



Virtual Public Workshop #2 – Monday, May 22, 2023

# Introductions

## ■ Presenters:

- DeIDOT Division of Transportation Resiliency & Sustainability
  - Jim Pappas, P.E. – Director
  - Stephanie Johnson – Assistant Director
- AECOM – Planning and Design Consultant
  - Joe Hofstee, P.E. – Project Manager
  - Kira Murphy – Marine Structural Engineer
  - Marge Quinn – Planning Manager
- Remline – Public Outreach Consultant
  - Danielle Lloyd – Outreach and Engagement Director





# Agenda

- Expectations for the Workshop and the Study
- Review of Study's Purpose and Need
- Study Areas
- Coastal Model
- Flood Mitigation/Protection
- Evaluation Criteria
- Path Forward
- How to Stay Involved
- Questions and Answers



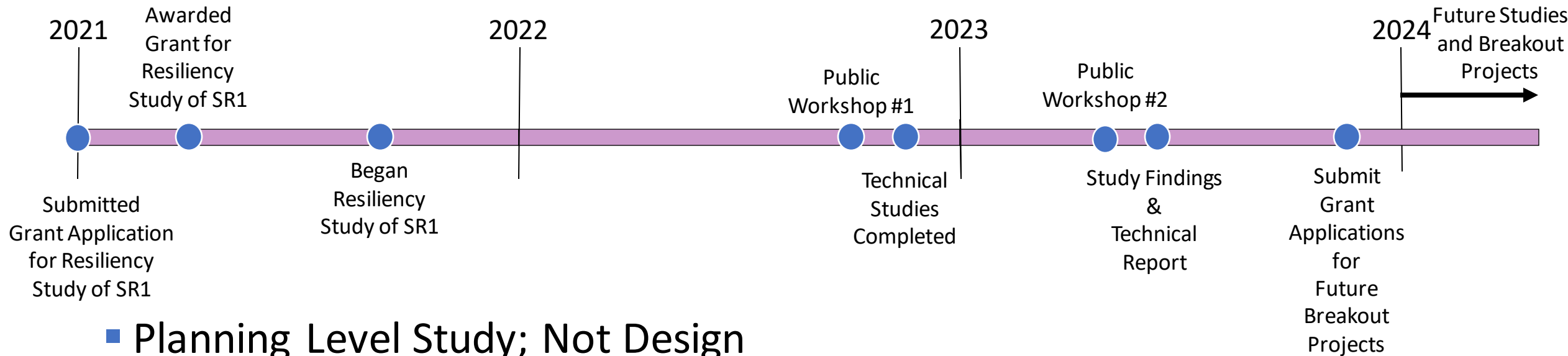
# Workshop Expectations

- Second Workshop – follow up to workshop held on September 20, 2022
- Why Are We Here?
  - Provide update on the study
  - Continue public engagement
  - Present findings
- How to Provide Comments or Ask Questions?
  - Tonight, use the meeting's Q&A function, anytime during the presentation and during the question-and-answer period, to offer comments or ask a question
  - Anytime, fill-out a comment form on the project's website <https://de.gov/sr1coastalcorridor>
  - Anytime, send an e-mail [dotpublic@delaware.gov](mailto:dotpublic@delaware.gov)



# Study Timeline

## ■ SR1 Coastal Corridor Resiliency Study Timeline



- Planning Level Study; Not Design
- Future Projects will be identified as part of the Study



**SR1 COASTAL CORRIDOR RESILIENCY STUDY**

# Purpose and Need

- What is the purpose of the Study?
  - Establish existing and future conditions.
  - Identify a range of potential mitigation alternatives.
  - Establish criteria to evaluate the potential mitigation alternatives.
  - Evaluate the conceptual mitigation alternatives.
  - Work with public and stakeholders, determine preferred alternatives.



