

# TOWN OF SOUTHERN SHORES: BEACH ASSESSMENT REPORT

Ken Willson

March 6, 2018



## 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

## 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

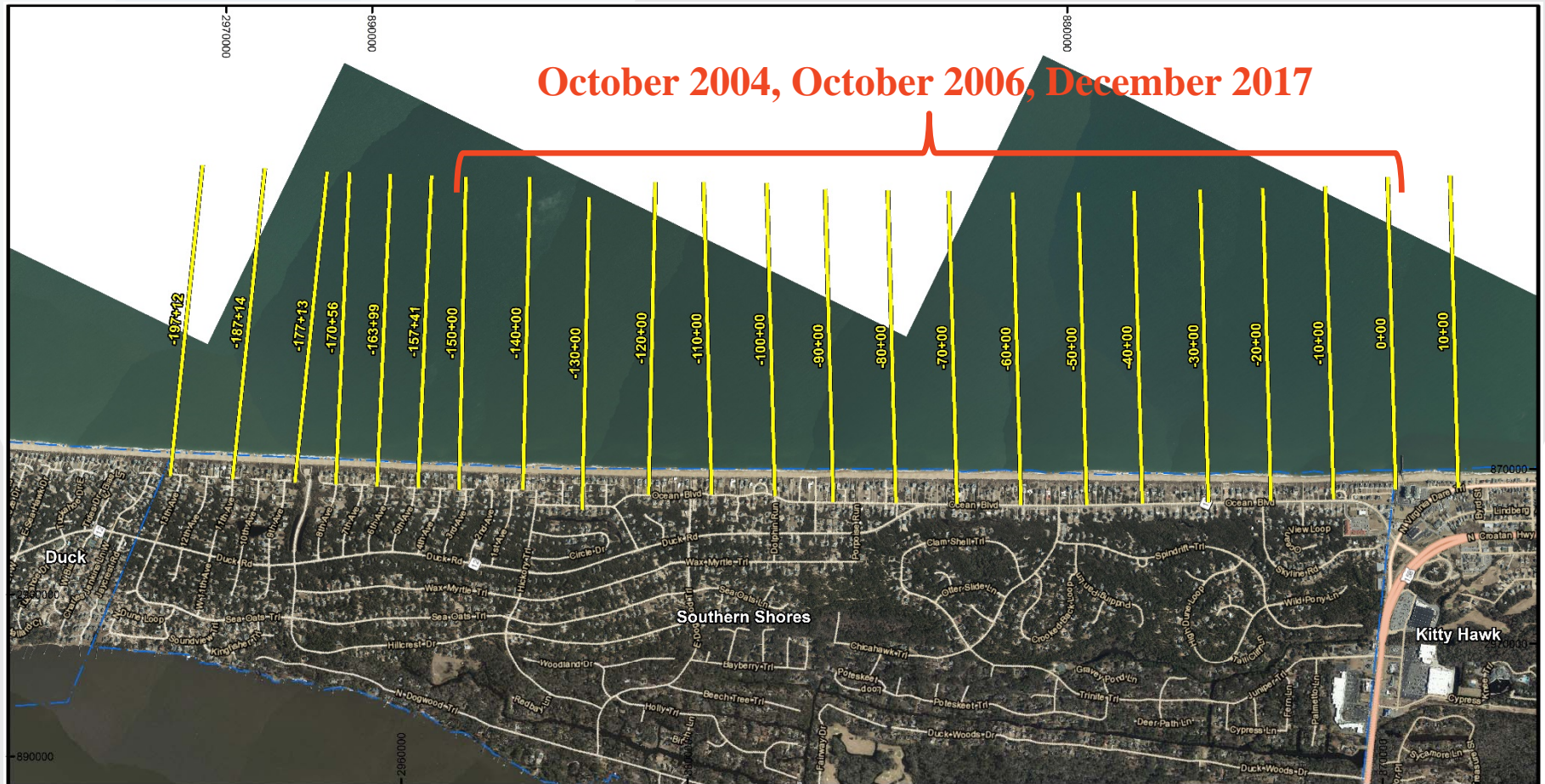
## DATA USED IN THE ASSESSMENT:

- 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.

## SPATIAL & TEMPORAL LIMITS:

- October 2004 to October 2006 (Station -150+00 located near 3<sup>rd</sup> 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 3<sup>rd</sup> 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 9<sup>th</sup> 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).

# SPATIAL & TEMPORAL LIMITS:



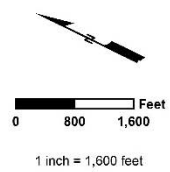
October 2004, October 2006, December 2017

**Notes:**

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

**Legend:**

- Profiles
- Municipal Boundaries



TITLE:

**Profile Map  
Dare County, NC**



Aptim  
Coastal Planning & Engineering  
of North Carolina, Inc.  
4038 MASONBORO LOOP ROAD  
WILMINGTON, NC 28409  
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Date: 12/18/17 By: HMV Comm No. 636216500 | Figure No.:2

# SPATIAL & TEMPORAL LIMITS:

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

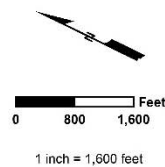


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### Legend:

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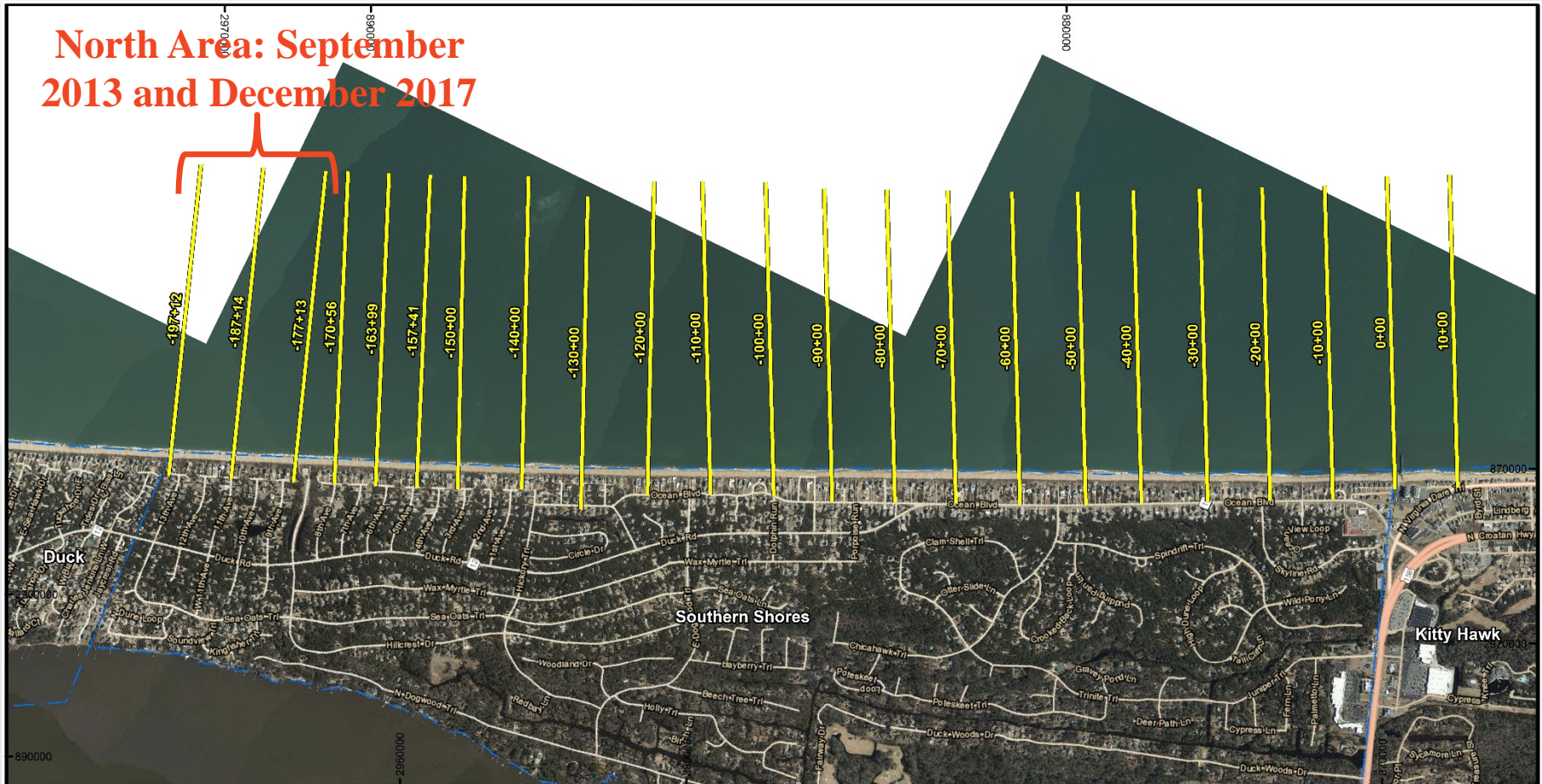


