AND OPERATING EXPENDITURES	**(336,525.00)**

Government and Education Access Channel
Proposed Budget Notes for 2018-2019

Goals and Objectives to be achieved with this budget.

1. Continue to fund the operation of the channel at a level that provides a professional, reliable and quality service to the citizens of Dare County.
2. Continue to bring the fund balance down to an appropriate level and strategically use the fund balance to fund channel initiatives.

[1] Member Fees - Each entity member pays an annual membership fee to participate in the Government and Education Channel Access. This money must remain in place in order for each entity to receive the PEG Supplement from the state. **There is no change to this amount from last year, so impact on each entity's budget is unchanged..**

[2] NC PEG Supplemental Video Disbursement - this is revenue that is collected by the state in the form of a use tax on cable and satellite providers. The money is pooled and disbursed to qualifying PEG operations within the state. PEG stands for Public, Education, and Government Access. Dare County has 10 qualifying PEG entities, each is a member of the Government and Education Access Channel Committee. Each quarter, this money is disbursed to the entities by the state, and then the Government and Education Access Channels invoices the entities for this money. These state funds are the main source of funding for the Government and Education Access Channels.

[3] Interest Income - This is interest the Government and Education Access Channels Committee receives on the fund balance.

[4] Appropriated Fund Balance - The unappropriated fund balance is projected to be $333,218.41 on June 30, 2018. The appropriated fund balance is the amount pulled from the unappropriated fund balance to meet the obligations of the budget.

[5] Salaries - This budget currently funds two full-time positions that are considered to be Dare County employees.

[6] Contractual Services - This is for the production of Destination Dare and Dare Education Awareness, our two main programming initiatives that highlight interesting aspects of government and education in Dare County. Each entity contributes one segment to each episode. Destination Dare is produced every other month, and Dare Education Awareness is produced on the alternate months.

[7] Channel Operations - Expenses that support the day to day operation of the channels. This includes:

- Tightrope Hardware Assurance $3,850 to cover the master control server
- Adobe Creative Cloud - subscription for professional non-linear editing tools
- Gracenote - e-guide subscription $3,090
- And other expenses that may be required for on-going station operations

[8] Streaming Video/VOD Reflect - As part of the playout server upgrade, we are providing a more effective streaming capability of our signal online, and, in addition, provide a video on demand service that will be much better than our current YouTube channel. This is the annual subscription to support that service.

[9] Supplies - This supports the purchase of supplies such as batteries, gaffers tape, lighting gels, accessories, and small equipment items that do not qualify as Capital Outlay.

[10] Marketing - For ongoing maintenance and support of the CurrentTV Website

[11] Capital Outlay - None requested this year..

[12] Professional Memberships - This supports memberships for the two staff positions for the Southeastern Association of Telecommunications Officers and Advisors (SEATOA), National Association of Telecommunications Officers and Advisors (NATOA), and The North Carolina City and County Communicators (NC3C). These are national, regional and state professional associations for PEG Channel Operators.

[13] Contingency - This is for expenses that come up that were either unplanned or unforeseen. Not for use of everyday expenses.

[14] Emergency Contingency - This pays for storm related overtime for the hourly employee during Emergency Management Activations.

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TOWN OF SOUTHERN SHORES: BEACH ASSESSMENT REPORT

Ken Willson

March 6, 2018

APTIM

PRESENTATION OUTLINE:

- Goals of the study
- Data used in the assessment
- Spatial and temporal limits of the assessment
- Types of Assessment (Shoreline Change & Volume Change)
- Results
- Recommendations

APTIM

GOALS OF THE STUDY:

- Establish a town-wide baseline survey for future comparison.
- Determine shoreline change and volume change rates along the Towns oceanfront where possible
- Evaluate long-term and short term shoreline change and volume change trends
- Provide the Town with information that can be used for planning with respect to managing the oceanfront beach

APTIM

DATA USED IN THE ASSESSMENT:

- The North Carolina Division of Coastal Management (NC DCM) long-term (approximately 50 years) average annual shoreline change rates;
- Beach profile data collected by the USACE Field Research Facility (FRF) along the southern 15,000 ft. of the Town of Southern Shores in 2004, 2005 and 2006;
- Beach profile data collected by APTIM in 2013 and 2015 along the southern 2,000 ft. and northern 2,000 ft. of the Town of Southern Shores;
- Beach profile data collected by Great Lakes Dredge and Dock Company in 2017 (pre-construction, before dredging (BD) and after dredging (AD) surveys) along the Town of Kitty Hawk and the southern 2,500 ft. of the Town of Southern Shores;
- Beach profile data collected by APTIM in December 2017 (post-construction) along the entire oceanfront of the Town of Southern Shores.

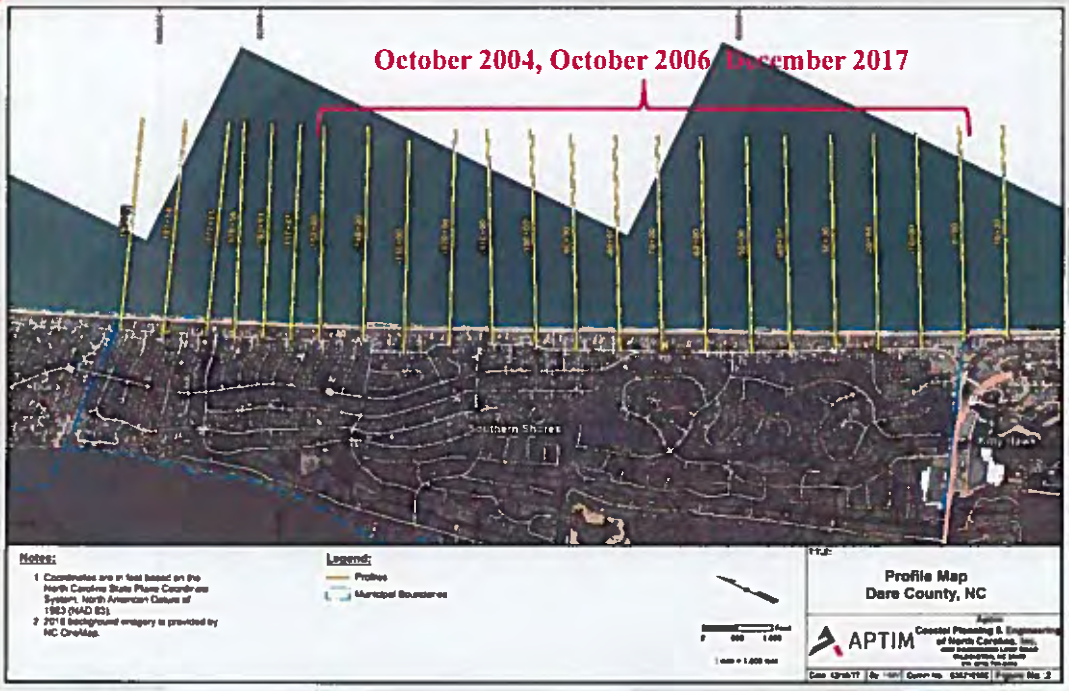
APTIM

SPATIAL & TEMPORAL LIMITS:

- October 2004 to October 2006 (Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary);
- October 2006 to May 2015 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary);
- May 2015 to June 2017 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary);
- October 2006 to December 2017 (Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary);
- September 2013 to December 2017 (Station -197+12 located at the northern Town Boundary to Station -177+13 located approximately 200 ft. south of 9th Ave.); and
- June 2017 to December 2017 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary).

APTIM

SPATIAL & TEMPORAL LIMITS:



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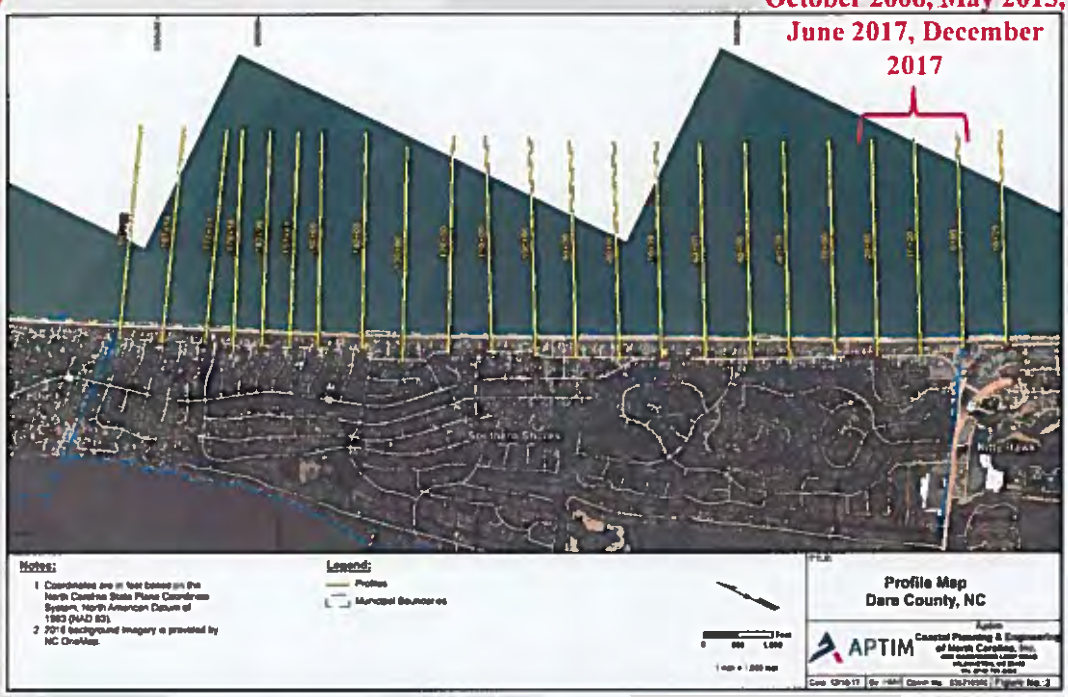

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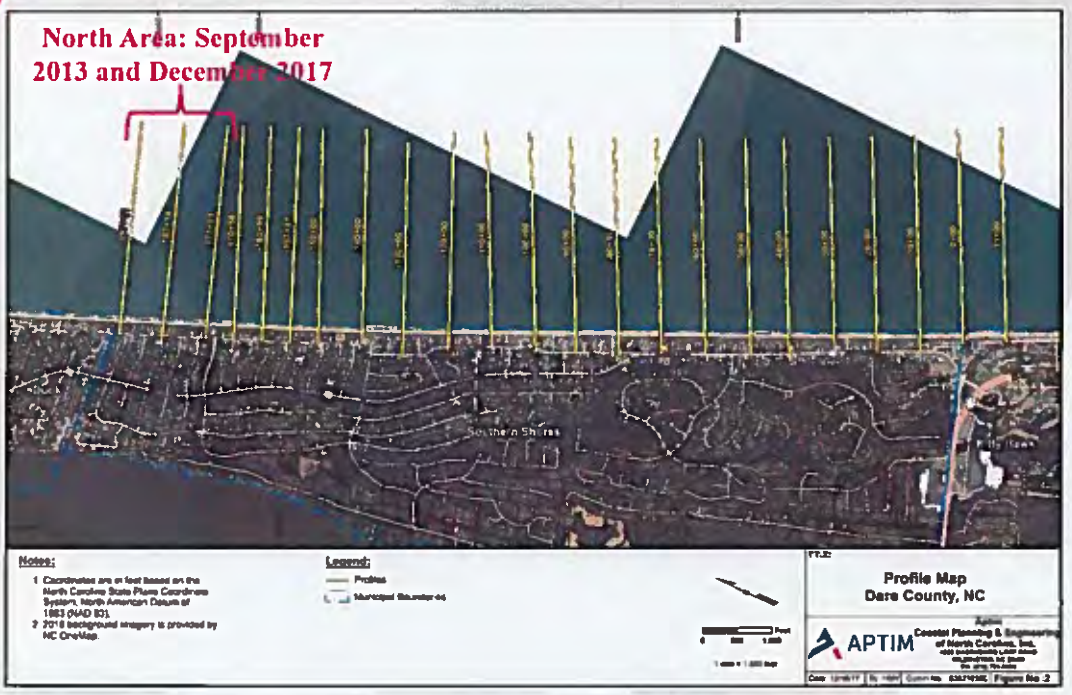

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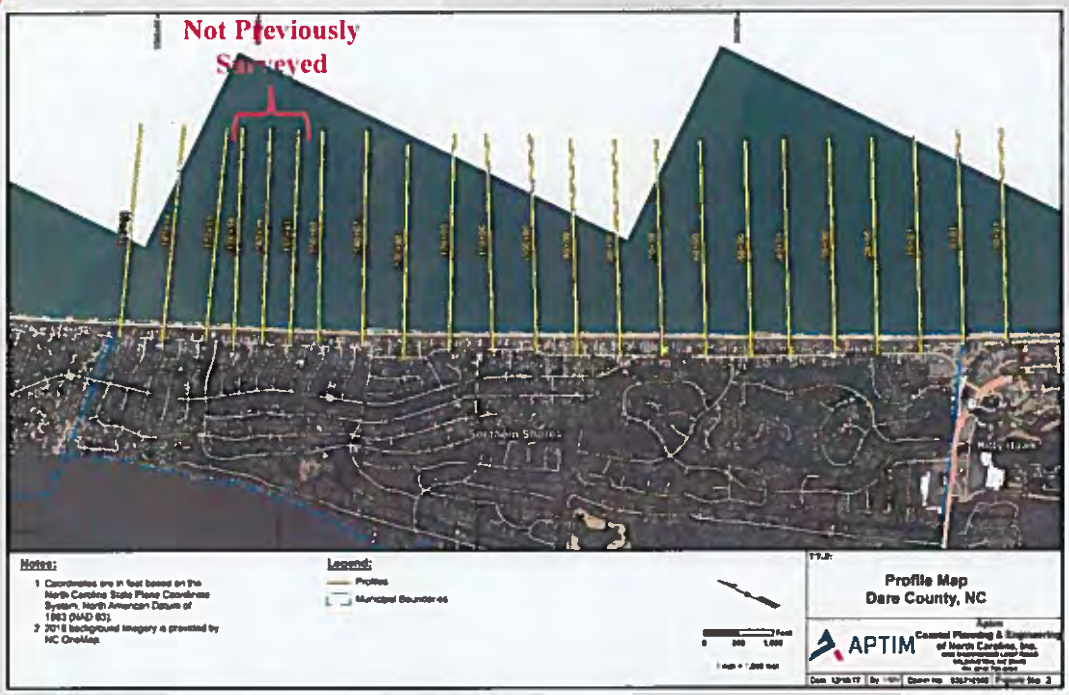
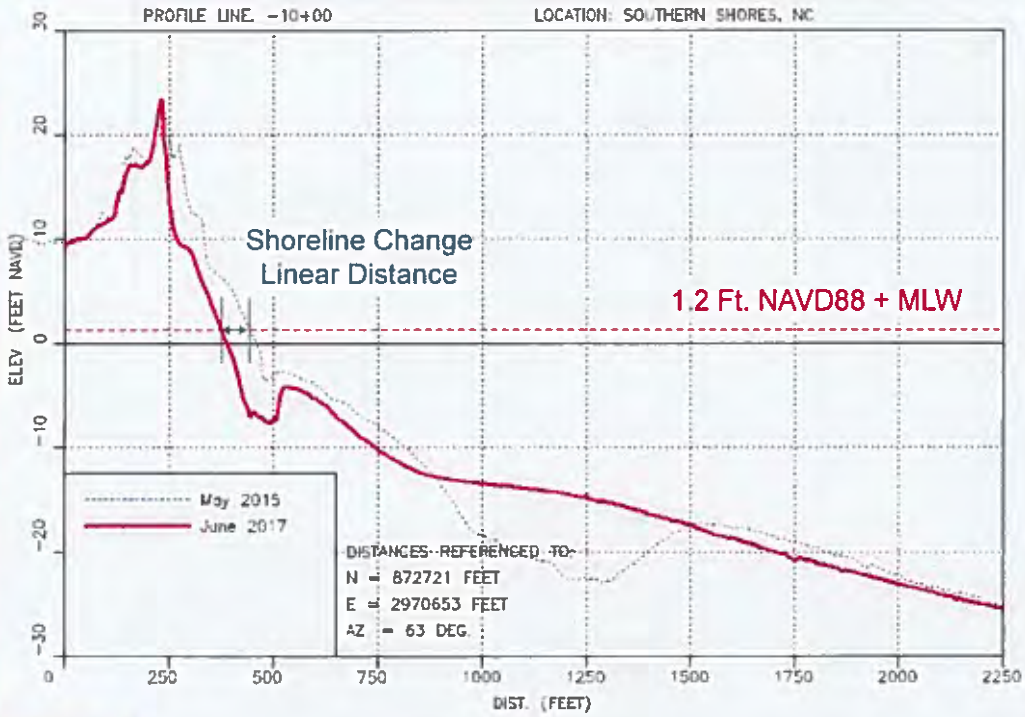
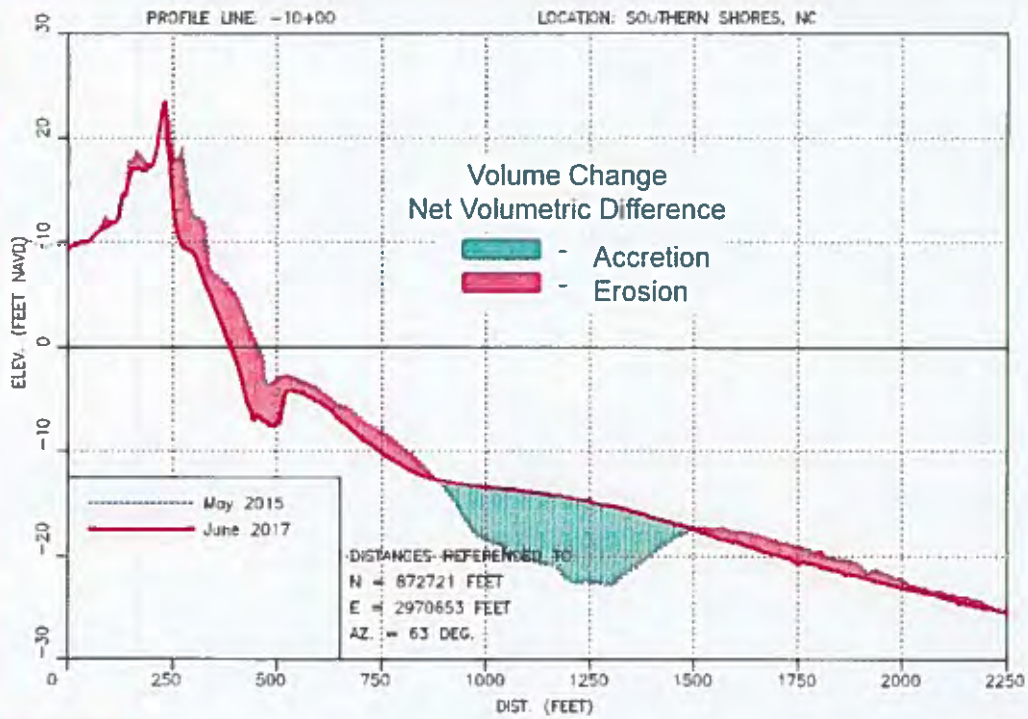


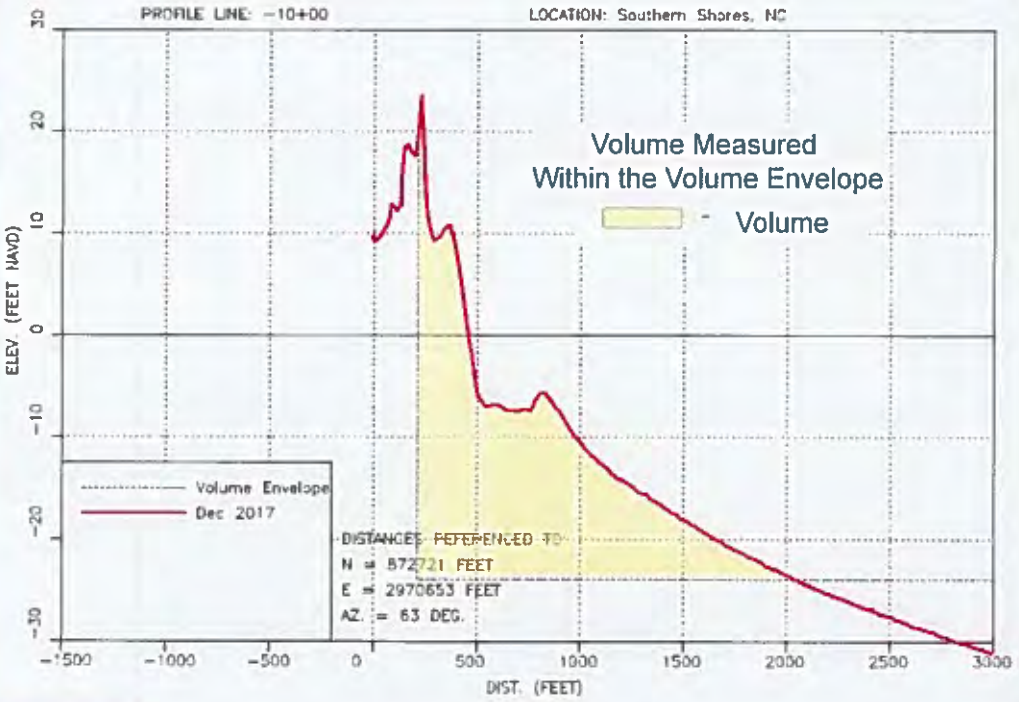
TYPES OF ASSESSMENT: SHORELINE CHANGE



TYPES OF ASSESSMENT: VOLUME CHANGE

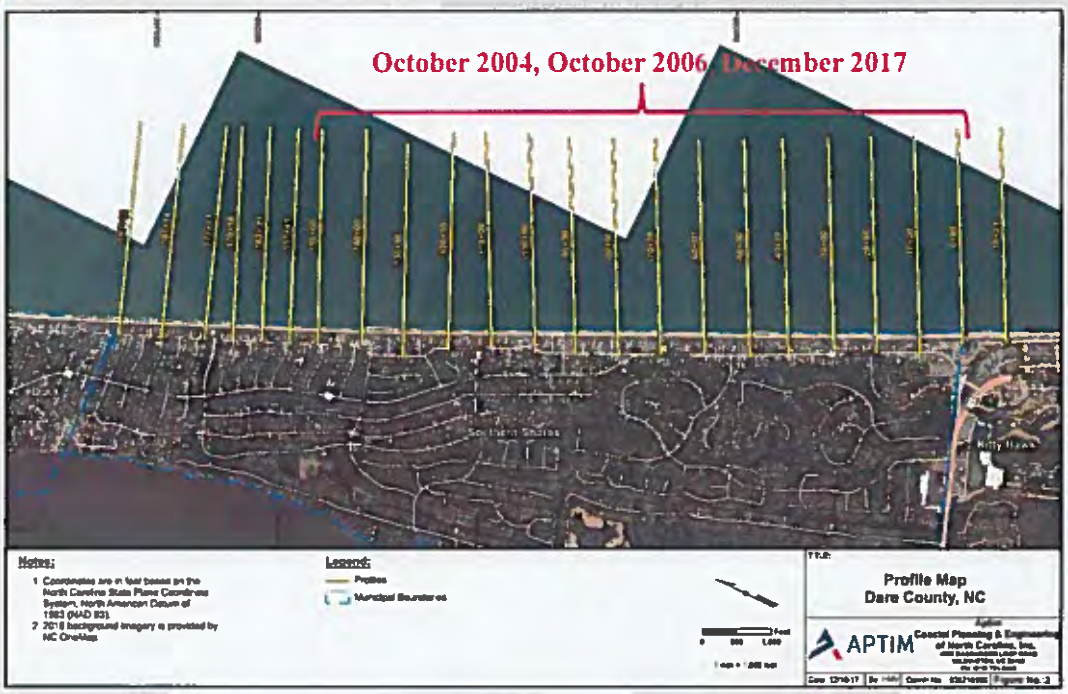


TYPES OF ASSESSMENT: VOLUME ENVELOPE



RESULTS:

October 2004 To October 2006
October 2006 To December 2017

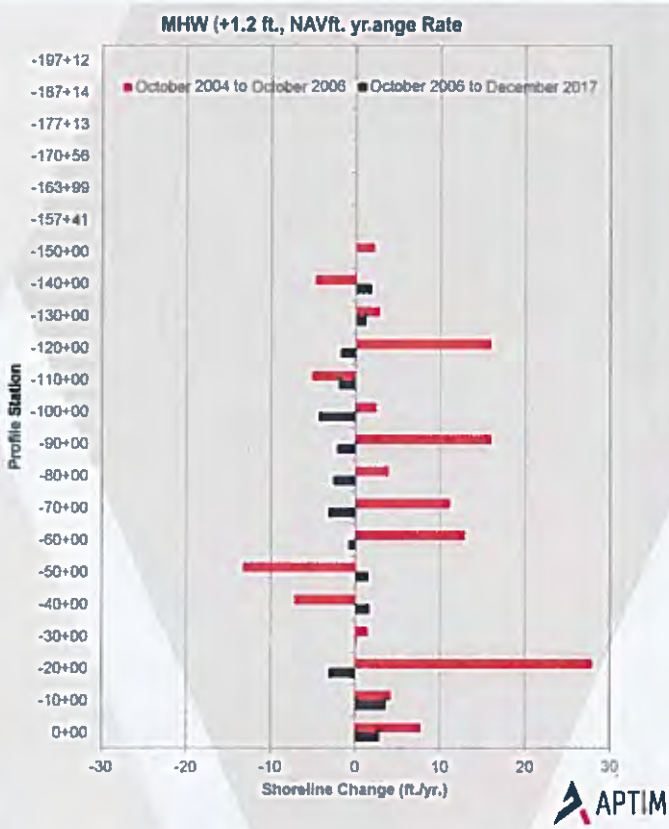


SHORELINE CHANGE:

Oct. 2004 to Oct. 2006

and

Oct. 2006 to Dec 2017

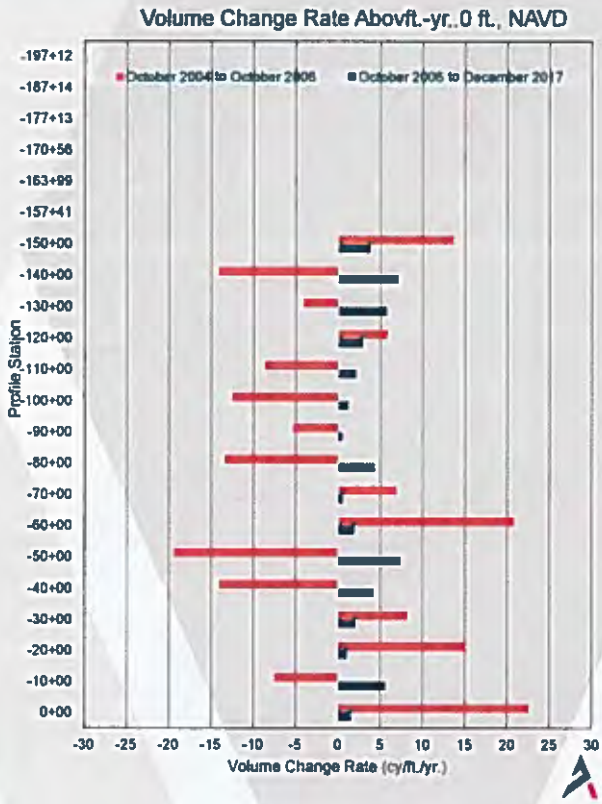


VOLUME CHANGE:

Oct. 2004 to Oct. 2006

and

Oct. 2006 to Dec 2017

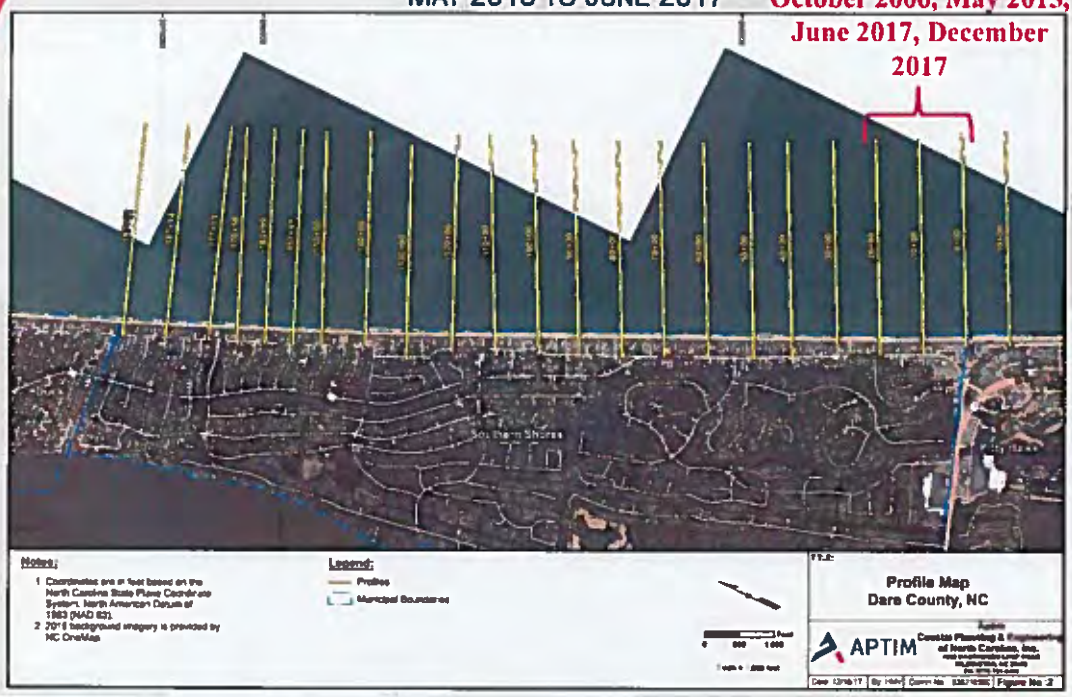


APTIM

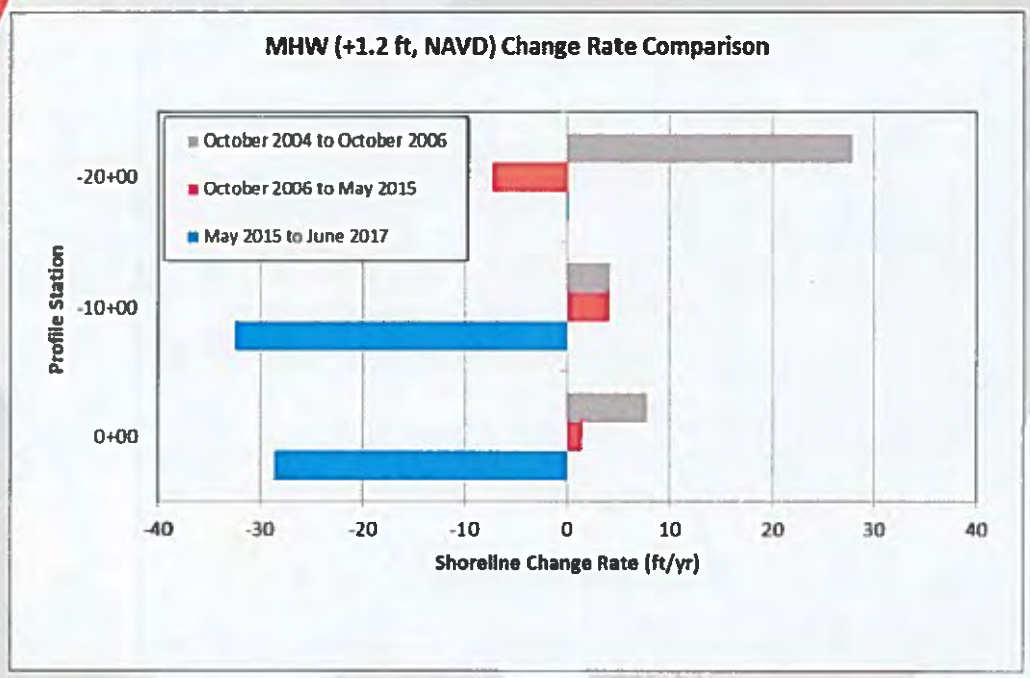
RESULTS:

Oct 2004 To Oct 2006
Oct 2006 To May 2015
May 2015 to June 2017

Fill Area: October 2004, October 2006, May 2015, June 2017, December 2017



SHORELINE CHANGE: FILL AREA



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VOLUME CHANGE: FILL AREA

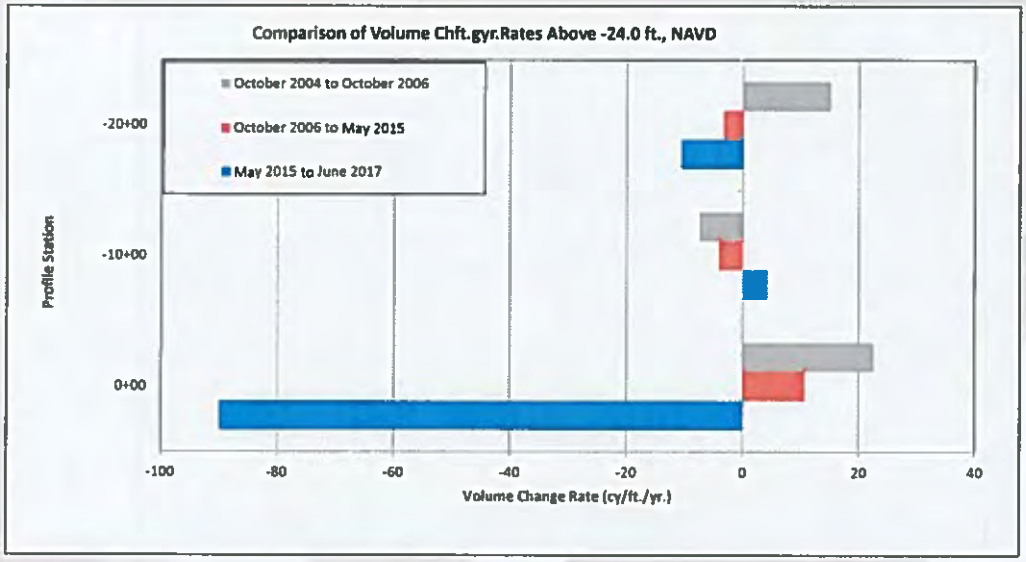

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FIGURE 14. PHOTOS COMPARING THE FILL AREA IN MAY 2015 AND JANUARY 2017.

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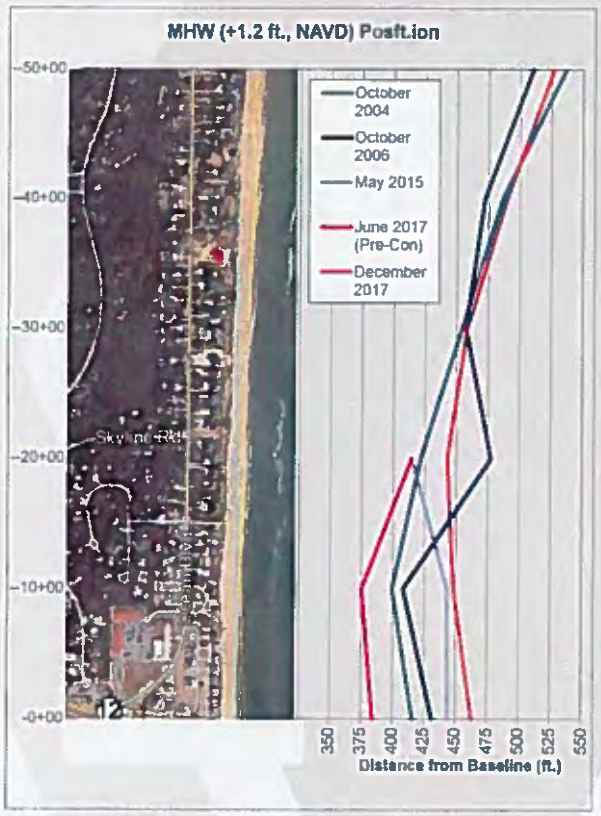
FIGURE 9. MHW SHORELINE POSITION AS MEASURED ALONG MONITORING PROFILES BETWEEN OCTOBER 2004 AND DECEMBER 2017.