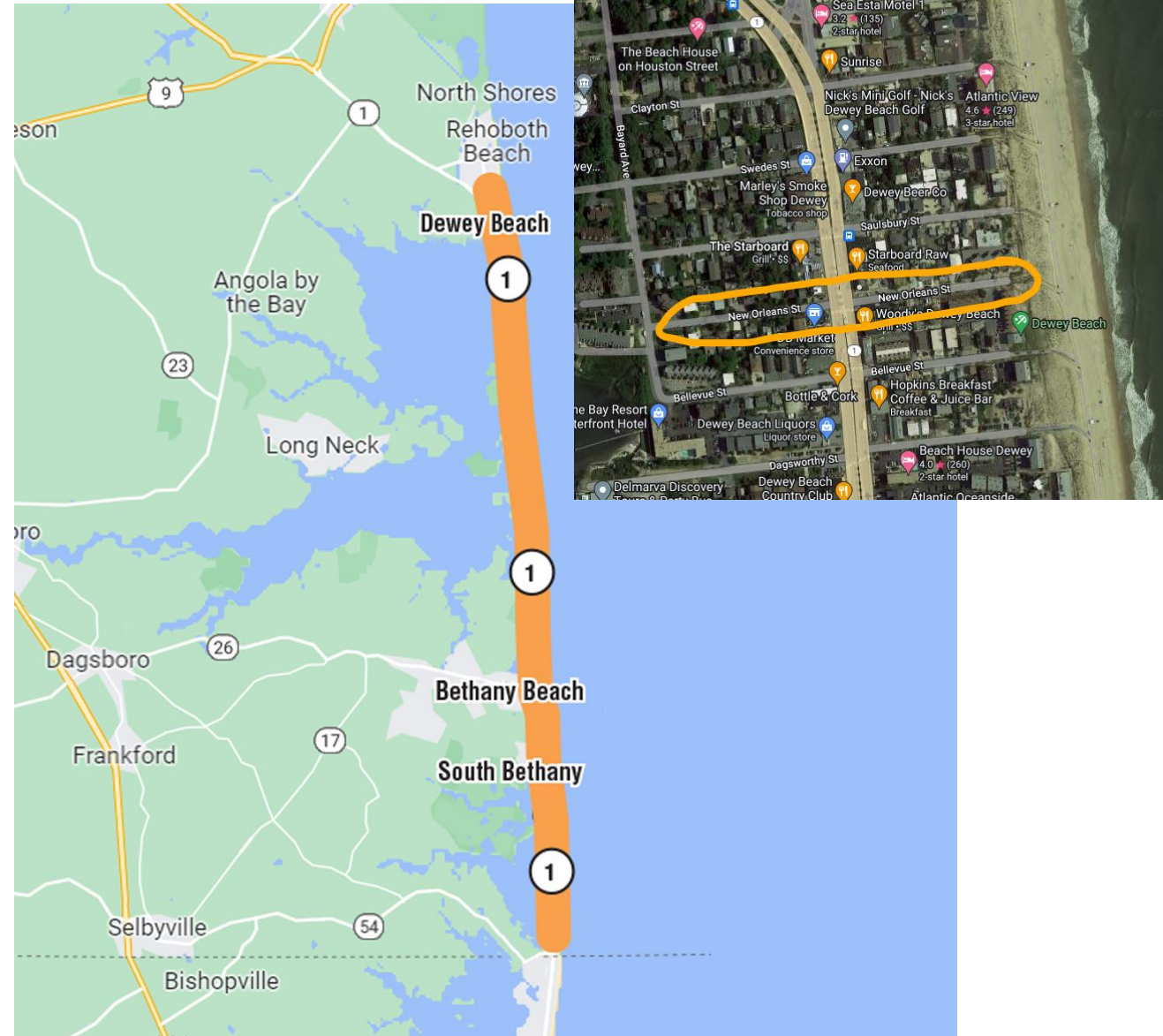
# Purpose and Need

- Why is this Study needed?
  - SR1 is the Primary Evacuation Route for Bethany Beach, South Bethany Beach, Fenwick Island, and Ocean City Maryland.
  - Closure of SR1 between Indian River Bridge and Dewey Beach results in a 18 mile detour.
  - Improve the overall resiliency of SR1 to reduce maintenance cost and ensure a direct route of travel.
  - Supports the 2016 Multi-Jurisdictional All Hazard Mitigation Plan and the 2018 State of Delaware All Hazards Mitigation Plan.
  - SR1 is vital to the economic well-being of the area and the State as a whole.
  - SR1 provides the link for those looking to visit the Delaware beaches and provides year-round travelers and residents ease of access to coastal communities.