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# SPATIAL & TEMPORAL LIMITS:

## North Area: September 2013 and December 2017

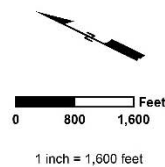


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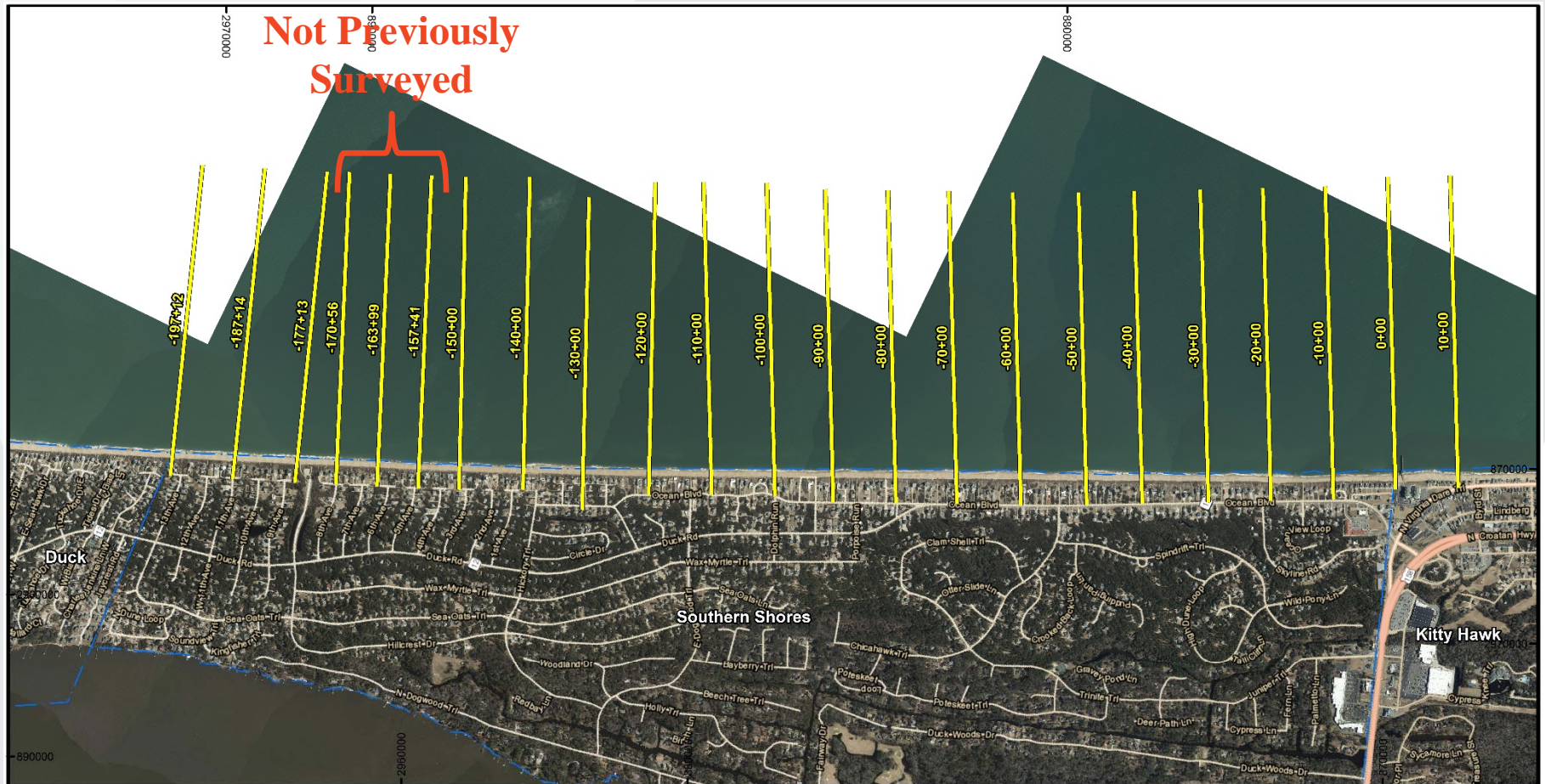


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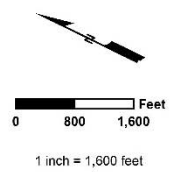


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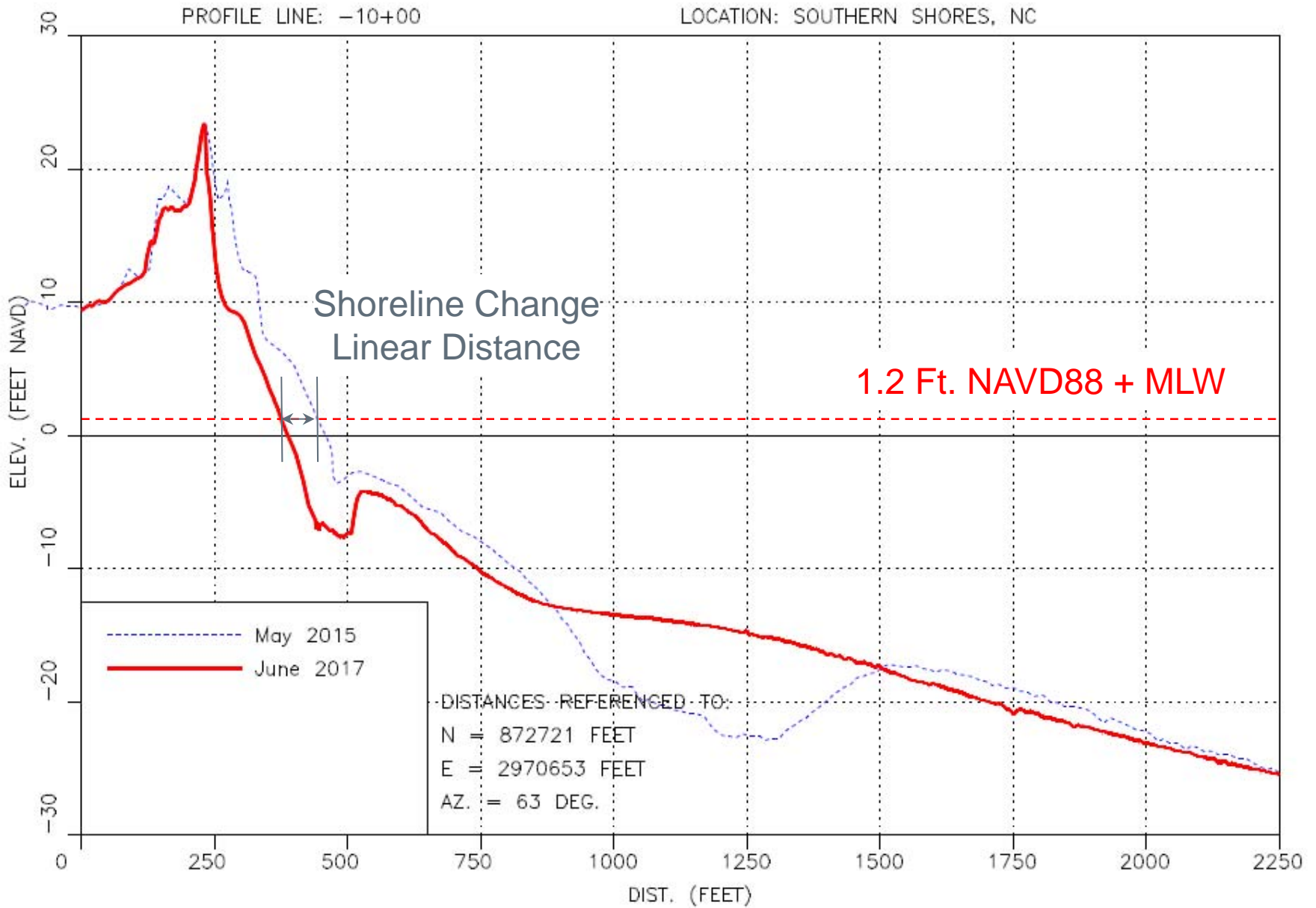