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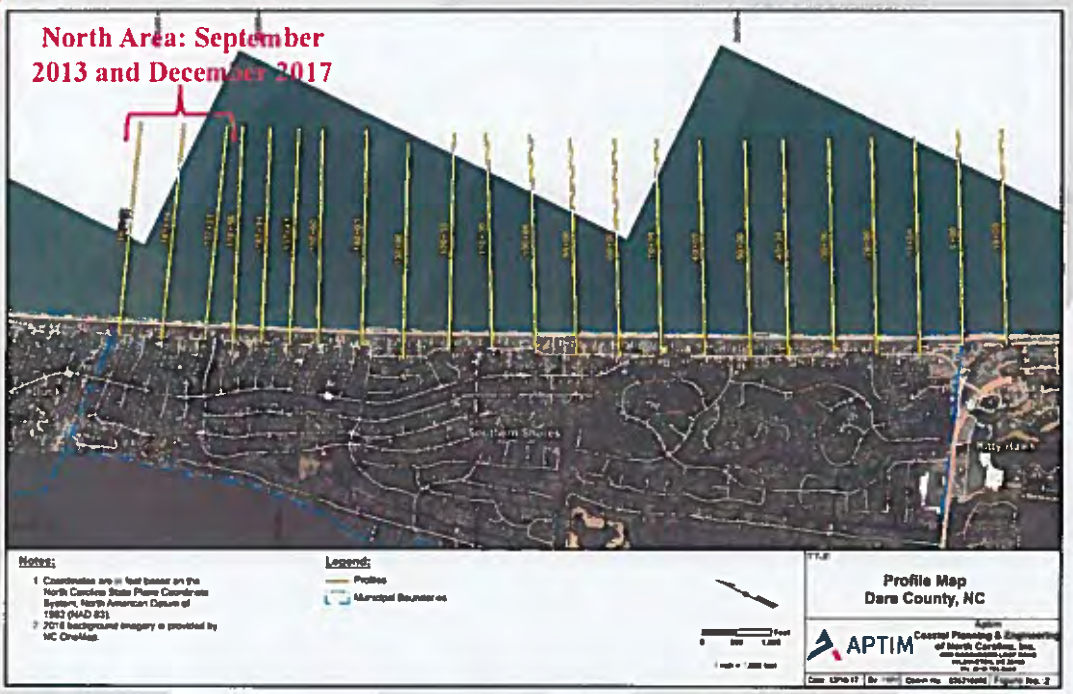
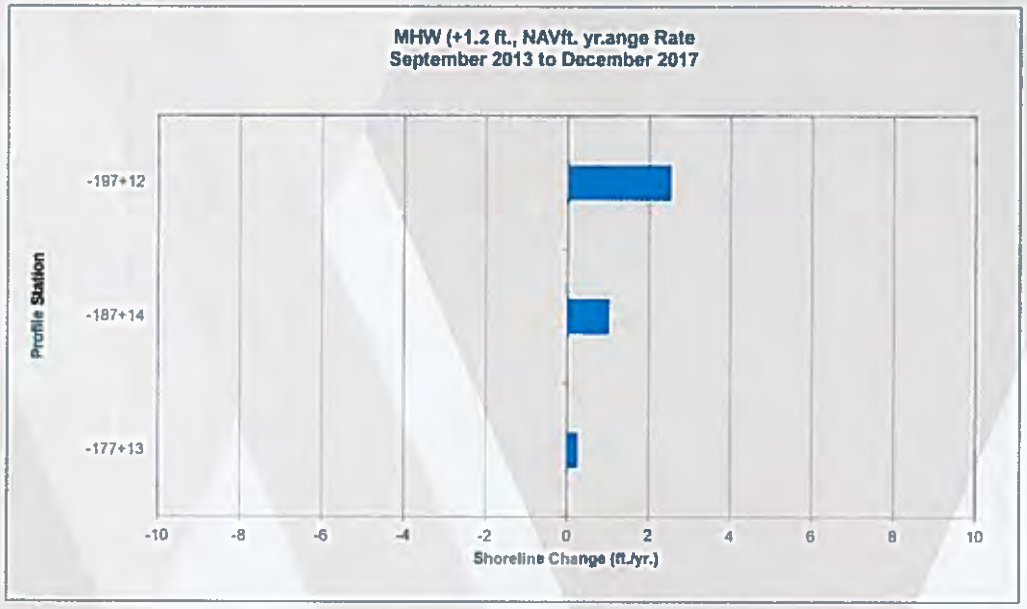
RESULTS:
SEPT. 2013 TO DEC 2017



SHORELINE CHANGE: NORTH AREA



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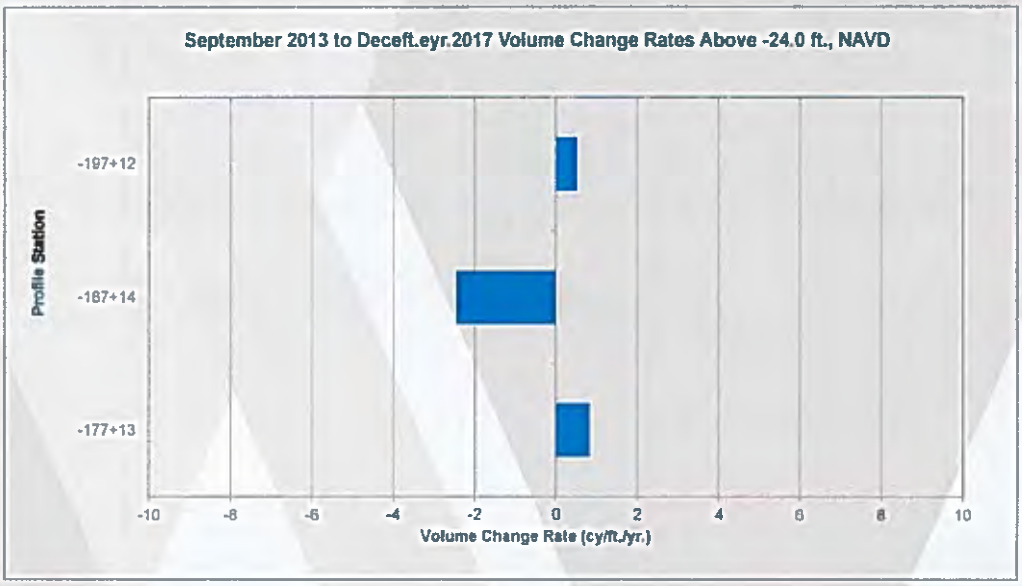
VOLUME CHANGE: NORTH AREA



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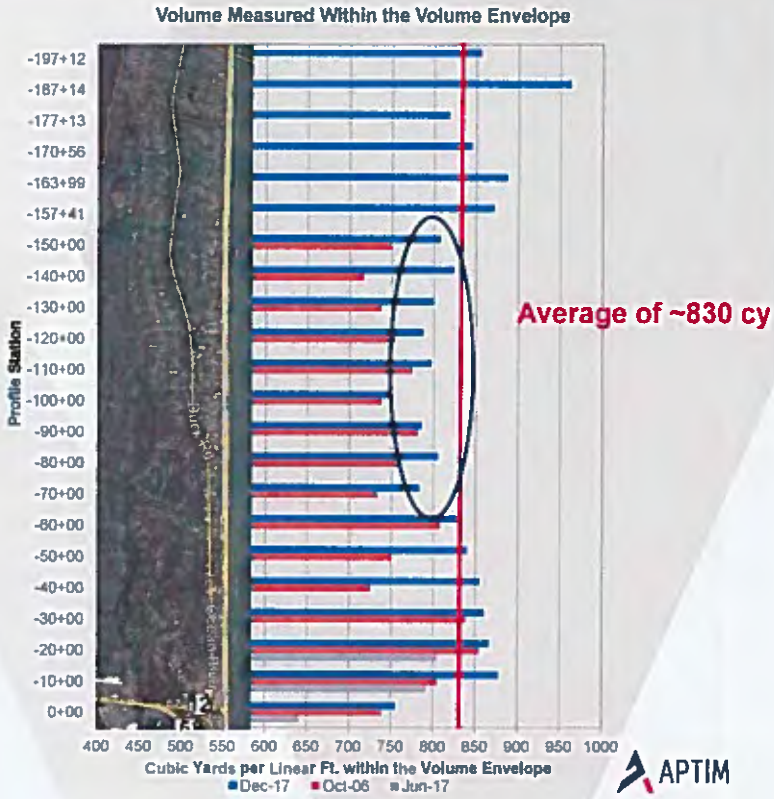

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RECOMMENDATIONS:

1. Conduct a vulnerability assessment of the oceanfront structures:
2. Continue Monitoring of the Beach Profiles:
3. Determine a Minimum Cross Section Volume:

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QUESTIONS:

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APTIM

TOWN OF SOUTHERN SHORES NORTH CAROLINA
BEACH ASSESSMENT REPORT

SUBMITTED TO:

TOWN OF SOUTHERN SHORES

SUBMITTED BY:

APTIM COASTAL PLANNING & ENGINEERING OF NORTH CAROLINA, INC.

February 2018

Aptim Coastal Planning & Engineering of North Carolina, Inc.

EXECUTIVE SUMMARY

The Town of Southern Shores undertook this study to determine long-term and short-term shoreline and volumetric changes that have occurred along its oceanfront beaches. The study is a first step toward assessing long term needs to sustain the beaches that support a significant portion of their local economy and maintains the tax base of the Town. In order to more accurately resolve the erosional and accretional trends occurring along the Southern Shores oceanfront, this report has compiled and utilized a variety of data sources collected by the US Army Corps of Engineers (USACE) Field Research Facility (FRF), Aptim Coastal Planning & Engineering of North Carolina, Inc. (APTIM) and others. This study provides valuable information to the Town regarding the current conditions of the beach and erosional and accretional trends, which will assist them in determining future coastal management needs.

The data collection process entailed the acquisition of several different existing data sets as well as conducting beach profile surveys to acquire updated beach profile data along the entire Southern Shores oceanfront beach. The data sets used include:

- The North Carolina Division of Coastal Management (NC DCM) long-term (approximately 50 years) average annual shoreline change rates;
- Beach profile data collected by the USACE Field Research Facility (FRF) along the southern 15,000 ft. of the Town of Southern Shores in 2004, 2005 and 2006;
- Beach profile data collected by APTIM in 2013 and 2015 along the southern 2,000 ft. and northern 2,000 ft. of the Town of Southern Shores;
- Beach profile data collected by Great Lakes Dredge and Dock Company in 2017 (pre-construction, before dredging (BD) and after dredging (AD) surveys) along the Town of Kitty Hawk and the southern 3,500 ft. of the Town of Southern Shores;
- Beach profile data collected by APTIM in December 2017 (post-construction) along the entire oceanfront of the Town of Southern Shores.

Based on an assessment of the various data sets available, this report examined shoreline change and volume change between the following time periods and along the following portions of the Town:

- October 2004 to October 2006 (Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary);
- October 2006 to May 2015 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary);
- May 2015 to June 2017 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary);
- October 2006 to December 2017 (Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary);
- September 2013 to December 2017 (Station -197+12 located at the northern Town Boundary to Station -177+13 located approximately 200 ft. south of 9th Ave.); and
- June 2017 to December 2017 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary).

Shoreline Change Analysis

The shoreline change analysis examined the change in the MHW line (+1.2 ft. NAVD contour). The portion of shoreline from Station -150+00 to Station 0+00 experienced an average shoreline change rate of +4.9 ft./yr. in the two-year period between October 2004 and October 2006; however extensive variability was measured from station to station. This variability may be due to the recovery of the shoreline following Hurricane Isabel, which impacted the Outer Banks region in September 2003. The average MHW shoreline change rate measured along this same portion of the shoreline during the approximately 11-year period between October 2006 and December 2017 was -0.4 ft./yr., indicating an essentially stable shoreline.

The "Fill" area (southern 2,000 ft. of the Town) experienced an average shoreline change rate of 13.3 ft./yr. between October 2004 and October 2006. This average rate was highly influenced by the MHW shoreline change measured along Station -20+00, which moved seaward 55 ft. over the two (2) year period. This relatively large variation may be due to shoreline adjustments taking place after the impact of Hurricane Isabel to the region in 2003. Over the approximately 8.6-year period from October 2006 to May 2015 the MHW shoreline rate along Station -20+00 was -7.3 ft./yr. (recession); whereas the MHW shoreline change rate along Stations -10+00 and 0+00 were 4.1 ft./yr. and 1.5 ft./yr. (advance), respectively. Between May 2015 and June 2017, the fill area, specifically profiles -10+00 and 0+00 experienced severe shoreline retreat, which prompted the Town to pursue the beach fill project. Surveys conducted in May 2015 and June 2017 show that over the 25-month period, Stations -10+00 and 0+00 experienced shoreline change of -67.6 ft. and -59.5 ft., respectively.

A comparison of the December 2017 data with data collected in September 2013 as part of an assessment completed for the Town of Duck, provided insight into shoreline change along the northern 2000 ft. of the Town's oceanfront. An average MHW shoreline change rate of 1.3 ft./yr. was measured between Stations -197+12 (northern Town Limit) and -177+13 (approximately 200 feet south of 9th Ave.). This suggests the shoreline in this area was fairly stable between September 2013 and December 2017.

Volume Change Analysis

The volume change analysis examined the changes in the volume measured along profiles above the -24 ft. NAVD88 contour. The depth of -24 ft. NAVD88 was used as the depth of closure in the design of the beach nourishment projects constructed as part of the multi-town project in 2017. Similarly to what was found in the shoreline change analysis, between October 2004 and October 2006, there was a considerable amount of variability in the volume change rates measured between Stations -150+00 and 0+00. Although the average volume change rate through this portion of the Town over the 2-year period was only -0.4 cy/ft./yr., the individual volume change rates along the profiles varied from -19.4 cy/ft./yr. to +22.6 cy/ft./yr. The overall variability in volume change may be due to the response of the beach following Hurricane Isabel, which impacted the Outer Banks region in September 2003. In comparison, the average volume change rate measured along this same portion of the shoreline (Stations -150+00 to 0+00) during the approximately 11-year period between October 2006 and December 2017 was 3.2 ft./yr. (accretion). Far less variability in the volume change rates were observed from station to station over the approximately 11-year

period. The volume change along each of the 16 profiles exhibited an accretional trend during this period.

Between October 2004 and October 2006, the "Fill" area experienced a positive volume change of approximately 23,000 cy. Stations -20+00 and 0+00 exhibit positive volume change rates; whereas Station -10+00 experience an erosional rate of -7.5 cy/ft./yr. Over the approximately 8.6-year period from October 2006 to May 2015, profiles at Stations -20+00 and -10+00 experienced negative volume change rates of -3.3 and -4.1 cy/ft., respectively; whereas the profile at Station 0+00 saw a significant increase in volume, with a calculated volume change rate of 10.8 cy/ft./yr. Between May 2015 and June 2017, a net negative volume change of approximately 93,000 cubic yards was measured in the fill area. This was largely driven by the losses between Stations -10+00 and 0+00 of approximately 88,000 cy over a 1,000 ft. length of beach. These dramatic changes prompted the Town to initiate the 2017 beach fill project. Based on the data analyzed in this study and discussions with Town officials, the dramatic erosion that took place between May 2015 and June 2017 was unprecedented. The reason for the accelerated erosion rates may be associated with variations in the offshore bathymetry that resulted in the variations of wave approaches to shore. Such variations can have dramatic effects on long shore transport of sand and result in locally high erosion or hot spot areas.

A comparison of the December 2017 data and data collected in September 2013 as part of an assessment completed for the Town of Duck showed an average volume change rate of -0.4 cy/ft./yr. was measured between Stations -197+12 (northern Town Limit) and -177+13 (approximately 200 feet south of 9th Ave.). This area exhibited relatively stable volume change over the approximately 4.25-year period.

Executive Summary Table 1 lists the average volumetric change rates above the -24 ft. contour for 1) all profiles from Stations -150+00 to 0+00; 2) profiles from Stations -20+00 to 0+00 (Fill Section); and 3) profiles from Stations -197+12 to -177+13 (North Section).

Executive Summary Table 1. Average volume change rates above the -24 ft. contour.

	Stations -150+00 to 0+00 16 Profiles	Fill Section (Stations -20+00 to 0+00) 3 Profiles	North Section (Stations -197+12 to -177+13) 3 Profiles
Volume Change Rate (CY/Ft./Yr.)			
October 2004 to October 2006	-0.4 cy/ft/yr.	10.1 cy/ft/yr.	
October 2006 to May 2015		1.1 cy/ft/yr.	
May 2015 to June 2017		-31.7 cy/ft/yr.	
October 2006 to December 2017	3.2 cy/ft/yr.	2.7 cy/ft/yr. *	
September 2013 to December 2017			-0.4 cy/ft/yr.

* Rate includes the impact of the beach fill project constructed in August 2017

In order to evaluate the profiles for which no historical data existed, the total volume measured along each profile above the -24 ft. NAVD88 contour and seaward of the +20 ft. contour on the landward side of the dune, was calculated. This area of the profile is referred to in this report as the volume envelope. Comparing the volume measured in the volume envelope along the Town's oceanfront allows for the relative comparison of each profile.

The average volume within the envelope measured along all 22 profiles in December 2017 was 830 cy/ft. The area from Station -150+00 (located near 3rd Ave.) to Station -70+00 (located approximately 500 ft. south of where Ocean Blvd. and Duck Rd. meet), is relatively less than the portions of Southern Shores to the north and south of this section. The average volume within the envelope measured along the nine (9) profiles from Stations -150+00 to -70+00 is 793 cy/ft. The average volume within the volume envelope measured along the six (6) profiles to the north from Stations -197+12 to -157+41 was 873 cy/ft. and the volume measured along the seven (7) profiles to the south from Stations -60+00 to 0+00 is 840.9 cy/ft.

Although the volume of sand present within the envelope provides for a way of making relative comparisons between one profile and another, this volume is not necessarily indicative of the vulnerability of structures in a given vicinity. In this regard, the greater the distance a given structure is set back from the dune the higher the level of storm damage reduction. A qualitative assessment of the distance structures are set back from the vegetation line was made using publicly available satellite imagery from Google Earth. A visual examination of imagery from March 2017 shows that houses are generally situated closest to the vegetation line between Stations -140+00 and -100+00 and along the very southern part of the Town between Stations -10+00 and 0+00. Houses located between Stations -157+00 and -140+00 and Stations -100+00 to -70+00 generally appear to have a relatively moderate setback. The area north of Station -157+00 and between Stations -40+00 and -20+00 appear to have the greatest setback from the edge of vegetation.

Recommendations

Based on the analysis and conclusions discussed in this report, APTIM makes the following recommendations:

1. **Conduct a vulnerability assessment of the oceanfront structures:** The vulnerability assessment employs a profile-based storm simulation model called SBEACH. A similar assessment was conducted during the design phase of the Duck and Kill Devil Hills Beach Projects. The vulnerability assessment can both identify structures that may be vulnerable to a specific design storm and determine the design requirements to avoid impacts to a design storm.
2. **Continue Monitoring of the Beach Profiles:** In order to monitor the shoreline and volume change trends along the Town's oceanfront shoreline, Southern Shores should implement an annual beach profile monitoring program starting in spring 2019. Coordinating with monitoring that is occurring along the Towns of Duck and Kitty Hawk may provide cost savings to the Town in data acquisition.

3. **Determine a Minimum Cross Section Volume:** Based on the results of the vulnerability analysis and the beach fill design for the Towns of Duck and Kill Devil Hills, the Town should determine the ideal minimum cross section volume it should maintain in order to provide an acceptable level of storm damage reduction.

Through the implementation of these recommendations, the Town of Southern Shores can determine what level of storm damage mitigation is currently in place, where vulnerability exists, and project if, and when, beach nourishment may be required. With this information, the Town can then determine the financial needs necessary to maintain an acceptable level of storm damage mitigation.

Given the active programs established in Dare County for beach nourishment, the Town of Southern Shores is well positioned to develop a long-term management program that leverages cost saving opportunities realized through multi-town cooperation as was seen during the 2017 beach fill project. Furthermore, by developing a management plan before the beach reaches a critically eroded state, the Town may be able to maintain a greater level of storm damage reduction.

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A 2017 Dare County, NC Post Construction and Monitoring Beach Profile Survey Report: Town of Duck, Town of Southern Shores, Town of Kitty Hawk, and Town of Kill Devil Hills

BEACH ASSESSMENT
TOWN OF SOUTHERN SHORES, NC

INTRODUCTION

The Town of Southern Shores undertook this study to determine long-term and short-term shoreline and volumetric changes that have occurred along its oceanfront beaches. The study is a first step toward assessing long term needs to sustain the beaches that support a significant portion of their local economy and maintains the tax base of the Town. Infrastructure protection, storm damage mitigation and rapid recovery from storm events are important considerations for any oceanfront community. This study consisted of two phases referred to as (1) data collection and (2) beach analysis. The results of the study establish long-term and short-term trends in shoreline movement and volume change.

The State of North Carolina's Division of Environmental Quality publishes long-term average annual shoreline change rates for the entire coast of North Carolina, for the sole purpose of establishing oceanfront construction setback factors. The change rates, which utilize the endpoint method, typically represents the rate change as measured from aerial photos over 50 years. While these general trends may be sufficient for establishing construction setback guidance, more detailed shoreline and volume change analyses are typically used to determine higher resolution erosional and accretional trends both spatially and temporally.

In order to more accurately resolve the erosional and accretional trends occurring along the Southern Shores oceanfront, this report has compiled and utilized a variety of data sources collected by the US Army Corps of Engineers (USACE) Field Research Facility (FRF), Aptim Coastal Planning & Engineering of North Carolina, Inc. (APTIM), and others.

PROJECT LOCATION

The Town of Southern Shores is located on the Outer Banks of North Carolina approximately 29 miles south-southeast of the North Carolina and Virginia border. The Town encompasses approximately 9.9 square miles extending along 3.7 miles of Atlantic Ocean shoreline from the Town of Duck south-southeast to the Town of Kitty Hawk. A location map is provided in Figure 1.

During initial public discussions regarding this beach assessment study, an erosion hot spot spanning approximately 1,500 ft. along the southern most portion of the Town of Southern Shores was identified. In the spring of 2016, three other beach towns in Dare County (Kill Devil Hills, Kitty Hawk, and Duck) obtained permits and authorizations to construct a multi-town beach nourishment project, proposed to be constructed in 2017. To address the immediate erosion hot spot identified along the Town's southern boundary, the Town of Southern Shores coordinated with Dare County, the Town of Kitty Hawk and APTIM, and sought and obtained permits and authorizations to provide a one-time beach nourishment project that would include sand placement along the most critically eroded portion of the Town's shoreline. Figure 1 shows the location of the Southern Shores project in relation to the other three (3) beach projects in northern Dare County. The Southern Shores portion of this project was constructed in cooperation with Dare County and the Towns of Duck, Kitty Hawk, and Kill Devil Hills in early August 2017.

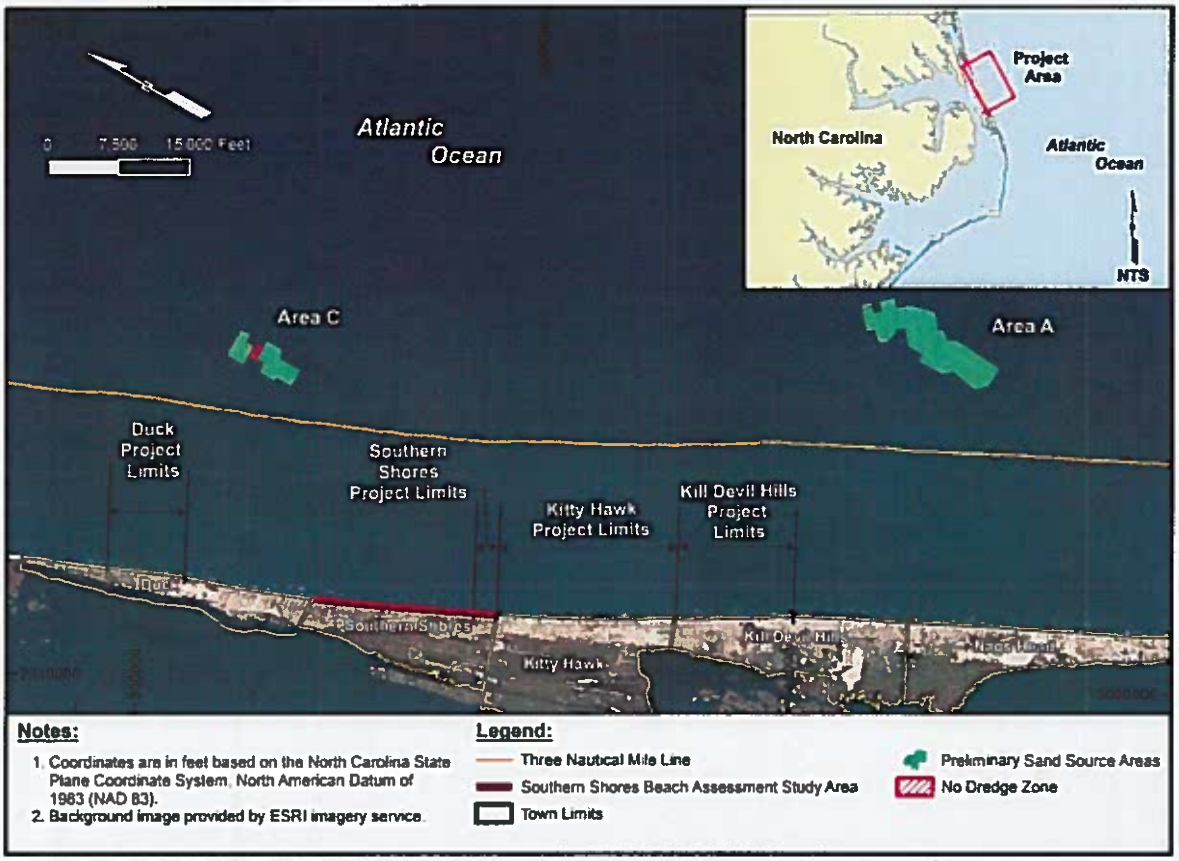

Figure 1. Project Location Map.

DATA COLLECTION

The data collection process entailed the acquisition of several different existing data sets as well as conducting beach profile surveys to acquire updated beach profile data along the entire Southern Shores oceanfront beach. Figure 2 shows the locations of the beach profile stations along the oceanfront shoreline of Southern Shores. The data sets used include:

- The North Carolina Division of Coastal Management (NC DCM) long-term (approximately 50 years) average annual shoreline change rates;
- Beach profile data collected by the USACE Field Research Facility (FRF) along the southern 15,000 ft. of the Town of Southern Shores (Stations -150+00 to 0+00) in 2004, 2005 and 2006;
- Beach profile data collected by APTIM in 2013 and 2015 along the southern 2,000 ft. (Stations -20+00 to 0+00) and northern 2,000 ft. of the Town of Southern Shores (Stations -197+12 to -177+13);
- Beach profile data collected by Great Lakes Dredge and Dock Company in 2017 (pre-construction, before dredging (BD) and after dredging (AD) surveys) along the Town of

Kitty Hawk and the southern 2,000 ft. of the Town of Southern Shores (Stations -20+00 to 0+00);

- Beach profile data collected by APTIM in December 2017 (post-construction) along the entire oceanfront of the Town of Southern Shores (Stations -197+12 to 0+00).

Though numerous historical data sets were used to evaluate shoreline and volume change rates, the beach profile surveys conducted by APTIM in December 2017 represent the first Town-wide beach profile survey and will serve as a baseline for future monitoring and analysis. The December 2017 surveys consist of a total of 22 profiles with a spacing of roughly 1,000 feet (Stations -197+12 to 0+00). Concurrently with this survey, APTIM conducted beach profile surveys for the Towns of Duck and Kitty Hawk, which provided data to assess the shorelines in proximity to the northern and southern Town boundaries. Survey data along the Town of Southern Shores were collected along the transects listed in Table 1. Coordinates shown in Table 1 are referenced to the North Carolina State Plane coordinate system in feet NAD83 and the profile azimuth refers to degrees referenced to true north. Transects listed in Table 1 are shown graphically in Figure 2. The complete survey report, which includes detailed plan view maps and comparative profile cross sections, is included as Appendix A.

Notes:

1. Coordinates are in feet based on the North Carolina State Plane Coordinate System, North American Datum of 1983 (NAD 83).
2. 2016 background imagery is provided by NC OneMap.

Legend:

- Profiles
- Municipal Boundaries

Feet
0 800 1,600

1 inch = 1,600 feet

TITLE:

Profile Map
Dare County, NC

APTIM

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4838 MASONBORO LOOP ROAD
WILMINGTON, NC 28409
PH. (910) 791-4484

Date: 12/18/17	By: HMV	Comm No. 636216500	Figure No.:2

Table 1. Profile Survey Baseline and Azimuth

Profile[1]	Easting	Northing	Azimuth
-197+12	2962840	889616.1	70
-187+14	2963230	888697.7	70
-177+13	2963619	887775.8	70
-170+56	2963880	887172.9	66.6
-163+99	2964142	886569.9	66.6
-157+41	2964403	885966.9	66.6
-150+00	2964665	885364.0	65.3
-140+00	2965116	884444.0	65.3
-130+00	2965239	883452.0	65.3
-120+00	2965920	882604.0	65.3
-110+00	2966366	881697.0	62.6
-100+00	2966790	880778.0	62.6
-90+00	2967110	879895.0	62.6
-80+00	2967533	878988.0	62.6
-70+00	2967951	878106.0	62.6
-60+00	2968381	877175.0	62.6
-50+00	2968838	876228.0	62.6
-40+00	2969249	875440.0	62.6
-30+00	2969732	874496.1	62.6
-20+00	2970190	873607.2	62.6
-10+00	2970653	872721.0	62.6
0+00	2971224	871890.8	62.6

[1]Southern Shores transects (XX+XX) based on USACE baseline

NC DCM Long-Term Average Annual Shoreline Change Rates

As described on the North Carolina Division of Environmental Quality's website (https://deq.nc.gov/about/divisions/coastal-management/coastal-management-oceanfront-shorelines/oceanfront-construction-setback-erosion-rate) long-term average annual shoreline change rates are computed for the sole purpose of establishing oceanfront construction setback factors. The change rates are calculated using the endpoint method, which uses the earliest and most current shoreline data points where they intersect a given shore-perpendicular transect. The distance between the shoreline position of the two data sets is computed and divided by the time between the data sets. Typically, the State rates represent a 50-year rate. The shoreline position change rate information provided by the State is admittedly not predictive, nor does it reflect the short-term erosion that can occur during storms.

USACE FRF Beach Profile Data

The 2004, 2005 and 2006 beach profile survey data was collected as part of the Dare County Beaches, Shore Protection Project. The physical monitoring program initiated by the USACE as part of the Dare County Beaches project included beach profile surveys from approximately 3rd Ave. in Southern Shores south to Oregon Inlet. Although the Dare County Beaches federal storm damage reduction project was authorized by Congress in 2000, sufficient construction funds were never appropriated and the project was never constructed. However, the data collected by the USACE FRF in 2004, 2005 and 2006 provided useful data for this assessment.

The USACE FRF utilized a combination of data acquisition techniques during the beach profile surveys. A Lighter Amphibious Resupply Cargo vessel or LARC equipped with Real Time Kinematic (RTK) GPS, a Knudsen 320BP dual frequency fathometer and a VT TSS Ltd. DMS Series 3-25 heave, roll, and pitch sensor was used to collect data from the toe of the dune out to a depth of approximately 30 ft. Topographic or beach portions of the profiles were obtained with a backpack mounted Trimble 4700 RTK system. Points along the profile were surveyed approximately every 10 ft. On each profile the topographic surveys overlapped the LARC surveys for quality control purposes. Additional information on the USACE FRF data collection methodology can be found in USACE, 2004.

Great Lakes Dredge and Dock 2017 Construction Data

As part of the 2017 construction project, Great Lakes Dredge and Dock Company conducted three sets of surveys along the Town of Kitty Hawk and along the southern 2,500 ft. of Southern Shores. A pre-construction survey was conducted at 500 ft. intervals in early June 2017, which includes the dune, berm, shoreface and nearshore zone out to a depth of between -20.0 and -25.0 ft. NAVD88. The profiles located along the Southern Shores oceanfront included in the pre-con survey were Stations 0+00, -5+00, -10+00, -15+00, -20+00, and -25+00. A before dredge (BD) and an after dredge (AD) survey was also conducted along each 100 ft. station along the Southern Shores project area between Stations 0+00 and -25+08; however the BD and AD surveys were not used in this analysis as the data only extends out to a depth of approximately -12.0 ft. NAVD88.

The standards used for the pre-construction surveys conducted by Great Lakes required that a sufficient number of points be surveyed along each profile line to ensure adequate description of all topographic features, and major breaks in slope, including dunes, beach berms, foreshore, and bar trough systems, with a maximum elevation difference of approximately 1 foot between adjacent points and a maximum horizontal distance of 25 feet between adjacent points. All surveys within the pay template were performed with RTK technology. Vertical accuracy met or exceeded 0.3 feet and horizontal accuracy met a maximum of 3.0 feet tolerance. Surveys extended a minimum distance of 250 ft. seaward of the construction toe of fill.

APTIM Beach Profile Data

In 2015, APTIM conducted beach profile surveys for the Towns of Duck and Kitty Hawk in preparation for the development of the plans for the 2017 beach nourishment projects. The survey conducted in May 2015 included profiles within the northern and southern 2,000 ft. of the Town

of Southern Shores. Furthermore, during the design of the two projects, APTIM conducted a survey in September 2013 and April 2014 for the Towns of Duck and Kitty Hawk, respectively. These surveys also included the northern and southern 2,000 ft. of the Southern Shores oceanfront. Finally, in December 2017, following the construction of the multi-town beach nourishment projects in northern Dare County, APTIM conducted a beach profile survey along the entire Southern Shores Oceanfront as well as the Towns of Duck and Kitty Hawk. All of the APTIM surveys include a topographic survey of the dune, berm, and foreshore section of the beach and a bathymetric survey of the offshore portion of the profile.

Beach profiles extended landward from the beach toward the baseline until a structure was encountered or a range of 25 feet beyond the dune was reached, whichever was more seaward. Elevation measurements were also taken seaward along the profile to a range of 2,500 feet beyond the shoreline or to the -30 NAVD88 contour, whichever was more landward.

Land-based or "upland" data collection includes all grade breaks and changes in topography to provide a representative description of the conditions at the time of the work. The maximum spacing between data points along individual profiles is 25 feet. The upland work extended into wading depths sufficiently to provide a minimum 50-foot overlap with the offshore data. This overlap between the topographic and bathymetric surveys provides quality control and quality assurance of the survey.

The hydrographic survey work or "offshore" portions of the beach profiles was conducted with an Odom Hydrotrac depth sounder at 200 kHz and RTK GPS systems. Tide corrections were obtained redundantly through the use of RTK GPS and the tide station located at the USACE FRF in Duck, North Carolina. Offshore data points were collected with a maximum spacing of 25 feet.

Horizontal and vertical positioning checks were conducted to verify the accuracy was within a horizontal limit of 3 feet and a vertical limit of 0.5 ft. for all electronic equipment. Vertical positioning checks for depth measuring equipment were conducted at 5 ft. increments between the minimum and maximum depths expected. These specifications meet the Minimum Performance Standards for the U.S. Army Corps of Engineers (USACE) (EM 1110-2-1003).

Based on an assessment of the various data sets available, this report examined shoreline and volume change between the following periods and along the following portions of the Town:

- October 2004 to October 2006 (Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary);
- October 2006 to May 2015 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary);
- May 2015 to June 2017 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary);
- October 2006 to December 2017 (Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary);
- September 2013 to December 2017 (Station -197+12 located at the northern Town Boundary to Station -177+13 located approximately 200 ft. south of 9th Ave.); and
- June 2017 to December 2017 (Fill Area Only: Station -20+00 located approximately 150 feet south of Skyline Road to Station 0+00 located at the southern Town Boundary)

SHORELINE CHANGE ANALYSIS

As previously mentioned, the State of North Carolina maintains long-term shoreline change rates for the States shoreline for the sole purpose of establishing construction setbacks. Figure 3 shows a map from the NC DEQ website depicting the long-term oceanfront setback factors (SBF) for the Town of Southern Shores. The SBF for the entire Town is 2.0 ft., which means that the calculated long-term shoreline change rate is 2 feet or less per year over the long term as measured by the State. However, as noted by the State in their disclaimer, the shoreline position change rates are not predictive and do not reflect short-term erosion that can occur over shorter periods of time (i.e. decadal, seasonally or during storm events).

Figure 3. Map showing the SBF for the Town of Southern Shores from (https://deq.nc.gov/about/divisions/coastal-management/coastal-management-oceanfront-shorelines/oceanfront-construction-setback-erosion-rate)

Using available beach profile data, a shoreline change analysis was conducted to assess shoreline advance and recession where data were available along the study area between 2004 and 2017. As it relates to shoreline change, the "shoreline" is typically defined as a specified elevation contour. For this study, the shoreline was defined as the Mean High Water (MHW) contour, which represents the +1.2 feet NAVD elevation. Shoreline change is calculated by comparing shoreline

position along shore perpendicular transects. Figure 4 shows a typical comparison plot of two beach profile surveys conducted approximately 2 years apart along Station -10+00, illustrating graphically how the shoreline change is measured. Shoreline change is provided in terms of the actual linear change measured between surveys and as a rate in an annualized form. The rate is calculated by dividing the measured distance of shoreline change by the time period (number of years) between survey events (i.e. feet per year). These rates are described in terms of positive ("+") or advance (shoreline moving seaward) and negative ("-") or recession (shoreline moving landward).

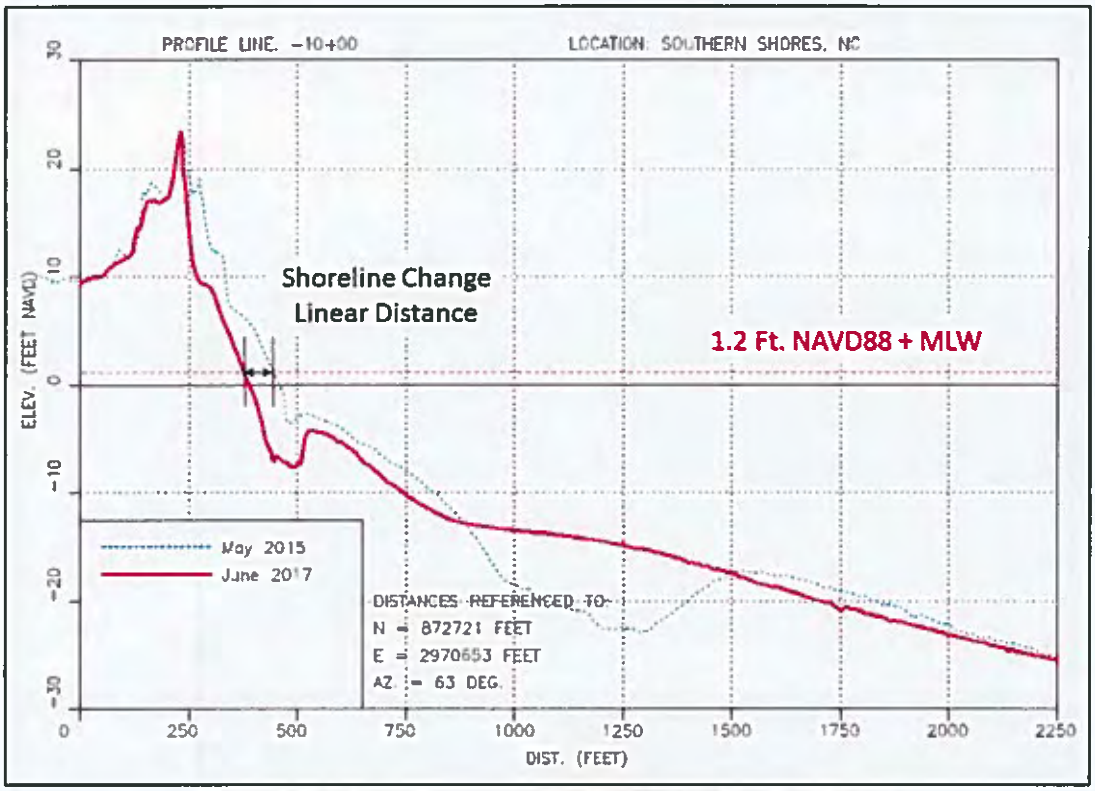


Figure 4. Beach profile cross section illustrating shoreline change.

October 2004 to October 2006:

Data collected along approximately 1,000 ft. spaced profiles from approximately 3rd Ave. (Station -150+00) south to the southern Town limit of Southern Shores in October 2004 and October 2006 was examined to compare the MHW (+1.2 Ft. NAVD) location and determine shoreline change rates. Both of these data sets were collected by the USACE FRF.

The average MHW shoreline change rate measured between October 2004 and October 2006 between Stations -150+00 and 0+00 was +4.9 ft./yr. (shoreline advanced seaward). Although the average shoreline change was positive, a profile by profile comparison shows variation ranging

from -13.3 ft./yr. at Station -50+00 (approximately 450 ft. south of Chicahauk Tr.) to +27.9 ft./yr. at Station -20+00 (approximately 130 ft. south of Skyline Rd.). The MHW shoreline change rates measured between October 2004 and October 2006 for each profile between Stations -150+00 and 0+00 are shown in Figure 5. Figure 5 also includes shoreline change rates measured between October 2006 and December 2017, which are described later in this report.