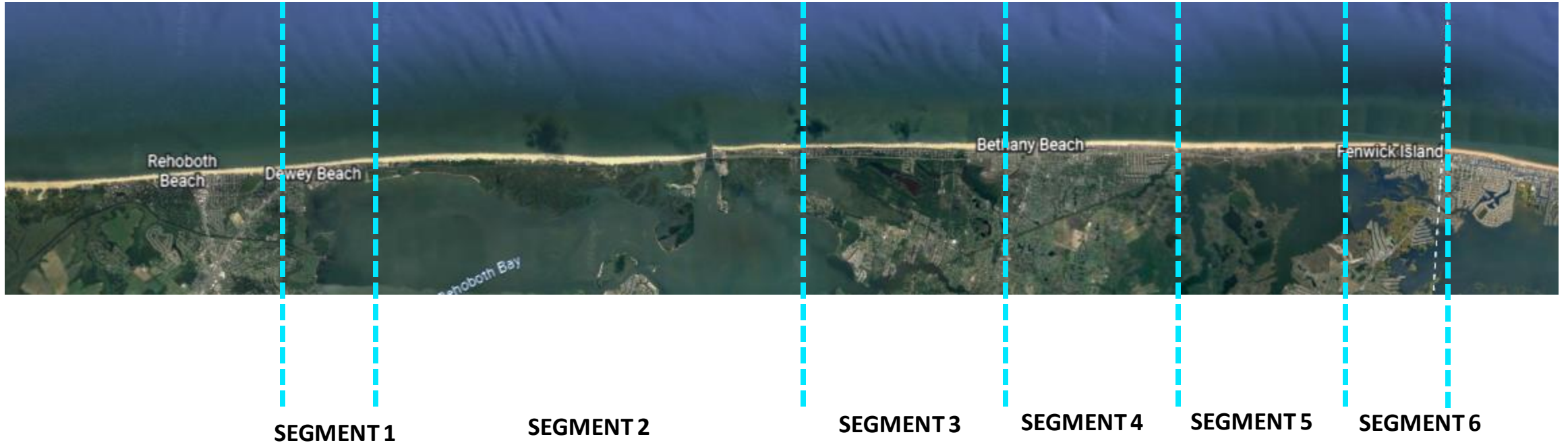
# Study Area

- Sixteen (16) miles of State Route 1 (SR1) - Coastal Highway
- Northern Limits
  - Dewey Beach – New Orleans Street
- Southern Limits
  - Maryland State Line





# Study Area – Proposed Segments

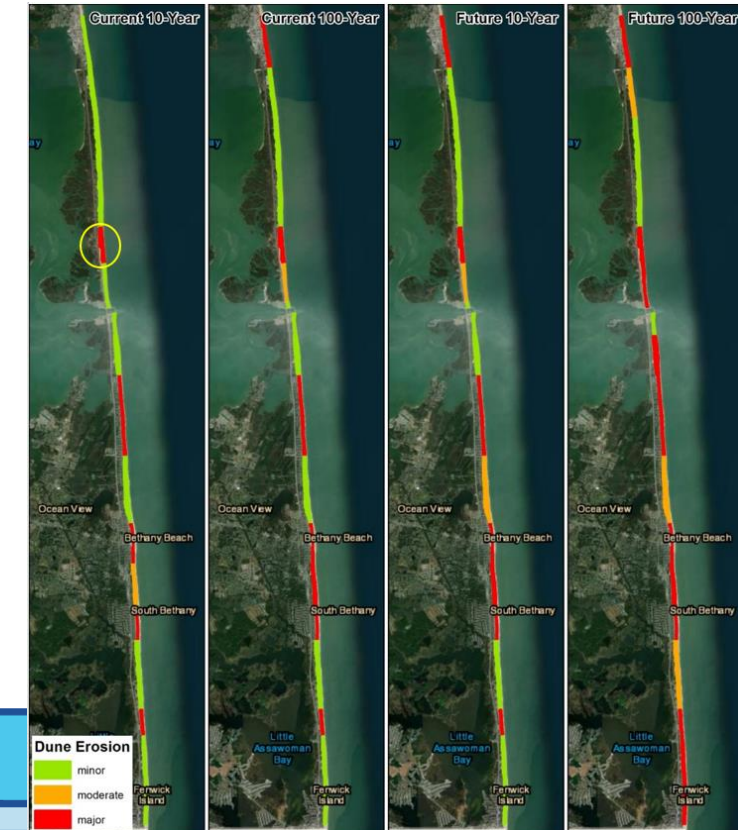
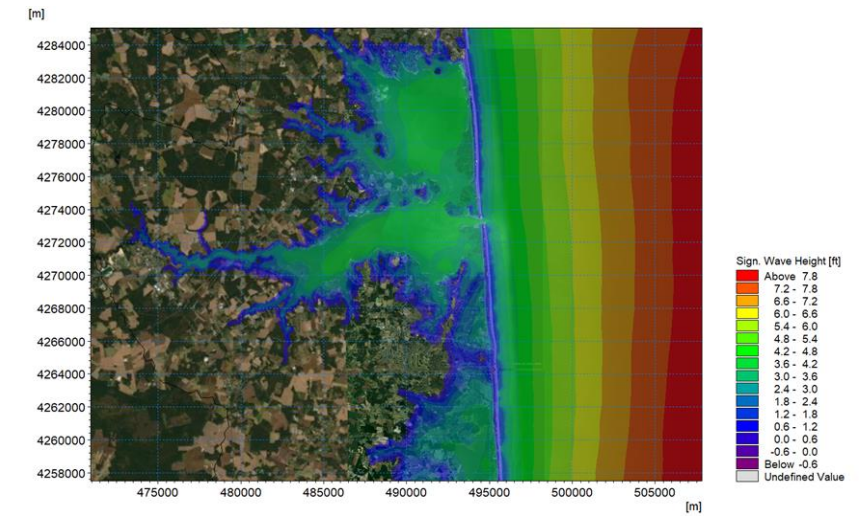