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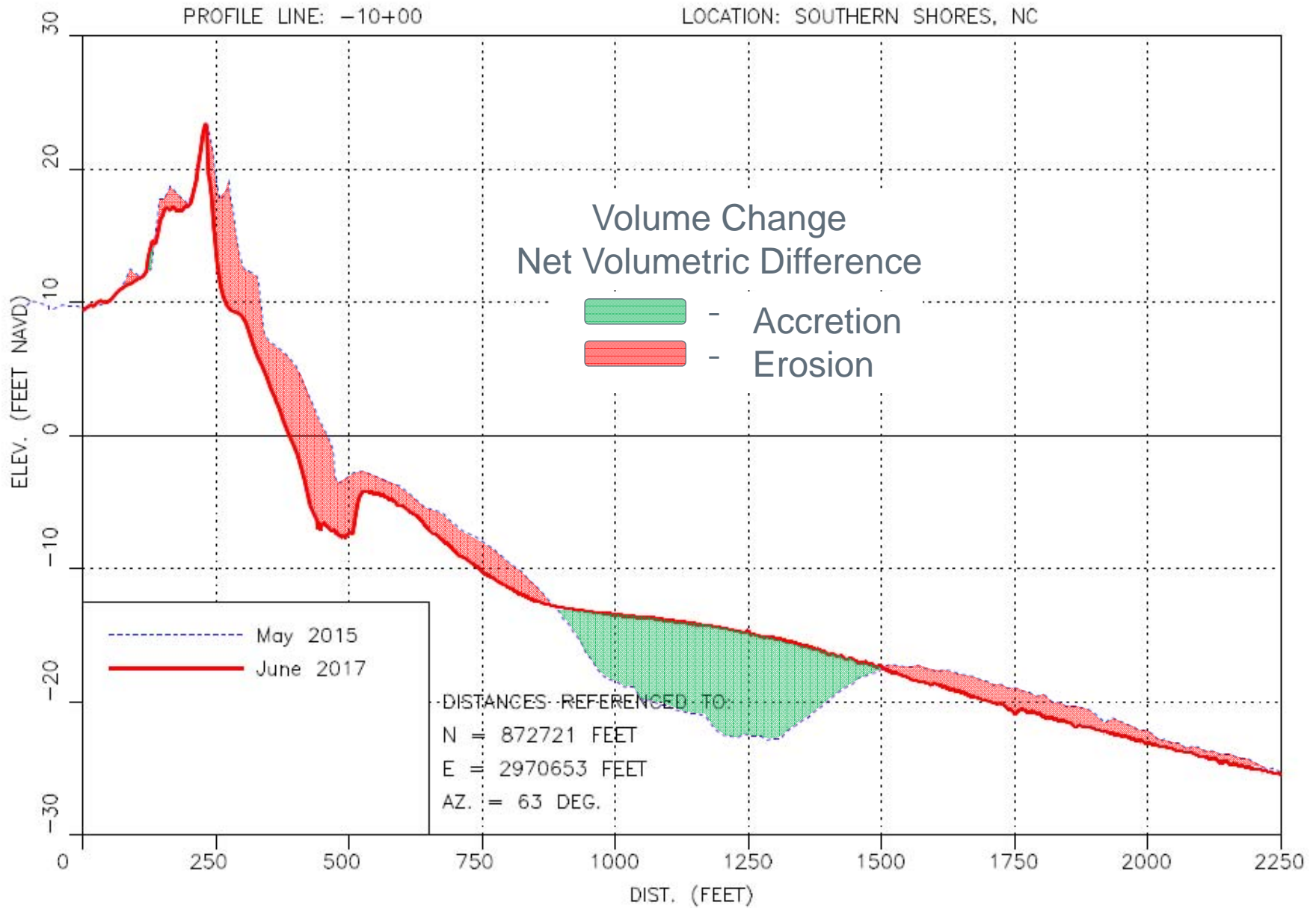
**Profile Map  
Dare County, NC**

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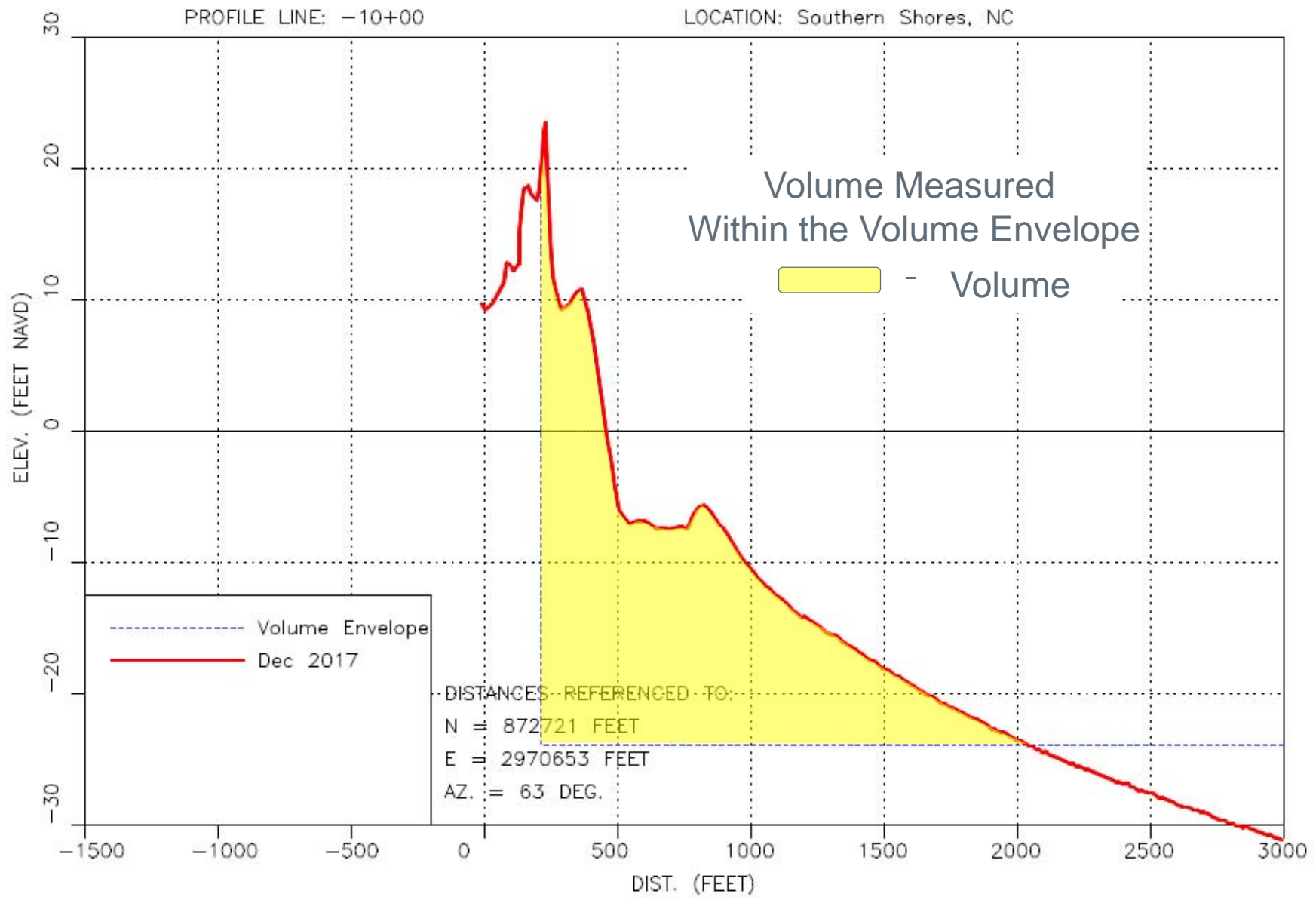
# TYPES OF ASSESSMENT: SHORELINE CHANGE