The average MHW shoreline change rate was also calculated within the area in which fill was placed as part of the 2017 beach nourishment project (Stations -20+00 to 0+00). The beach fill placed during the 2017 project in the Town of Southern Shores was placed between Stations -25+00 and 0+00 and therefore, we refer to the analyses in this report that compares data from Stations -20+00 to 0+00 as the "fill area". The average MHW shoreline change rate measured between October 2004 and October 2006 in the fill area was +13.3 ft./yr. (shoreline advanced seaward). All three profiles evaluated within the fill area between October 2004 and October 2006 showed a seaward movement of the MHW line.

October 2006 to May 2015:

In May 2015, APTIM surveyed the Town of Kitty Hawk as part of the final design development for their beach nourishment project. That survey included the three profiles between Skyline Dr. and the southern town limit of Southern Shores (Stations -20+00, -10+00 and 0+00), referred to as the "fill area".

The position of the MHW shoreline in the fill area at the time of the October 2006 survey was compared to the position measured during the May 2015 survey. An average MHW shoreline change of -5.2 ft. was measured over the approximately 8.6-year period. This equates to an average MHW shoreline change rate of -0.6 ft./yr. Although the average shoreline change and shoreline change rate are relatively low, a profile by profile comparison shows a wide range of changes in the MHW position between the two surveys. The measured MHW shoreline change at Station -20+00 from October 2006 to May 2015 was -63.1 feet; whereas, the change measured along Stations -10+00 and 0+00 over the same time period was +35.0 ft. and +12.6 ft., respectively.

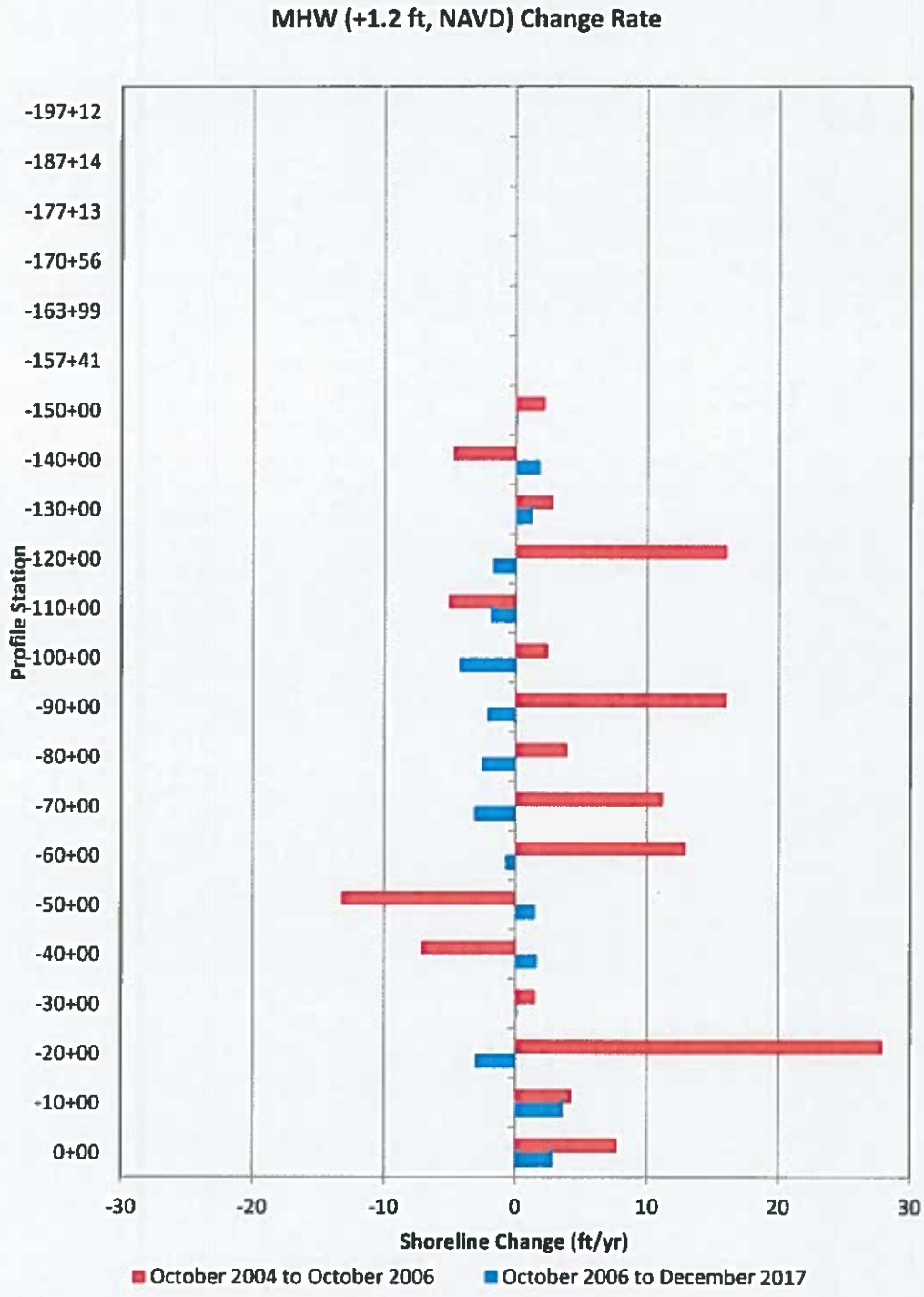


Figure 5. Shoreline change rate measured between October 2004 and October 2006, and October 2006 and December 2017 between Stations -150+00 and 0+00.

May 2015 to June 2017:

In June 2017, Great Lakes Dredge and Dock Company conducted a pre-construction survey of the fill area (Stations -20+00 to 0+00), as part of the 2017 construction project. The position of the MHW shoreline in the fill area at the time of the May 2015 survey was compared to the position measured during the June 2017 pre-construction survey. An average MHW shoreline change of -42.2 ft. was measured over the 25-month period. This equates to an average MHW shoreline change rate of -20.3 ft./yr. This is a significant increase in the rate from that which was measured in the same area between October 2006 and May 2015, which was -0.6 ft./yr. The rate measured along the profile at Station -20+00 was essentially unchanged (0.2 ft./yr.); whereas the rate measured along Stations -10+00 and 0+00 were -32.4 ft./yr. and -28.6 ft./yr., respectively.

Figure 6 shows the comparison of the MHW shoreline change rate for each profile in the fill area measured between October 2004 and October 2006; October 2006 and May 2015; and May 2015 and June 2017.

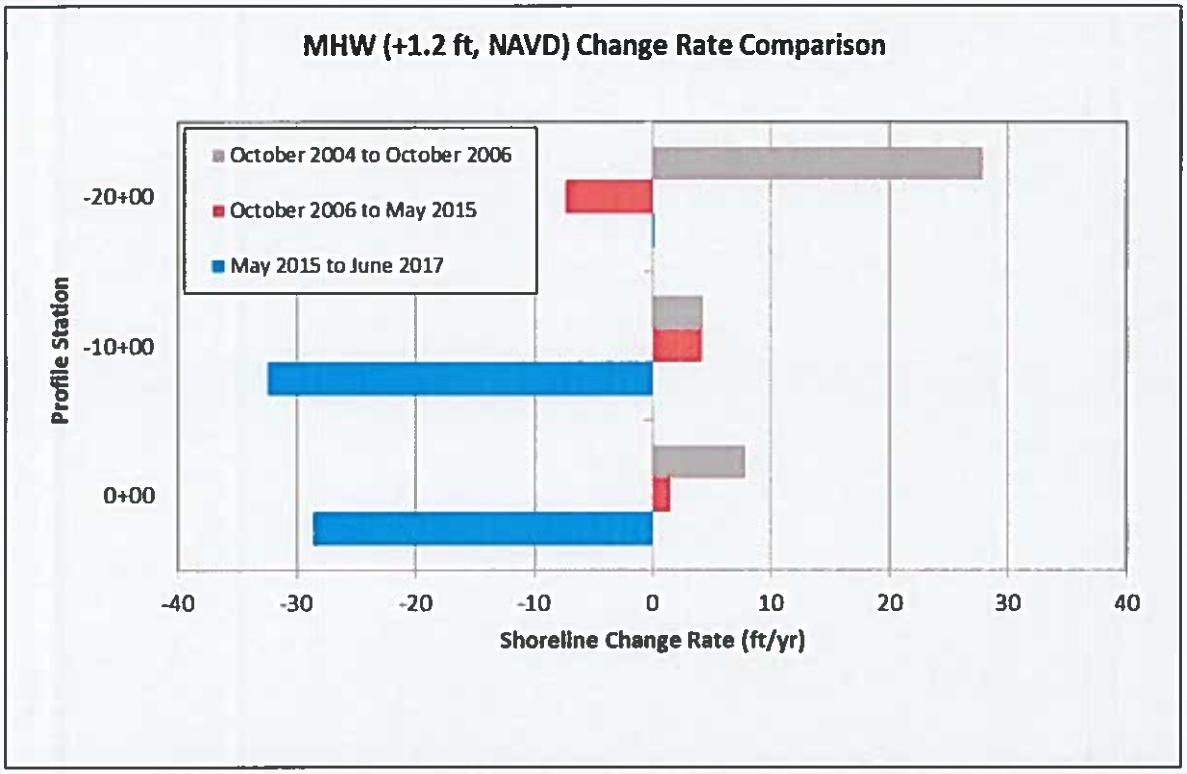


Figure 6. Shoreline change rates measured in the "Fill Area" between Oct. 2004 and Oct. 2006 (gray), Oct. 2006 and May 2015 (orange), and May 2015 and June 2017 (blue).

October 2006 to December 2017:

In December 2017, APTIM conducted beach profile surveys along the entire oceanfront of Southern Shores. All 22 beach profiles from Station -197+12 at the northern town boundary to Station 0+00 at the southern town boundary were surveyed. The position of the MHW shoreline along the portion of beach from Stations -150+00 to 0+00, was compared to the position of the MHW shoreline measured during the 2006 survey conducted by the USACE FRF. An average MHW shoreline change of -4.9 ft. was measured over the approximately 11-year period. This equates to an average MHW shoreline change rate of -0.4 ft./yr. This rate of less than 1 ft. per year of change, suggests that on average, this portion of the shoreline is relatively stable. A profile by profile comparison shows relatively minimal variation throughout the area with rates ranging from -4.3 ft./yr. at Station -100+00 (Dolphin Run) to 3.6 ft./yr. at Station -10+00 (approximately 490 ft. south of Ocean View Loop). It should be noted that the gains seen at Station -10+00 are in large part due to the beach fill placed between Stations 0+00 and -25+00 in August 2017. Figure 7 shows a photo of the beach fill project under construction in August 2017. The effective average shoreline change rate along the portion of the shoreline from Stations -150+00 to -30+00 (eliminating the fill area) is -0.8 ft./yr. Although the average rate is negative (shoreline retreat) the rate is still relatively small, suggesting a relatively stable shoreline. The MHW shoreline change rates measured between October 2006 and December 2017 for each profile between Stations -150+00 and 0+00 are shown in Figure 5.

Figure 7. Aerial photo looking north along the Southern Shores Beach Nourishment project on August 4th, 2017.

September 2013 to December 2017:

APTIM is not aware of any historical beach profile survey data available north of Station -150+00 in Southern Shores, with the exception of three (3) profiles that were surveyed in 2013 and 2015 as part of a monitoring initiative conducted by the Town of Duck. Comparisons of the MHW shoreline position as measured during the September 2013 and December 2017 surveys along Stations -197+12 (northern Town Limit), -187+14 (11th Ave.) and -177+13 (approximately 200 feet south of 9th Ave.) were evaluated. An average MHW shoreline change of 5.4 ft. (seaward movement) was measured over the approximately 4.25-year period. This equates to an average MHW shoreline change rate of 1.3 ft./yr. The greatest change rate of 2.5 ft./yr. was measured along Station -197+12. The lowest rate of change of 0.3 ft./yr. was measured at Station -177+13. Figure 8 shows the MHW shoreline change rate for each of the three northern profiles measured between September 2013 and December 2017.

June 2017 to December 2017:

A comparison of MHW shoreline position was also made between the June 2017 pre-construction survey and the December 2017 town-wide survey to examine the effect of the beach fill project constructed in August 2017. Because the June 2017 survey only covered the fill area (Stations 0+00 to -20+00) the comparison is limited to this portion of Town. An average MHW shoreline change of 60.0 ft. was measured over the approximately 6-month period. This seaward advance is a direct result of the beach fill project constructed in August 2017. The change measured along Stations -10+00 and 0+00 were 73.1 ft. and 78.8 ft. respectively. The change measured at Station -20+00 was 28.2 ft. This trend follows the relative fill density placed during the project in that Station 0+00 received the highest fill density and Station -20+00 was in the taper area.

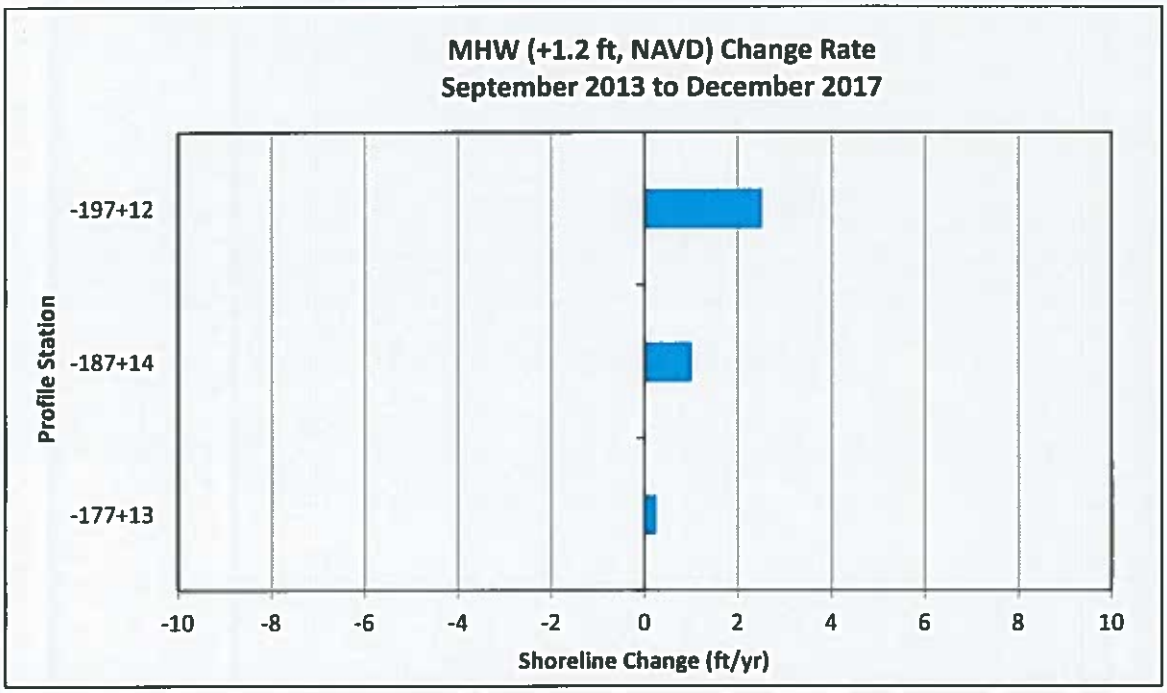


Figure 8. Shoreline change rates measured along the northern portion of the Town between September 2013 and December 2017.

Figure 9 shows the comparison of the MHW shoreline position along the southern 5,000 ft. of the Town of Southern Shores as measured in October 2004, October 2006, May 2015, June 2017 (Pre-Construction) and December 2017 (Post-Construction). The comparison of the shoreline positions show a seaward shift in the MHW shoreline south of Station -30+00 between October 2004 and October 2006 and a landward shift in the MHW shoreline position north of Station -30+00. From October 2004 to May 2015, the MHW shoreline position continued to move seaward. From May 2015 to June 2017, the MHW shoreline retreated considerably to its most landward location of the five (5) surveys. As a result of the beach fill project constructed in August 2017, the MHW shoreline position in December 2017 was shifted approximately 75 ft. seaward at Stations 0+00 and -10+00 and approximately 28 ft. seaward at Station -20+00.

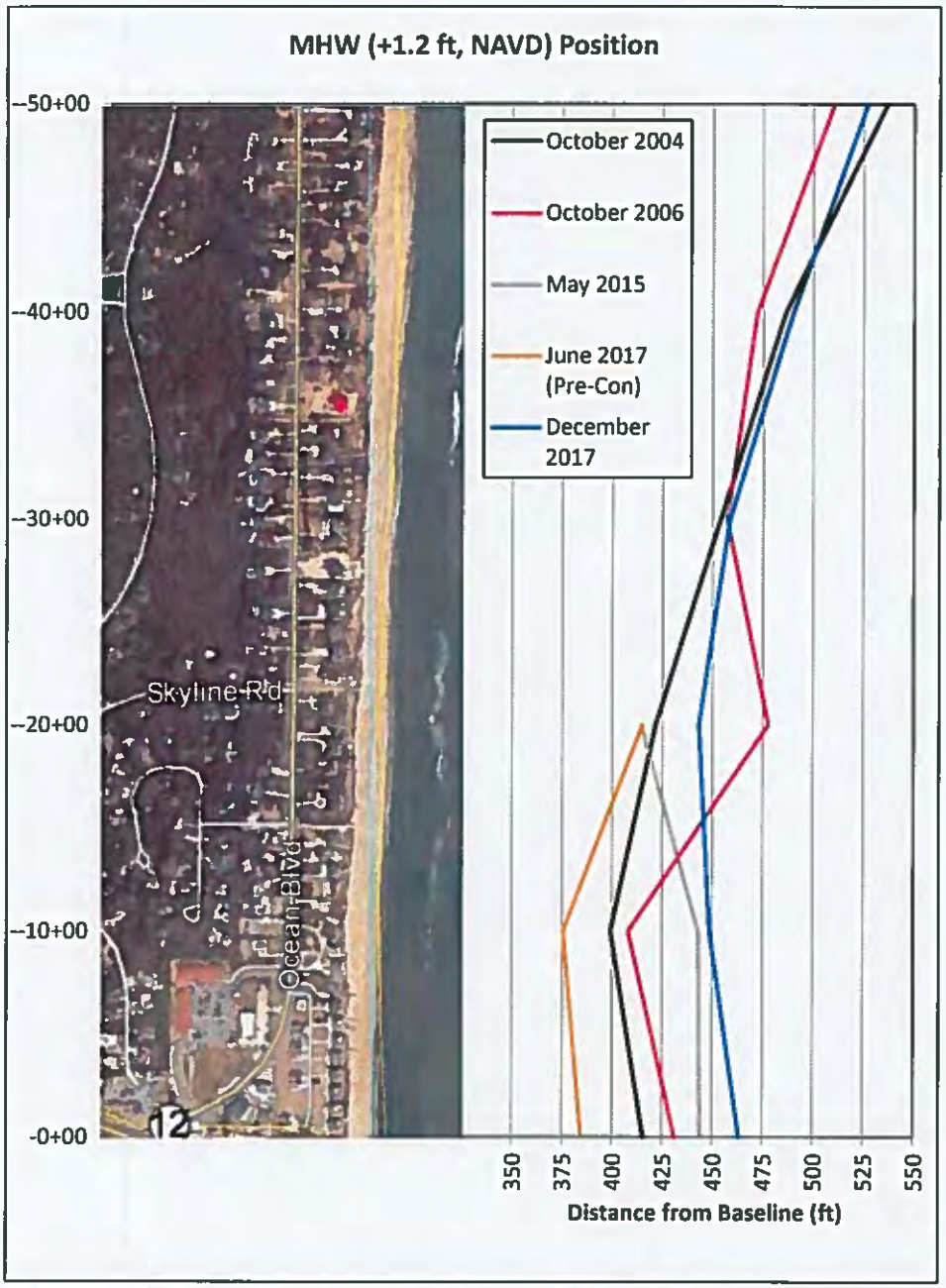


Figure 9. MHW shoreline position as measured along monitoring profiles between October 2004 and December 2017.

VOLUME CHANGE ANALYSIS

Changes in the shoreline position represented by the MHW contour can vary considerably based on sea conditions leading up to the time in which the surveys were conducted. This difference is often due to differences in the slope of the foreshore at a particular station. The trends observed through shoreline change analysis of a particular contour (i.e. MHW line) may give a sense of how the beach is performing, but it can also differ from the volume change trends.

Sand on the beach is distributed by wind and wave action over the entire active profile (from the dunes/vegetation out to the depth of closure). The dry beach often observed above the water represents only a fraction of the active beach profile. Therefore, the volume of sand measured on the entire profile is an important parameter to track and to gauge the health of the beach and performance of beach fill projects. The volume of sand in place is the metric that defines the three-dimensional beach, which provides storm protection. Figure 10 shows the same two profiles shown in Figure 4 with areas between the profiles color coded to show gains (green-accretion) and losses (red-erosion) in volume along the profile. The net difference between these gains and losses is referred to as the volume change.

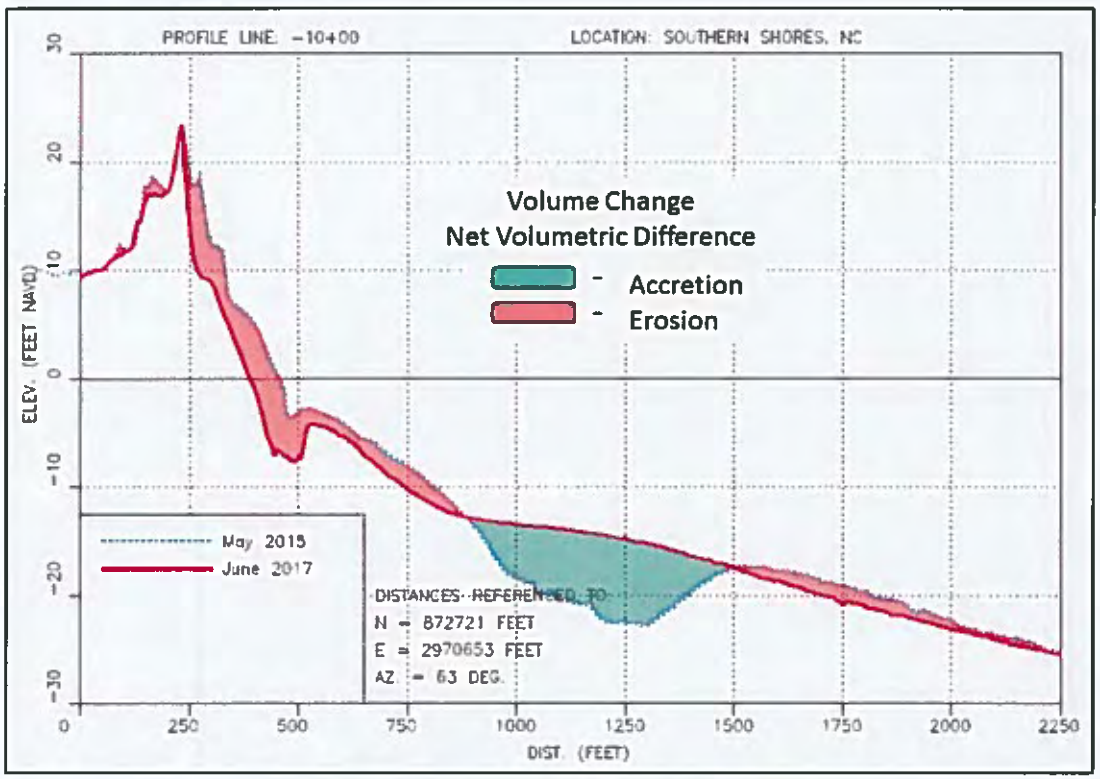


Figure 10. Beach profile cross section illustrating volume change.

Volumetric changes discussed in this report represent the change in the quantity of sediment measured through comparison of the available data sets collected between 2004 and 2017.

All volumetric changes along a profile or averaged over multiple profiles are given in cubic yards per linear foot. At times, this report also provides total volume in cubic yards measured between certain profiles. These volumes are based on the average end area method; whereby the average volume change between adjacent profiles is multiplied by the distance between stations. Volumetric change rates are given in cubic yards per linear feet of shoreline per year. The volumetric changes are calculated along the entirety of the profile from the depth of closure, which in this case is the -24 ft. contour, to the landward most point at which overlapping data exists.

October 2004 to October 2006:

Data collected along approximately 1,000-foot spaced profiles from approximately 3rd Ave. (Station -150+00) south to the southern Town limit of Southern Shores in October 2004 and October 2006 were examined to compare volumetric changes along that portion of the Town. This data was collected by the USACE FRF.

The average volumetric change rate measured along the profiles from Station -150+00 to Station 0+00 above the -24 ft. contour was -0.4 cy/ft./yr. Although the average volume change rate is less than 1 cy/ft./yr., considerable variability in the volume change rate was measured from profile to profile. The measured rates of volume change along this stretch of beach varied from a gain 22.6 cy/ft./yr. at Station 0+00 (Southern Shores/Kitty Hawk Town boundary) to a loss of -19.4 cy/ft./yr. at Station -50+00 (approximately 450 ft. south of Chicahauk Tr.). A profile by profile comparison of the volume change rate is provided in Figure 11. Figure 11 also includes volume change rates measured between October 2006 and December 2017, which are described later in this report.

As previously discussed in the Shoreline Change section, the beach fill placed during the 2017 project in the Town of Southern Shores was placed between Stations -25+00 and 0+00 and therefore, we have referred to the analyses in this report that compares data from Stations -20+00 to 0+00 as the "fill area". The average volumetric change rate in the fill area between October 2004 and October 2006 was +10.1 cy/ft./yr. This high rate of accretion was primarily driven by positive volume change along Stations -20+00 (22.6 cy/ft./yr.) and 0+00 (15.1 cy/ft./yr.); however, profile -10+00 showed a negative volume change rate of -7.5 cy/ft./yr.

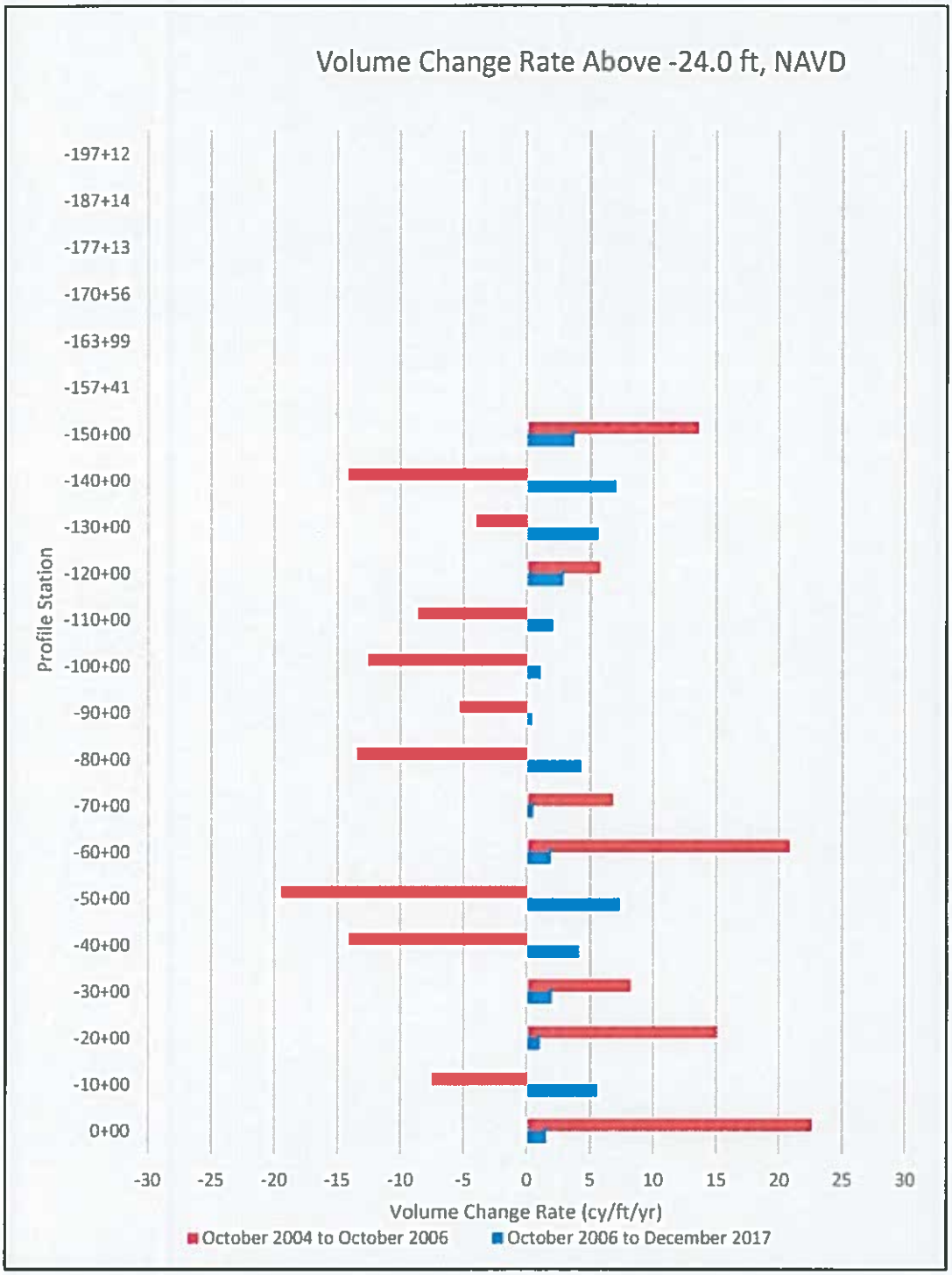


Figure 11. Annual Volumetric Change Rate above -24 FT NAVD (CY/FT/YR) between October 2004 and October 2006, and between October 2006 and December 2017.

October 2006 to May 2015:

Data collected by APTIM in May 2015 as part of the design survey for the Kitty Hawk Beach project was compared to the October 2006 data collected by the USACE to determine volume changes from 2006 to 2015 in the fill area. The average volumetric change rate measured along the profiles from Station -20+00 to Station 0+00 above the -24 ft. contour was +1.1 cy/ft./yr. Recall that from October 2004 to October 2006, the average volume change rate in the fill area was 10.1 cy/ft./yr. The relative stability in the fill area suggested by the average rate of +1.1 cy/ft./yr. was a combination of erosion rates of -3.3 cy/ft./yr. and -4.1 cy/ft./yr. along profiles -20+00 and -10+00, respectively and accretion of +10.8 cy/ft./yr. at Station 0+00.

Figure 12 shows a comparison of the volume change rates measured in the fill area between October 2004 and October 2006, October 2006 and May 2015, and May 2015 and June 2017.

The average end area method was used to compute the change in the volume of sand between Stations -20+00 and 0+00. Between October 2006 and May 2015, a net volume change of approximately -3,100 cy was computed along this portion of the beach above the -24.0 ft. NAVD88 contour. Annualizing this loss over the nearly 8.5-year period would result in a volume change rate of approximately -364 cy/yr. in the fill area.

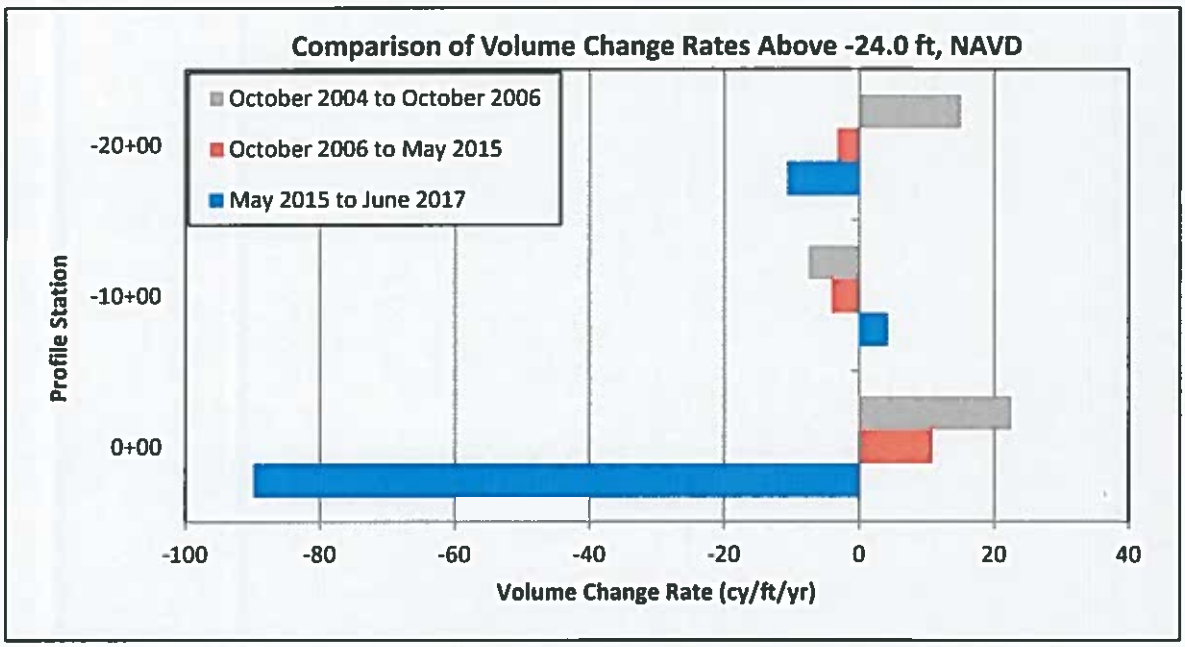


Figure 12. Volume change rates measured in the "Fill Area" between Oct. 2004 and Oct. 2006 (gray), Oct. 2006 and May 2015 (orange), and May 2015 and June 2017 (blue).

May 2015 to June 2017:

Great Lakes Dredge and Dock Company conducted a pre-construction survey of the fill area (Stations -20+00 to 0+00) as part of the 2017 construction project in June 2017. Using this survey and the APTIM survey conducted in May 2015, volume change was measured in the fill area between May 2015 and June 2017 (25 months). The average volumetric change rate measured along the profiles from Station -20+00 to Station 0+00 above the -24 ft. contour was -31.7 cy/ft./yr. Recall that the volume change trend in the fill area from October 2004 to October 2006 was accretional and the trend from October 2006 to May 2015 was essentially stable. The high rate of negative volume change was primarily driven by a measured loss of approximately 187 cy/ft. along Station 0+00 from May 2015 to June 2017. Figure 12 shows a comparison of the volume change rates measured in the fill area between October 2004 and October 2006, October 2006 and May 2015, and May 2015 and June 2017.

The average end area method was used to compute the change in the volume of sand between Stations -20+00 and 0+00. Between May 2015 and June 2017, a net volume change of approximately -93,200 cy was computed along this portion of the beach above the -24.0 ft. NAVD88 contour. As a point of comparison, this area only saw a net loss of 3,100 cy of sand over the approximately 8.5-year period from October 2006 to May 2015.

October 2006 to December 2017:

In December 2017, APTIM conducted beach profile surveys along the entire oceanfront of Southern Shores. All 22 beach profiles from Station -197+12 at the northern town boundary to Station 0+00 at the southern town boundary were surveyed. Using this survey and the USACE FRF October 2006 survey data, volume change was measured along the portion of beach from Stations -150+00 to 0+00. The average volumetric change rate measured over the approximately 11-year period along the profiles from Station -150+00 to Station 0+00 above the -24 ft. contour was 3.2 cy/ft./yr. Recall that the volume change rate along this same area from October 2004 to October 2006 was -0.4 cy/ft./yr., or essentially stable.

A profile by profile comparison of the volume change rate is provided in Figure 11. The comparison of the October 2006 and December 2017 profile data show that all 16 profiles experienced positive volume changes over the approximate 11 years ranging from a gain of 0.4 cy/ft./yr. at Station -90+00 (between Porpoise Run and Trout Run) to a gain of 7.4 cy/ft./yr. at Station -50+00 (approximately 450' south of Chicahauk Trl.).

September 2013 to December 2017:

As mentioned previously, APTIM is not aware of any historical beach profile survey data available north of Station -150+00 in Southern Shores, with the exception of three (3) profiles that were surveyed in 2013 and 2015 as part of a monitoring initiative conducted by the Town of Duck. Volume change between September 2013 and December 2017 was computed along Stations -197+12 (northern Town Limit), -187+14 (11th Ave.) and -177+13 (approximately 200 feet south of 9th Ave.). An average volume change of -1.6 cy/ft. (erosion) was measured over the

approximately 4.25-year period. This equates to an average volume change rate of -0.4 cy/ft./yr. An erosional rate of -2.5 cy/ft./yr. was measured along Station -187+14; whereas, an accretional rate of 0.5 cy/ft./yr. and 0.8 cy/ft./yr. was measured along Stations -197+12 and -177+13, respectively. Figure 13 shows the volume change rates for each of the three northern profiles measured between September 2013 and December 2017.

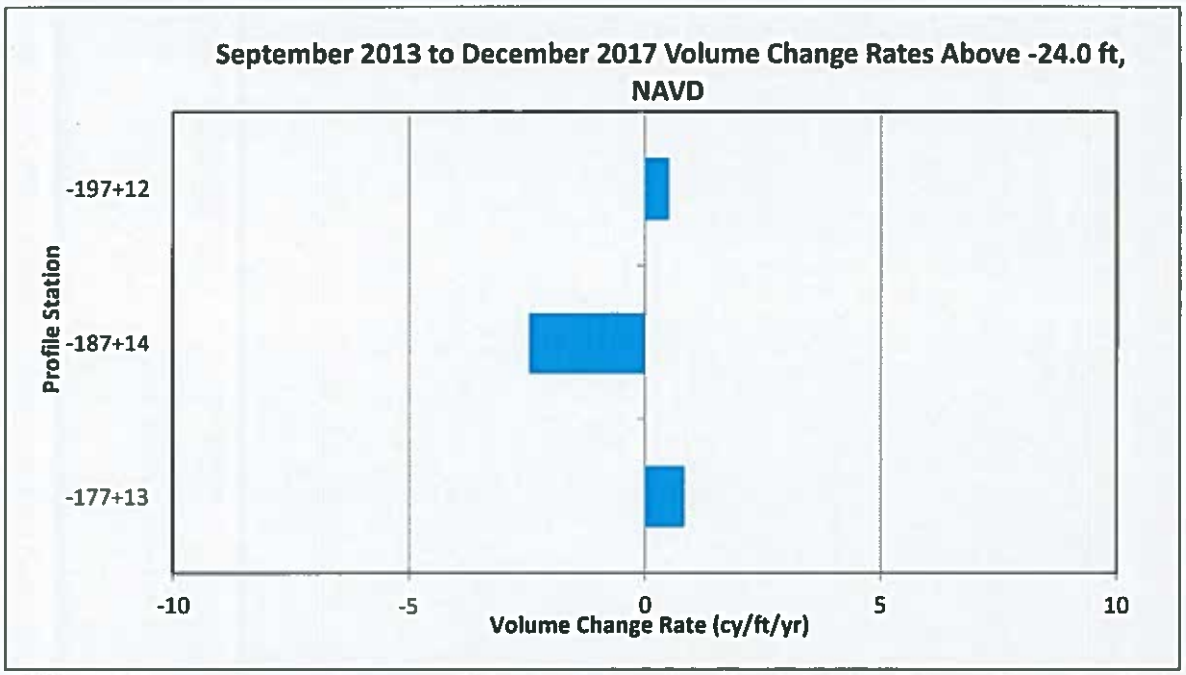


Figure 13. Volume change rates measured along the northern portion of the Town between September 2013 and December 2017.