- Six (6) Segments – based on surrounding terrain conditions

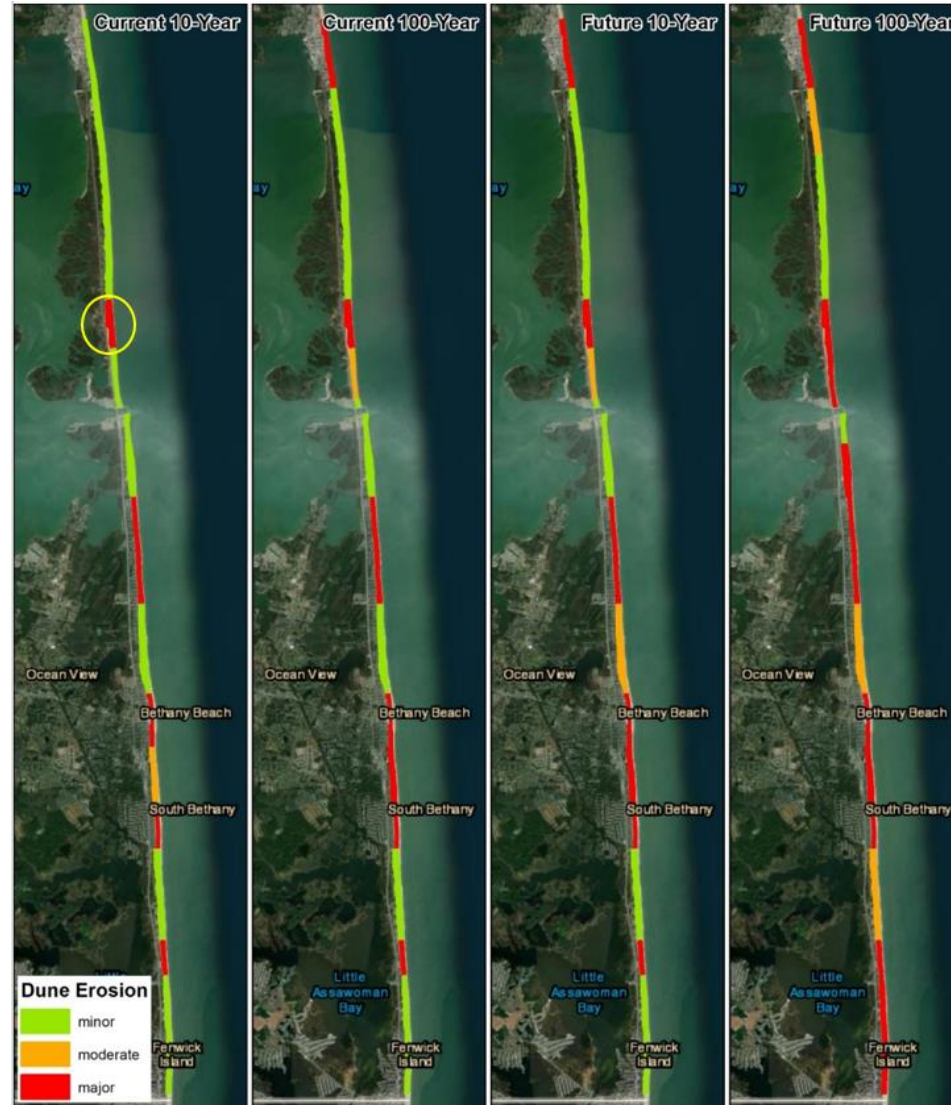


# Coastal Models

- Analyzed bayside and oceanside
- Four storm events were analyzed:
  - Short Term Risk Group:
    - Current condition – 10 year storm
    - Current condition – 100 year storm
  - Long Term Risk Group:
    - Future condition (year 2075) – 10 year storm
    - Future condition (year 2075) – 100 year storm
- Sediment Transport Model
- Coordinating with other studies:
  - US Army Corps of Engineers and Towns (if applicable)