# TYPES OF ASSESSMENT: VOLUME CHANGE



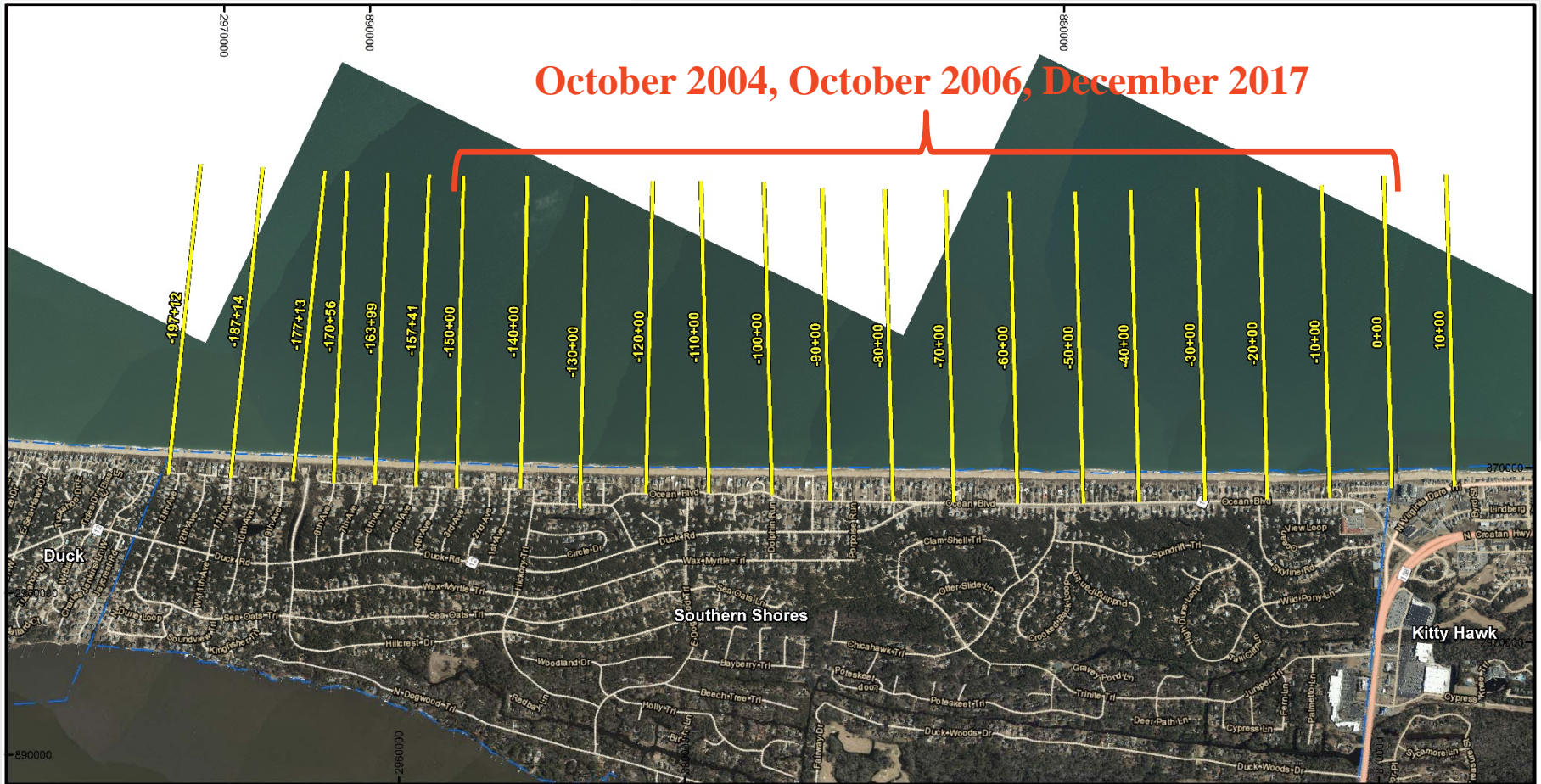
# TYPES OF ASSESSMENT: VOLUME ENVELOPE



# RESULTS:

OCTOBER 2004 TO OCTOBER 2006  
 OCTOBER 2006 TO DECEMBER 2017

October 2004, October 2006, December 2017

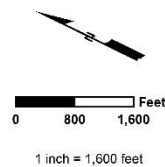


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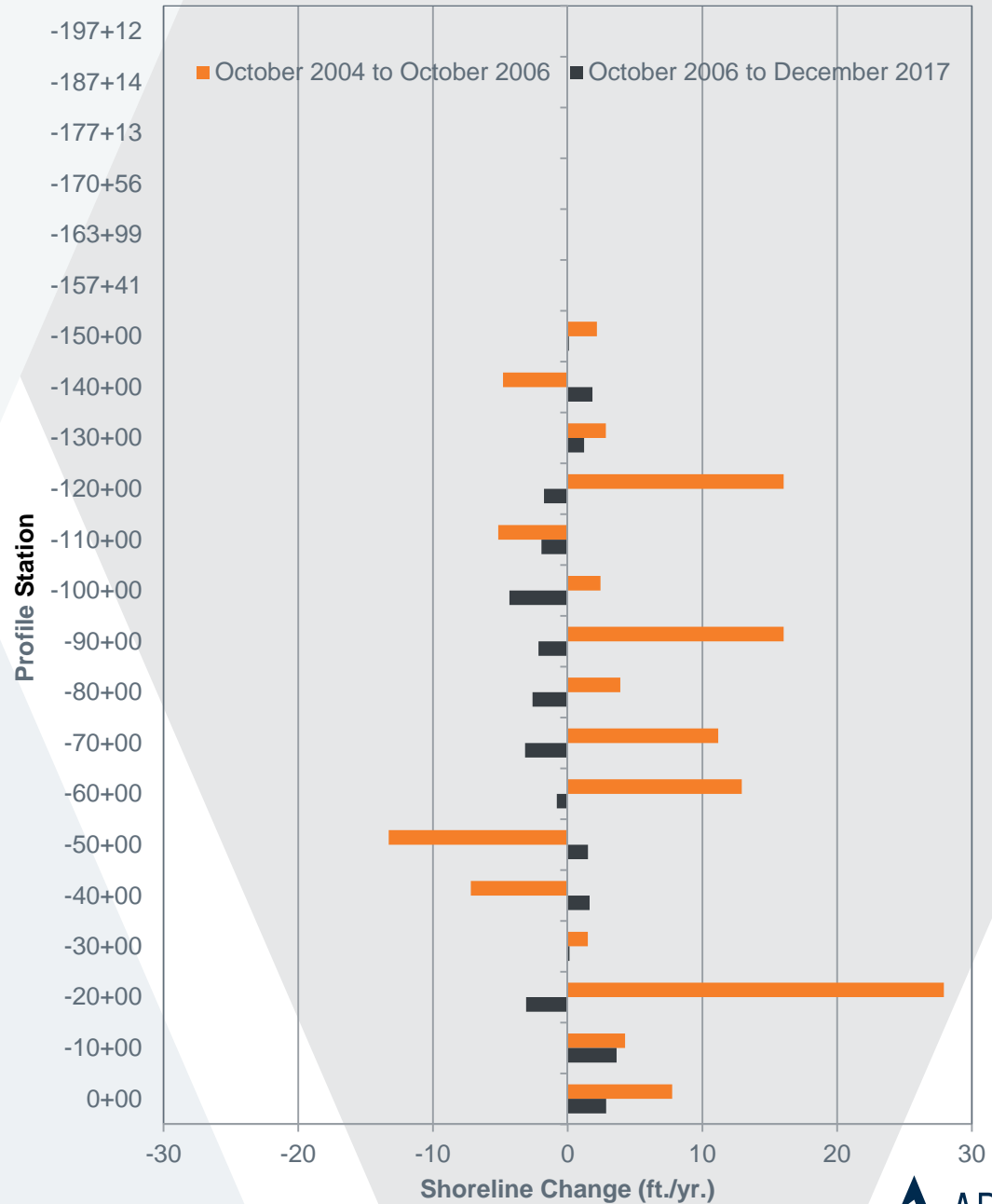
# SHORELINE CHANGE:

OCT. 2004 TO  
OCT. 2006

and

OCT. 2006 TO  
DEC 2017

MHW (+1.2 ft., NAVft. yr.ange Rate



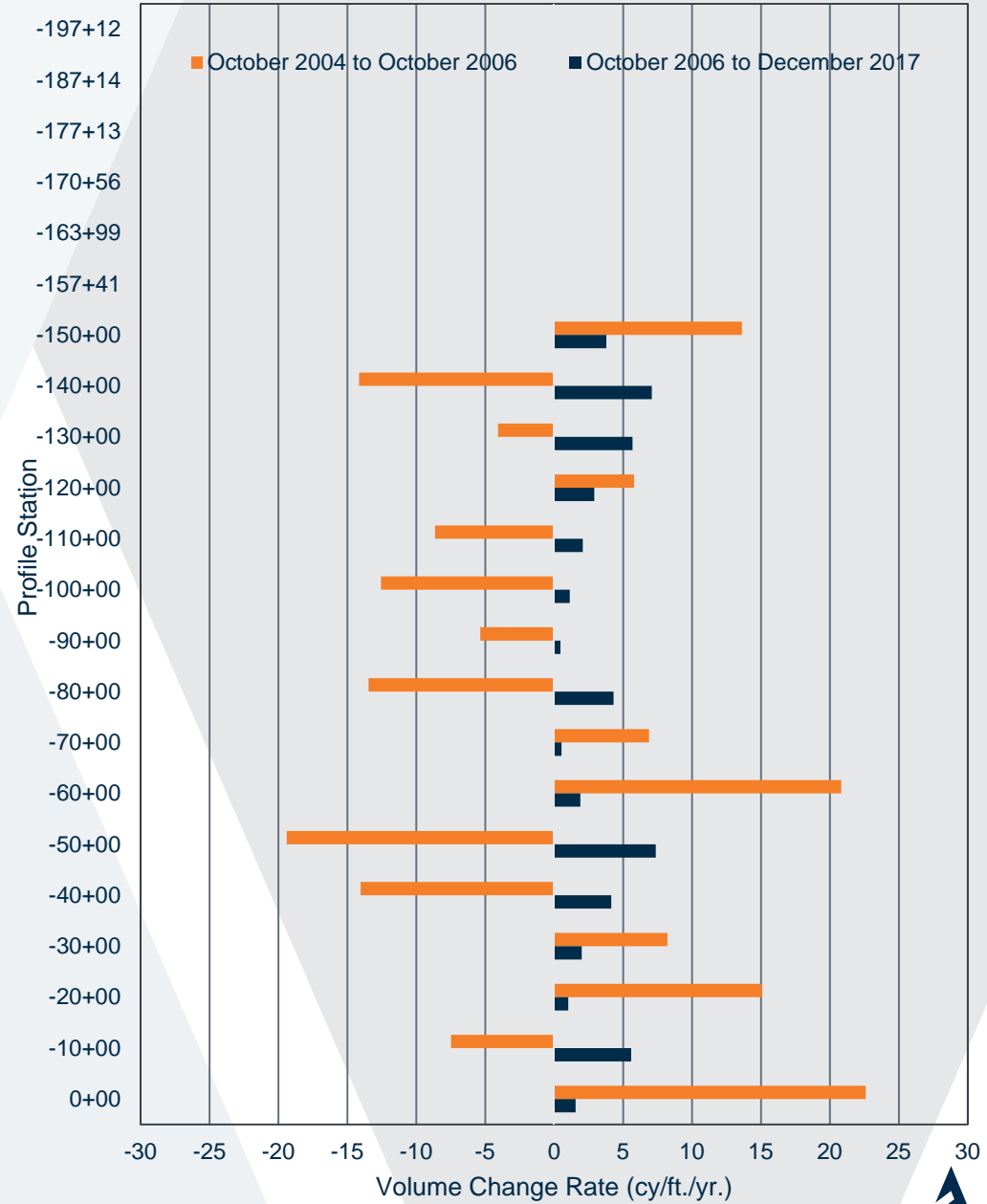
# VOLUME CHANGE:

OCT. 2004 TO  
OCT. 2006

and

OCT. 2006 TO  
DEC 2017

### Volume Change Rate Aboveft.-yr..0 ft., NAVD



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

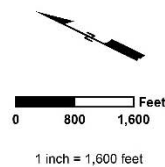


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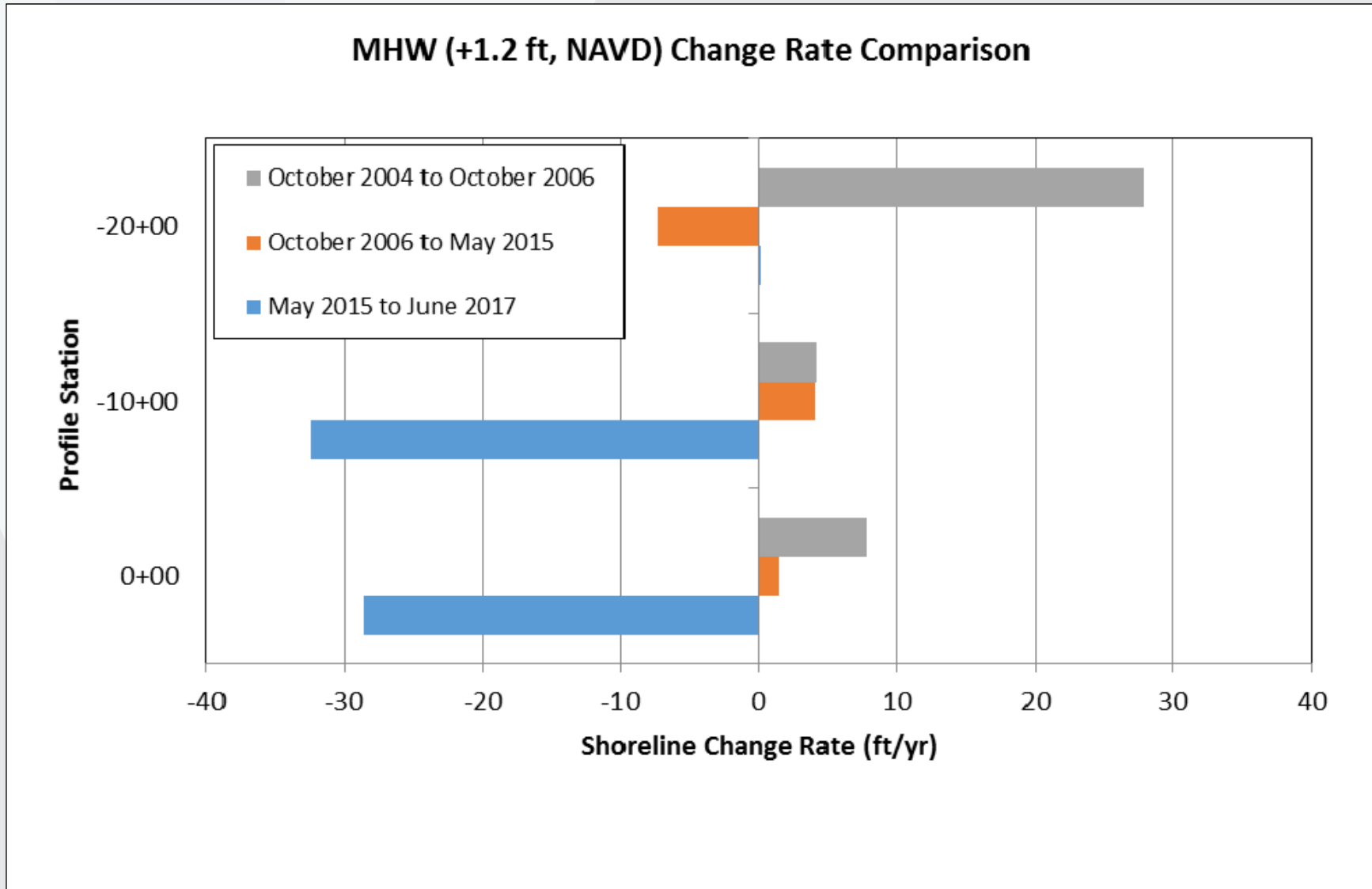
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# SHORELINE CHANGE: FILL AREA