June 2017 to December 2017:

A calculation of the volume change between the June 2017 pre-construction survey and the December 2017 town-wide survey was also made to examine the effect of the beach fill project constructed in August 2017. Because the June 2017 survey only covered the fill area (Stations 0+00 to -20+00) the comparison is limited to this portion of Town. An average volume change of 87.6 cy/ft. was measured over the approximately 6-month period. This increase in volume is a direct result of the beach fill project constructed in August 2017. The change measured along Stations -10+00 and 0+00 were 86.0 cy/ft. and 114.7 cy/ft., respectively. The change measured at Station -20+00 was 62.2 cy/ft. This trend follows the relative fill density placed during the project in that Station 0+00 received the highest fill density and Station -20+00 was in the taper area.

CONCLUSIONS

The Town of Southern Shores undertook this study to determine long-term and short-term shoreline and volumetric changes that have occurred along its oceanfront beaches. This report compiled and utilized a variety of data sources collected by the USACE FRF, APTIM and others to evaluate the shoreline change and volume changes that have occurred between 2004 and 2017.

The historic data sets used for this analysis did not provide continuous coverage throughout the Town. The December 2017 survey conducted by APTIM as part of this study is the first known survey to have covered the entire Town. Given the discontinuous nature of the historic data, this assessment focused on trends in three (3) primary areas where multiple data sets were available for comparison. Data collected by the USACE FRF in 2004 and 2006 covered the area from Station -150+00 located near 3rd Ave. to Station 0+00 located at the southern Town Boundary. Several surveys conducted between 2015 and 2017 included three (3) profiles along the southern 2,000 feet of the Town from approximately 150 feet south of Skyline Road to the southern Town Boundary. This is also the area in which the beach fill project was constructed in August 2017 and is therefore referred to as "The Fill Area". Surveys conducted in 2013 and 2015 by the Town of Duck, similarly covered the 2000 ft. of shoreline on the north end of Southern Shores from Station -197+12 located at the northern Town Boundary to Station -177+13 located approximately 200 ft. south of 9th Ave.

Shoreline Change Analysis: The shoreline change analysis examined the change in the MHW line (+1.2 ft. NAVD contour). The portion of shoreline from Station -150+00 to Station 0+00 experienced an average shoreline change rate of +4.9 ft./yr. in the two-year period between October 2004 and October 2006; however, the profile by profile comparison shows considerable variability from station to station. Variation during this time period ranged from -13.3 ft./yr. to +27.9 ft./yr. This variability may be due to the recovery of the shoreline following Hurricane Isabel, which impacted the Outer Banks region in September 2003. The average MHW shoreline change rate measured along this same portion of the shoreline during the approximately 11-year period between October 2006 and December 2017 was -0.4 ft./yr. The rate indicates an essentially stable shoreline. Figure 5 shows a comparison of the October 2004 to October 2006 rates and the October 2006 to December 2017 rates. Figure 5 shows that all the profiles from Station -120+00 (approximately 600 ft. north of Dogwood Trail) to -60+00 (approximately 600 ft. north of Chicahauk Tr.) experienced a long-term recession trend, which averaged -2.4 ft./yr.

The "Fill" area (southern 2,000 ft. of the Town) experienced an average shoreline change rate of 13.3 ft./yr. between October 2004 and October 2006. This average rate was highly influenced by the MHW shoreline change measured along Station -20+00, which moved seaward 55 ft. over the two (2) year period; whereas the shoreline change measured along Stations -10+00 and 0+00 during the same two (2) year period were 8.5 ft. and 15.5 ft., respectively. As stated previously, this relatively large variation may be due to shoreline adjustments taking place after the impact of Hurricane Isabel to the region in 2003. Over the approximately 8.6-year period from October 2006 to May 2015 the MHW shoreline rate along Station -20+00 was -7.3 ft./yr. (recession); whereas the MHW shoreline change rates along Stations -10+00 and 0+00 were 4.1 ft./yr. and 1.5 ft./yr. (advance), respectively. Between May 2015 and June 2017, the fill area, specifically profiles -10+00 and 0+00 experienced severe shoreline retreat, which is what prompted the Town to pursue

the beach fill project. Surveys conducted in May 2015 and June 2017 show that over the 25-month period, Stations -10+00 and 0+00 experienced shoreline change of -67.6 ft. and -59.5 ft., respectively. This equates to a shoreline change rate of -32.4 ft./yr. and -28.6 ft./yr., respectively. Figure 6 provides a comparison of the different shoreline change rates measured in the fill area between October 2004 and June 2017.

A comparison of the June 2017 pre-construction survey and the December 2017 post-construction survey of the beach fill project constructed in August 2017 indicate that the MHW shoreline advanced seaward approximately 60 ft. in the fill area as a result of the project. The shoreline change resulting from the fill project along Stations -10+00 and -0+00 was 78.8 ft. and 73.1 ft., respectively and the shoreline change along Station -20+00 was 28.2 ft. As shown in Figure 9 the beach fill project resulted in a shoreline seaward of where the shoreline existed in October 2004 and May 2015.

A comparison of the December 2017 data with data collected in September 2013 as part of an assessment completed for the Town of Duck, provided insight into shoreline change along the northern 2000 ft. of the Town's oceanfront. An average MHW shoreline change rate of 1.3 ft./yr. was measured between Stations -197+12 (northern Town Limit) and -177+13 (approximately 200 feet south of 9th Ave.). As shown in Figure 8, all three (3) profiles showed rates less than 3 ft./yr. over the approximately 4.25-year period. This suggests the shoreline in this area was fairly stable between September 2013 and December 2017.

Volume Change Analysis: The volume change analysis examined the changes in the volume measured along profiles above the -24 ft. NAVD88 contour. The depth of -24 ft. NAVD88 was used as the depth of closure in the design of the beach nourishment projects constructed as part of the multi-town project in 2017. Similarly to what was found in the shoreline change analysis between October 2004 and October 2006, there was a considerable amount of variability in the volume change rates measured between Stations -150+00 and 0+00. Although the average volume change rate through this portion of the Town over the 2-year period was only -0.4 cy/ft./yr., the individual volume change rates along the profiles varied from -19.4 cy/ft./yr. at Station 50+00 to +22.6 cy/ft./yr. at Station 0+00. The net volume change measured along this approximately 15,000 ft. portion of the Town's oceanfront over the 2-year period was approximately -42,000 cy. However, the area between Stations -150+00 and -80+00 exhibited a larger net volume loss of approximately -82,000 cy. The overall variability in volume change may be due to the response of the beach following Hurricane Isabel, which impacted the Outer Banks region in September 2003. In comparison, the average volume change rate measured along this same portion of the shoreline (Stations -150+00 to 0+00) during the approximately 11-year period between October 2006 and December 2017 was 3.2 ft./yr. (accretion). Figure 11 shows a comparison of the October 2004 to October 2006 rates and the October 2006 to December 2017 rates. All of the profiles from Stations -150+00 to 0+00 exhibited an accretional trend over the approximately 11-year period.

Between October 2004 and October 2006, the "Fill" area experienced a positive volume change of approximately 23,000 cy. Figure 12 shows the variability by profile in the fill area where Stations -20+00 and 0+00 exhibit positive volume change rates; whereas Station -10+00

experienced an erosional rate of -7.5 cy/ft./yr. Over the approximately 8.6-year period from October 2006 to May 2015, profiles at Stations -20+00 and -10+00 experienced negative volume change rates of -3.3 and -4.1 cy/ft./yr., respectively; whereas the profile at Station 0+00 saw a significant increase in volume, with a calculated volume change rate of 10.8 cy/ft./yr. Between May 2015 and June 2017, a net negative volume change of approximately 93,000 cubic yards was measured in the fill area. This was largely driven by the losses between Stations -10+00 and 0+00 of approximately 88,000 cy over a 1,000 ft. length of beach. These dramatic changes can be seen in the photos in Figure 14. Based on the data analyzed in this study and discussions with Town officials, the dramatic erosion that took place between May 2015 and June 2017 was unprecedented. The reason for the accelerated erosion rates may be associated with variations in the offshore bathymetry that resulted in the variations of wave approaches to shore. Such variations can have dramatic effects on long shore transport of sand and result in locally high erosion or hot spot areas.

Figure 14. Photos comparing the fill area in May 2015 (A) and January 2017 (B). Note the orange arrows which indicate the location of the same set of stairs in both pictures.

A comparison of the June 2017 pre-construction survey and the December 2017 post-construction survey of the beach fill project constructed in August 2017, indicate that the fill area experienced a net increase in volume of approximately 174,000 cy. Surveys conducted during the beach fill project in August 2017 measured a direct placement of approximately 85,000 cy of beach fill in the fill template along the southern 2,500 ft. of the Town. The additional volume measured based on the comparison of the June 2017 and December 2017 may be a combination of some shoreline recovery that occurred between June 2017 and the time the beach fill project was constructed in August and the spreading of material off of the larger Kitty Hawk project following the construction of the northern portion of the Kitty Hawk project in August and September.

A comparison of the December 2017 data with data collected in September 2013 as part of an assessment completed for the Town of Duck provided insight into volume change along the northern 2000 ft. of the Town's oceanfront. An average volume change rate of -0.4 cy/ft./yr. was measured between Stations -197+12 (northern Town Limit) and -177+13 (approximately 200 feet south of 9th Ave.). Figure 7 depicts the individual rates for each of the three (3) profiles in this area. This area exhibited relatively stable volume change over the approximately 4.25-year period.

Table 2 lists the average volumetric change rates above the -24 ft. contour for 1) all profiles from Stations -150+00 to 0+00; 2) profiles from Stations -20+00 to 0+00 (Fill Section); and 3) profiles from Stations -197+12 to -177+13 (North Section).

Table 2. Average volume change rates above the -24 ft. contour.

	Stations -150+00 to 0+00 16 Profiles	Fill Section (Stations -20+00 to 0+00) 3 Profiles	North Section (Stations -197+12 to -177+13) 3 Profiles
Volume Change Rate (CY/Ft./Yr.)			
October 2004 to October 2006	-0.4 cy/ft./yr.	10.1 cy/ft./yr.	
October 2006 to May 2015		1.1 cy/ft./yr.	
May 2015 to June 2017		-31.7 cy/ft./yr.	
October 2006 to December 2017	3.2 cy/ft./yr.	2.7 cy/ft./yr. *	
September 2013 to December 2017			-0.4 cy/ft./yr.

* Rate includes the impact of the beach fill project constructed in August 2017

In order to evaluate the profiles for which no historical data existed, the total volume measured along each profile above the -24 ft. NAVD88 contour and seaward of the +20 ft. contour on the landward side of the dune, was calculated. This area of the profile is referred to in this report as the volume envelope. Figure 15 shows a cross section of profile -10+00, which graphically depicts the volume envelope. Comparing the volume measured in the volume envelope along the Town's oceanfront allows for the relative comparison of each profile.

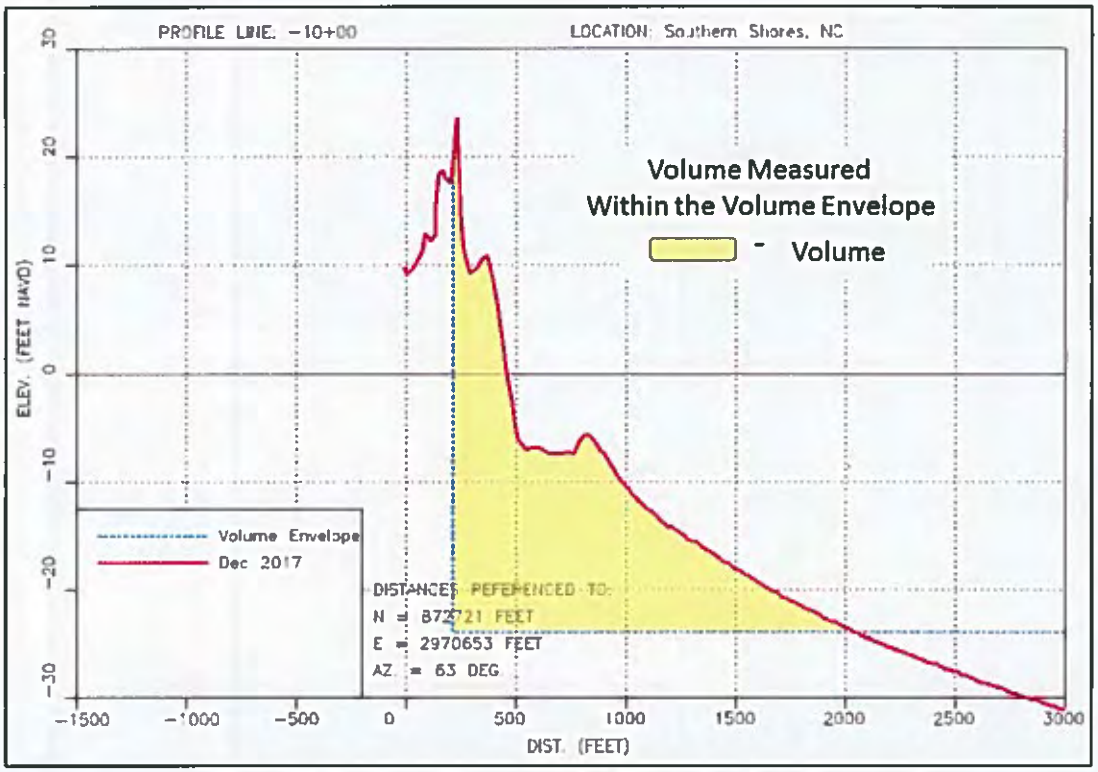


Figure 15. Beach profile cross section illustrating the volume envelope.

Figure 16 shows the volume measured within the volume envelope along each of the 22 Southern Shores profiles surveyed in December 2017. The average volume within the envelope measured along all 22 profiles in December 2017 was 830 cy/ft. The data represented in Figure 16 suggests that the area from Station -150+00 (located near 3rd Ave.) to Station -70+00 (located approximately 500 ft. south of where Ocean Blvd. and Duck Rd. meet), is relatively less than the portions of Southern Shores to the north and south of this section. The average volume within the envelope measured along the nine (9) profiles from Stations -150+00 to -70+00 is 793 cy/ft. The average volume within the volume envelope measured along the six (6) profiles to the north from Stations -197+12 to -157+41 was 873 cy/ft. and the volume measured along the seven (7) profiles to the south from Stations -60+00 to 0+00 is 841 cy/ft.

Figure 16 also shows the volume measured within the volume envelope along profiles surveyed by the USACE FRF in 2006 and along profiles surveyed by Great Lakes Dredge and Dock in June 2017. As previously mentioned, comparison of the volume present in October 2006 and the volume present in December 2017 shows all profiles had more volume within the volume envelope in December 2017 than were present at the time of the October 2006 survey. However, a comparison of the volume within the envelope in the Fill Area in June 2017 prior to the beach fill project, shows each of these three profiles had less volume than was present at the time of the October 2006 survey.

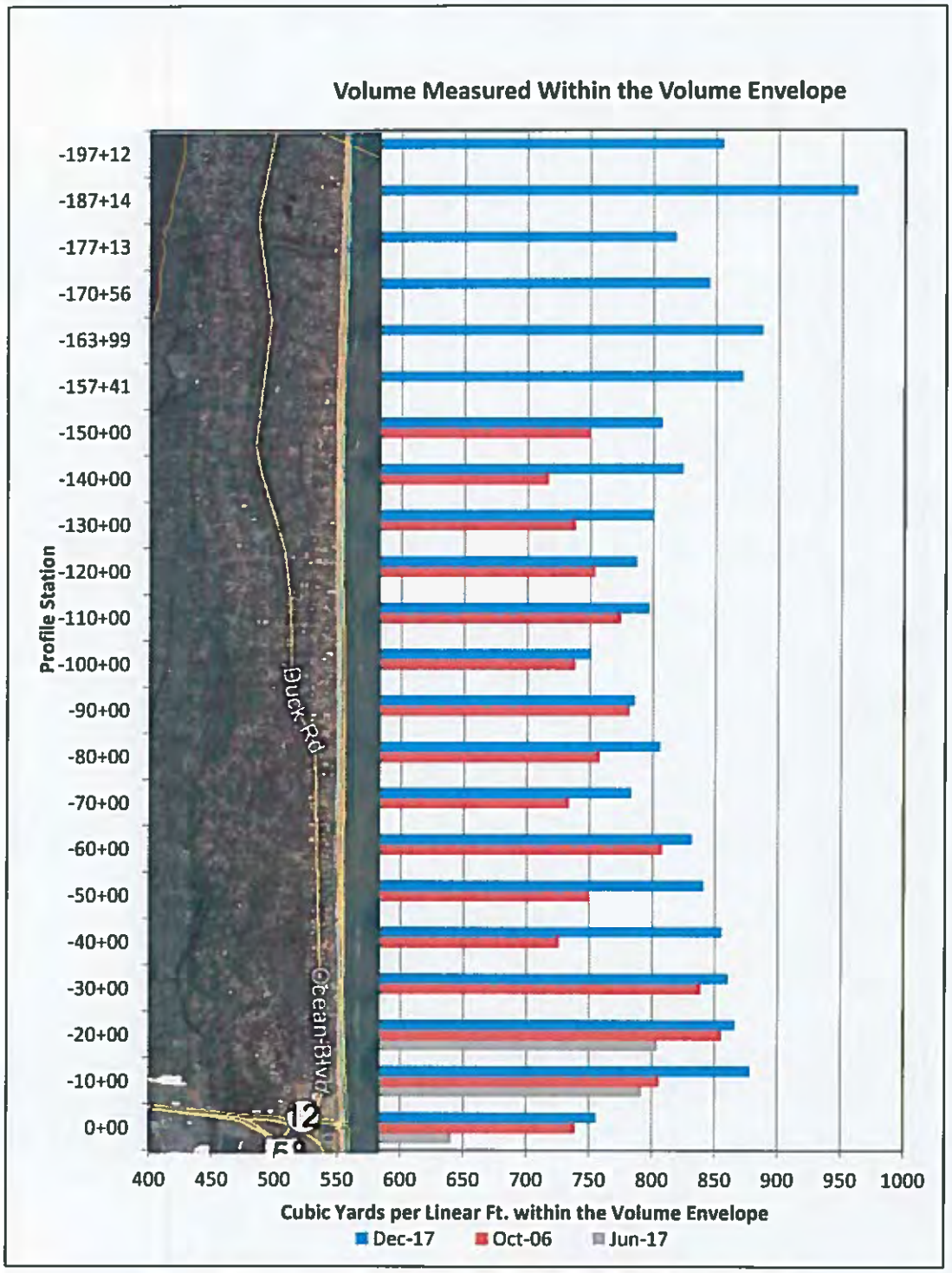


Figure 16. Beach profile cross section illustrating the volume envelope.

Although the volume of sand present within the envelope provides for a way of making relative comparisons of the available level of storm damage reduction between one profile and another, this volume is not necessarily the only indication of a structures vulnerability to potential storm damage. In this regard, the greater the distance a given structure is set back from the dune the higher the level of potential storm damage reduction.

A qualitative assessment of the distance structures are set back from the vegetation line was made using publicly available satellite imagery from Google Earth. A visual examination of imagery from March 2017 shows that houses are generally situated closest to the vegetation line between Stations -140+00 and -100+00 and along the very southern part of the Town between Stations -10+00 and 0+00. Houses located between Stations -157+00 and -140+00 and Stations -100+00 to -70+00 generally appear to have a relatively moderate setback. The area north of Station -157+00 and between Stations -40+00 and -20+00 appear to have the greatest setback from the edge of vegetation. Figure 17 shows examples of the comparison of the relatively minimal setback of structures between Stations -110+00 and -100+00 and the relatively greater setback of structures between Stations -170+56 and -163+99.

Figure 17. Google Earth Images from March 2017 showing the relatively minimal setback of structures from the vegetation between Stations -110+00 and -100+00 (A.) and the relatively greater setback of structures from the vegetation between Stations -170+56 and -163+99.

RECOMMENDATIONS

Based on the analysis and conclusions discussed in this report, APTIM is recommending the following:

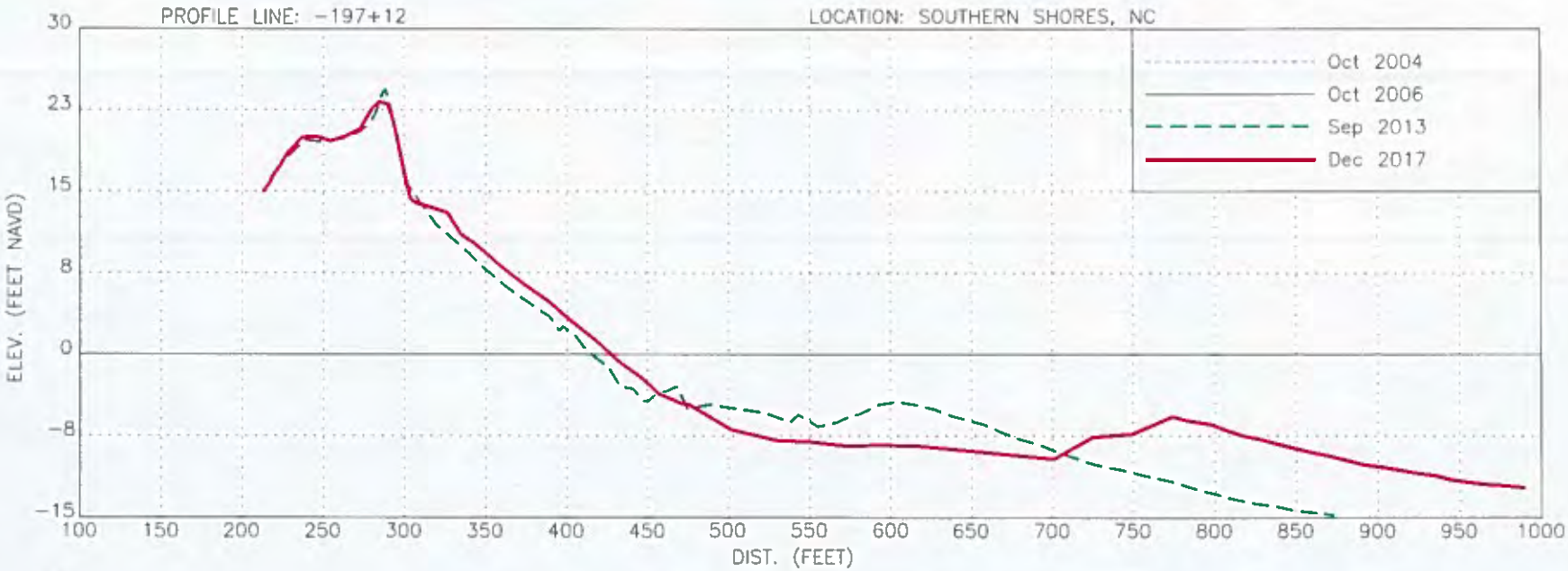
1. **Conduct a vulnerability assessment of the oceanfront structures:** The vulnerability assessment employees a profile-based storm simulation model called SBEACH. A similar assessment was conducted during the design phase of the Duck and Kill Devil Hills Beach Projects. The vulnerability assessment can both identify structures that may be vulnerable to a specific design storm and determine the design requirements to avoid impacts to a design storm.
2. **Continue Monitoring of the Beach Profiles:** In order to monitor the shoreline and volume change trends along the Town's oceanfront shoreline, Southern Shores should implement an annual beach profile monitoring program starting in spring 2019. Coordinating with monitoring that is occurring along the Towns of Duck and Kitty Hawk may provide cost savings to the Town in data acquisition.
3. **Determine a Minimum Cross Section Volume:** Based on the results of the vulnerability analysis and the beach fill design for the Towns of Duck and Kill Devil Hills, the Town should determine the ideal minimum cross section volume to maintain to provide an acceptable level of storm damage reduction.

Through the implementation of these recommendations, the Town of Southern Shores can determine what level of storm damage mitigation is currently in place, where vulnerability exist, and project if and when beach nourishment may be required. With this information, the Town can then determine the financial needs necessary to maintain an acceptable level of storm damage mitigation.

Given the active programs established in Dare County for beach nourishment, the Town of Southern Shores is well positioned to develop a long term management program that leverages cost saving opportunities realized through multi-town cooperation as was seen during the 2017 beach fill project. Furthermore, by developing a management plan before the beach reaches a critically eroded state, the Town may be able to maintain a greater level of storm damage reduction.