# Sediment Transport Model



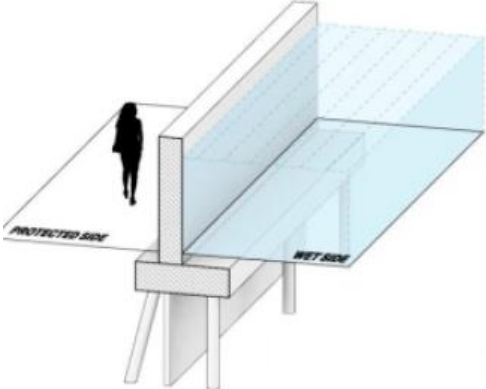
**SRI COASTAL CORRIDOR RESILIENCY STUDY**

# Evaluation Criteria

Criteria	Explanation
<b>Level of Flood Protection</b>	The water elevation that the countermeasure would protect up to.
<b>Environmental Effects</b>	Benefits & impacts to the natural environment (carbon reduction, wildlife habitats, etc.)
<b>Physical Constraints</b>	Estimated amount of time needed, right-of-way needed, and other physical constraints present.
<b>Construction Cost</b>	Estimated \$ to build including right of way acquisition & utility relocation costs.
<b>Benefit-Cost Ratio</b>	Compares future risk reduction benefits to its costs.
<b>Community Effects</b>	Benefits & impacts to the built environment (traffic volumes, travel times, etc.)
<b>Aesthetics/Visual Effects</b>	Visual effects (community impression, aesthetics, etc.)
<b>Operations &amp; Maintenance Cost</b>	Estimated annual \$ to maintain the improved infrastructure over its lifecycle.