# VOLUME CHANGE: FILL AREA

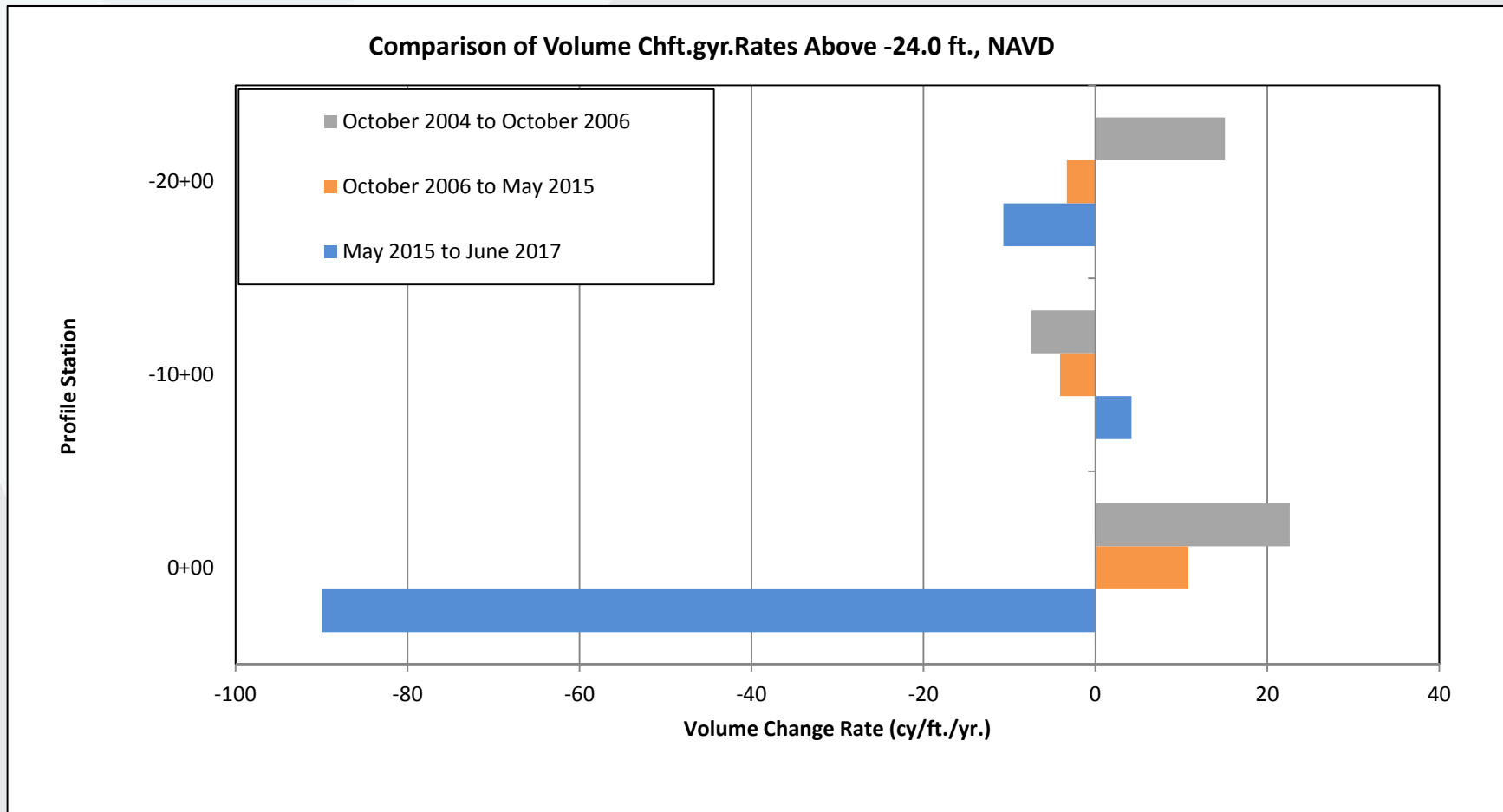


FIGURE 14.  
PHOTOS  
COMPARING  
THE FILL AREA  
IN MAY 2015  
AND JANUARY  
2017.

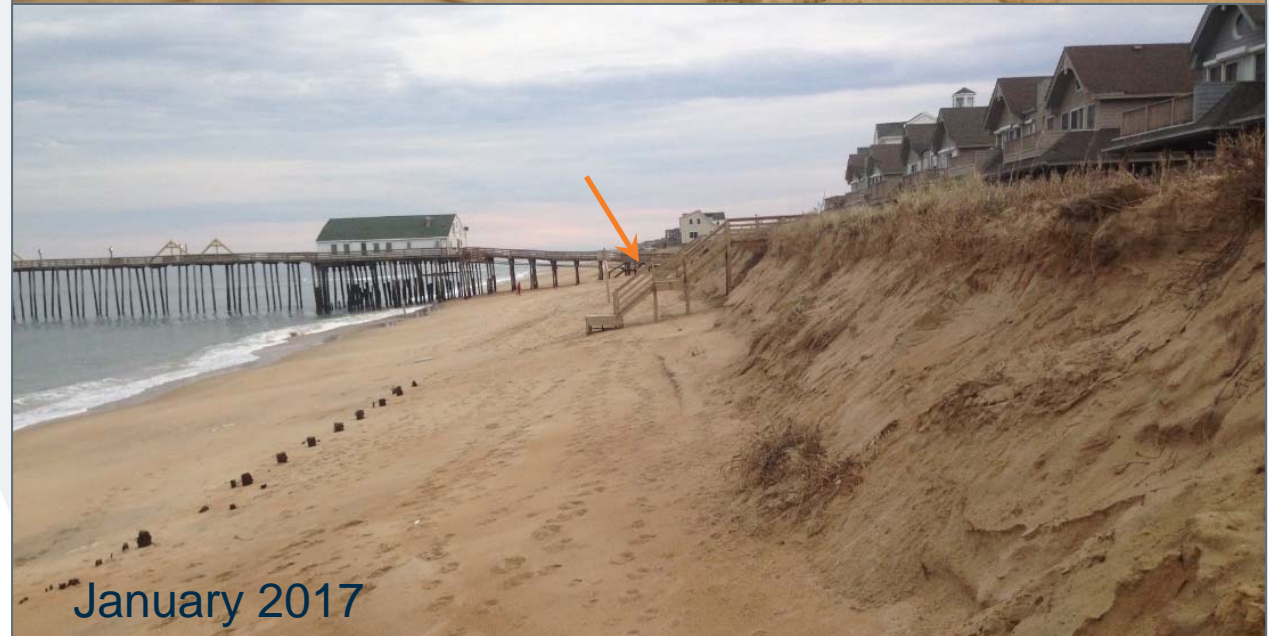
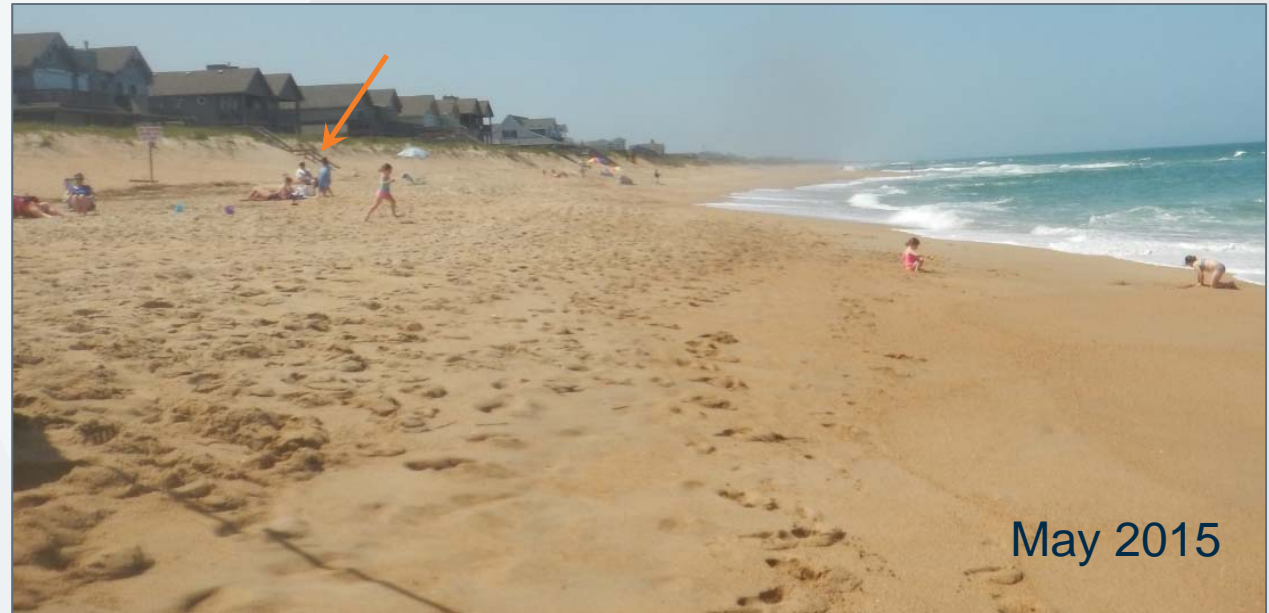
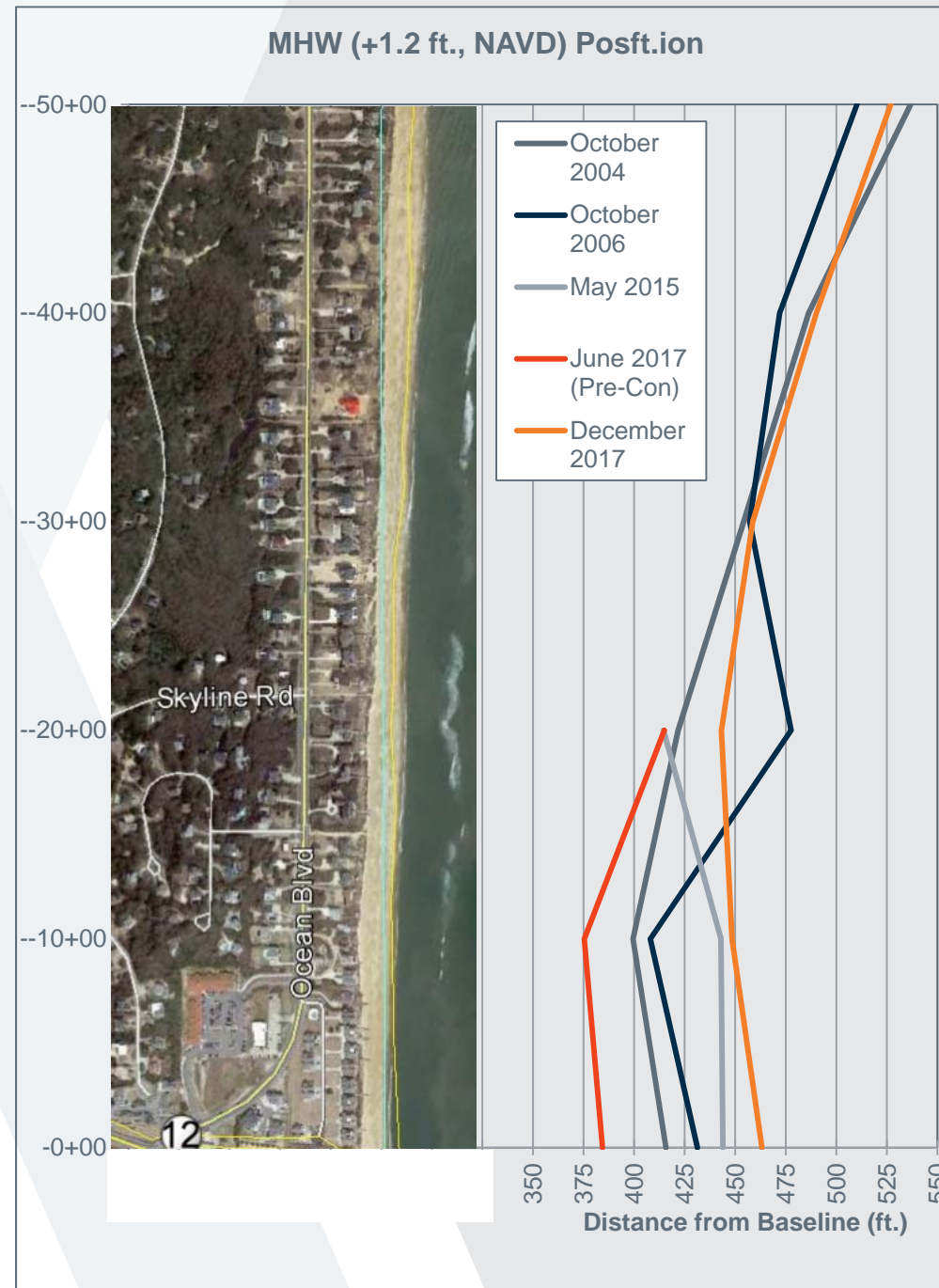
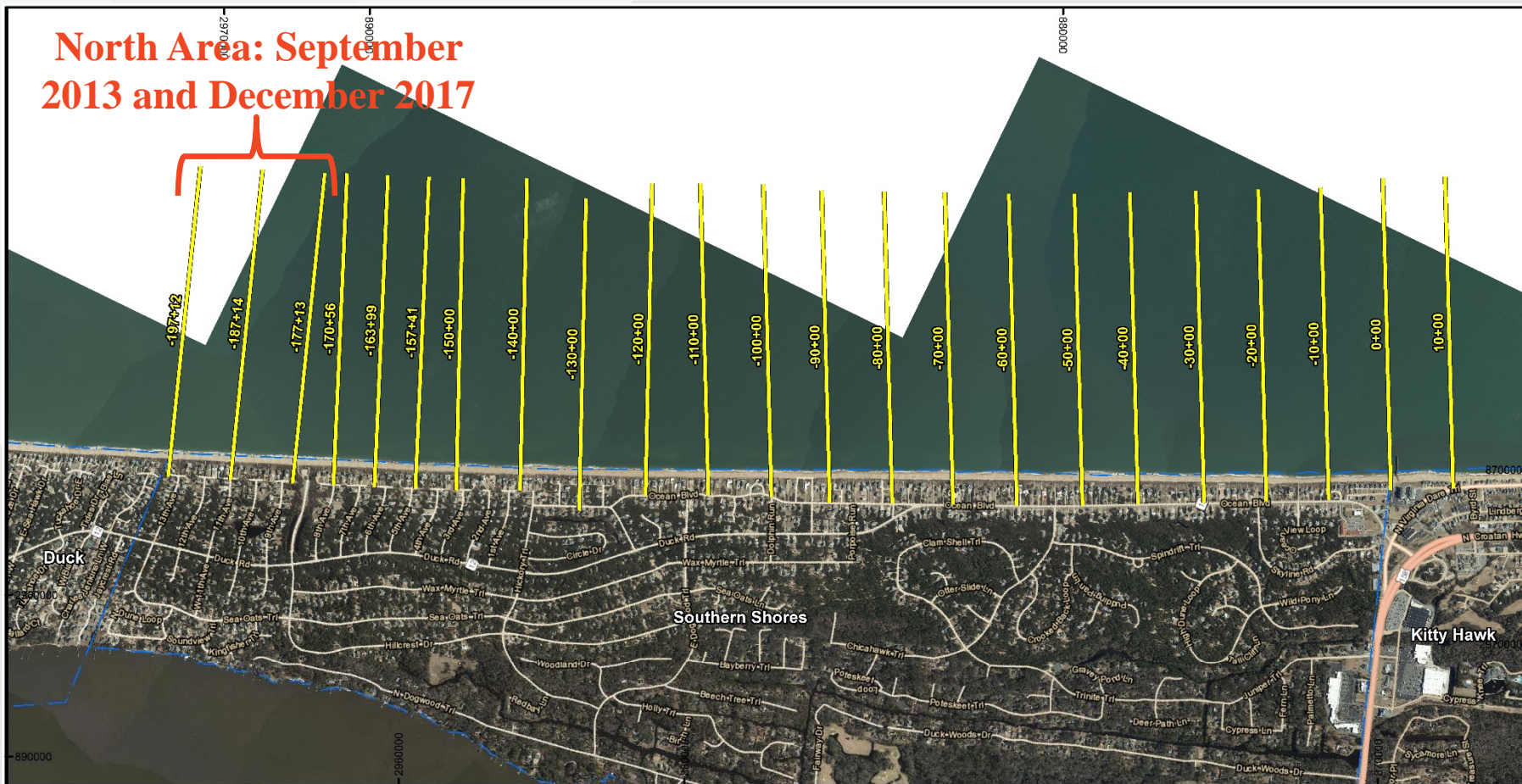