REFERENCES

U.S. Army Corps of Engineers, 2004. Dare County Beaches, Shore Protection Project Physical Monitoring Program Profile Survey and Sediment Sampling Report 2004. Prepared by USACE-ERDC-CHL Field Research Facility, 16 pgs.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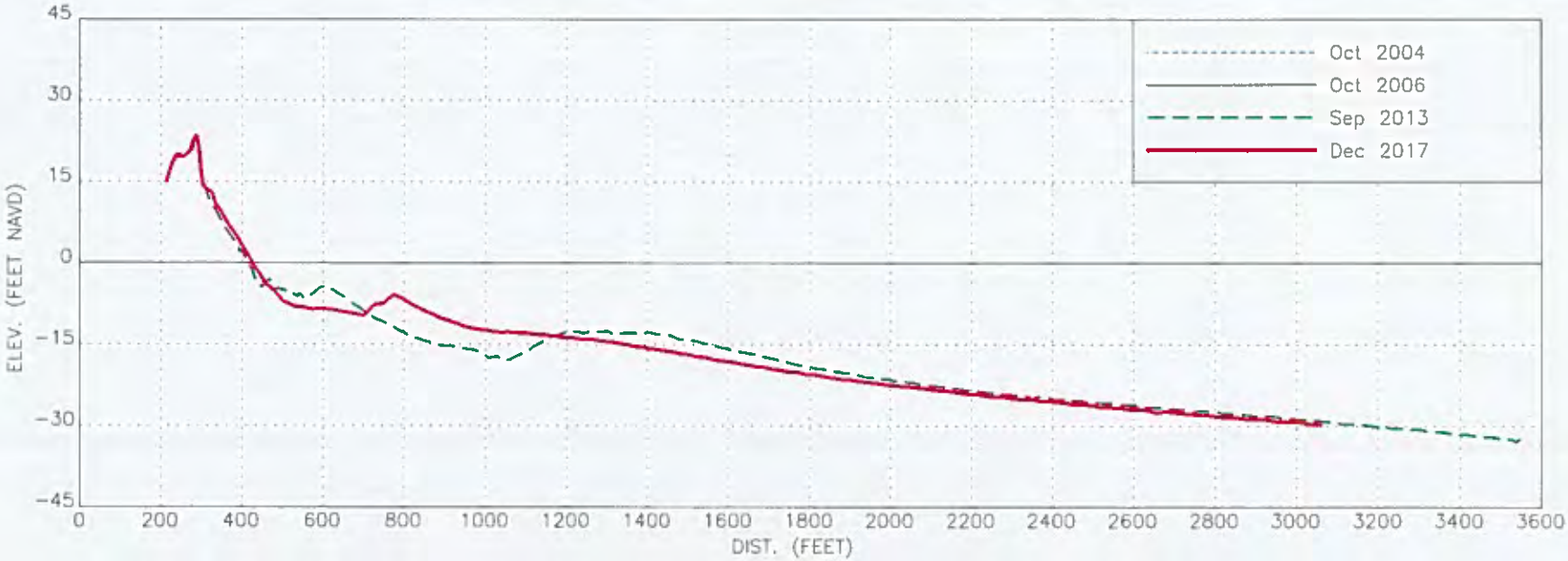
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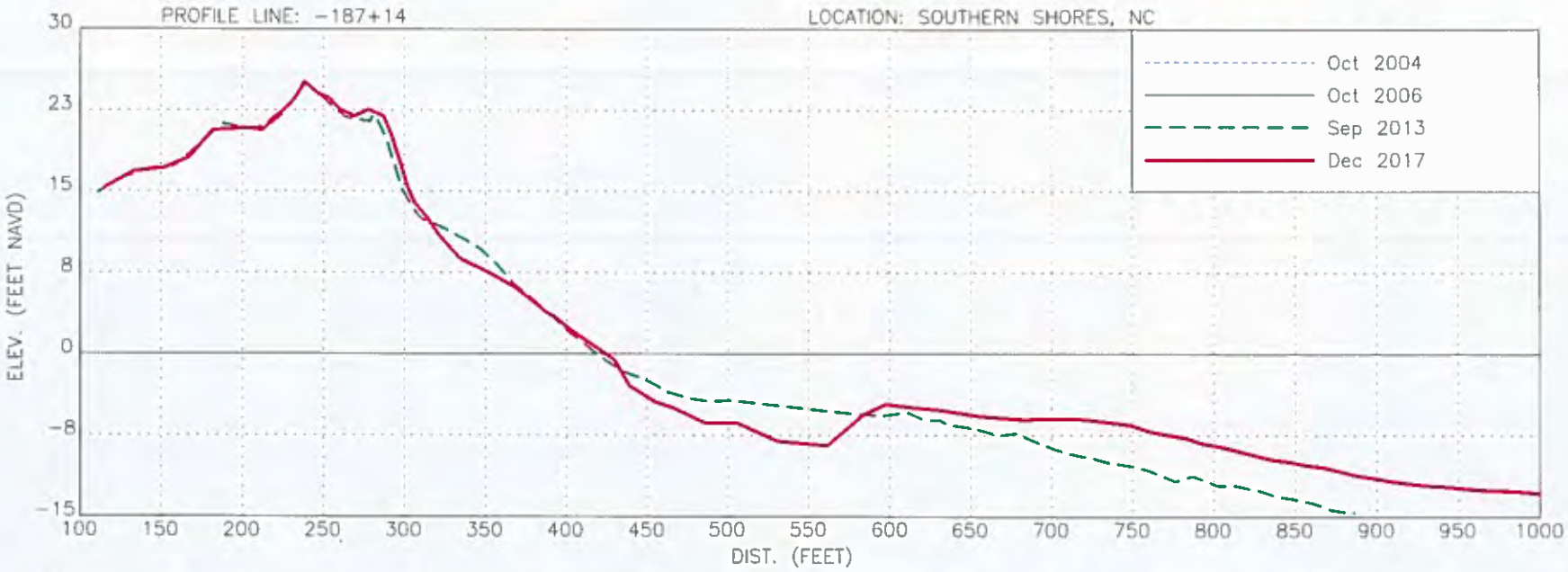
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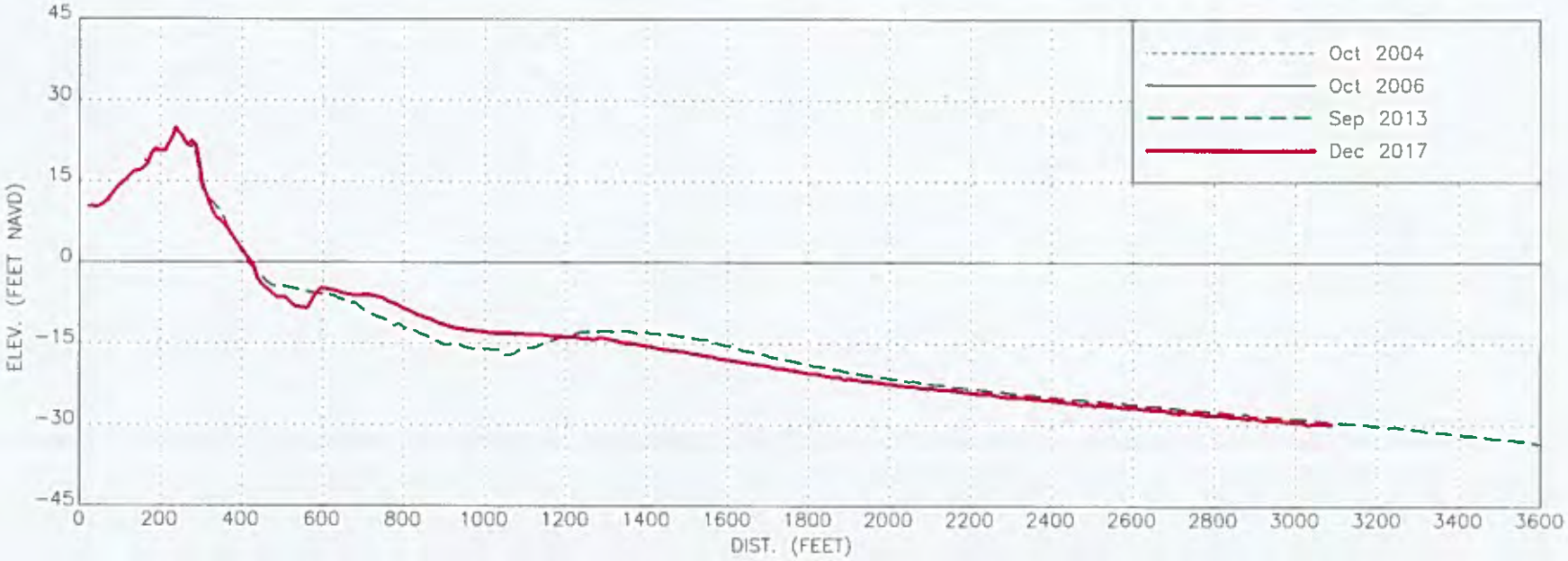
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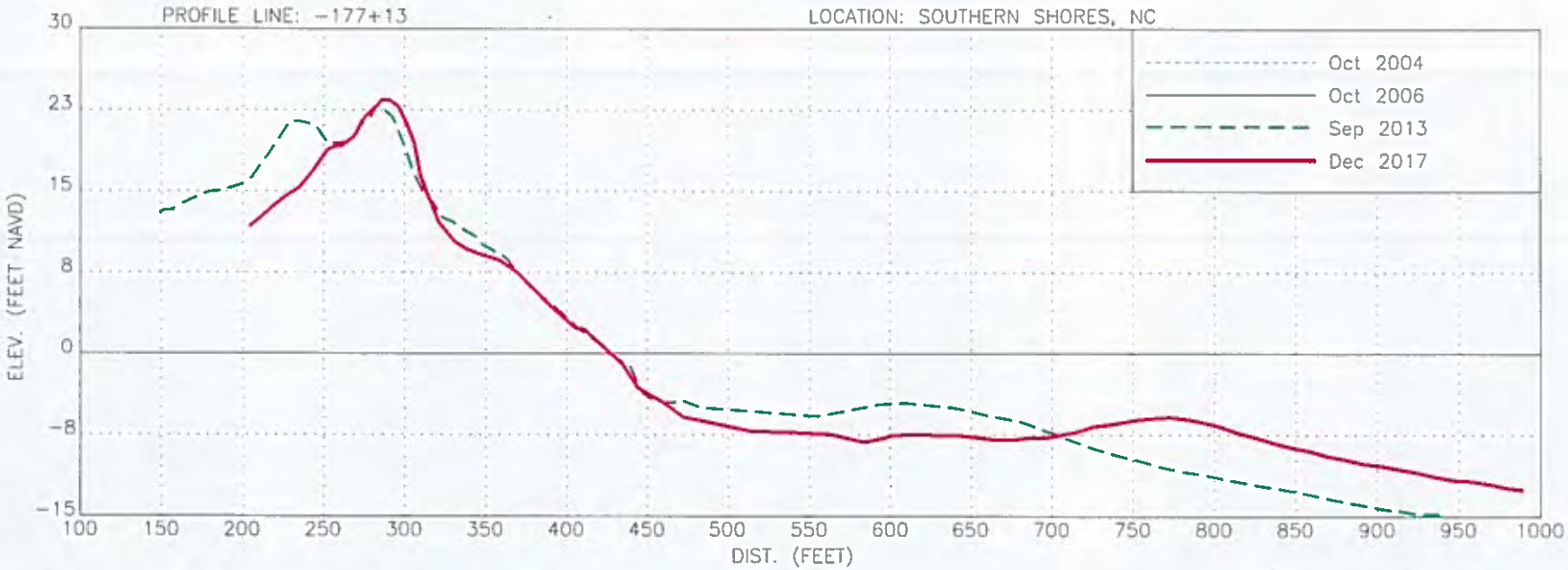
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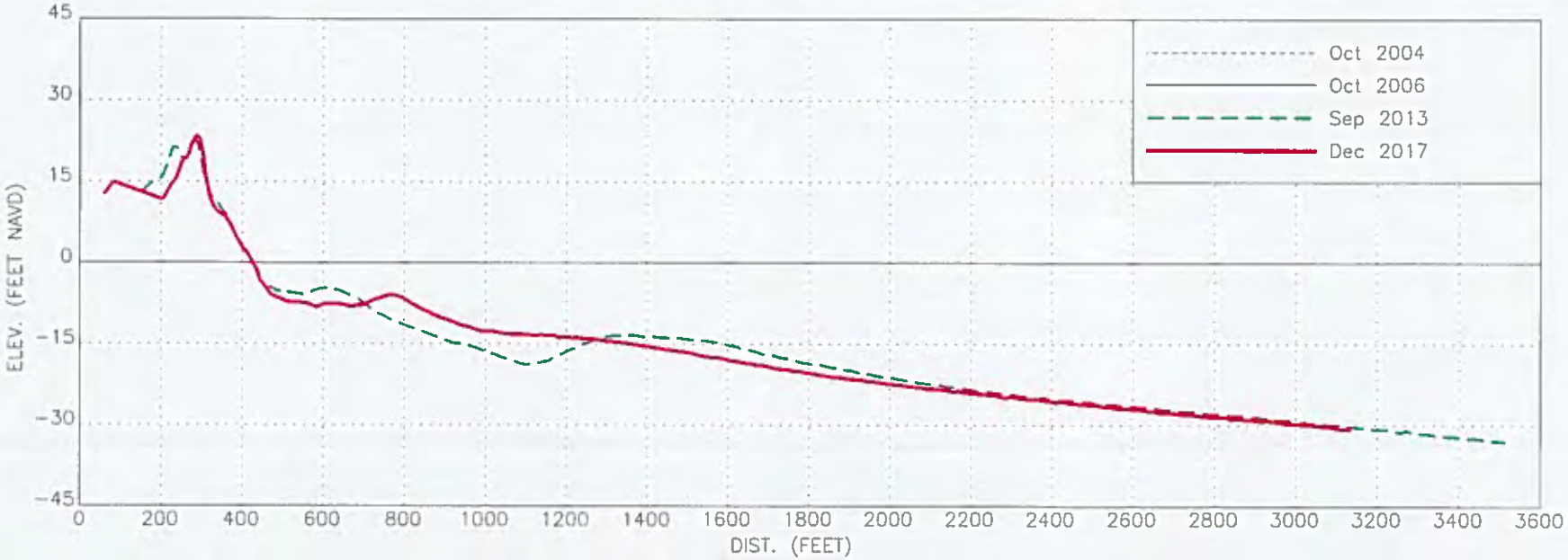
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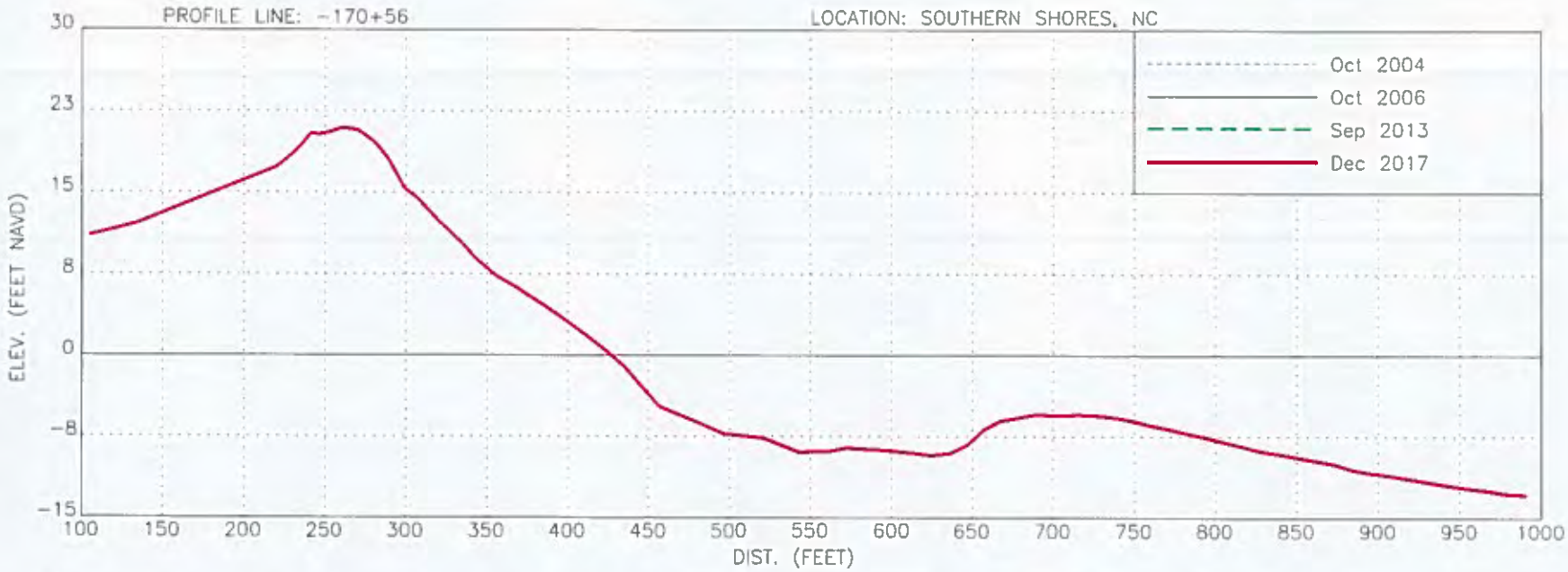
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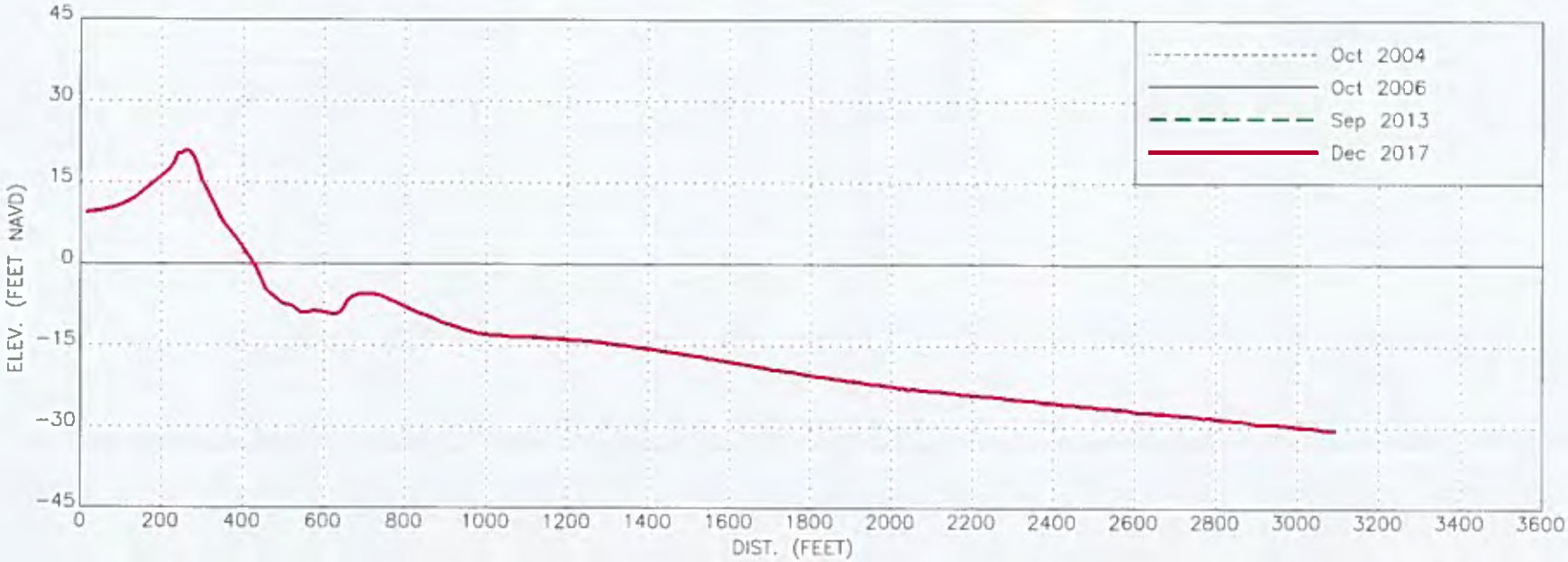
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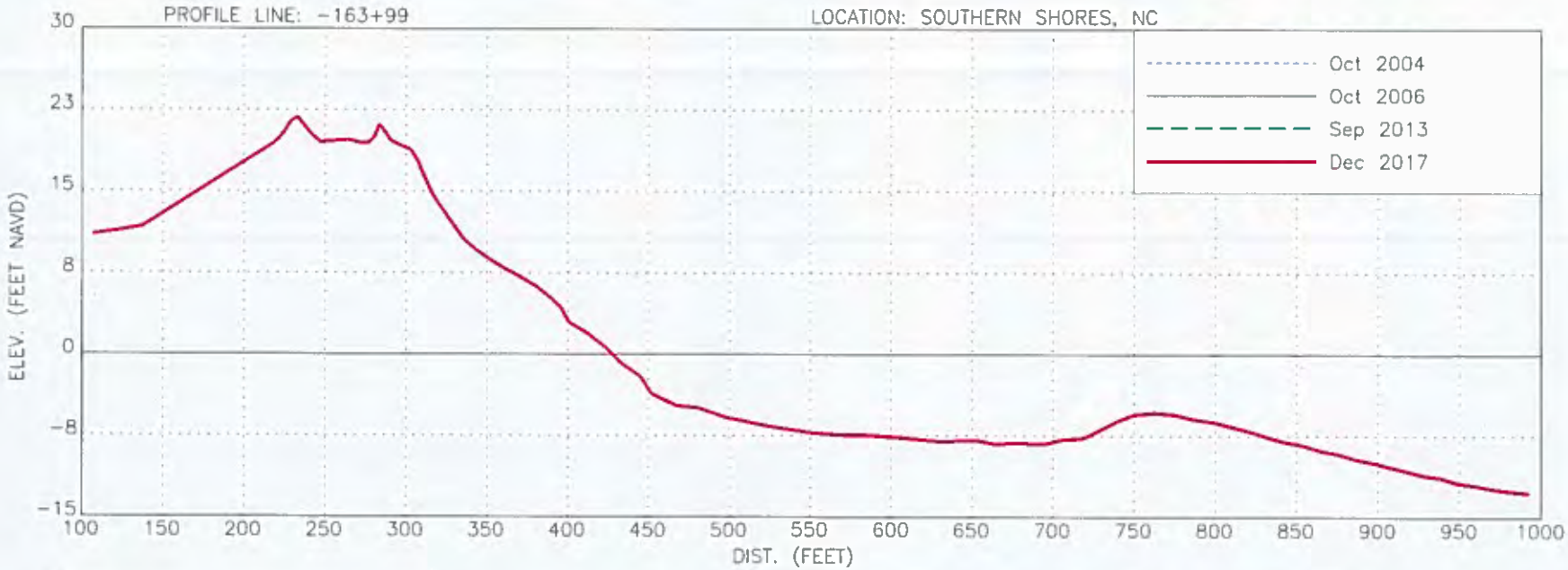
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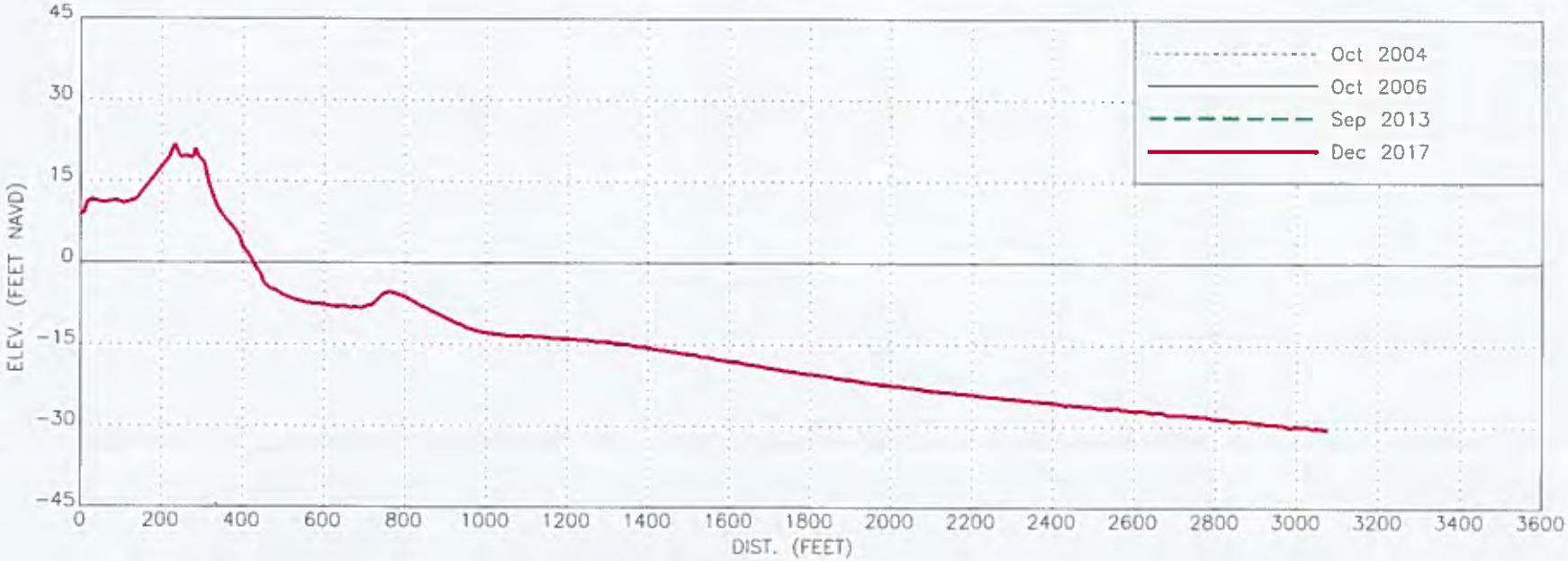
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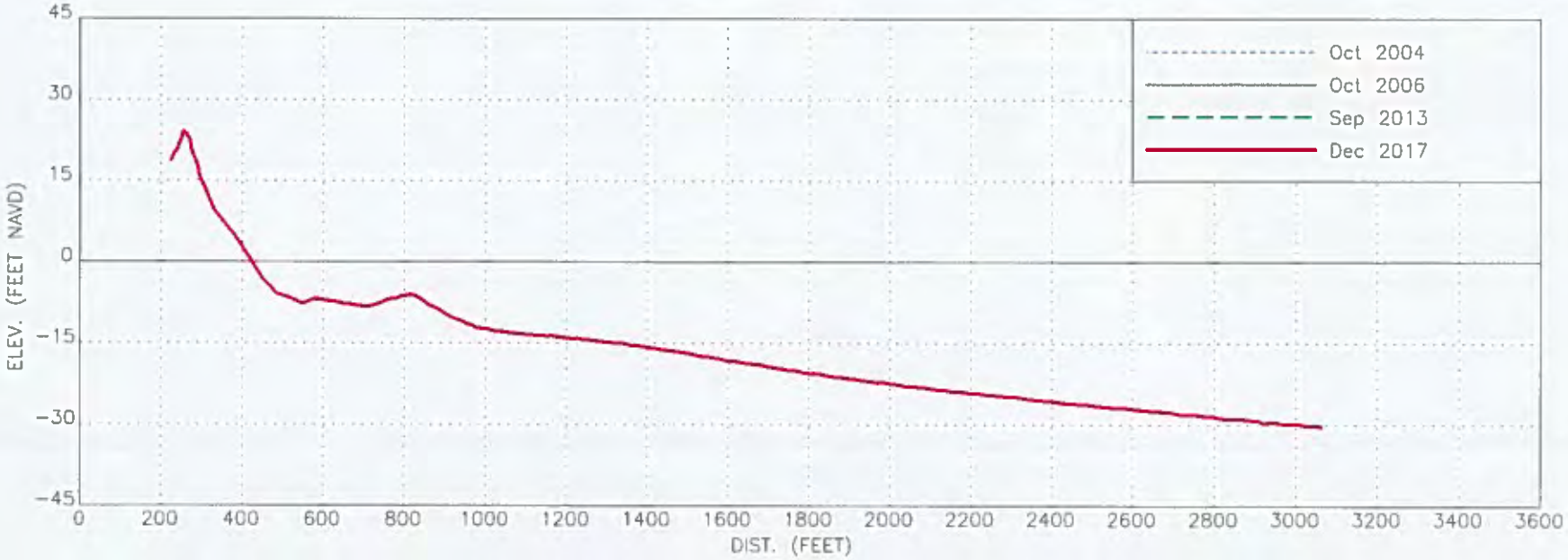
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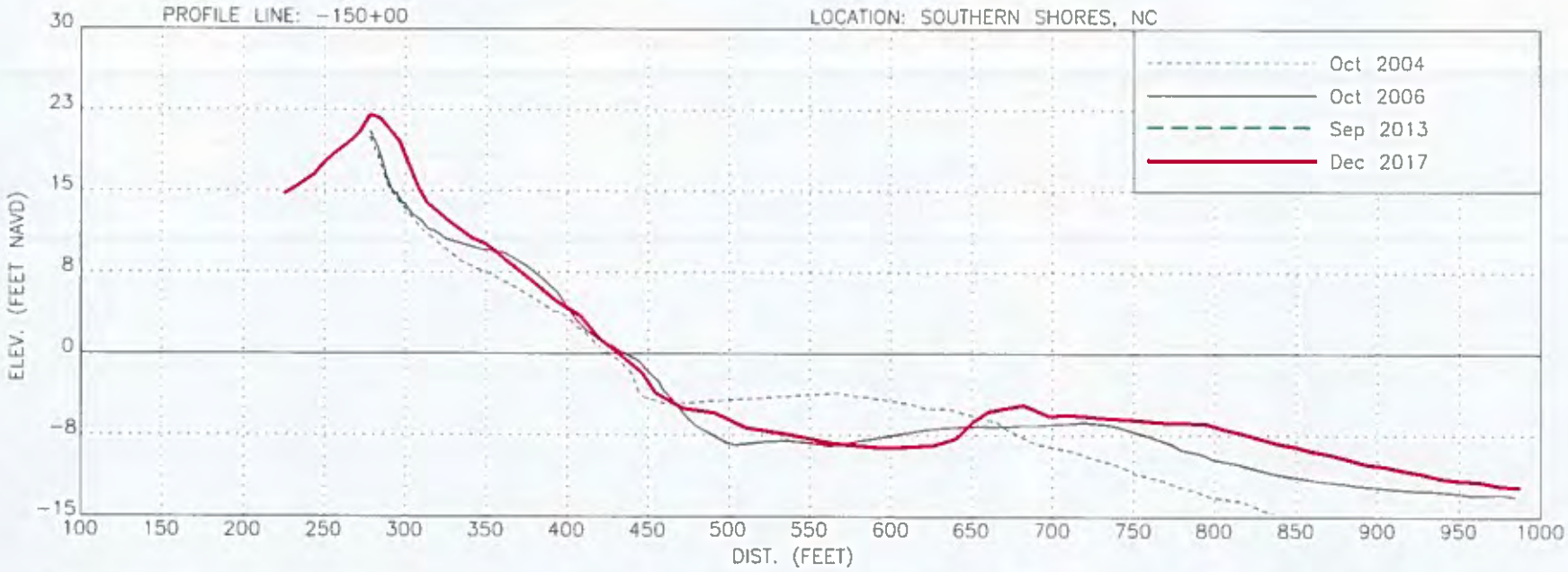
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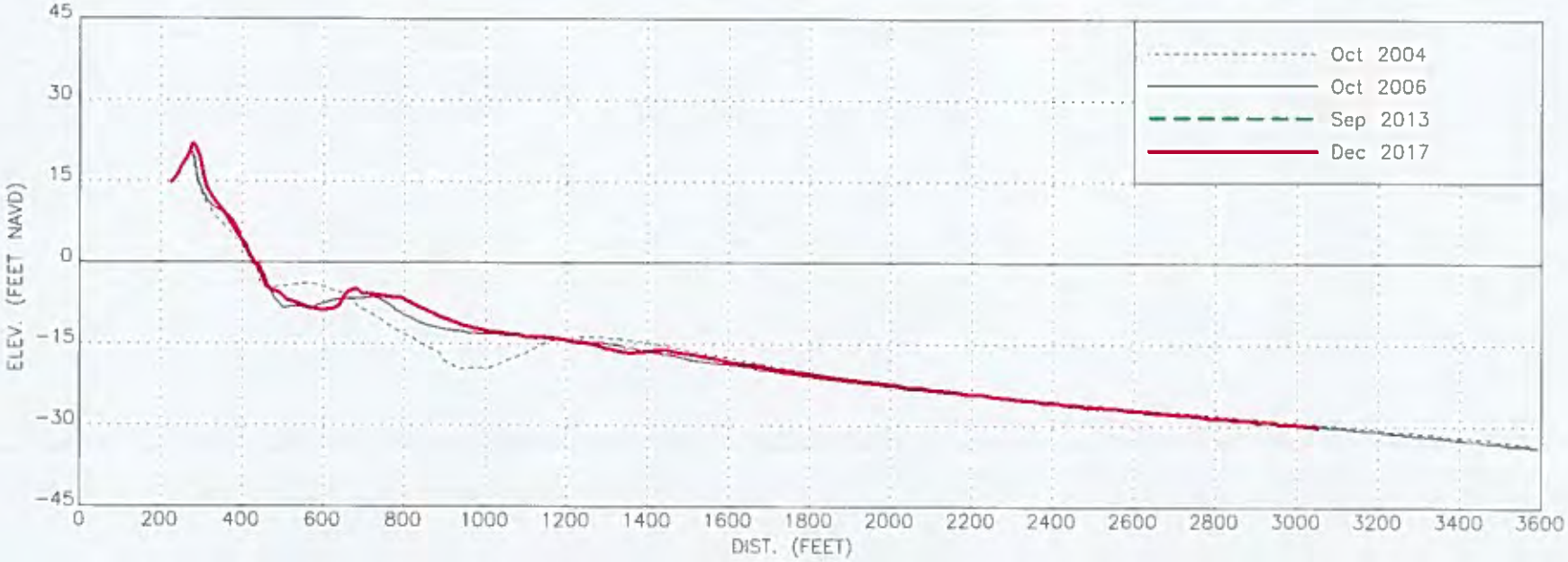
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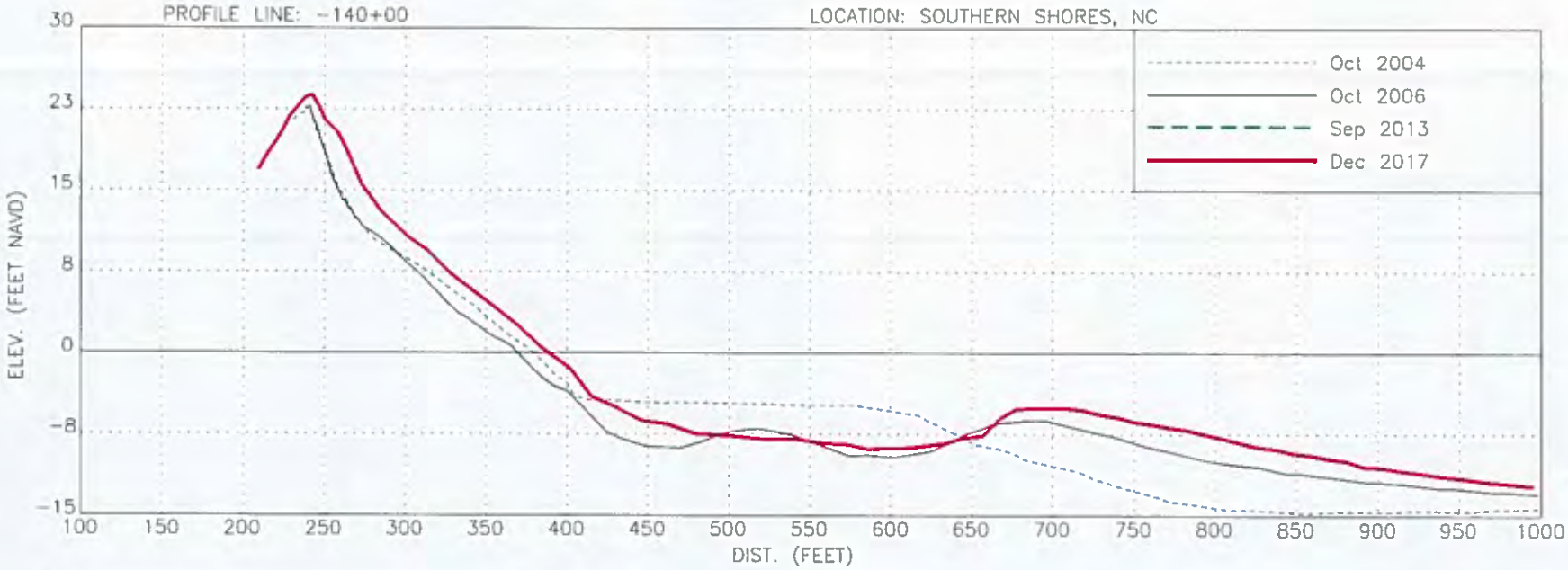
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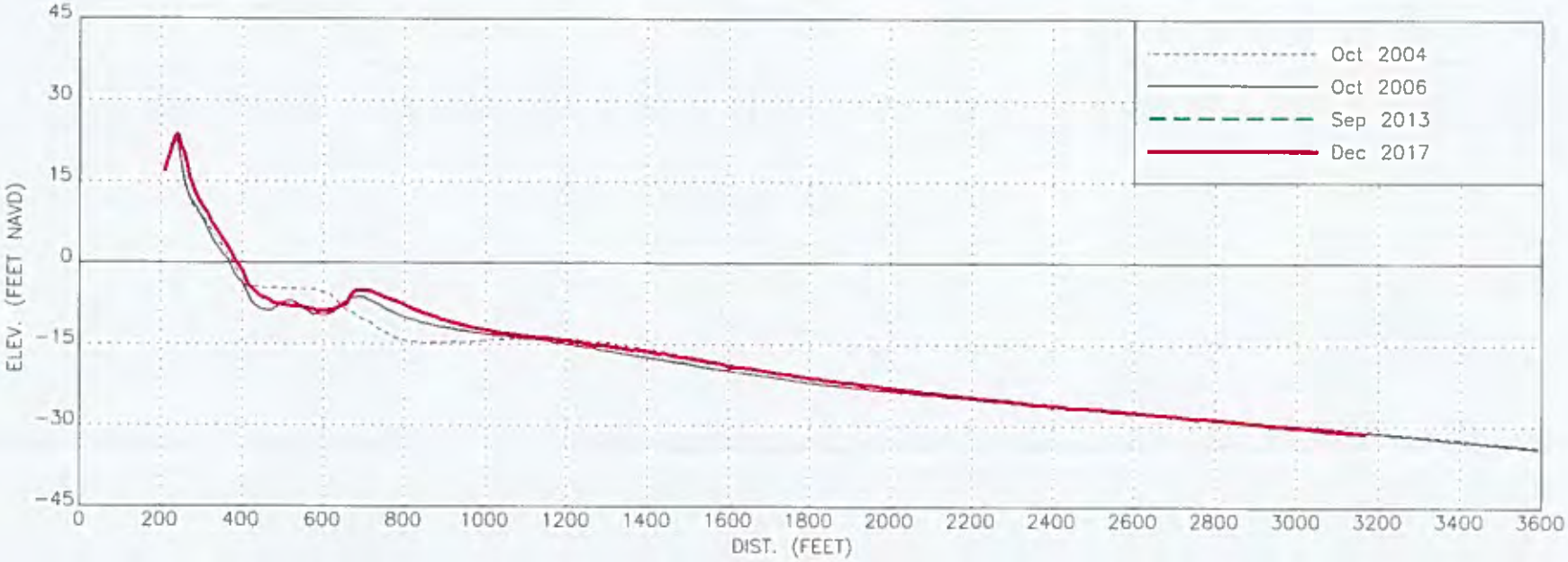
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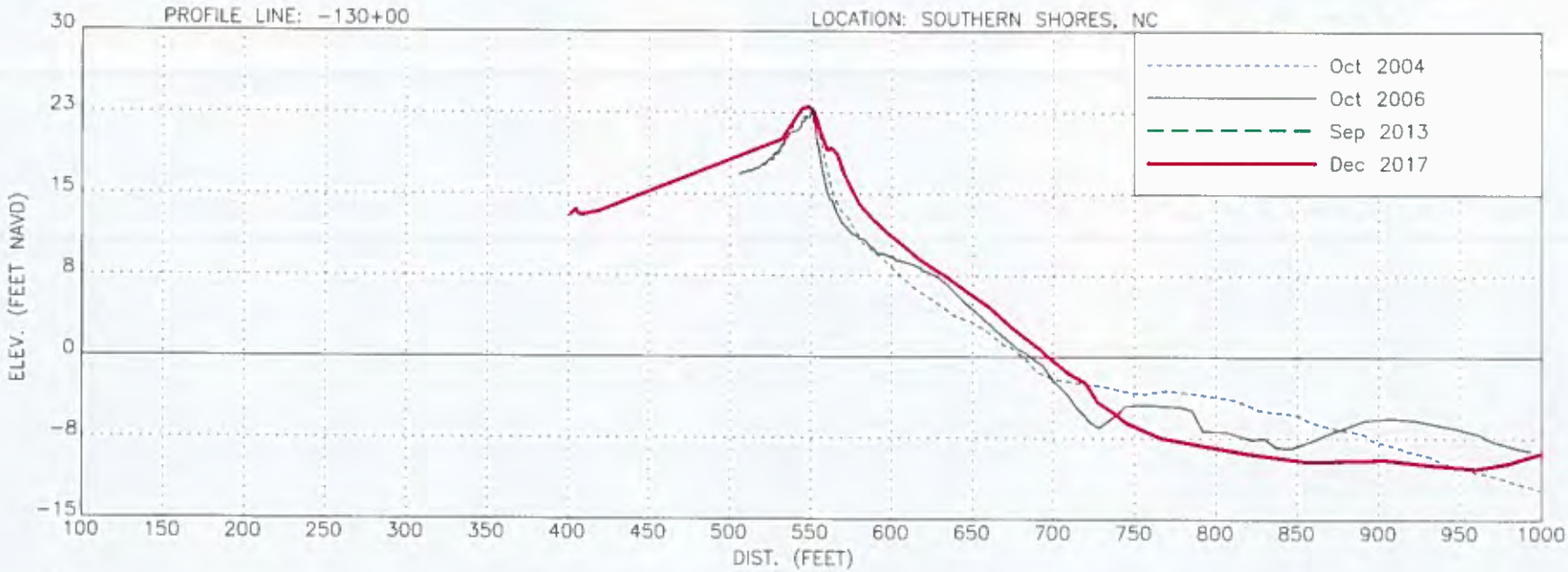
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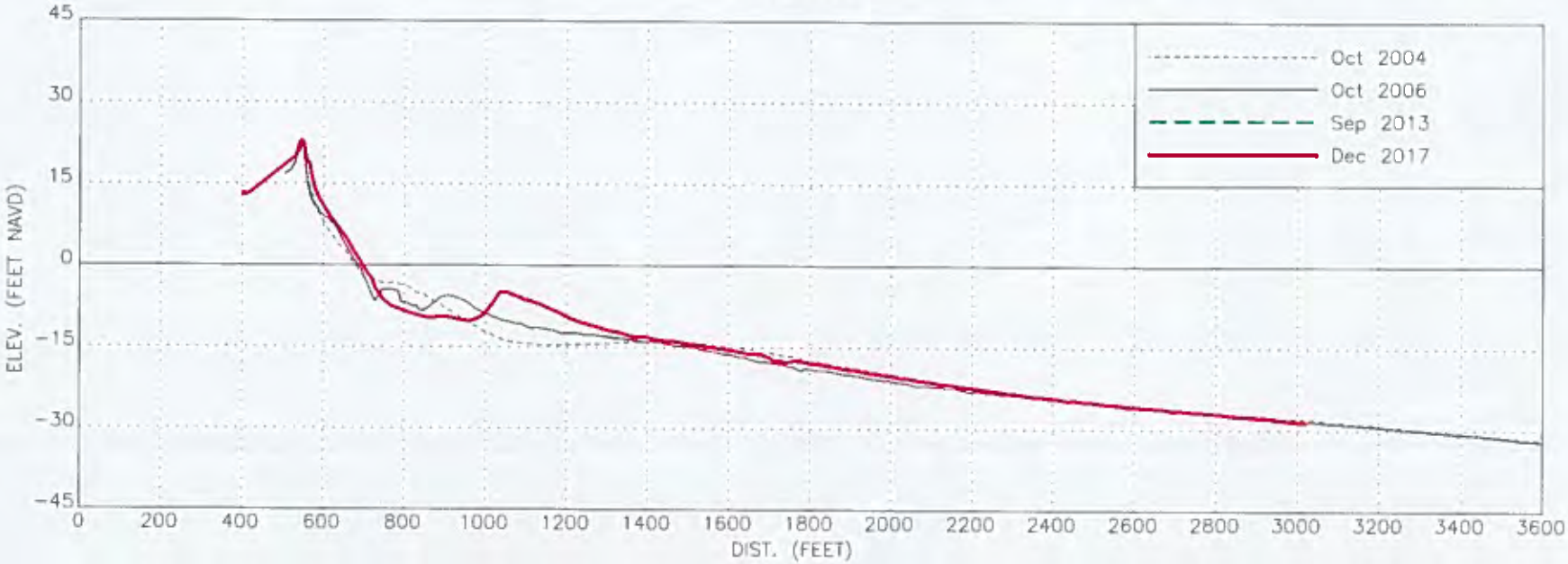
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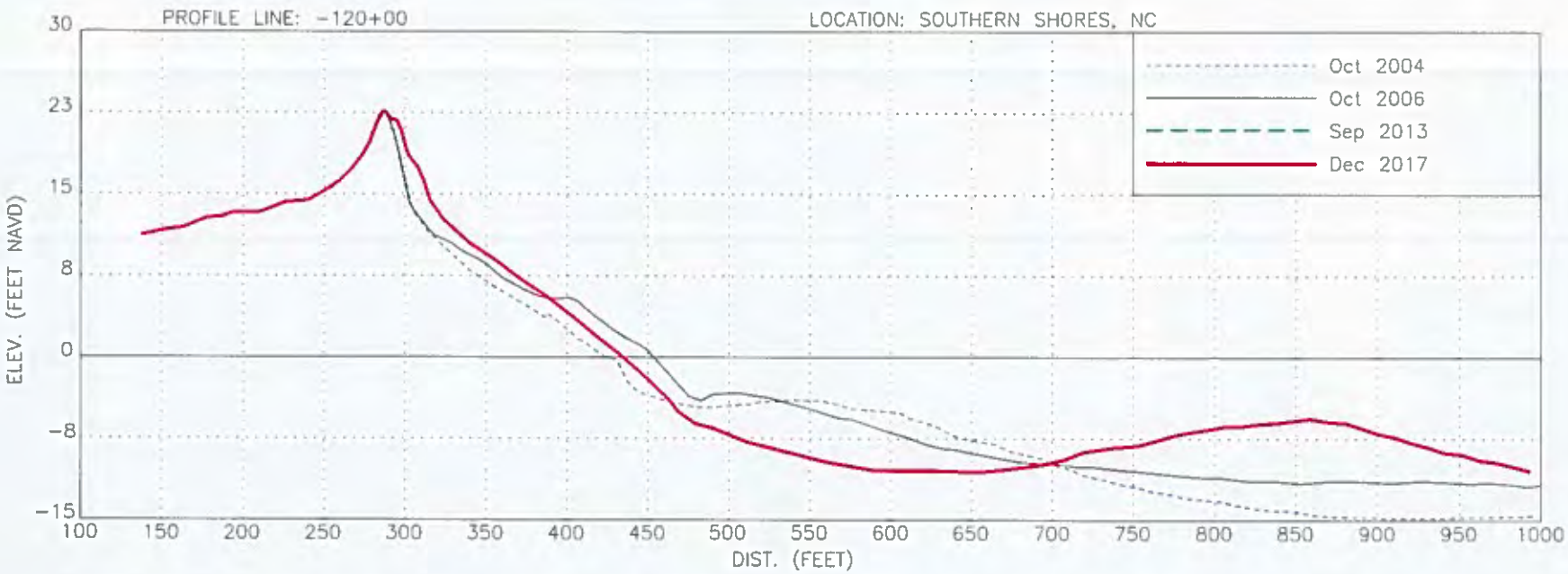
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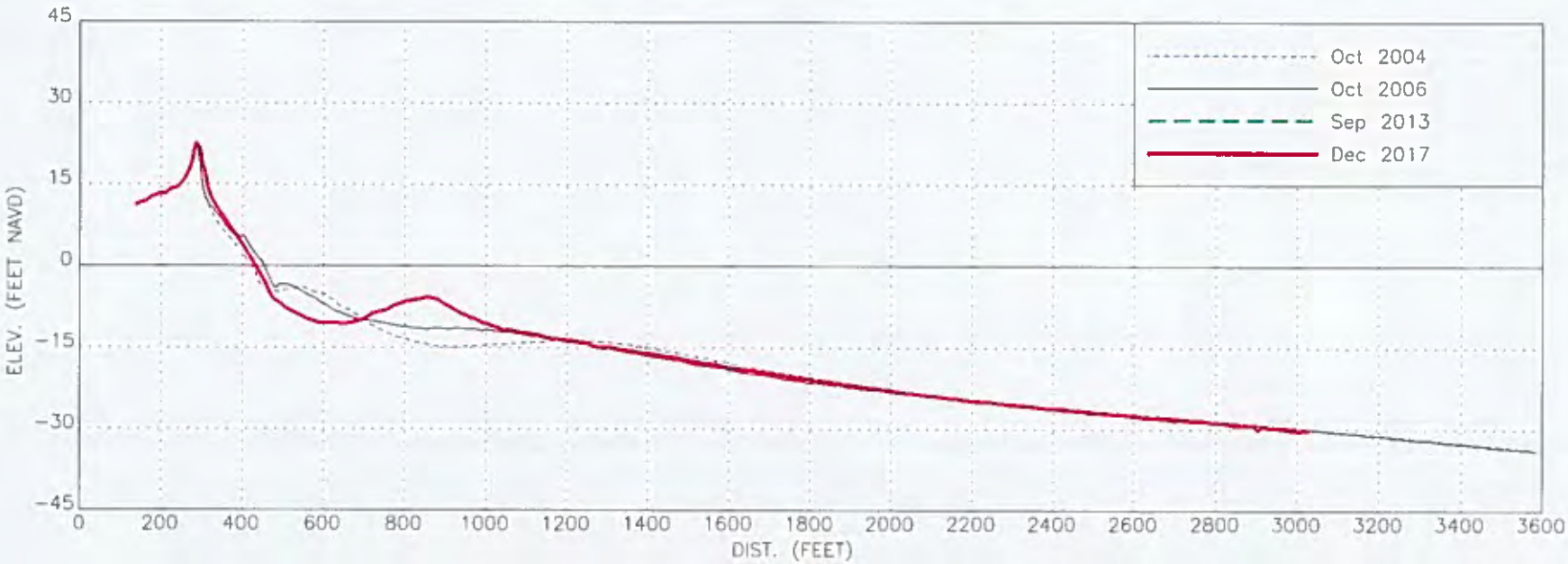
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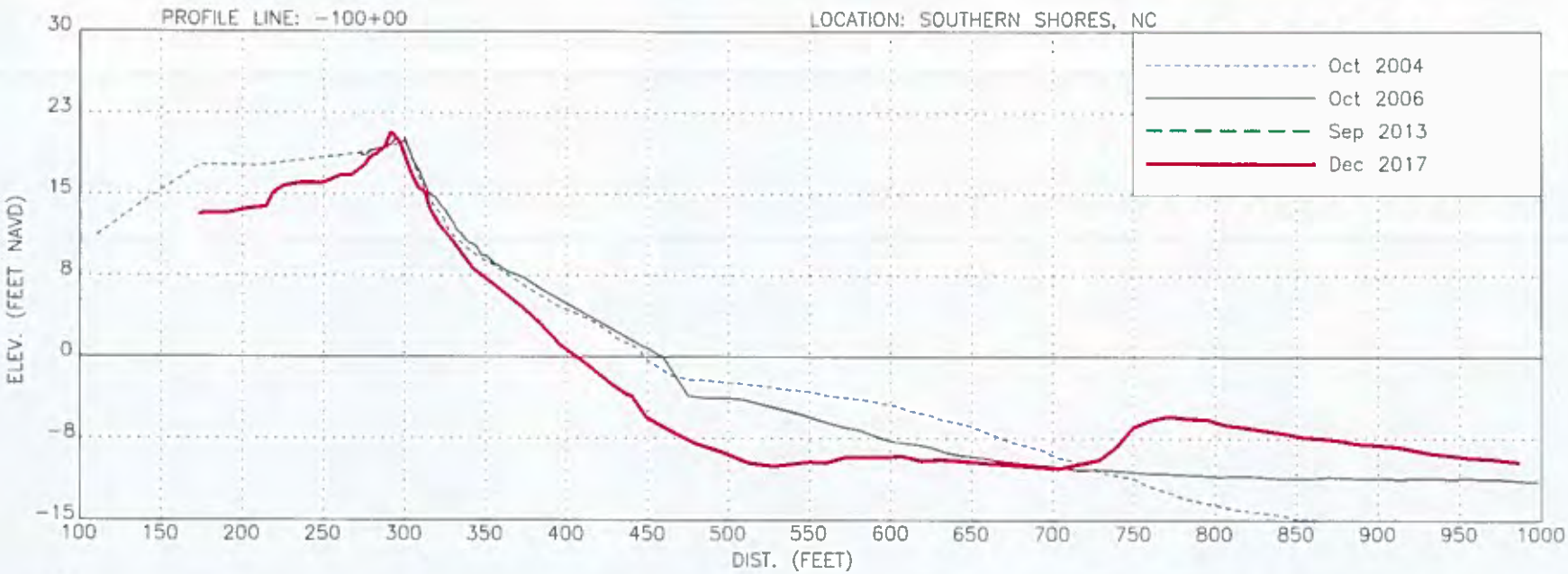