# Examples of Primary Flood Mitigation/Protection



**EXPOSED FLOODWALL**



**BURIED FLOODWALL / STRUCTURAL DUNE**  
MANTALOKING, NJ, MOTT MACDONALD



**SHORT-TERM DEPLOYABLES**  
TRAP BAGS SARASOTA, FLORIDA



**PERMANENT DEPLOYABLES**  
FLIP UP GATES BLOOMSBURG, PENNSYLVANIA



**RAISED & REROUTED ROADWAYS**  
STATE ROUTE 54, SUSSEX COUNTY, DELAWARE



# Examples of Secondary Flood Mitigation/Protection



LIVING SHORELINES

ORLEANS, MA

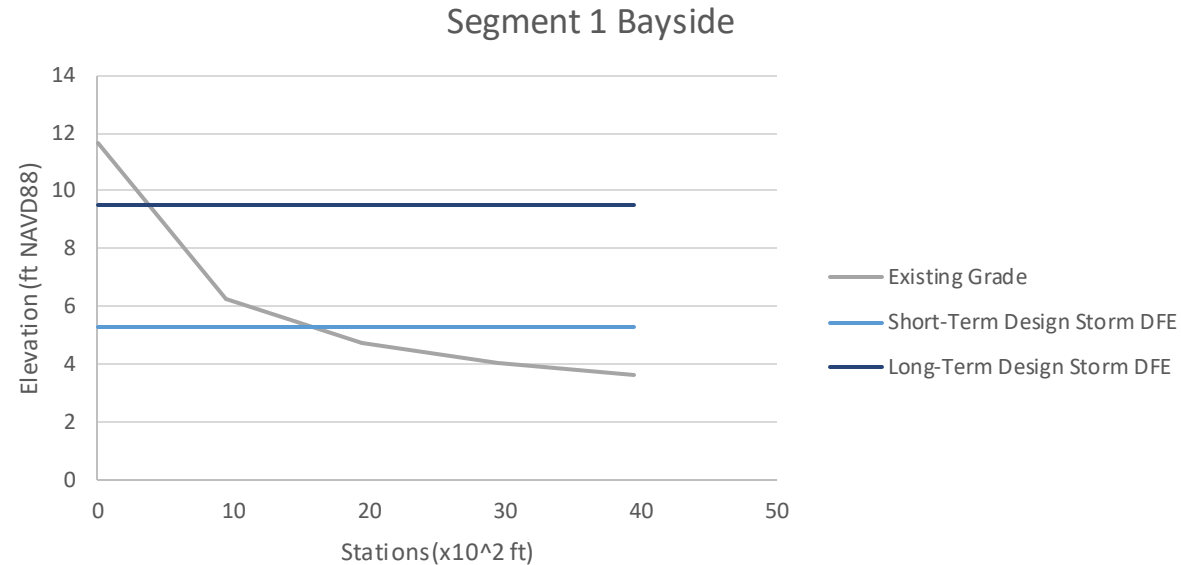


REVETMENTS

MAYPORT, GEORGIA



# Town of Dewey Beach – Segment 1 - Bayside



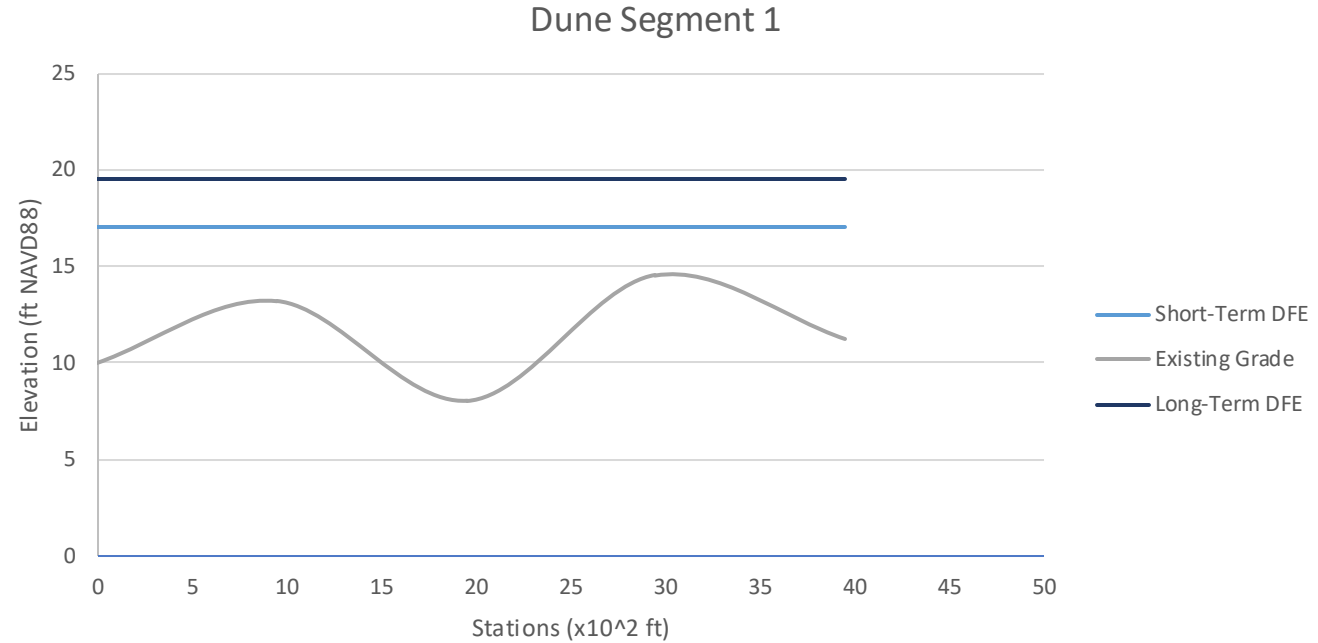
## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Reroute