FIGURE 9. MHW SHORELINE POSITION AS MEASURED ALONG MONITORING PROFILES BETWEEN OCTOBER 2004 AND DECEMBER 2017.



# RESULTS: SEPT. 2013 TO DEC 2017

## North Area: September 2013 and December 2017

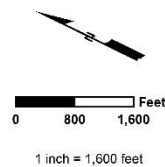


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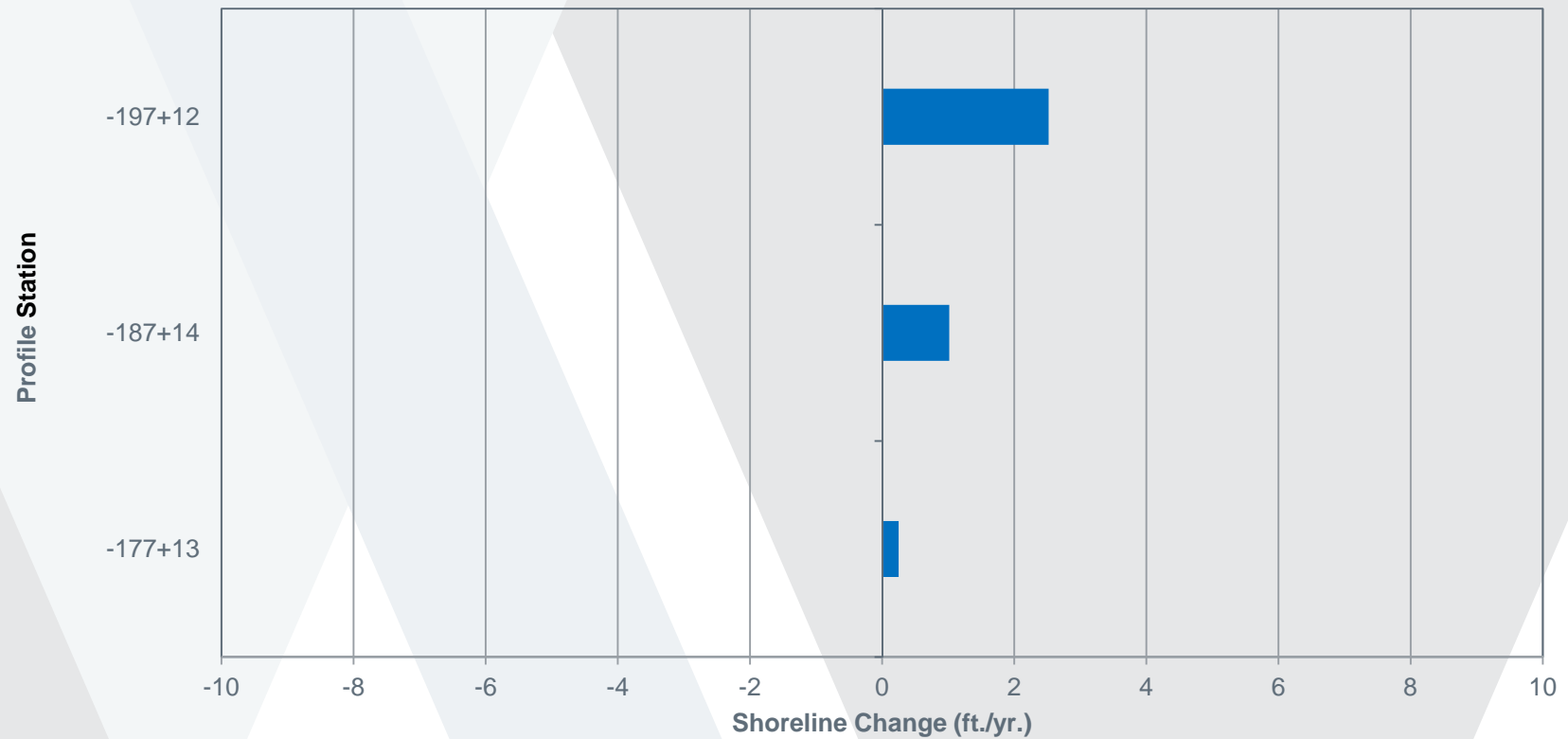