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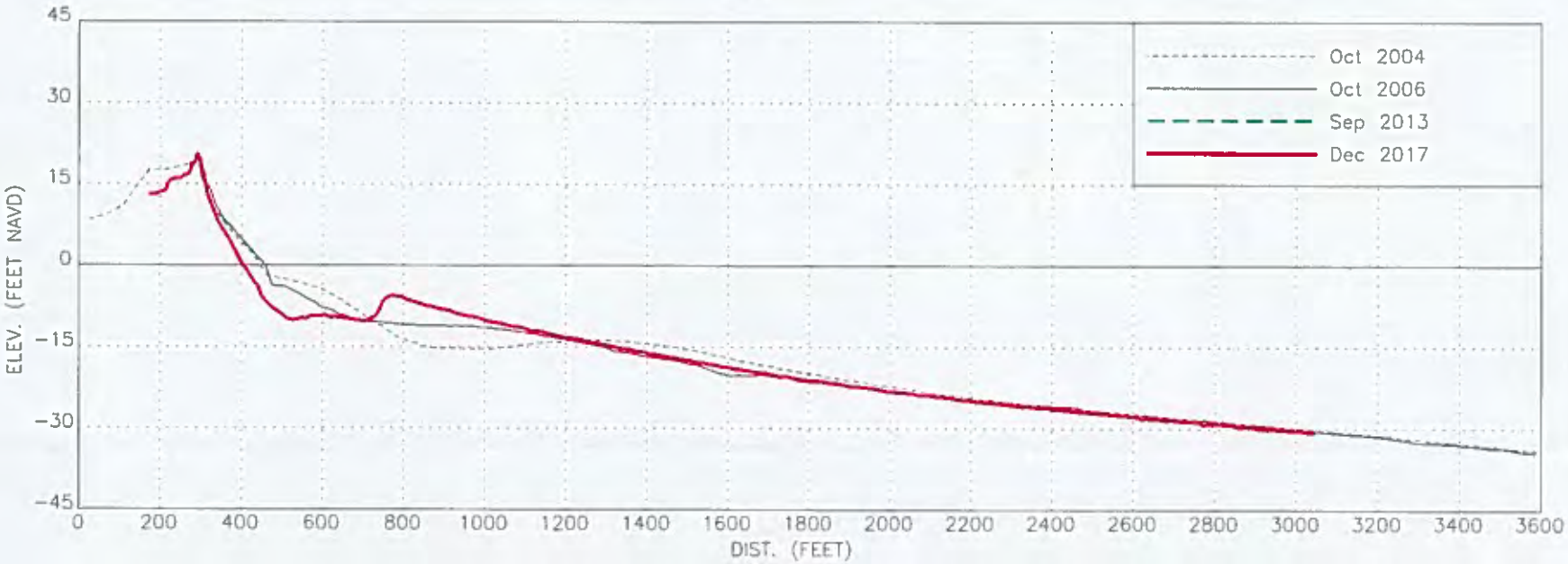
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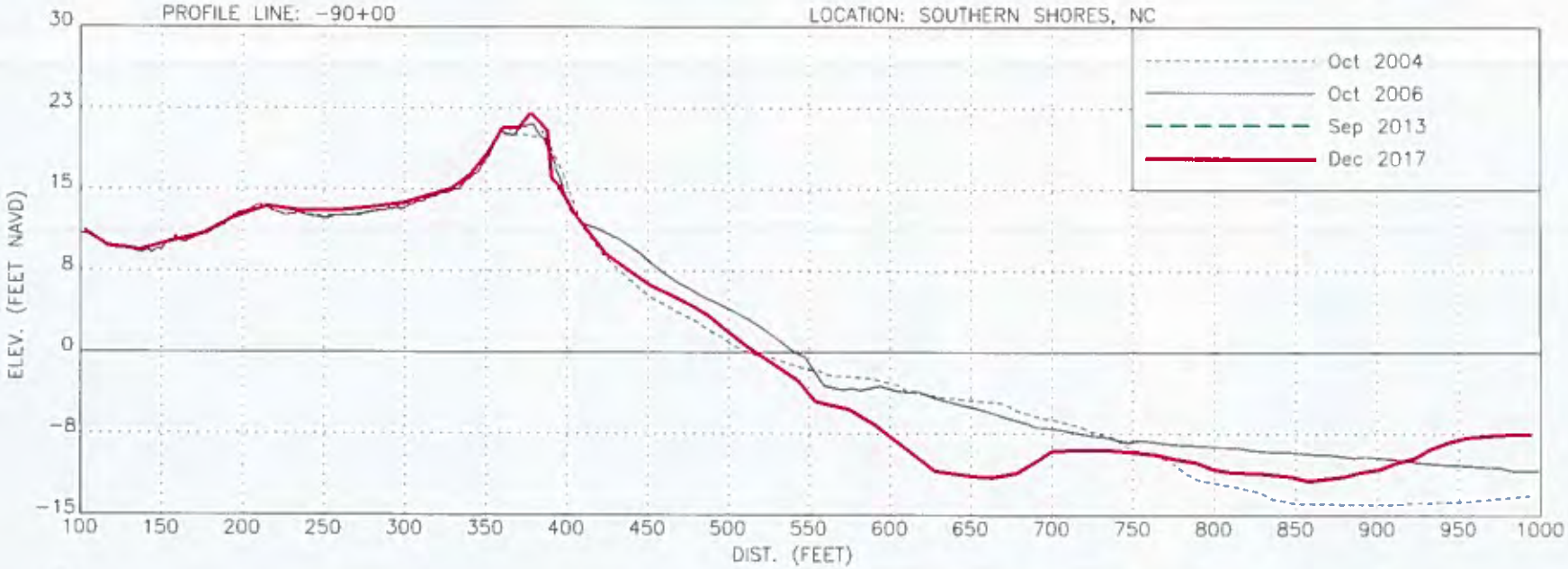
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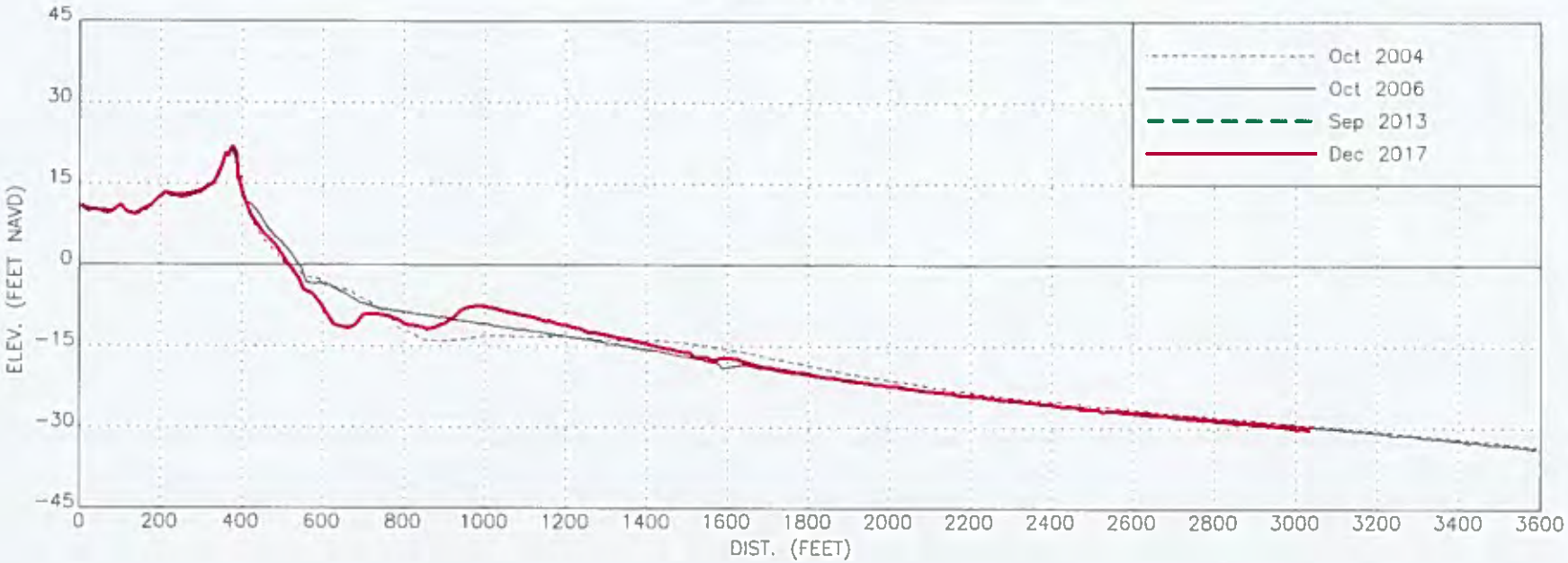
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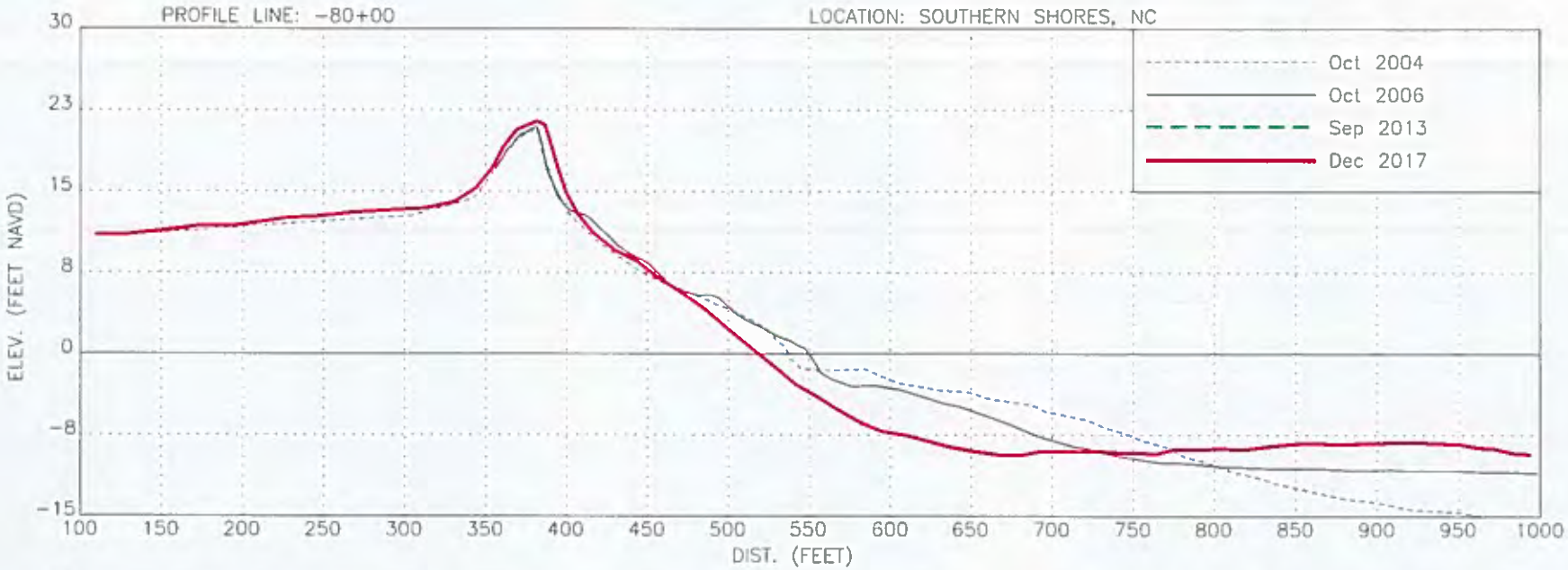
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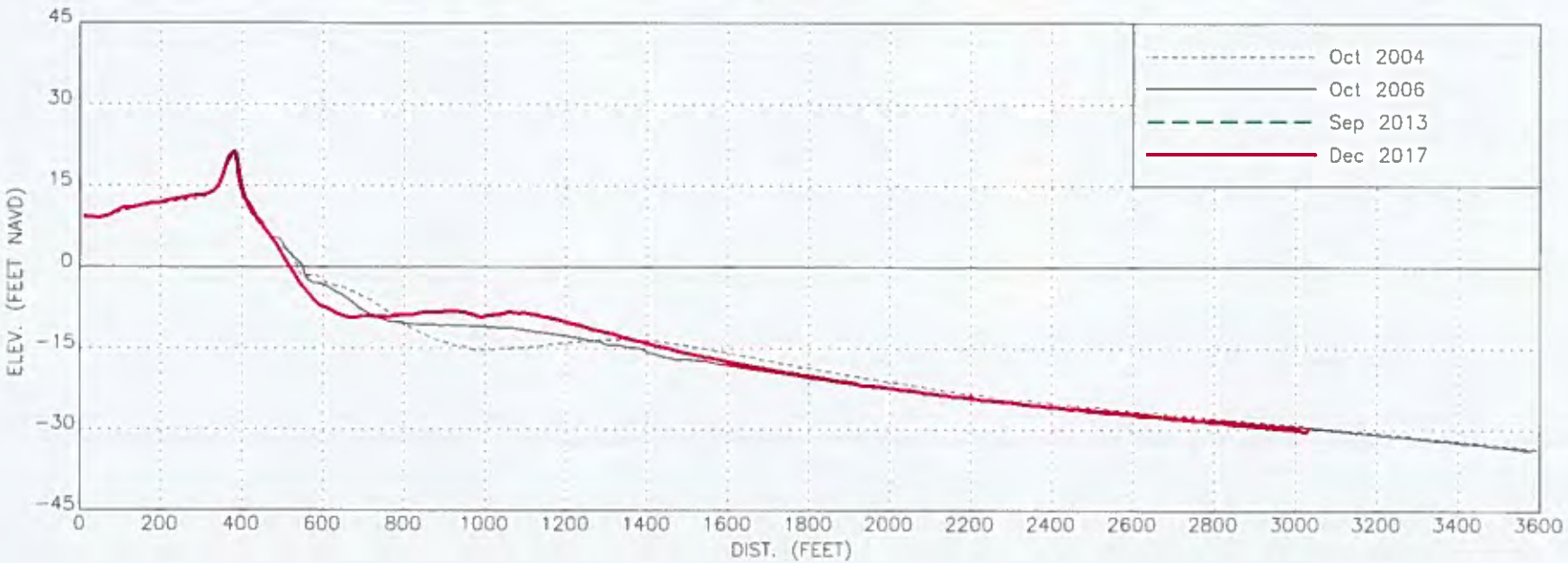
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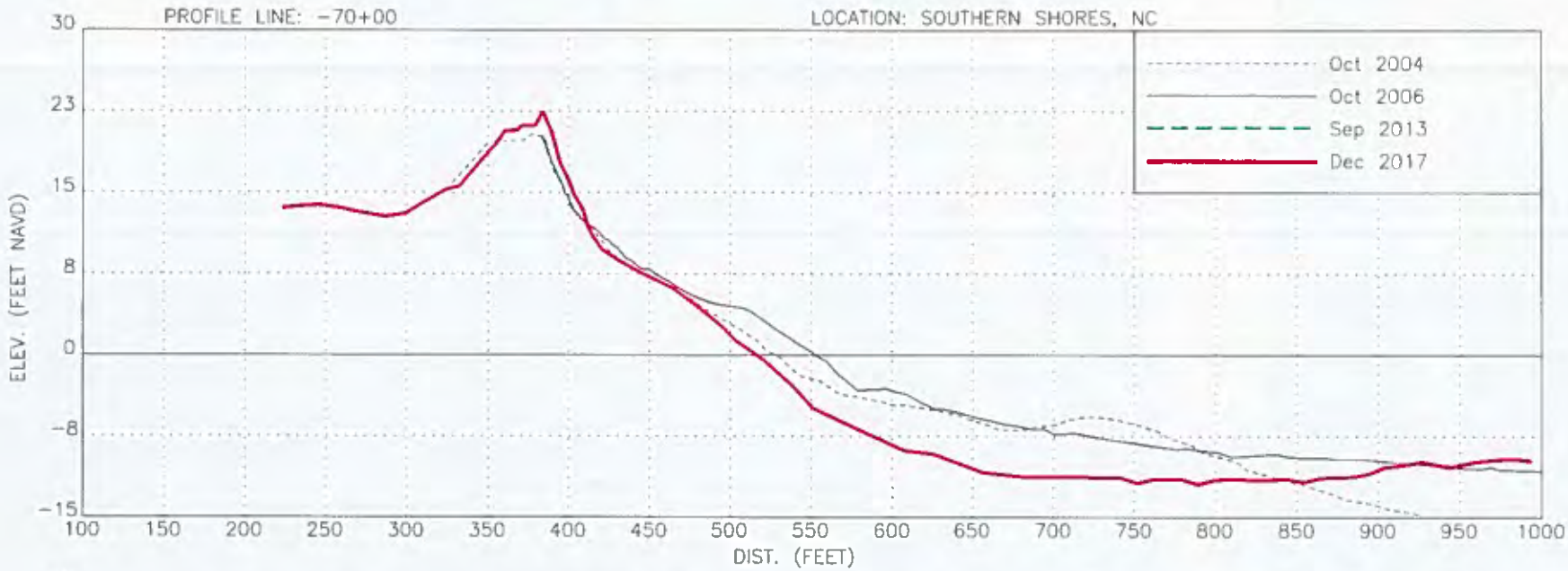
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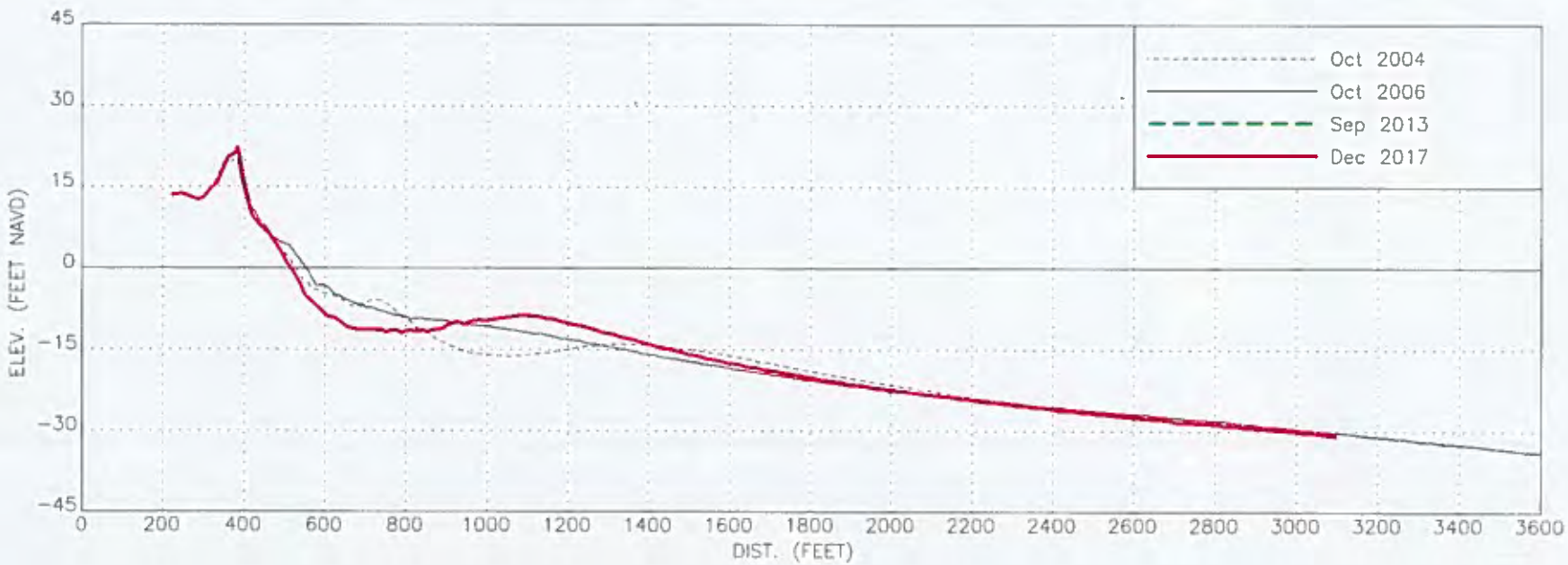
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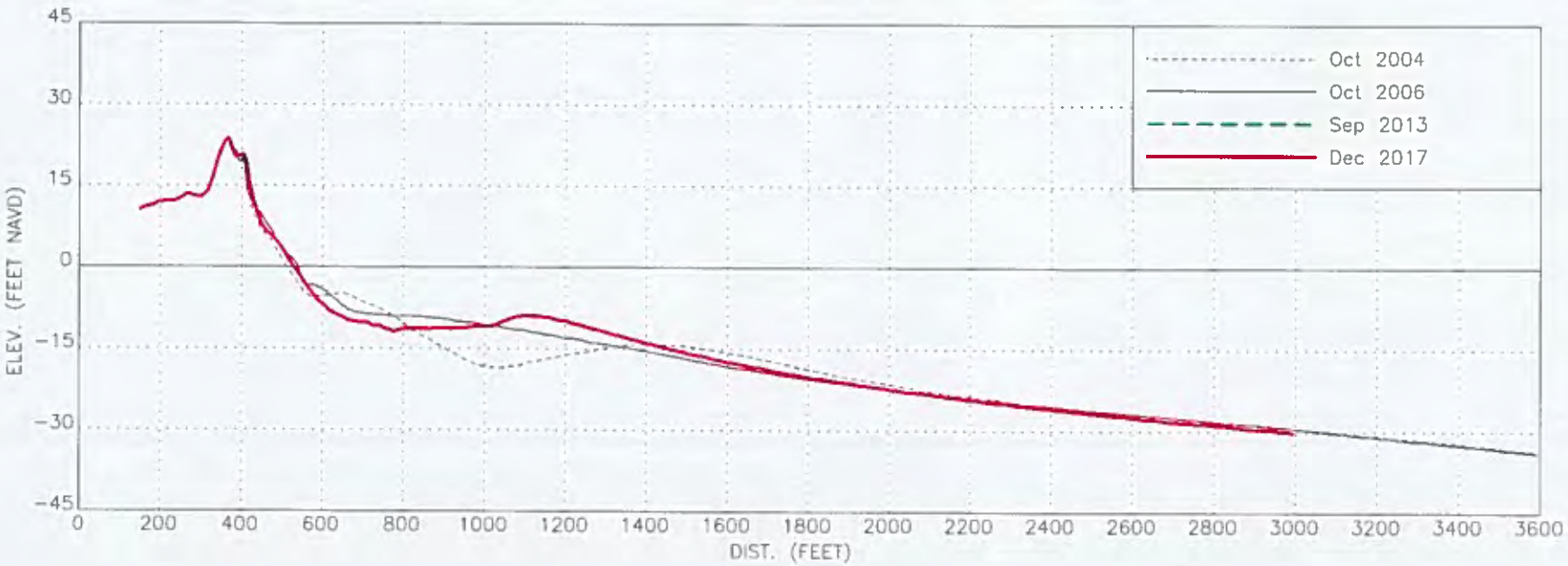
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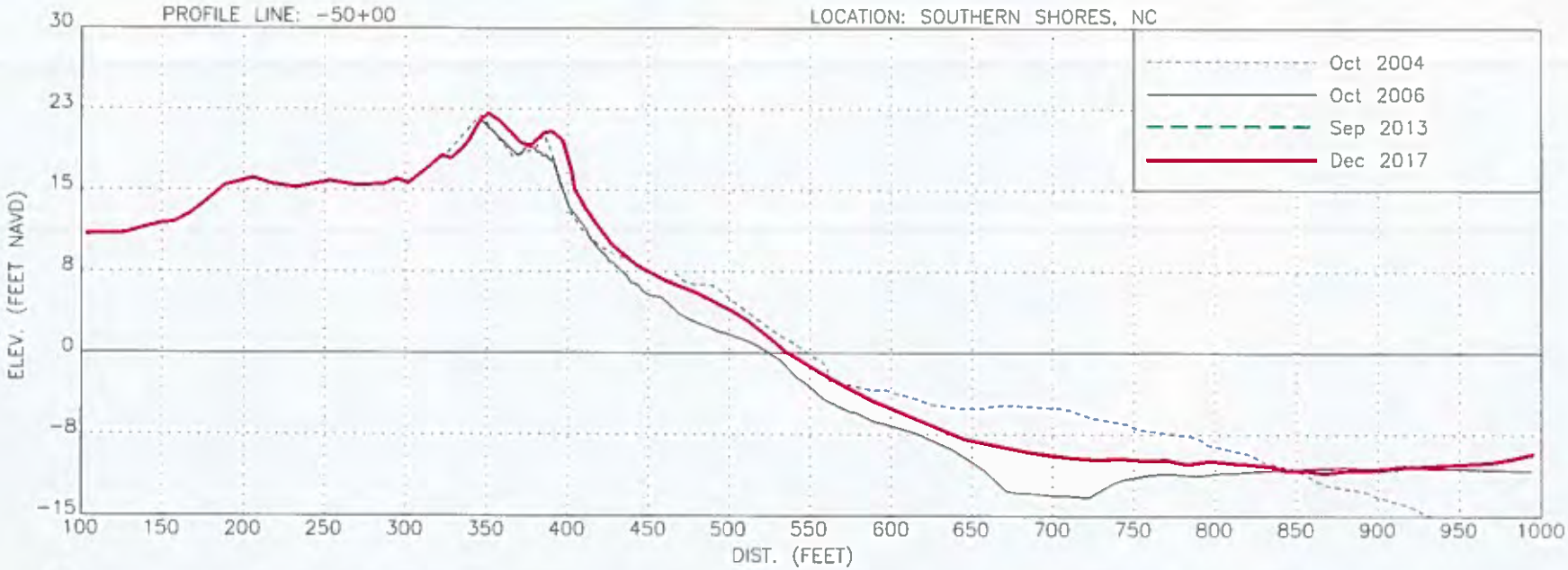
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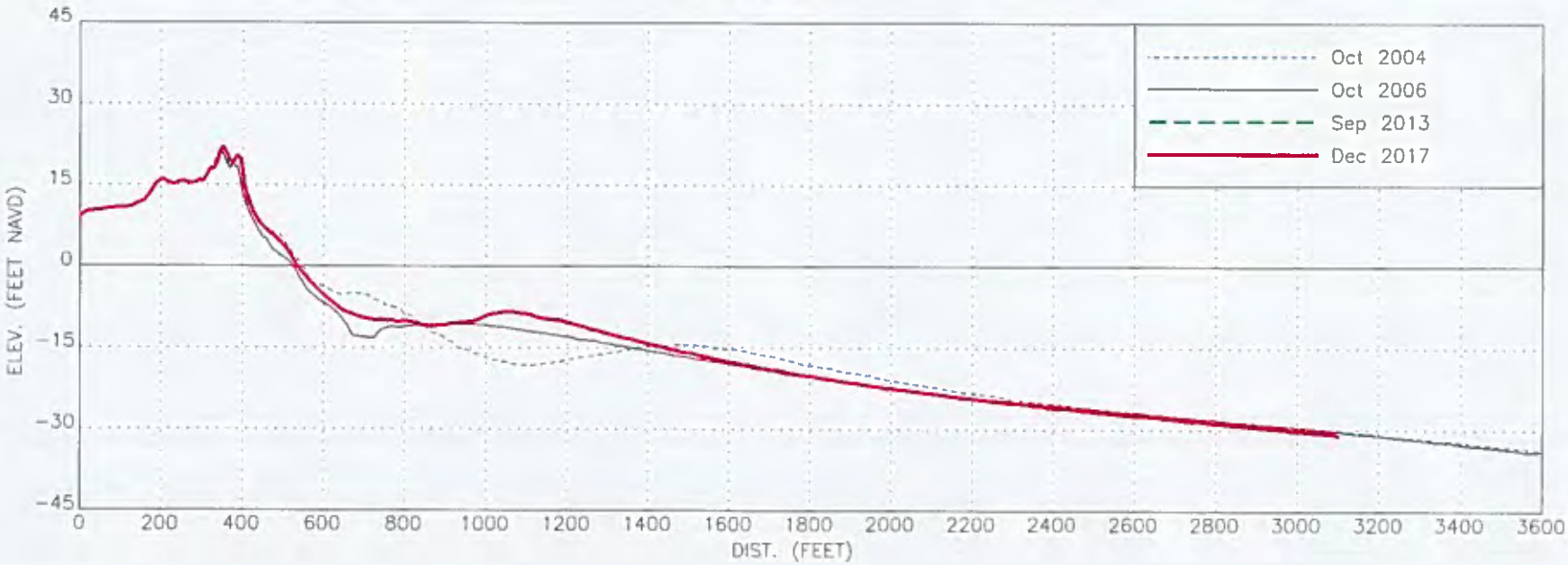
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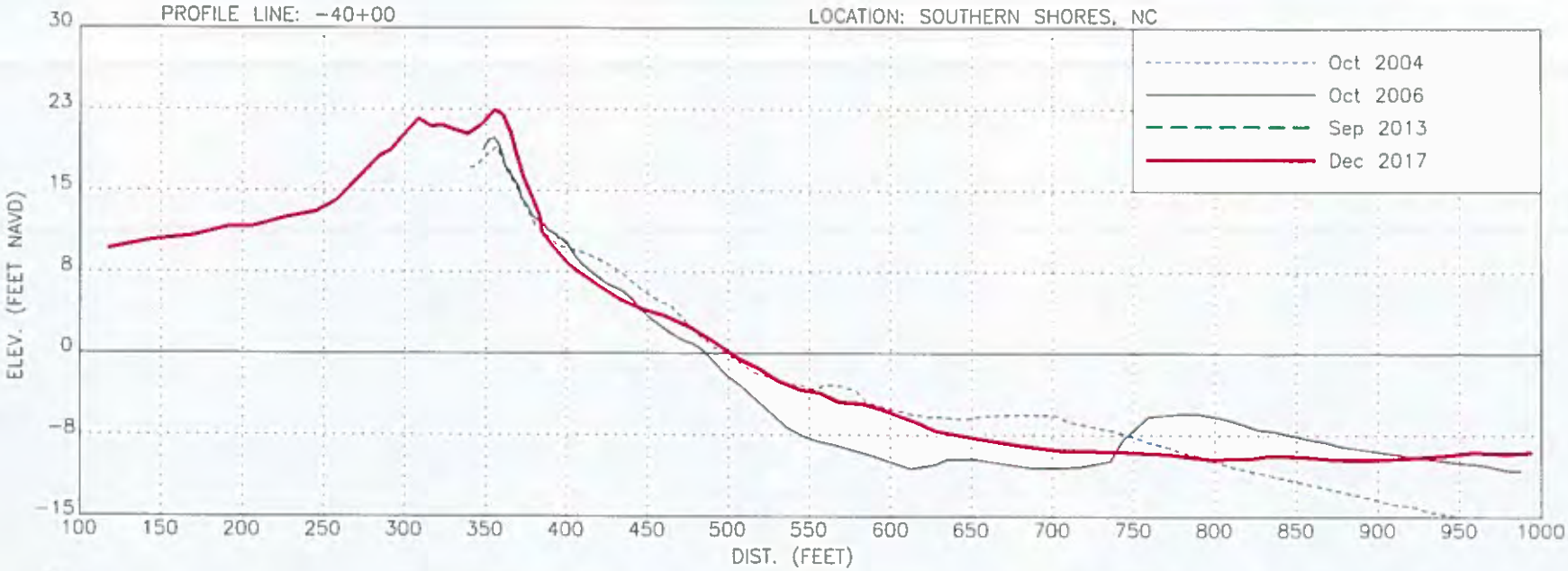
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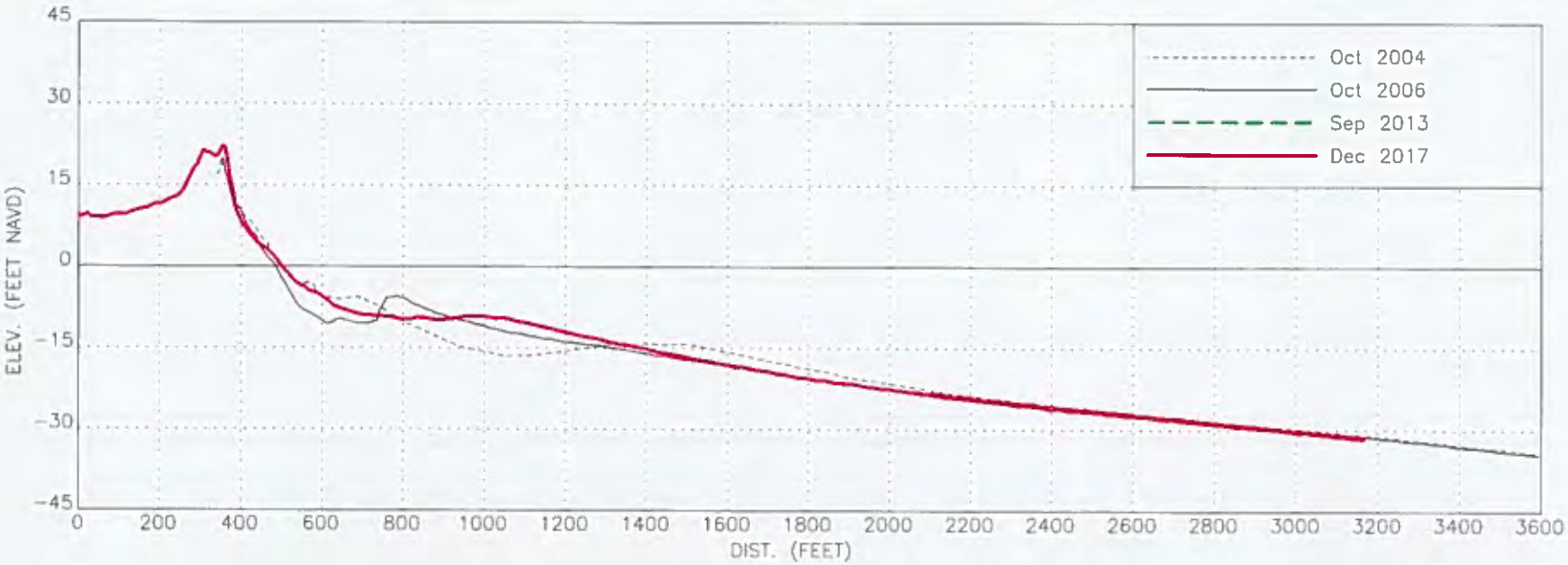
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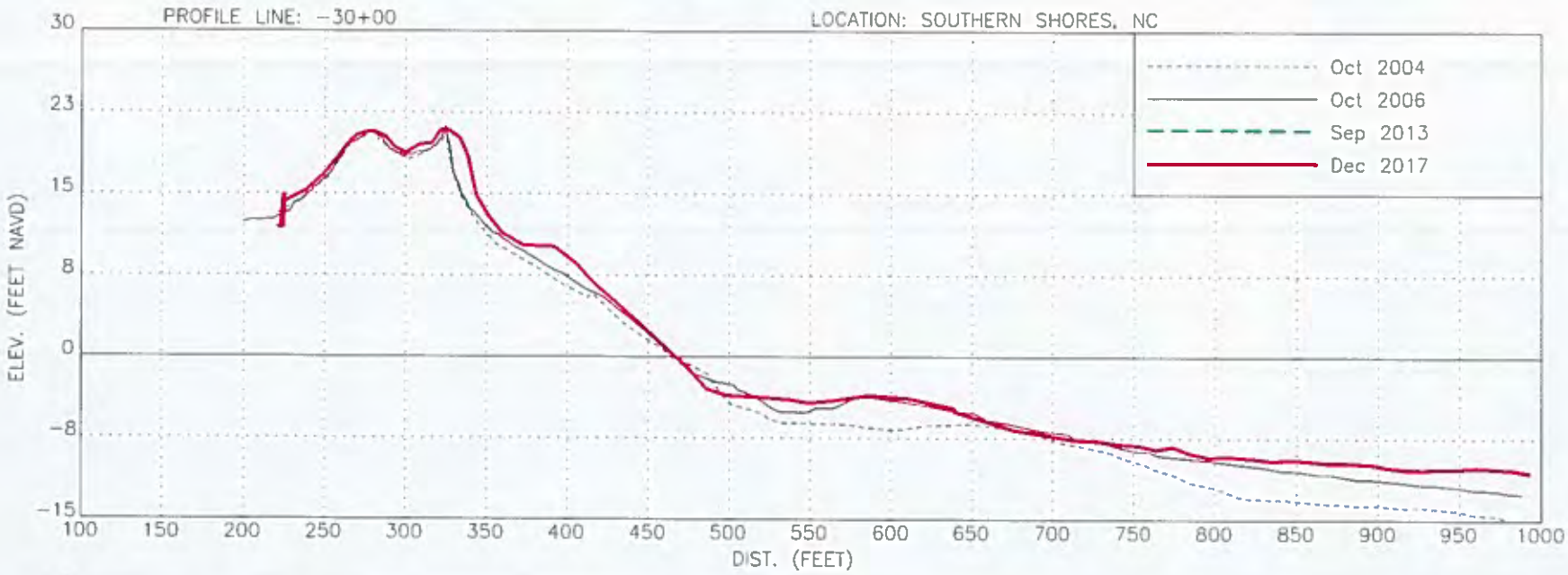
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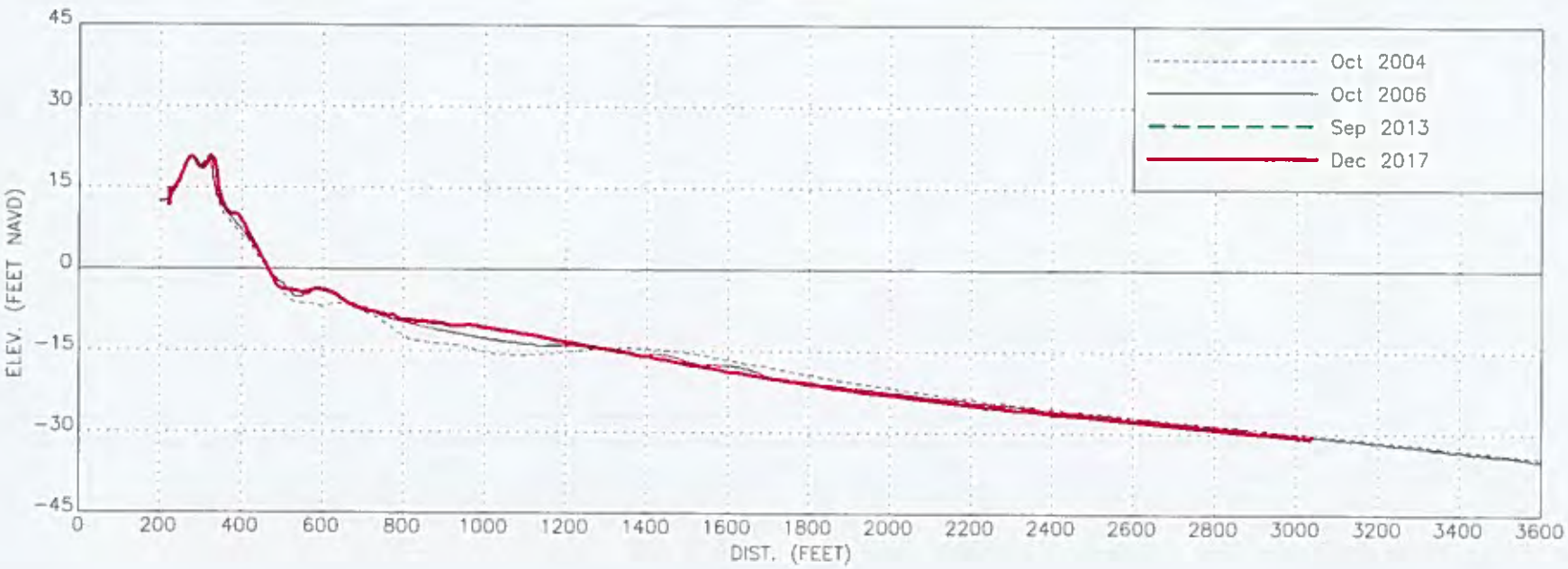
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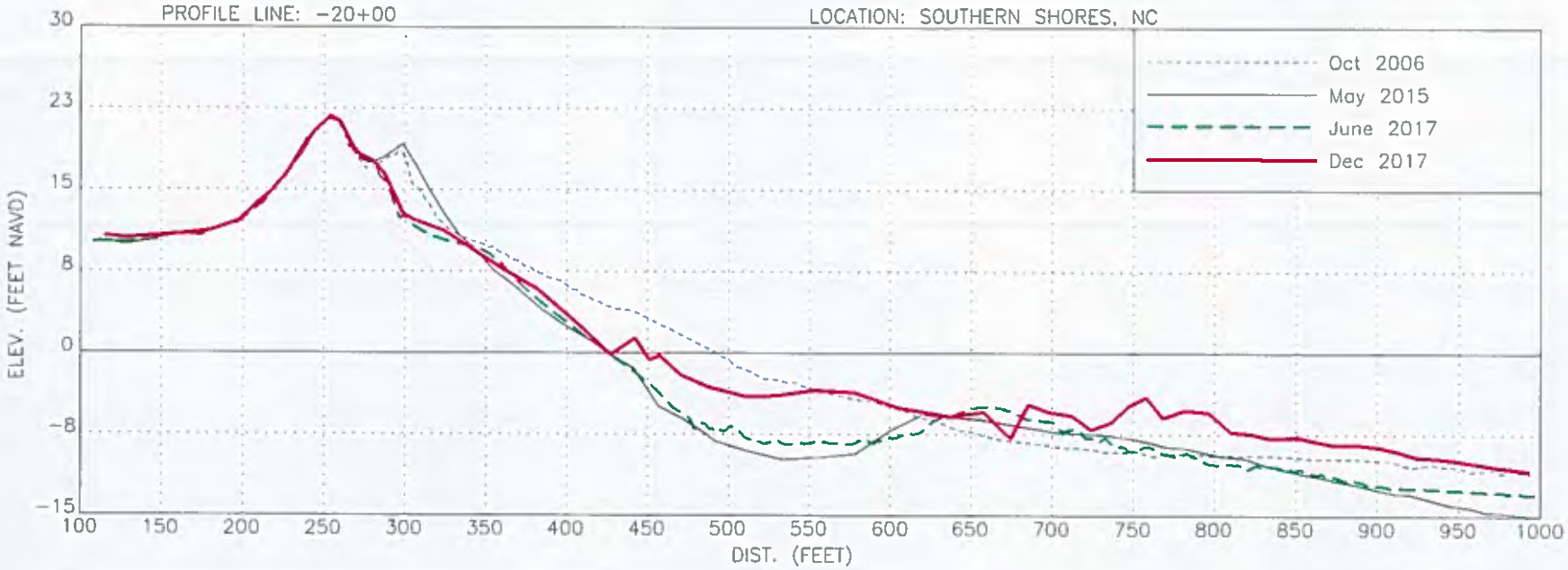
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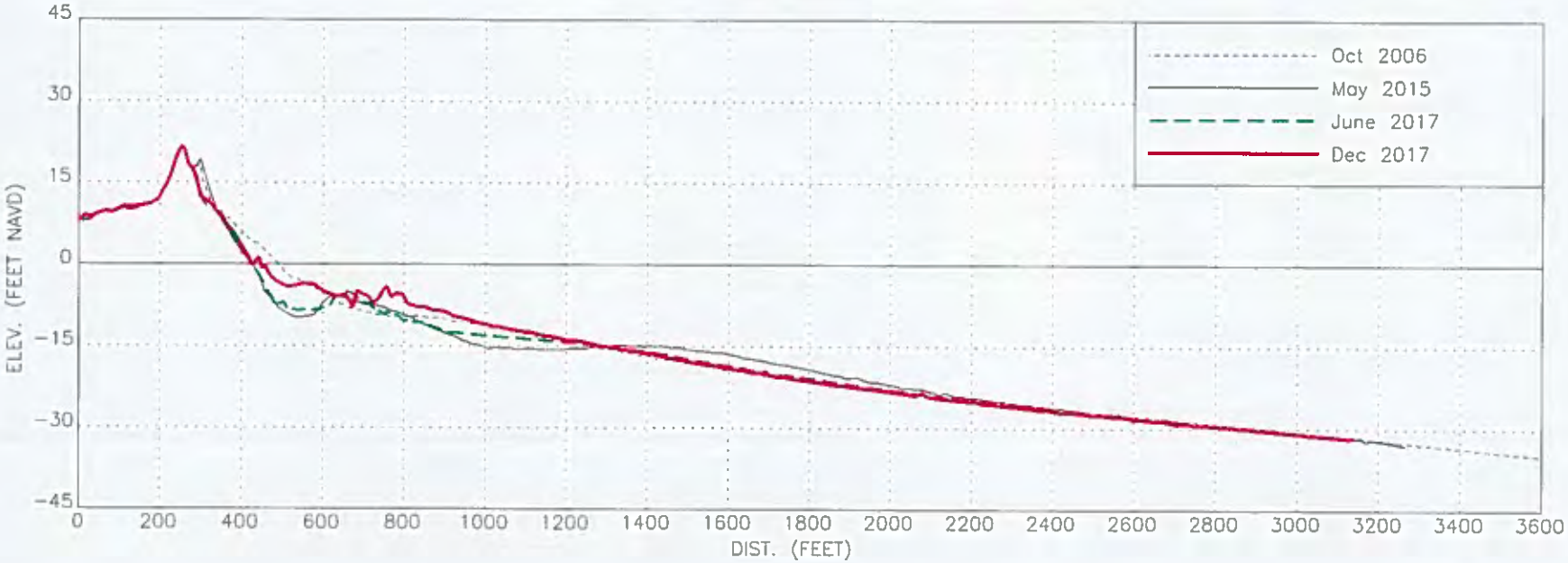
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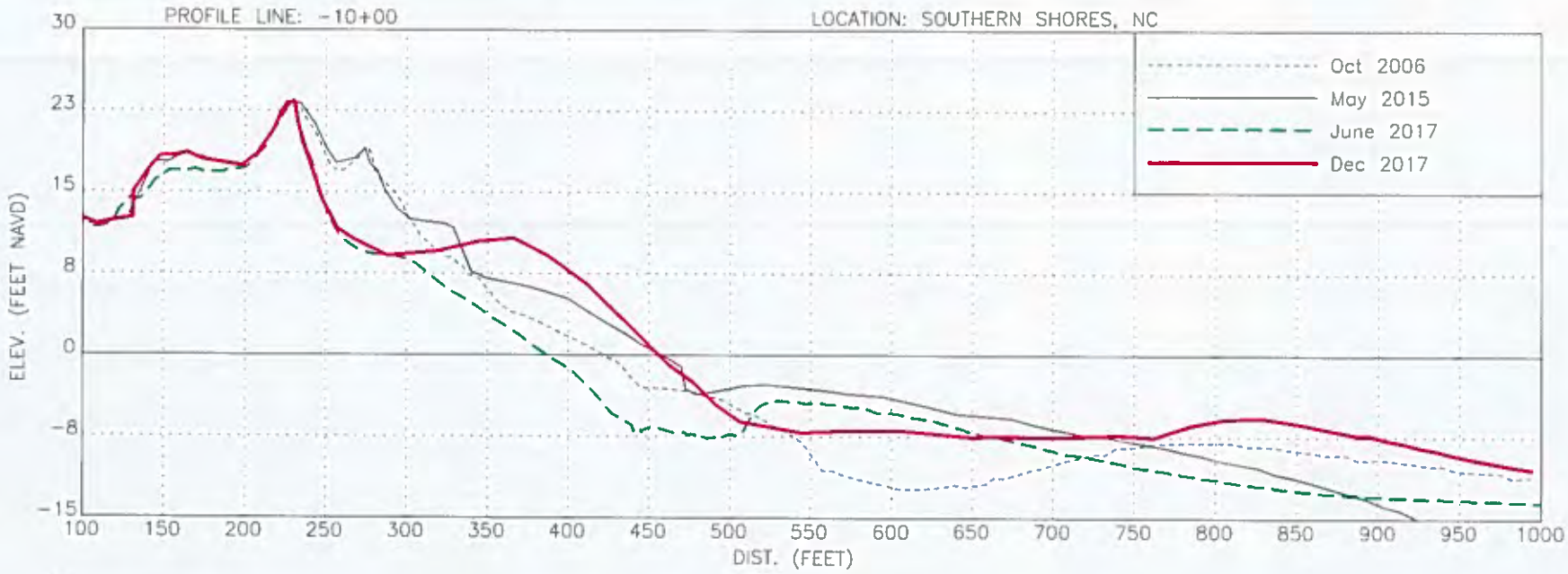
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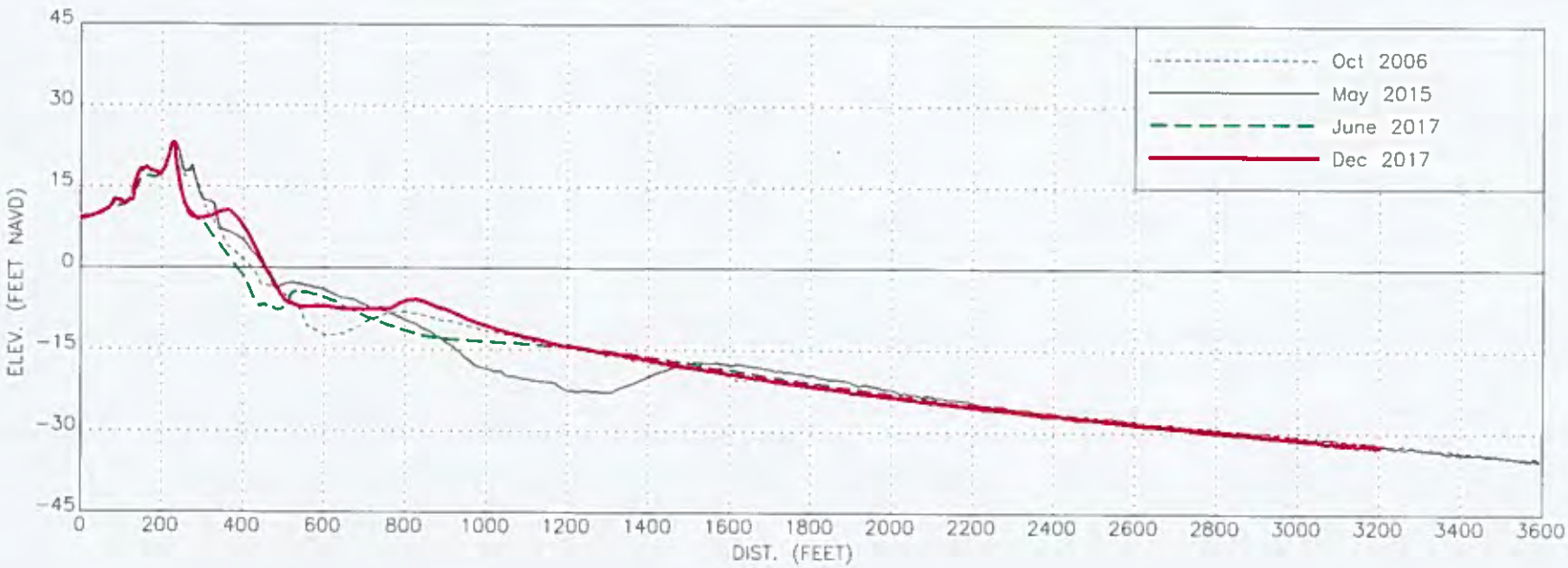
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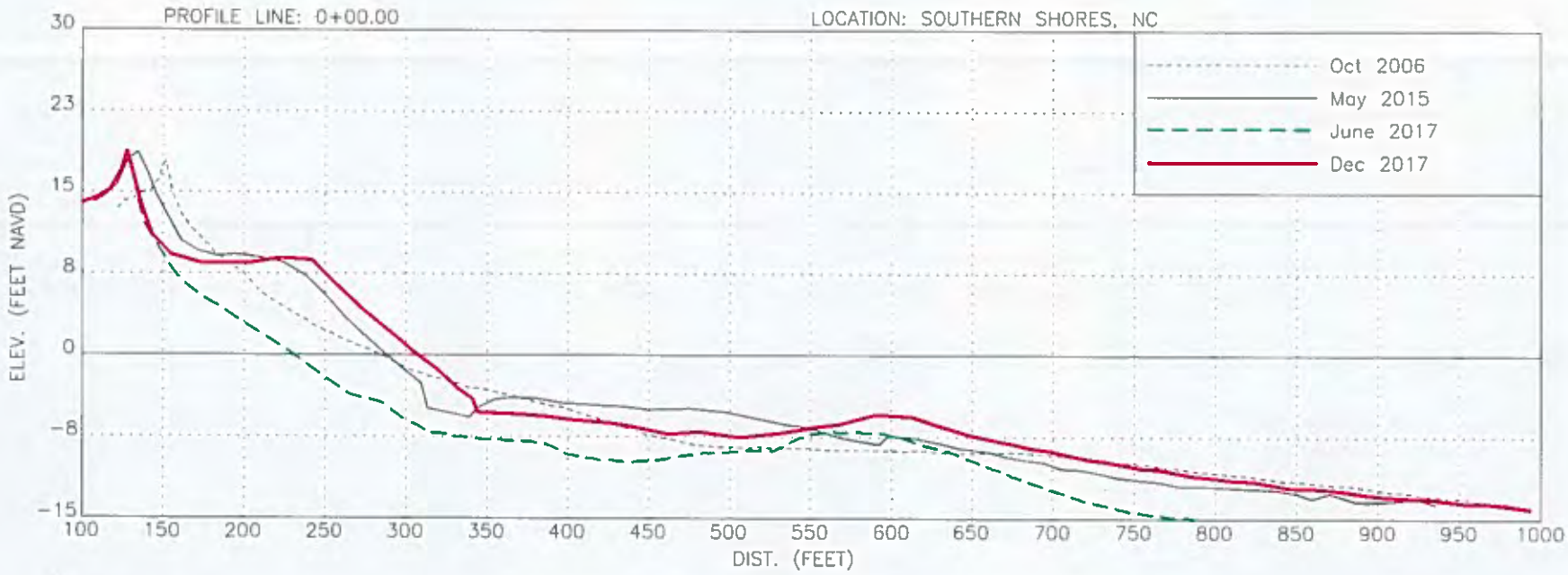
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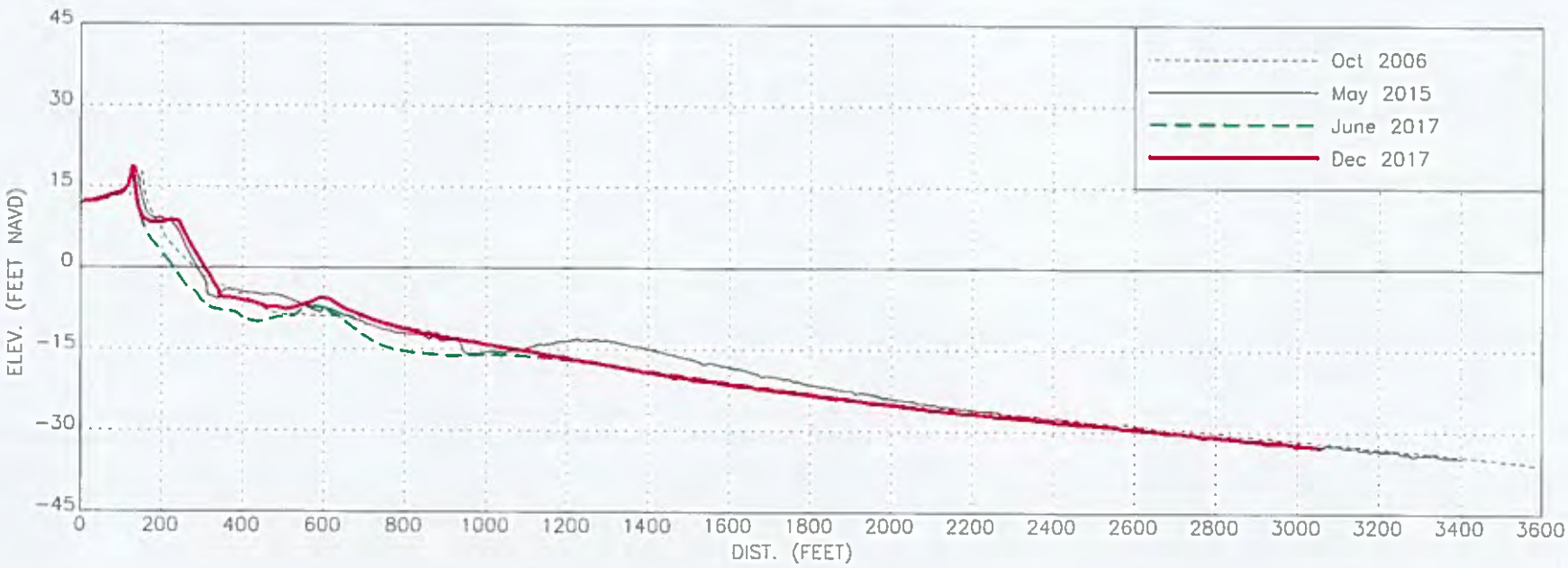
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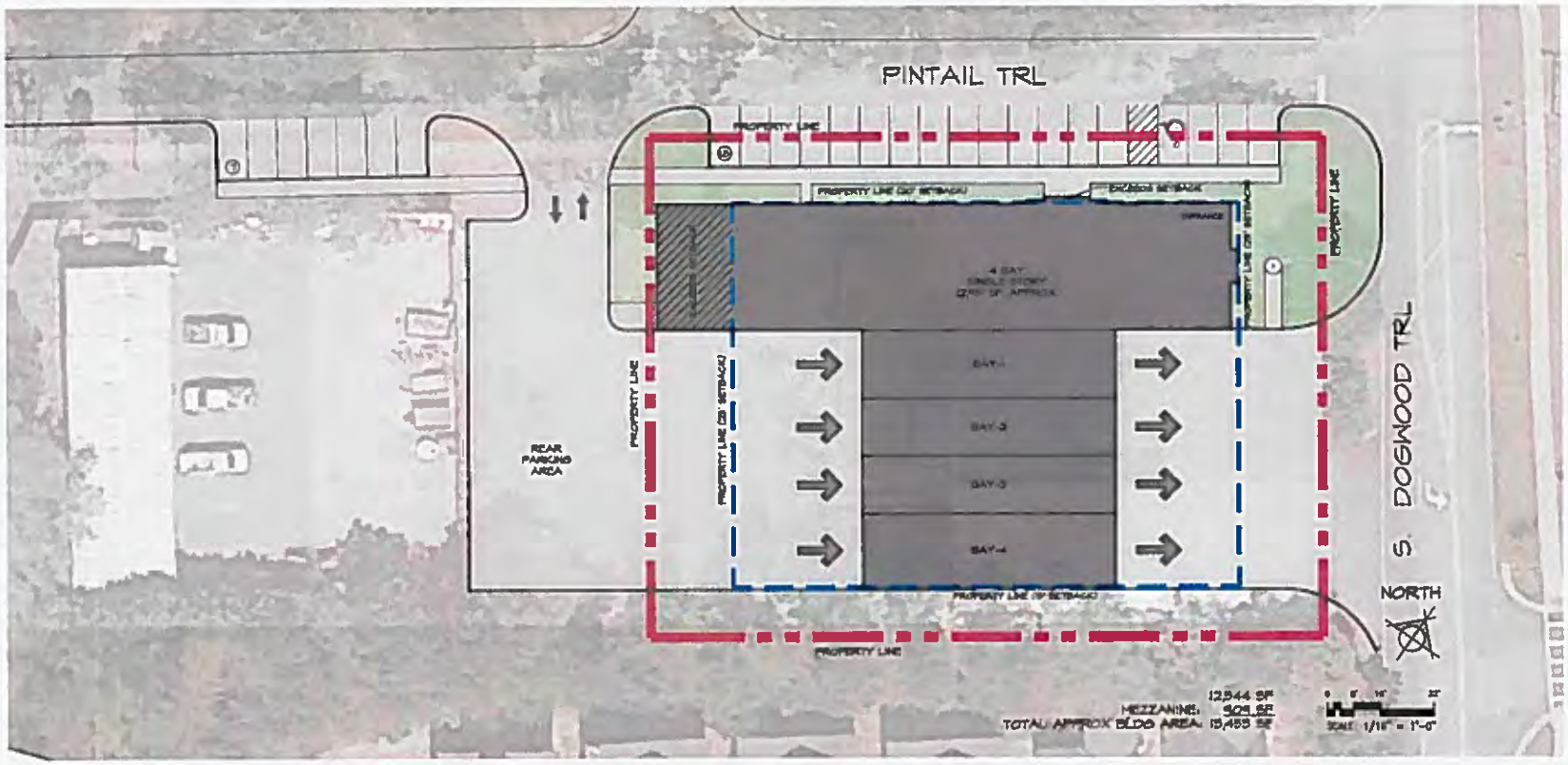
Town of Southern Shores