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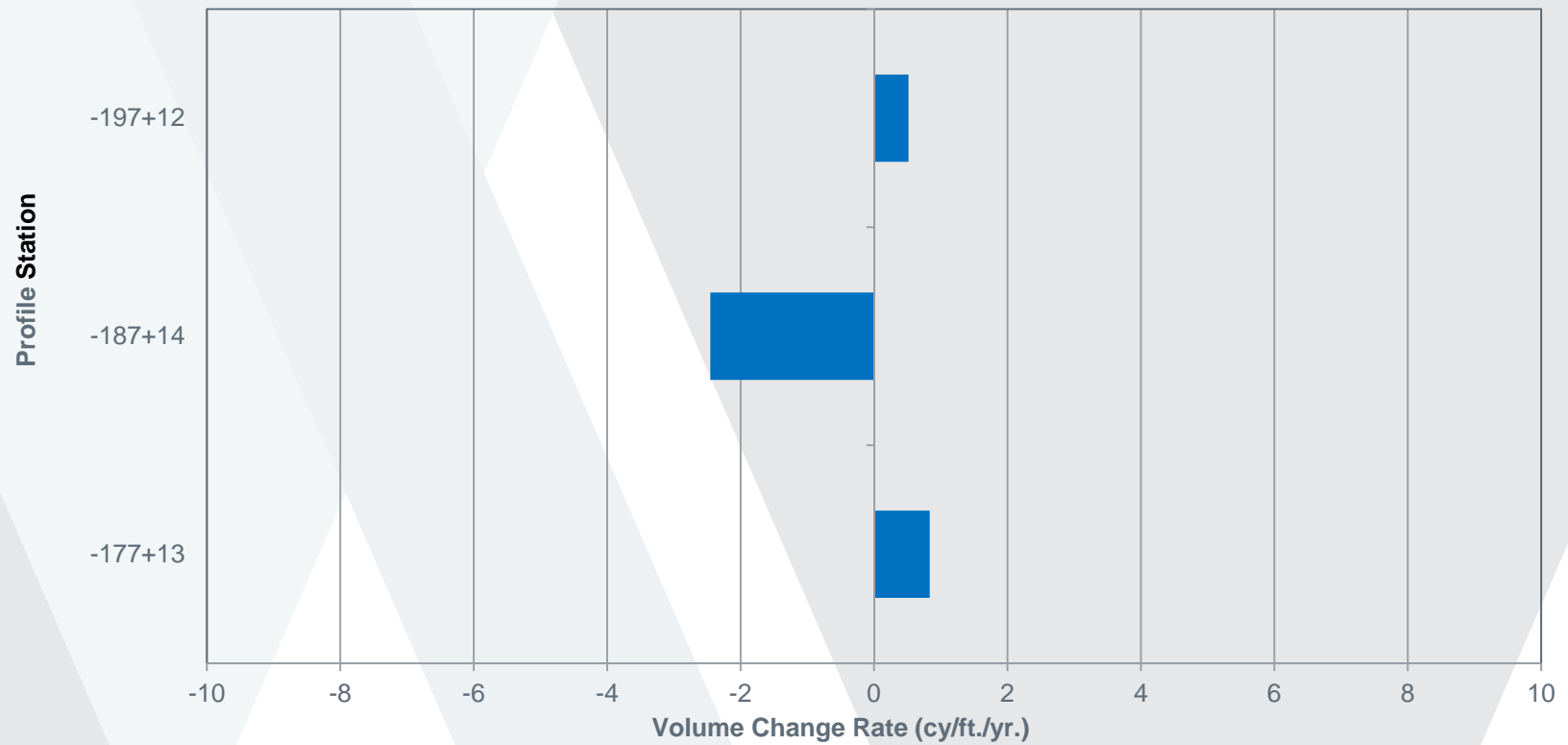
# SHORELINE CHANGE: NORTH AREA

MHW (+1.2 ft., NAVft. yr.ange Rate  
September 2013 to December 2017

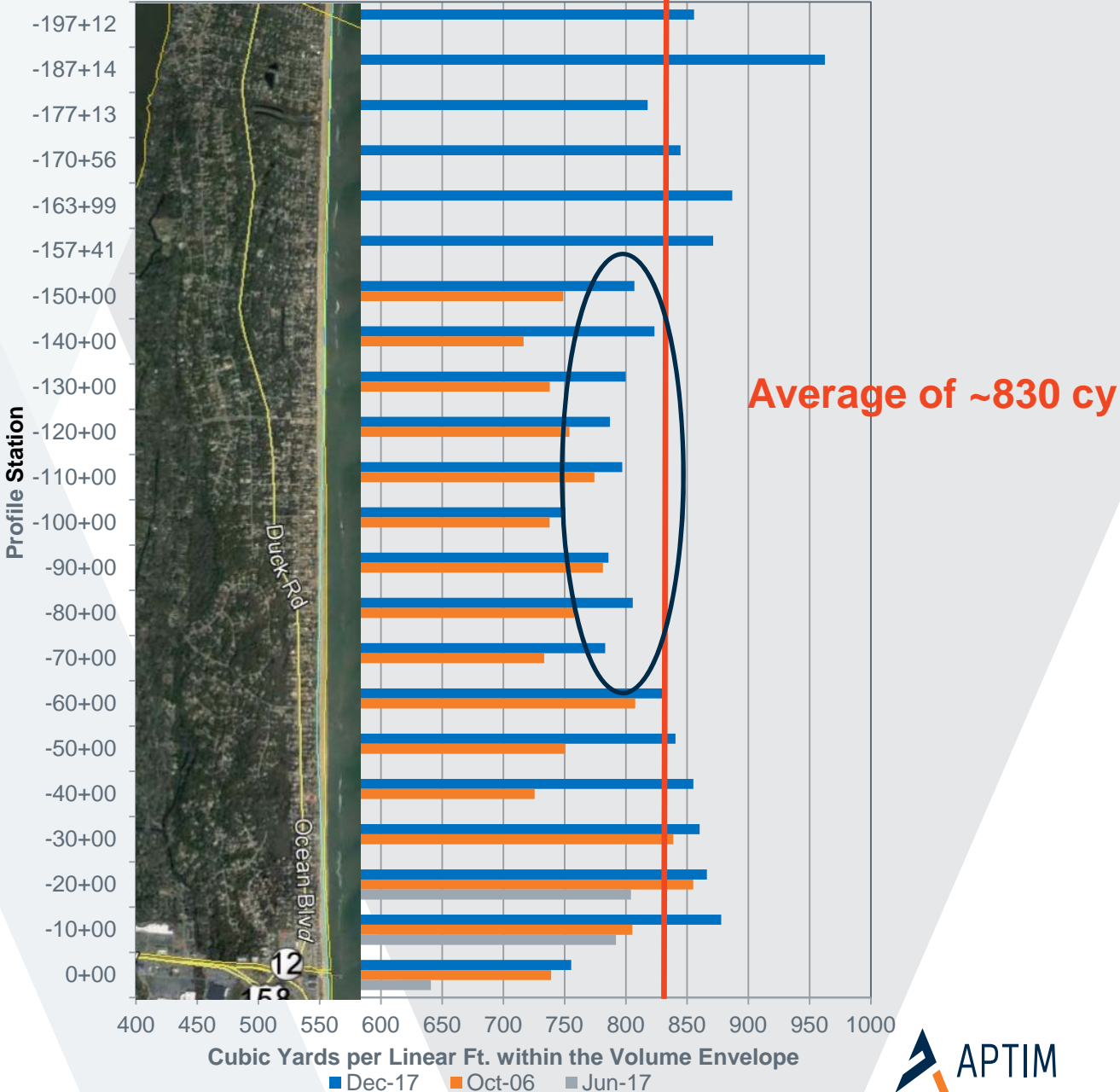


# VOLUME CHANGE: NORTH AREA

September 2013 to Decept.yr.2017 Volume Change Rates Above -24.0 ft., NAVD



### Volume Measured Within the Volume Envelope







## RECOMMENDATIONS:

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

# QUESTIONS:



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