5375 N. Virginia Dare Trail, Southern Shores, NC 27949
Phone 252-261-2394 / Fax 252-255-0876
www.southernshores-nc.gov

NOTICE OF PUBLIC INFORMATION SESSION

The Public is invited to attend an Information Session on Tuesday March 6, 2018 from 3:00 PM to 5:00 PM, hosted by Stewart-Cooper-Newell Architects, architect for the Southern Shores Volunteer Fire Department, Inc. The purpose of the session is the display of design drawings of a new proposed fire station at 15 S. Dogwood Trail, Southern Shores, NC. and to be available for public inquiries and comments. The session will be conducted in the Pitts Center, Southern Shores Town Hall Complex, 5377 N. Virginia Dare Trail, Southern Shores, NC 27949



SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

PN. 1347

SITE PLAN
SCALE: 1/16"=1'-0"
DATE: 02.20.18

Stewart · Cooper · Newell · Architects
Architecture Planning Interiors
www.scn-architects.com

PUBLIC

PRIVATE

APPARATUS AND SUPPORT

CRITICAL PATH

SCALE 1/8" = 1'-0"

SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

FLOOR PLAN
SCALE: 1/8"=1'-0"
DATE: 02.20.18
13,453 SF

Stewart · Cooper · Newell · Architects
Architecture Planning Interiors
www.scn-architects.com

SIDE ELEVATION - PINTAIL TRAIL

FRONT ELEVATION - SOUTH DOGWOOD TRAIL

SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

EXTERIOR ELEVATIONS - OPTION A
CMU BASE WITH CEMENTITIOUS SIDING
SCALE: 1/8"=1'-0"
DATE: 02.20.18

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Architecture Planning Interiors
www.scn-architects.com

SIDE ELEVATION

BACK ELEVATION

SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

EXTERIOR ELEVATIONS - OPTION A
CMU BASE WITH CEMENTITIOUS SIDING
SCALE: 1/8"=1'-0"
DATE: 02.20.18

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Architecture Planning Interiors
www.scn-architects.com

SIDE ELEVATION - PINTAIL TRAIL

FRONT ELEVATION - SOUTH DOGWOOD TRAIL

SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

EXTERIOR ELEVATIONS - OPTION B
CMU BASE WITH UPPER BRICK
SCALE: 1/8"=1'-0"
DATE: 02.20.18

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SIDE ELEVATION

BACK ELEVATION

SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

EXTERIOR ELEVATIONS - OPTION B
CMU BASE WITH UPPER BRICK
SCALE: 1/8"=1'-0"
DATE: 02.20.18

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Architecture Planning Interiors
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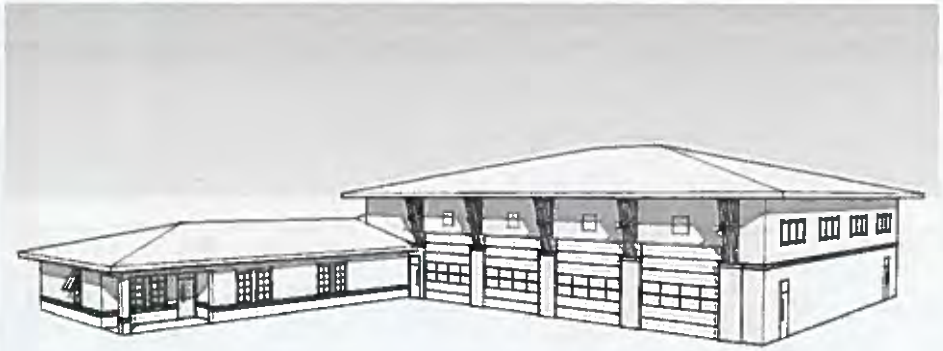
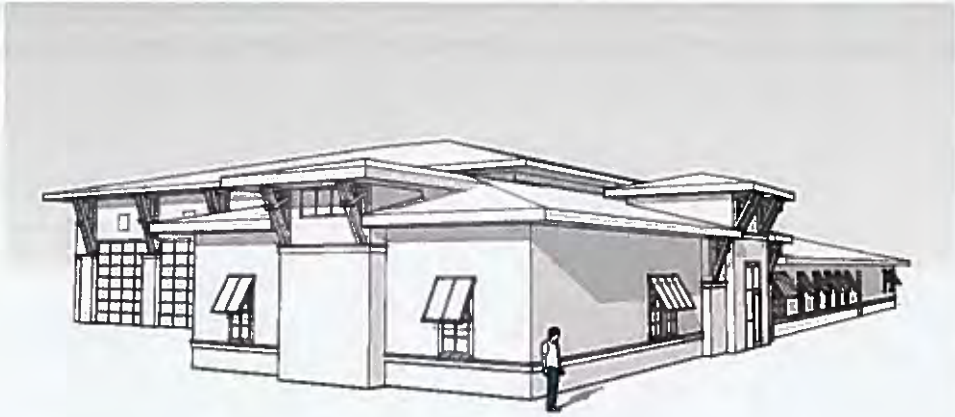
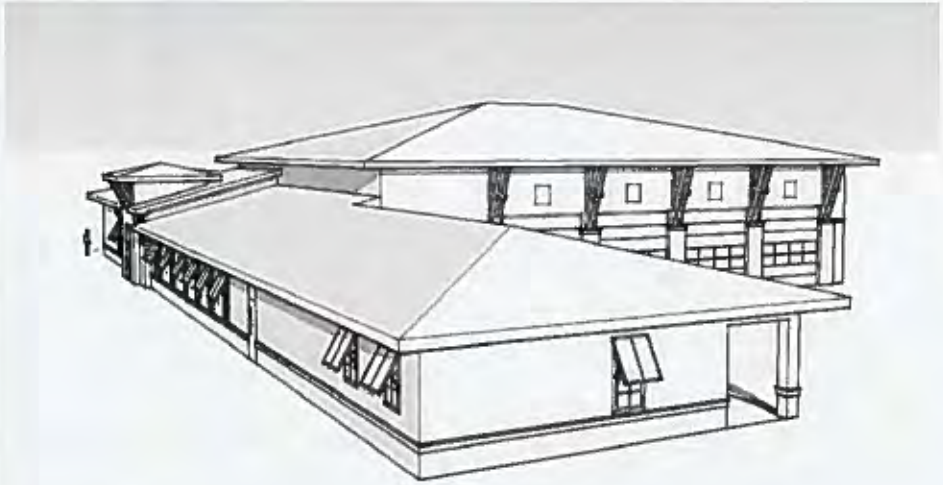


VIEW OF BAYS FROM REAR PARKING AREA



VIEW FROM THE CORNER OF S. DOGWOOD TRAIL AND PINTAIL TRAIL



VIEW FROM PINTAIL TRAIL AT REAR PARKING AREA

VIEW OF BAYS FROM S. DOGWOOD TRAIL

SOUTHERN SHORES VOLUNTEER FIRE DEPT
SOUTHERN SHORES, NC

PN. 1947

EXTERIOR PERSPECTIVES
SCALE: NOT TO SCALE
DATE: 02.20.18

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Architecture Planning Interiors
www.scn-architects.com

STAFF REPORT

To: Southern Shores Town Council
Date: February 28, 2018
Case: ZTA-18-02
Prepared By: Wes Haskett, Town Planner/Code Enforcement Officer

GENERAL INFORMATION

Applicant: Town of Southern Shores

Requested Action: Amendment of the Town Zoning Ordinance by amending Section 36-175, Wireless Telecommunications Sites and Towers

ANALYSIS

N.C.G.S. § 160A-400.50 et seq. governs the Town's authority to regulate wireless telecommunications facilities. 2017 N.C. Sess. Law 159 made substantial changes to the text of N.C.G.S. § 160A-400.50 et seq. and become the law of North Carolina as of July 21, 2017. The changes to N.C.G.S. § 160A-400.50 et seq. affect the Town's regulations of wireless telecommunications facilities and require that the Town's Zoning Ordinance be updated accordingly. N.C.G.S. § 160A-400.50 as amended provides that the Town is not authorized to require the construction or installation of wireless facilities or to regulate wireless services other than as set forth in N.C.G.S. § 160A-400.50 et seq. N.C.G.S. § 160A-400.54 provides that the Town shall not prohibit, regulate, or charge for the collocation of small wireless facilities other than as set forth in N.C.G.S. § 160A-400.50 et seq. Similarly, the statutory amendments place limitations on the Town's ability to regulate the use of rights-of-way and utility poles by wireless providers using small wireless facilities.

Town Staff is proposing to amend the Town Zoning Ordinance by amending Section 36-175, Wireless Telecommunications Sites and Towers by adding language to allow Small Wireless Facilities and the use and installation of utility poles in accordance with aforementioned General Statues. A Small Wireless Facility is defined as a wireless facility that meets both of the following qualifications:

1. Each antenna is located inside an enclosure of no more than six cubic feet in volume or, in the case of an antenna that has exposed elements, the antenna and all of its exposed elements, if enclosed, could fit within an enclosure of no more than six cubic feet.

2. All other wireless equipment associated with the facility has a cumulative volume of no more than 28 cubic feet. For purposes of this sub subdivision, the following types of ancillary equipment are not included in the calculation of equipment volume: electric meters, concealment elements, telecommunications demarcation boxes, ground based enclosures, grounding equipment, power transfer switches, cut off switches, vertical cable runs for the connection of power and other services, or other support structures.

The proposed language would allow Small Wireless Facilities as a permitted use in all zoning districts which may collocate along, across, upon, or under any Town rights-of-way. Following review and approval of a wireless application, a wireless provider may place, maintain, modify,

operate, or replace associated utility poles, city utility poles, conduit, cable, or related appurtenances and facilities along, across, upon, and under any Town rights-of-way. The placement, maintenance, modification, operation, or replacement of utility poles and city utility poles associated with the collocation of Small Wireless Facilities, along, across, upon, or under any Town rights-of-way shall be subject only to review or approval if the wireless provider meets all the following requirements:

1. Each new utility pole and each modified or replacement utility pole or city utility pole installed in the rights-of-way shall not exceed 50 feet above ground level.

2. Each new Small Wireless Facility in the rights-of-way shall not extend more than 10 feet above the utility pole, city utility pole, or wireless support structure on which it is collocated.

The Town may provide free access to Town rights-of-way on a nondiscriminatory basis in order to facilitate the public benefits of the deployment of wireless services. Or, the Town may assess a rights-of-way charge for use or occupation of the rights-of-way by a wireless provider. In addition, charges shall meet all of the following requirements:

1. The rights-of-way charge shall not exceed the direct and actual cost of managing the Town rights-of-way and shall not be based on the wireless provider's revenue or customer counts.

2. The rights-of-way charge shall not exceed that imposed on other users of the rights-of-way, including publicly, cooperatively, or municipally owned utilities.

3. The rights-of-way charge shall be reasonable and nondiscriminatory.

The Town's currently adopted Land Use Plan contains the following Policy that is applicable to the proposed ZTA:

- **Policy 2:** The community values and the Town will continue to comply with the founder's original vision for Southern Shores: a low density residential community comprised of single family dwellings on large lots (served by a small commercial district for convenience shopping and services located at the southern end of the Town. This blueprint for land use naturally protects environmental resources and fragile areas by limiting development and growth.

RECOMMENDATION

Town Staff and the Town Planning Board have determined that the proposed amendments are consistent with the Town's currently adopted Land Use Plan and the Town Planning Board unanimously (4-0) recommended approval of the application.

Town of Southern Shores

5375 N. Virginia Dare Trail, Southern Shores, NC 27949
Phone 252-261-2394 / Fax 252-255-0876
info@southernshores-nc.gov
www.southernshores-nc.gov

PLANNING BOARD
GENERAL APPLICATION FORM
TOWN OF SOUTHERN SHORES, NC 27949

Date: 1/19/18 Filing Fee: $200 Receipt No. N/A Application No. ZTA-18-02

NOTE: The Planning Board will follow the specific provisions of the Zoning Ordinance Chapter 36. Article X Administration and Enforcement, Section 36-299.

Please check the applicable Chapter/Article:

- ☐ Chapter 30. Subdivisions-Town Code
- ☐ Chapter 36. Article VII. Schedule of District Regulations. Section 36-207 C-General Commercial District
- ☐ Chapter 36. Article IX. Planned Unit Development (PUD)
- ☐ Chapter 36. Article X. Administration and Enforcement, Section 36-299 (b) Application for Building Permits and Site Plan Review other than one and two family dwelling units *
- ☐ Chapter 36. Article X. Section 36-300-Application for Permit for Conditional Use
- ☐ Chapter 36. Article X. Section 36-303 Fees
- ☐ Chapter 36. Article X. Section 36-304-Vested Rights
- ☑ Chapter 36. Article XIV. Changes and Amendments

Certification and Standing: As applicant of standing for project to be reviewed I certify that the information on this application is complete and accurate.

Applicant
Name Town of Southern Shores
Address: 5375 N. Virginia Dare Trl
Southern Shores, NC 27949
Phone (252) 261-2394 Email whaskett@southernshores-nc.gov

Applicant's Representative (if any)
Name _____
Agent, Contractor, Other (Circle one)
Address _____
_____
Phone _____ Email _____

Property Involved: __Southern Shores __Martin's Point (Commercial only)

Address: _____ Zoning district _____

Section _____ Block _____ Lot _____ Lot size (sq.ft.) _____

Request: __Site Plan Review __Final Site Plan Review __Conditional Use __Permitted Use
__PUD (Planned Unit Development) __Subdivision Ordinance __Vested Right __Variance

Change To: __Zoning Map ✓ Zoning Ordinance

Will Haskett
Signature

1-19-18
Date

* Attach supporting documentation.

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ZTA-18-02

AN ORDINANCE AMENDING THE CODE OF ORDINANCES
OF THE TOWN OF SOUTHERN SHORES, NORTH CAROLINA

ARTICLE I. Purpose(s) and Authority.

WHEREAS, pursuant to N.C.G.S. § 160A-381, the Town of Southern Shores (the "Town") may enact and amend ordinances regulating the zoning and development of land within its jurisdiction and specifically the location and use of buildings, structures and land. Pursuant to this authority and the additional authority granted by N.C.G.S. Chap. 160A, Art. 19 et. seq, the Town has adopted a comprehensive zoning ordinance (the "Town's Zoning Ordinance") and has codified the same as Chapter 36 of the Town's Code of Ordinances (the "Town Code"); and

WHEREAS, N.C.G.S. § 160A-400.50 et seq. governs the Town's authority to regulate wireless telecommunications facilities. 2017 N.C. Sess. Law 159 made substantial changes to the text of N.C.G.S. § 160A-400.50 et seq. and become the law of North Carolina as of July 21, 2017. The changes to N.C.G.S. § 160A-400.50 et seq. affect the Town's regulations of wireless telecommunications facilities and require that the Town's Zoning Ordinance be updated accordingly; and

WHEREAS, N.C.G.S. § 160A-400.50 as amended provides that the Town is not authorized to require the construction or installation of wireless facilities or to regulate wireless services other than as set forth in N.C.G.S. § 160A-400.50 et seq.; and

WHEREAS, N.C.G.S. § 160A-400.54 provides that the Town shall not prohibit, regulate, or charge for the collocation of small wireless facilities other than as set forth in N.C.G.S. § 160A-400.50 et seq.; and

WHEREAS, the Town further finds that in accordance with the findings above it is in the interest of and not contrary to the public's health, safety, morals and general welfare for the Town to amend the Town's Zoning Ordinance and Town Code of Ordinances as stated below.

ARTICLE II. Construction.

For purposes of this ordinance amendment, underlined words (underline) shall be considered as additions to existing Town Code language and strikethrough words (~~strikethrough~~) shall be considered deletions to existing language. Any portions of the

adopted Town Code which are not repeated herein, but are instead replaced by an ellipses ("...") shall remain as they currently exist within the Town Code.

ARTICLE III. Amendment of Zoning Ordinance.

NOW, THEREFORE, BE IT ORDAINED by the Town Council of the Town of Southern Shores, North Carolina, that the Town Code shall be amended as follows:

PART I. That **Sec. 36-175 Wireless telecommunications sites and towers.** be amended as follows:

Sec. 36-175. Wireless telecommunications sites, facilities and towers.

(a) *Definitions.* The following definitions shall apply to all portions of the Town Code relating to the use or construction of any portion of a wireless telecommunications site within the town.

(1) *Antenna:* Communications equipment that transmits, receives, or transmits and receives electromagnetic radio signals used in the provision of all types of wireless communications services.

(2) *Applicable Codes:* The North Carolina State Building Code and any other uniform building, fire, electrical, plumbing, or mechanical codes adopted by a recognized national code organization together with State or local amendments to those codes enacted solely to address imminent threats of destruction of property or injury to persons.

(~~2~~3) *Application:* ~~A formal request submitted to the town to construct or modify a wireless support structure or a wireless facility.~~ A request that is submitted by an applicant to a city for a permit to collocate wireless facilities or to approve the installation, modification, or replacement of a utility pole, city utility pole, or wireless support structure.

(~~3~~4) *Base station:* A station at a specific site authorized to communicate with mobile stations, generally consisting of radio receivers, antennas, coaxial cables, power supplies, and other associated electronics.

(~~4~~5) *Building permit:* An official administrative authorization issued by the town prior to beginning construction consistent with the provisions of G.S. 160A-417.

(6) *City rights-of-way:* A rights-of-way owned, leased, or operated by a city, including any public street or alley that is not a part of the State highway system.

(7) *City utility pole:* A pole owned by a city in the city rights-of-way that

provides lighting, traffic control, or a similar function.

(~~5~~8) *Collocation:* The ~~placement or installation~~ placement, installation, maintenance, modification, operation, or replacement of wireless facilities ~~on~~ on, under, within, or on the surface of the earth adjacent to existing structures, including ~~electrical transmission towers,~~ utility poles, city utility poles, water towers, buildings, and other structures capable of structurally supporting the attachment of wireless facilities in compliance with ~~this chapter~~ applicable codes. The term "collocation" does not include the installation of new utility poles, city utility poles, or wireless support structures.

(9) *Communications facility:* The set of equipment and network components, including wires and cables and associated facilities used by a communications service provider to provide communications service.

(10) *Communications service:* Cable service as defined in 47 U.S.C. § 522(6), information service as defined in 47 U.S.C. § 153(24), telecommunications service as defined in 47 U.S.C. § 153(53), or wireless services.

(11) *Communications service provider:* A cable operator as defined in 47 U.S.C. § 522(5); a provider of information service, as defined in 47 U.S.C. § 153(24); a telecommunications carrier, as defined in 47 U.S.C. § 153(51); or a wireless provider.

(~~6~~12) *Eligible facilities request:* A request for modification of an existing wireless tower or base station that involves collocation of new transmission equipment or replacement of transmission equipment but does not include a substantial modification.

(~~7~~13) *Equipment compound*: An area surrounding or near the base of a wireless support structure within which a wireless facility is located.

(~~8~~14) *Fall zone:* The area in which a wireless support structure may be expected to fall in the event of a structural failure, as measured by engineering standards.

(~~9~~15) *Geographic antenna coverage area:* The general vicinity within which an antenna serves the transmission requirements of a cellular or other broadcasting network.

(~~10~~16) *Land development regulation:* Any ordinance enacted pursuant to ~~this~~ Part 3E of Article 19 of Chapter 160A of the North Carolina General Statutes.

(17) *Micro wireless facility:* A small wireless facility that is no larger in dimension than 24 inches in length, 15 inches in width, and 12 inches in

height and that has an exterior antenna, if any, no longer than 11 inches.

(~~11~~18) *Monopole:* A slender self-supporting telecommunications tower consisting of a single pole.

(~~12~~19) *Search ring:* The area within which a wireless support facility or wireless facility must be located in order to meet service objectives of the wireless service provider using the wireless facility or wireless support structure.

(20) *Small wireless facility:* A wireless facility that meets both of the following qualifications:

a. Each antenna is located inside an enclosure of no more than six cubic feet in volume or, in the case of an antenna that has exposed elements, the antenna and all of its exposed elements, if enclosed, could fit within an enclosure of no more than six cubic feet.

b. All other wireless equipment associated with the facility has a cumulative volume of no more than 28 cubic feet. For purposes of this sub subdivision, the following types of ancillary equipment are not included in the calculation of equipment volume: electric meters, concealment elements, telecommunications demarcation boxes, ground based enclosures, grounding equipment, power transfer switches, cut off switches, vertical cable runs for the connection of power and other services, or other support structures.

(~~13~~21) *Stealth structure:* A wireless support structure designed to look like or incorporated within a structure which has a primary purpose as something other than a wireless support structure or is otherwise designed in a manner in which all wireless facilities attached to the structure are concealed from view, including, but not limited to trees, flag poles, slick sticks (flag poles without flags), clock towers, bell towers or church steeples.

(~~14~~22) *Substantial modification*: The mounting of a proposed wireless facility on a wireless support structure that substantially changes the physical dimensions of the support structure. A mounting is presumed to be a substantial modification if it meets any one or more of the criteria listed below. The burden is on the local government to demonstrate that a mounting that does not meet the listed criteria constitutes a substantial change to the physical dimensions of the wireless support structure.

a. Increasing the existing vertical height of the structure by the greater of (i) more than ten percent (10%) or (ii) the height of one additional antenna array with separation from the nearest existing antenna not to exceed 20 feet.

b. Except where necessary to shelter the antenna from inclement weather or to connect the antenna to the tower via cable, adding an appurtenance to the body of a wireless support structure that protrudes horizontally from the edge of the wireless support structure the greater of (i) more than 20 feet or (ii) more than the width of the wireless support structure at the level of the appurtenance.

c. Increasing the square footage of the existing equipment compound by more than 2,500 square feet.

(~~15~~23) *Telecommunications accessory equipment structure:* A building or cabinet-like structure located adjacent to, or in the immediate vicinity of a wireless support structure or antenna to house equipment incidental to the receiving or transmitting of wireless broadcasts, cellular telephone calls, voice messaging and paging services.

(~~16~~24) *Tower, short telecommunications:* A telecommunications tower with a height that is less than 70 feet.

(~~17~~25) *Tower, tall telecommunications:* A telecommunications tower with a height that is 70 feet tall or greater up to a height of 195 feet tall.

(~~18~~26) *Tower, telecommunication:* A freestanding wireless support structure, including stealth structures which are not incorporated within another type of structure, which are intended to support one or more wireless facilities.

(~~19~~27) *Utility pole:* A structure that is designed for and used to carry lines, cables, ~~or wires~~ wires, lighting facilities, or small wireless facilities for telephone, cable television, ~~or~~ electricity, ~~or to provide lighting~~ lighting, or wireless services.

(~~20~~28) *Water tower:* A water storage tank, a standpipe, or an elevated tank situated on a support structure originally constructed for use as a reservoir or facility to store or deliver water.

(~~21~~29) *Wireless facility:* ~~The set of equipment and network components, exclusive of the underlying wireless support structure or tower, including antennas, transmitters, receivers, base stations, power supplies, cabling, and associated equipment necessary to provide wireless data and wireless telecommunications services to a discrete geographic area.~~ Equipment at a fixed location that enables wireless communications between user equipment and a communications network, including (i) equipment associated with wireless communications and (ii) radio transceivers, antennas, wires, coaxial or fiber optic cable, regular and backup power

supplies, and comparable equipment, regardless of technological configuration. The term includes small wireless facilities. The term shall not include any of the following:

a. The structure or improvements on, under, within, or adjacent to which the equipment is collocated.

b. Wireline backhaul facilities.

c. Coaxial or fiber optic cable that is between wireless structures or utility poles or city utility poles or that is otherwise not immediately adjacent to or directly associated with a particular antenna.

(30) *Wireless infrastructure provider:* Any person with a certificate to provide telecommunications service in the State who builds or installs wireless communication transmission equipment, wireless facilities, or wireless support structures for small wireless facilities but that does not provide wireless services.

(31) *Wireless provider:* A wireless infrastructure provider or a wireless services provider.

(32) *Wireless services:* Any services, using licensed or unlicensed wireless spectrum, including the use of Wi Fi, whether at a fixed location or mobile, provided to the public using wireless facilities.

(33) *Wireless services provider:* A person who provides wireless services.

(~~22~~34) *Wireless support structure:* A new or existing structure, such as a monopole, lattice tower, or guyed tower that is designed to support or capable of supporting wireless facilities. A utility pole or a city utility pole is not a wireless support structure.

(~~23~~35) *Wireless telecommunications site:* The combination of all of the materials and equipment on a site used to provide wireless telecommunications service including, but not limited to, any wireless support structures, telecommunications towers, wireless facilities, antennae, ground based communications equipment, telecommunications accessory equipment structures and equipment compounds.

(b) *Requirements for wireless telecommunications sites, new wireless support structures or substantial modification of wireless support structures.* All wireless telecommunications sites, new wireless support structures or substantial modification of wireless support structures located within the town must comply with all of the following requirements:

(1) *Safety standards.* All proposed telecommunication towers, new wireless support structures or substantial modification of wireless support structures and wireless facilities shall comply with all applicable federal, state and local laws including specifically the following:

(a) Federal Communications Commission standards, rules and regulations;

(b) Federal Aviation Administration standards, rules and regulations;

(c) N.C.G.S. § 160-400.50 et seq.;

(d) The North Carolina Building Code;

(e) Accepted industry standards for wind loading, base stabilization and other critical engineering characteristics as defined by American National Standards Institute (ANSI), Telecommunications Industry Association (TIA) and Electronic Industry Alliance (EIA) 222-G or its successors.

(2) *Use guidelines and dimensional requirements.*

(a) *Permissible uses.* Wireless telecommunications sites and facilities shall only be permitted as follows:

1. As an accessory use to an existing primary use that is not a dwelling.

2. As a collocation of wireless facilities upon an existing permitted wireless telecommunications site.

(b) *Collocation.*

1. Collocation of new antennas, wireless facilities and other equipment on an existing wireless support structure or structures within the applicant's search ring shall be required whenever reasonably feasible. Collocation is not reasonably feasible if an applicant can show it is technically or commercially impractical for the applicant to collocate or if the owners of all of the telecommunication towers within the applicant's search ring where collocation would be technically practical are unwilling to enter into a contract for such use at fair market value.

2. Short telecommunications towers including the structure and

fenced compound shall be designed to accommodate the wireless facilities of at least one provider plus space for emergency communication antennas used by the town's police and fire service provider.

3. Tall telecommunications towers including the structure and fenced compound shall be designed to accommodate collocation of the wireless facilities of at least three providers plus space for emergency communication antennas used by the town's police and fire service provider.

(c) *Location.*

1. Tall telecommunications towers shall not be located within one-half mile of any other tall telecommunications tower or within 250 feet of any other wireless support structure located within the expected geographic antenna coverage area of the proposed telecommunication tower.

2. Short telecommunications towers and stealth structures incorporated within another structure shall not be located within 250 feet of any other wireless support structure located within the expected geographic antenna coverage area of the proposed wireless support structure unless the applicant can show that locating the structure within the prescribed distance is necessary to insure adequate coverage and capacity. In the case of a stealth structure incorporated within another structure, the town council may reduce or disregard the distance requirement stated herein.

(d) *Height.* The height of a wireless support structure includes any attached or proposed to be attached wireless facilities and shall be measured vertically from the pre-disturbance ground level at the center of the structure. The height shall not include emergency communications antennas or lightning rod(s) attached to the structure.

1. In no case shall a wireless support structure of any kind or any attached wireless facilities exceed 195 feet in height.

2. The height of tall telecommunications towers shall not exceed 195 feet.

3. The height of short telecommunications towers shall not exceed 70 feet.

4. The height of stealth structures incorporated within or upon an otherwise permitted structure shall not exceed the height allowed for the structure.

5. The height of stealth structures designed to look like another structure or naturally occurring thing, i.e. a tree, shall not unreasonably exceed the height allowed for the type of structure or the typical thing they are designed to look like. The reasonableness of excess height shall be considered on an application by application basis and shall take into account the totality of the circumstances including specifically, the height needed to provide communications services and the wireless support structure's visual consistency with the area in which it will be located.

6. In no case shall a wireless support structure of any kind or any attached wireless facilities exceed the minimum height necessary to accomplish the purpose it is proposed to serve. Notwithstanding the foregoing, when measuring the height of a wireless support structure, the purpose of the structure may include maximizing the ability for collocations upon the structure and shall include ensuring that the structure is capable of supporting at least the minimum number of collocations required by this ordinance.

(e) *Permitted structures.* Stand alone wireless support structures and pole-like stealth structures shall be monopoles. Stealth structures designed to look like other structures or naturally occurring things, i.e. a tree, or that are incorporated within or upon any existing or permitted structure are allowed if otherwise consistent with this ordinance. Wireless support structures using other designs, including, but not limited to guyed towers and lattice type towers shall not be permitted.

(f) *Setbacks.*

1. Unless otherwise provided by this ordinance, the dimensions of the entire lot shall be used to determine if a wireless telecommunications site meets the dimensional and setback requirements of this section. An existing use or structure on the same lot shall not preclude locating a wireless telecommunications site on a lot so long as compliance with subsection 36-175(2)(a) is maintained.

2. The base of a wireless support structure shall be at located at least one foot from the nearest property line for every one

foot of proposed height. In the case of stand alone stealth structures only, the town council may in its discretion consider publicly maintained roadways as providing additional property for calculation of set backs and/or reduce the setback requirement from this 1:1 setback ratio to a setback of one-third of the height of the proposed structure. The 1:1 setback requirement may only be reduced to one-third of the height of the proposed structure when a North Carolina registered professional engineer certifies that the wireless support structure's fall zone is equal to or less than the setback requested and that the structure is designed to collapse within the setback requested provided any or all of the following are also shown by the applicant:

i. No dwelling unit is located or can be constructed within the fall zone of the wireless support structure; or

ii. Where a dwelling unit is located or can be constructed within the fall zone of the wireless support structure, all property owners within the fall zone have agreed in writing or through sworn testimony that they are willing to accept the risks of the reduced setback.

3. When stealth structures are incorporated within or upon an existing or otherwise permitted structure, the setbacks associated with the structure shall apply.

4. Telecommunications accessory equipment structures, any equipment compounds and any other structures shall be set back a minimum of 50 feet from all property lines and rights-of-way. Where visual impact and public safety concerns will not be affected, the town council may reduce the setback to no less than 15 feet.

(g) *General aesthetics.*

1. Telecommunication towers, wireless facilities, accessory equipment structures and equipment compounds shall be constructed and maintained to minimize visual obtrusiveness in color and finish. Stealth structures shall be consistent with the overall appearance of the town and of the area of town in which they are located.

2. Accessory equipment structures, equipment compounds and

related structures at telecommunication tower sites shall be of such design, materials and colors to blend with surrounding structures.

3. Outdoor storage of equipment or related items shall be prohibited at all wireless telecommunication sites.

4. Electrical and telephone lines serving a wireless telecommunication site shall be installed underground from the point of existing service.

5. Sound emissions, such as alarm bells, buzzers and the like, shall not be permitted. Nothing contained herein shall prohibit the reasonable use of emergency generators at wireless telecommunications sites.

(h) *Fencing.* All telecommunication towers, their accessory equipment structures and equipment compounds shall be enclosed by chain link fencing and/or wall, not less than six feet nor more than ten feet in height. Such fences may be equipped with anti-climbing devices. The gate into the fenced area shall be located so that it is not easily visible from a street or adjacent property.

(i) *Screening/landscaping and buffers.*

1. The base of a wireless support structure, to a minimum height of ten feet above average grade at the tower base, shall not be visible from any publicly owned or maintained roadway.

2. Screening is required along all exterior sides of the fence described above excluding the gate. Screening shall be a minimum width of ten feet with two staggered rows of planting material placed ten feet on center, that are a minimum of five feet in height when planted, and that are expected to reach a height of eight feet within three years. Suitable plant types shall be those recommended by the U.S. Department of Agriculture to achieve a mature growth height of eight to ten feet in the coastal area. The town council may waive or modify this requirement where existing trees, vegetation and/or structures provide suitable screening and buffering.

(j) *Lighting.*

1. Telecommunication towers shall be lighted only if

specifically required by the Federal Aviation Administration, in which case, Federal Aviation Administration minimum lighting requirements shall be applied.

2. When lighting is required by the Federal Aviation Administration, strobe lights shall be avoided unless specified by Federal Aviation Administration. When strobe lights are required on telecommunication towers, a dual lighting system of white strobes for daytime lighting and a red flashing light atop the tower for nighttime lighting shall be used unless other lighting is specifically required by the Federal Aviation Administration, the U.S. Fish and Wildlife Service or any state or federal agency having regulatory authority over the applicant.

3. Except for lighting described in 2. above, all lighting at a wireless telecommunications site shall be shielded and shall comply with the provisions for outdoor lighting contained in section 36-166.

(k) *Signage.* Wireless telecommunication sites shall not display signage, logos symbols or any messages of a commercial or non-commercial nature except for legal notices, identifications, directional and informational signs erected or required by governmental bodies, public utilities or civic associations with the approval of town council;. A sign, not visible from a public right-of-way or adjacent residences, shall be posted on the fence gate identifying the current owner of the tower, emergency contact person or agency, and applicable contact numbers. This provision shall not preclude the applicant from posting any additional signage required by federal or state law.

(c) *Collocation and eligible facilities requests of wireless support structures.*

(1) The town may not deny and shall approve any eligible facilities request as provided in this section.

(2) No application or approval is required for routine maintenance and this section shall not be construed to limit the performance of routine maintenance on wireless support structures and facilities, including in-kind replacement of wireless facilities. Routine maintenance includes activities associated with regular and general upkeep of transmission equipment, including the replacement of existing wireless facilities with facilities of the same size.

(3) For all collocations and eligible facilities request, an application is required.

(4) A collocation or eligible facilities request application is deemed complete unless the town provides notice that the application is incomplete in writing to the applicant within 45 days of submission or within some other mutually agreed upon time frame. The notice shall identify the deficiencies in the application which, if cured, would make the application complete. The town may deem an application incomplete if there is insufficient evidence provided to show that the proposed collocation or eligible facilities request will comply with federal, State, and local safety requirements. The town may not deem an application incomplete for any issue not directly related to the actual content of the application and subject matter of the collocation or eligible facilities request. An application is deemed complete on resubmission if the additional materials cure the deficiencies indicated.

(5) The town shall issue a written decision approving an eligible facilities request application within 45 days of such application being deemed complete. For a collocation application that is not an eligible facilities request, the town shall issue its written decision to approve or deny the application within 45 days of the application being deemed complete.

(6) The town may impose a fee not to exceed one thousand dollars ($1,000) for technical consultation and the review of a collocation or eligible facilities request application. The fee must be based on the actual, direct, and reasonable administrative costs incurred for the review, processing, and approval of a collocation application. The town may engage a third-party consultant for technical consultation and the review of a collocation application. The town may incorporate such fees into its generally adopted fee schedule. The fee imposed by the town for the review of the application may not be used for either of the following:

(a) Travel expenses incurred in a third-party's review of a collocation application.

(b) Reimbursement for a consultant or other third party based on a contingent fee basis or results-based arrangement.

(d) *Application requirements:* Any person that proposes to construct or substantially modify a wireless telecommunications site (including construction of wireless support structures or substantial modifications of wireless support structures) or who proposes to collocate or make an eligible facilities request shall submit a completed application with the necessary copies to the town planning department. An application shall not be deemed complete until all of the following items required have been submitted:

(1). For wireless telecommunications sites only, documentation showing

the reasonable feasibility of collocating new antennas, wireless facilities and equipment on an existing structure or structures within the applicant's search ring. If an applicant contends that collocation on an existing structure is not reasonably feasible he shall submit documentation that (1) collocation is technically or commercially impractical; or (2) the owner of the telecommunication tower is unwilling to enter into a contract for such use at fair market value. At a minimum, technical documentation shall include a map of the search ring displaying all potential collocation sites and stating why each is suitable or unsuitable. Where an applicant contends that the owner or an existing wireless support structure or other feasible structure will not contract for its use for fair market value, the applicant must submit, in writing (1) a declaration from owners of all technically feasible collocation sites stating the price at which they are willing to negotiate space; (2) evidence that the applicant has tried in good faith to negotiate market value terms for the collocation at each site and (3) an licensed appraiser's certified opinion on the market value of collocation at each technically feasible collocation site.

(2). A scaled site plan, scaled elevation view, and supporting drawings, calculations and other documentation, prepared and sealed by appropriate licensed professionals, showing the location and dimensions of all improvements for the wireless telecommunications site including topography, wireless supports structure height requirements, setbacks, access driveways or easements, parking, fencing, landscaping, adjacent uses and any other information necessary to assess compliance with this article and compatibility with surrounding uses.

(3). For wireless telecommunications sites only, documentation that Federal Aviation Administration's minimum lighting standards have been met for the wireless telecommunications site.

(4). For wireless telecommunications sites only, documentation that the proposed wireless telecommunications site will comply with all applicable FCC rules and regulations.

(5). Documentation, prepared and sealed by a professional engineer registered in North Carolina, that the proposed wireless support structure and any attached wireless facilities and antennae meet or exceed accepted industry standards for wind loading, base stabilization and other critical engineering characteristics required by this ordinance, the North Carolina Building Code and the accepted industry standards for wind loading, base stabilization and other critical engineering characteristics as defined by American

National Standards Institute (ANSI), Telecommunications Industry Association (TIA) and Electronic Industry Alliance (EIA) 222-G or its successors.

(6). Documentation, prepared and sealed by a professional engineer registered in North Carolina, that the proposed wireless support structure and any attached wireless facilities and antennas do not exceed the minimum height necessary to accomplish the purpose for which they are constructed.

(7). For wireless telecommunications sites only, documentation, prepared and sealed by a professional engineer registered in the state, stating the number of collocations that the proposed wireless support structure is designed to accommodate once constructed.

(8). Documentation, prepared and sealed by a professional engineer registered in the state, to demonstrate that the wireless support structure has sufficient structural integrity for its intended uses. Documentation shall include a certification that all wireless support structures and attached wireless facilities shall be capable of withstanding sustained winds of at least 135 miles per hour whether or not all of the collocations the structure has been designed to accommodate have been attached to the structure.

(9). A copy of the lease agreement with the property owner along with copies of any easement agreements necessary for ingress, egress and use of the property.

(10). Documentation consisting of a certificate of insurance verifying the existence of general liability insurance coverage of at least $5,000,000.00 at no cost to the town. The certificate shall contain a requirement that the insurance company notify the town 30 days prior to the cancellation, modification, or failure to renew the insurance coverage required.

(11). For wireless telecommunications sites only, a copy of the approved National Environmental Policy Act of 1969 (NEPA) compliance report for all wireless support structures, antennas, wireless facilities, accessory structures or equipment proposed for the site, if such report is required to be produced pursuant to federal or state law.

(12). For wireless telecommunications sites only, documentation from the town's police and fire service providers regarding the number and type of emergency communication antennas which are necessary for the wireless telecommunications site to support such

communications along with a certification from a professional engineer registered in the state stating that the wireless telecommunications site is designed to support the attachment of the necessary emergency communication antennas.

(13). For wireless telecommunications sites only, a memorandum of understanding regarding removal of abandoned structures and equipment located at the proposed wireless telecommunication site. Any wireless telecommunications site that is not operated for 180 continuous days in a 12-month period shall be considered abandoned. The owner of an abandoned wireless telecommunications site shall be responsible for the removal of all structures and equipment on the site within ninety (90) days of receipt of such notification by the town. Failure to remove abandoned equipment will result in its removal by the town at the owner's expense. In its discretion, the town may condition approval of a permit for building of the proposed wireless support structure on the applicant providing a bond or letter of credit sufficient to allow the town to remove the proposed structure if it is abandoned and not removed within the allowed time period by the applicant.

(14). Any other documentation necessary to ensure compliance with this section as well as applicable federal and state laws.

(e) *Review process.* The town will use the following criteria in its review of an application for any wireless telecommunication site, telecommunication tower, wireless facility, antennae or accessory structure <u>other than small wireless facilities</u>.

1. The proposed application meets or exceeds the standards of this section.

2. The use will not materially endanger the public health, safety or welfare if located where proposed and developed according to the plan submitted.

3. The required conditions, specifications, and actions described in this article have been met.

<u>4</u>. The location and character of the facility will be in harmony with the area in which it is to be located.

(a) *Consultants.* The town may fix and charge an application fee, consulting fee, or other fee associated with the submission, review, processing, and approval of an application to site new wireless support structures or to substantially modify wireless support structures or wireless facilities that is based on the costs of the services provided and does not exceed what is usual and customary for such services. Any charges or fees assessed by the Town on

account of an outside consultant shall be fixed in advance and incorporated into a permit or application fee and shall be based on the reasonable costs to be incurred by the town in connection with the regulatory review authorized under this section. The town may incorporate such fees into its generally adopted fee schedule. The town may impose additional reasonable and cost based fees for costs incurred should an applicant amend its application. On request, the amount of the consultant charges incorporated into the permit or application fee shall be separately identified and disclosed to the applicant. The fee imposed by the town for review of the application may not be used for either of the following:

(i) Travel time or expenses, meals, or overnight accommodations incurred in the review of an application by a consultant or other third party.

(ii) Reimbursements for a consultant or other third party based on a contingent fee basis or a results-based arrangement.

(b) *Conditions.* The town council may place reasonable conditions on the issuance of a conditional use permit pursuant to this section regarding public safety, land use, or zoning issues, including, but not limited to, aesthetics, landscaping, land-use based location priorities, structural design, setbacks, and fall zones. The town may condition approval of an application for a new wireless support structure on the provision of documentation prior to the issuance of a building permit establishing the existence of one or more parties, including the owner of the wireless support structure, who intend to locate wireless facilities on the wireless support structure. The town shall not deny an initial land-use or zoning permit based on such documentation.

(c) *Decisions.* The town shall issue a written decision approving or denying an application under this section within a reasonable period of time consistent with the issuance of other land-use permits in the case of other applications, each as measured from the time the application is deemed complete.

(f) *Annual review.* Any person who holds a zoning or conditional use permit issued pursuant to this section shall annually submit an application for a renewal permit.

(1) *Procedure.* In order for a zoning or conditional use permit to remain valid, a renewal permit must be issued within 365 days of the issuance of the certificate of occupancy related to the initial permit or of the date of the issuance of the previous annual renewal permit. The application for a renewal permit must be received no less than ten days prior to nor more than 30 days prior to the date a renewal permit must be issued. Upon review of the application and determination of the applicant's compliance with the annual review requirements of this section the town's code enforcement and inspections department shall issue a renewal permit for an additional 365-day period. A permit holder's renewal application packet must include all of the following:

a. A renewal application fee in the amount set by the town.

b. A complete renewal application presented on a form prepared and provided by the town's code enforcement and inspections department.

c. Documentation consisting of a certificate of insurance verifying the continued existence of general liability insurance coverage meeting or exceeding the requirements of section 36-175(c)(3)j. during the time period that the renewal permit will be valid.

d. Documentation signed and sealed by a state registered engineer indicating that all structures and equipment have remained in compliance with all local, state, and federal requirements, including but not limited to, the requirements of this ordinance at the time the original permit was issued and any requirements or conditions stated in the original permit.

(2) *Noncompliance.* Upon a permit holder's failure to submit a timely renewal application or the permit holder's failure to otherwise comply with this section the previously issued permit and/or renewal permit shall be suspended upon reaching the date that a renewal permit must be issued. Once suspended, the permit shall remain suspended until the permit holder submits an application and a review of the application by the town's code enforcement and inspections departments determines that the permit holder has complied with the annual review requirements of this section. Upon such a showing, the town shall issue a renewal permit for an additional 365-day period. If a suspension continues for more than 30 days, the permit holder's existing permit and/or renewal permit(s) shall expire.

(g) *Validity of permits.* A conditional use permit or zoning permit issued pursuant to this section shall expire if the improvements permitted are not completely constructed within 24 months of the date of the approval of a building permit.

(h) *Waiver or modification of requirements:* If upon the review of any application submitted pursuant to this section, the town council determines that denial of a permit based on any requirement or requirements of this section as applied to the application before the town council may be contrary to federal or state law, the town council may in its sole discretion vary, modify or disregard any such requirement in a manner which complies with the relevant law. The town council may continue any public hearing on a permit application for a reasonable time to consider such a determination and it actions thereon.

(i) *Small wireless facilities.* The collocation and use of small wireless facilities, including micro wireless facilities, by wireless service providers shall be governed by this

section. Small wireless facilities meeting the requirements of this section are a permitted use in all town zoning districts.

(1) *Applications and Permits.* Applicants must obtain a permit to collocate a small wireless facility.

a. *Application Requirements*: The application must affirmatively show that the proposed small wireless facilities meet: (i) the town's applicable codes; (ii) town code of ordinance provisions or regulations that concern public safety, objective design standards for decorative utility poles, city utility poles, or reasonable and nondiscriminatory stealth and concealment requirements, including screening or landscaping for ground mounted equipment; (iii) public safety and reasonable spacing requirements concerning the location of ground mounted equipment in a right-of-way; or (iv) the historic preservation requirements in subsection 160A 400.52(i).

b. *Attestation Requirement*: An application must include an attestation that the small wireless facilities shall be collocated on the utility pole, city utility pole, or wireless support structure and that the small wireless facilities shall be activated for use by a wireless services provider to provide service no later than one year from the permit issuance date, unless the town and the wireless provider agree to extend this period or a delay is caused by a lack of commercial power at the site.

b. *Completeness of Application*: A permit application shall be deemed complete unless the town provides notice otherwise in writing to the applicant within 30 days of submission or within some other mutually agreed upon time frame. The notice shall identify the deficiencies in the application which, if cured, would make the application complete. The application shall be deemed complete on resubmission if the additional materials cure the deficiencies identified.

c. *Procedure for Processing*: The permit application shall be processed on a nondiscriminatory basis and shall be deemed approved if the town fails to approve or deny the application within 45 days from the time the application is deemed complete or a mutually agreed upon time frame between the town and the applicant.

d. *Permit denials and resubmissions*: An application may only be denied for failure to meet the requirements of this section. If an application is denied, the town must (i) document the basis for a denial, including the specific code provisions on which the denial was based and (ii) send the documentation to the applicant on or

before the day the town denies an application. The applicant may cure the deficiencies identified by the town and resubmit the application within 30 days of the denial without paying an additional application fee. The town shall approve or deny the revised application within 30 days of the date on which the application was resubmitted. Any subsequent review shall be limited to the deficiencies cited in the prior denial.

e. *Consolidated Applications*: An applicant seeking to collocate small wireless facilities at multiple locations within the town shall be allowed at the applicant's discretion to file a consolidated application for no more than 25 separate facilities and receive a permit for the collocation of all the small wireless facilities meeting the requirements of this section. The town may remove small wireless facility collocations from a consolidated application and treat separately small wireless facility collocations (i) for which incomplete information has been provided or (ii) that are denied. The town may issue a separate permit for each collocation that is approved.

f. *Time for commencement and activation of collocation*: The permit may specify that collocation of the small wireless facility shall commence within six months of approval and shall be activated for use no later than one year from the permit issuance date, unless the town and the wireless provider agree to extend this period or a delay is caused by a lack of commercial power at the site.

g. *Application fees*: The town may charge an application fee that shall not exceed the lesser of (i) the actual, direct, and reasonable costs to process and review applications for collocated small wireless facilities; (ii) the amount charged by the town for permitting of any similar activity; or (iii) one hundred dollars ($100.00) per facility for the first five small wireless facilities addressed in an application, plus fifty dollars ($50.00) for each additional small wireless facility addressed in the application. In any dispute concerning the appropriateness of a fee, the town has the burden of proving that the fee meets the requirements of this subsection.

h. *Technical Consulting fees*: The town may impose a technical consulting fee for each application, not to exceed five hundred dollars ($500.00), to offset the cost of reviewing and processing applications required by this section. The fee must be based on the actual, direct, and reasonable administrative costs incurred for the review, processing, and approval of an application. The town may engage an outside consultant for technical consultation and the review of an application. The fee imposed by the town for the review

of the application shall not be used for either of the following:

(1) Travel expenses incurred in the review of a collocation application by an outside consultant or other third party.

(2) Direct payment or reimbursement for an outside consultant or other third party based on a contingent fee basis or results based arrangement.

In any dispute concerning the appropriateness of a fee, the town has the burden of proving that the fee meets the requirements of this subsection.

i. *Removal of abandoned facilities*: A wireless services provider shall remove an abandoned wireless facility within 180 days of abandonment. Should the wireless services provider fail to timely remove the abandoned wireless facility, the town may cause such wireless facility to be removed and may recover the actual cost of such removal, including legal fees, if any, from the wireless services provider. For purposes of this subsection, a wireless facility shall be deemed abandoned at the earlier of the date that the wireless services provider indicates that it is abandoning such facility or the date that is 180 days after the date that such wireless facility ceases to transmit a signal, unless the wireless services provider gives the town reasonable evidence that it is diligently working to place such wireless facility back in service.

j. *Routine maintenance and replacement*: No application, permit or fees are required for (i) routine maintenance; (ii) the replacement of small wireless facilities with small wireless facilities that are the same size or smaller; or (iii) installation, placement, maintenance, or replacement of micro wireless facilities that are suspended on cables strung between existing utility poles or city utility poles in compliance with applicable codes by or for a communications service provider authorized to occupy the city rights-of-way and who is remitting taxes under G.S. 105 164.4(a)(4c) or G.S. 105 164.4(a)(6). The town may require production of sufficient information to make the determination that no application, permit or fees are required under this section.

k. *Other permits not precluded*: Nothing in this section shall prevent the town from requiring other town permits for work that involves excavation, affects traffic patterns, or obstructs vehicular traffic in the city rights-of-way.

(2) *Use of town rights-of-way.* Wireless providers may use town rights-of-ways in accordance with this section. Wireless providers may use Department of Transportation rights-of-way pursuant to lawful authorization from the Department of Transportation.

a. *Collocation of small wireless facilities*: Subject to the requirements of Section 36-175(i)(1), a wireless provider may collocate small wireless facilities along, across, upon, or under any town rights-of-way.

b. *Utilities and poles within rights-of-way*: A wireless provider may place, maintain, modify, operate, or replace associated utility poles, city utility poles, conduit, cable, or related appurtenances and facilities along, across, upon, and under any town rights-of-way. The placement, maintenance, modification, operation, or replacement of utility poles and city utility poles associated with the collocation of small wireless facilities, along, across, upon, or under any town rights-of-way shall be subject only to review or approval under Section 36-175(i)(1) if the wireless provider meets all the following requirements:

(1) Each new utility pole and each modified or replacement utility pole or city utility pole installed in the rights-of-way shall not exceed 50 feet above ground level.

(2) Each new small wireless facility in the rights-of-way shall not extend more than 10 feet above the utility pole, city utility pole, or wireless support structure on which it is collocated.

c. *Application required to place or modify utility poles in rights-of-way*: A wireless provider shall apply to place utility poles in the city rights-of-way, or to replace or modify utility poles or city utility poles in the public rights-of-way, to support the collocation of small wireless facilities. The town shall accept and process the application in accordance with the provisions of Section 36-175(i)(1), applicable codes, and other local codes governing the placement of utility poles or city utility poles in the town rights-of-way, including provisions or regulations that concern public safety, objective design standards for decorative utility poles or city utility poles, or reasonable and nondiscriminatory stealth and concealment requirements, including those relating to screening or landscaping, or public safety and reasonable spacing requirements. The application may be submitted in conjunction with the associated small wireless facility application.

d. *Rights-of-way use to comply with other requirements*: Applicants for use of a city rights-of-way shall comply with Chapter 28 undergrounding requirements prohibiting the installation of above ground structures in the town's rights-of-way without prior approval. In no instance in an area zoned single family residential where the existing utilities are installed underground may a utility pole, city utility pole, or wireless support structure exceed forty (40) feet above ground level, unless the town grants a waiver or variance approving a taller utility pole, city utility pole, or wireless support structure.

e. *Rights-of-way charges*: The town may assess a rights-of-way charge for use or occupation of the rights-of-way by a wireless provider, subject to the restrictions set forth under G.S. 160A-296(a)(6). In addition, charges authorized by this section shall meet all of the following requirements:

(1) The rights-of-way charge shall not exceed the direct and actual cost of managing the city rights-of-way and shall not be based on the wireless provider's revenue or customer counts.

(2) The rights-of-way charge shall not exceed that imposed on other users of the rights-of-way, including publicly, cooperatively, or municipally owned utilities.

(3) The rights-of-way charge shall be reasonable and nondiscriminatory.

The town may provide free access to town rights-of-way on a nondiscriminatory basis in order to facilitate the public benefits of the deployment of wireless services.

f. *Consent required for use of private property*: No person may place, maintain, modify, operate, or replace a privately owned utility pole or wireless support structure or to collocate small wireless facilities on a privately owned utility pole, a privately owned wireless support structure, or other private property without the consent of the property owner.

g. *Damages to rights-of-way*: Wireless providers shall repair all damage to a town rights-of-way directly caused by the activities of the wireless provider, while occupying, installing, repairing, or maintaining wireless facilities, wireless support structures, city utility poles, or utility poles and to return the rights-of-way to its functional equivalence before the damage. If the wireless provider

fails to make the repairs required by the town within a reasonable time after written notice, the town may undertake those repairs and charge the applicable party the reasonable and documented cost of the repairs. The town may maintain an action to recover the costs of the repairs.

h. *Approval under section relates only to small wireless facility*: The approval of the installation, placement, maintenance, or operation of a small wireless facility does not authorize the provision of any communications services or the installation, placement, maintenance, or operation of any communications facility, including a wireline backhaul facility, other than a small wireless facility, in the rights-of-way.

ARTICLE IV. Statement of Consistency with Comprehensive Plan and Reasonableness.

The Town's adoption of this ordinance amendment is consistent with the Town's adopted comprehensive zoning ordinance, land use plan and any other officially adopted plan that is applicable. For all of the above-stated reasons and any additional reasons supporting the Town's adoption of this ordinance amendment, the Town considers the adoption of this ordinance amendment to be reasonable and in the public interest.

ARTICLE V. Severability.

All Town ordinances or parts of ordinances in conflict with this ordinance amendment are hereby repealed. Should a court of competent jurisdiction declare this ordinance amendment or any part thereof to be invalid, such decision shall not affect the remaining provisions of this ordinance amendment nor the Zoning Ordinance or Town Code of the Town of Southern Shores, North Carolina which shall remain in full force and effect.

ARTICLE VI. Effective Date.

This ordinance amendment shall be in full force and effect from and after the ____day of _____, 2018.

_____, Mayor

ATTEST:

_____

Town Clerk

APPROVED AS TO FORM:

_____
Town Attorney

Date adopted:

_____
Motion to adopt by Councilmember:

_____
Motion seconded by Councilmember:

Vote:___AYES___NAYS