# Town of Dewey Beach – Segment 1 - Oceanside



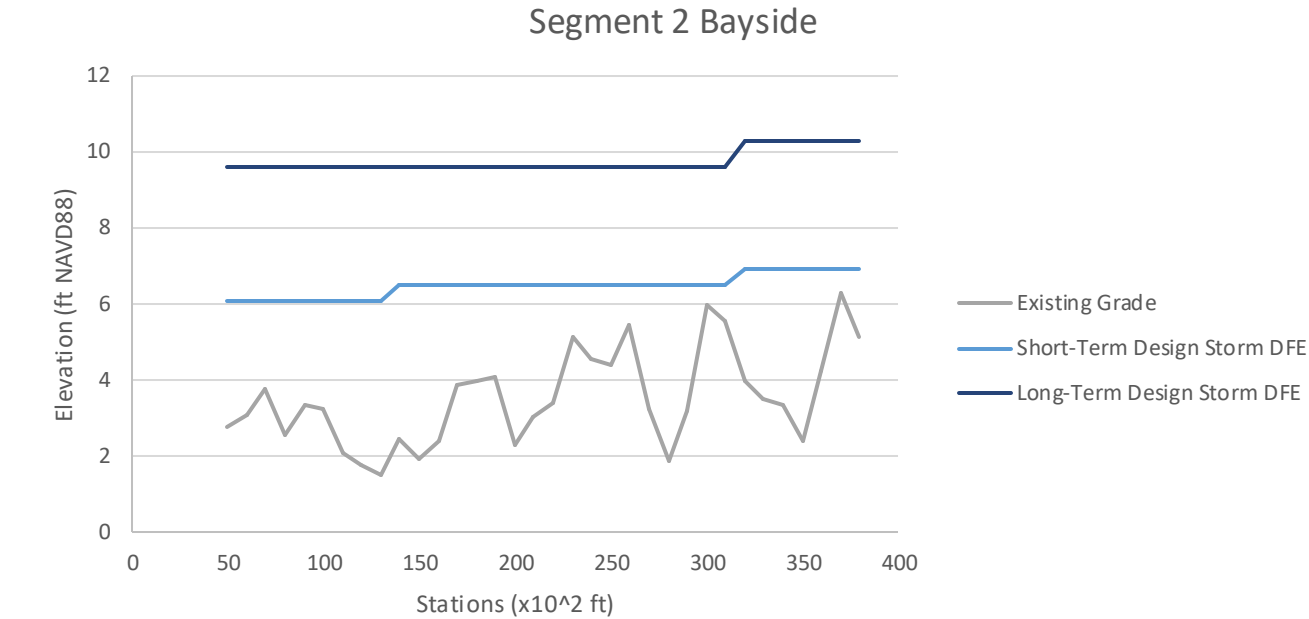
## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Structural Dune





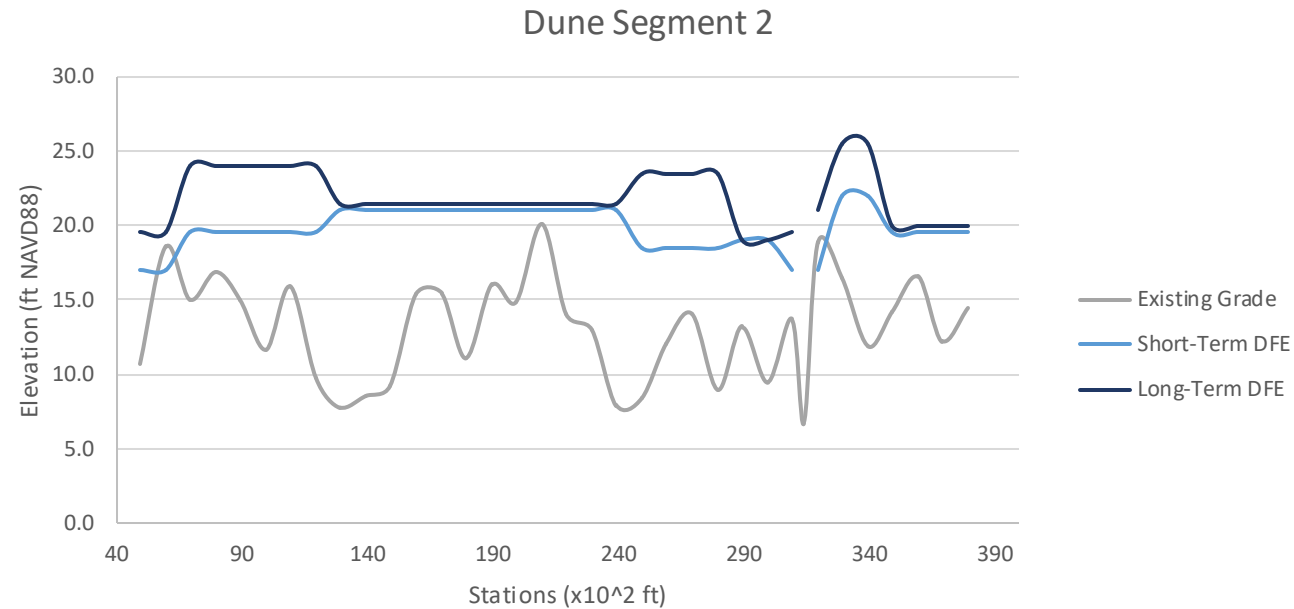
# Bayberry Lane to Dune Road – Segment 2 - Bayside



## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Reroute (this may be possible for part of the segment)

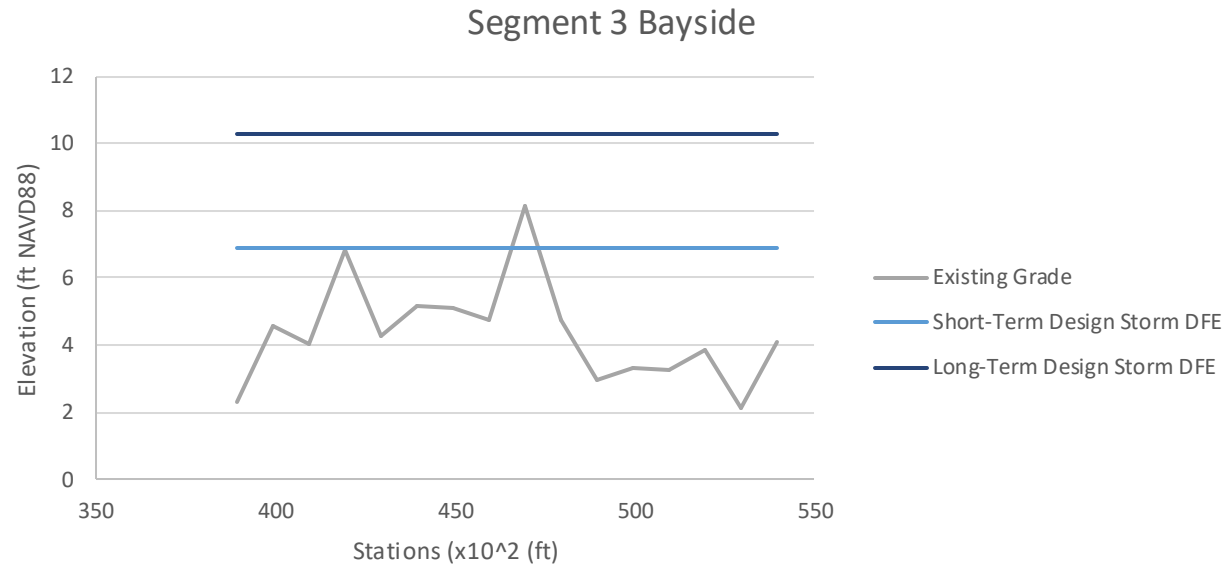
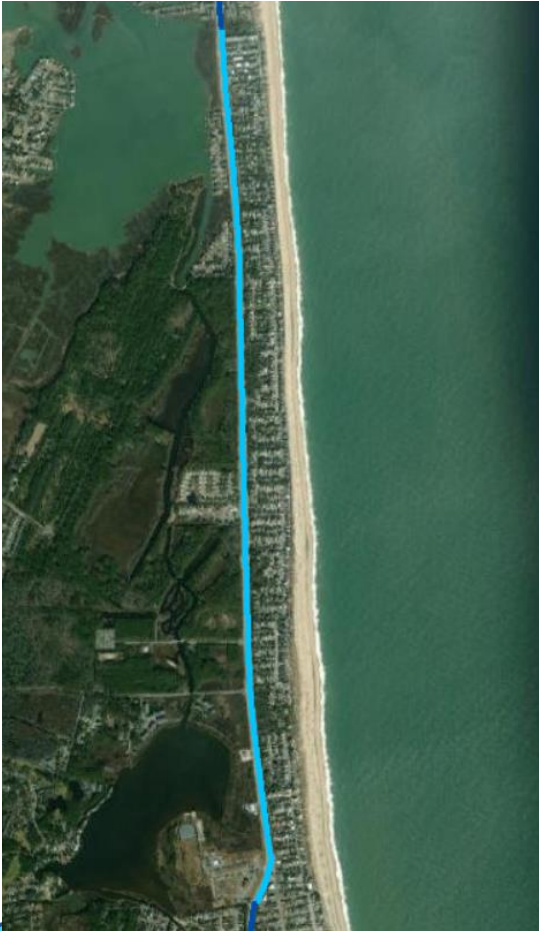
# Bayberry Lane to Dune Road – Segment 2 - Oceanside



## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Structural Dune

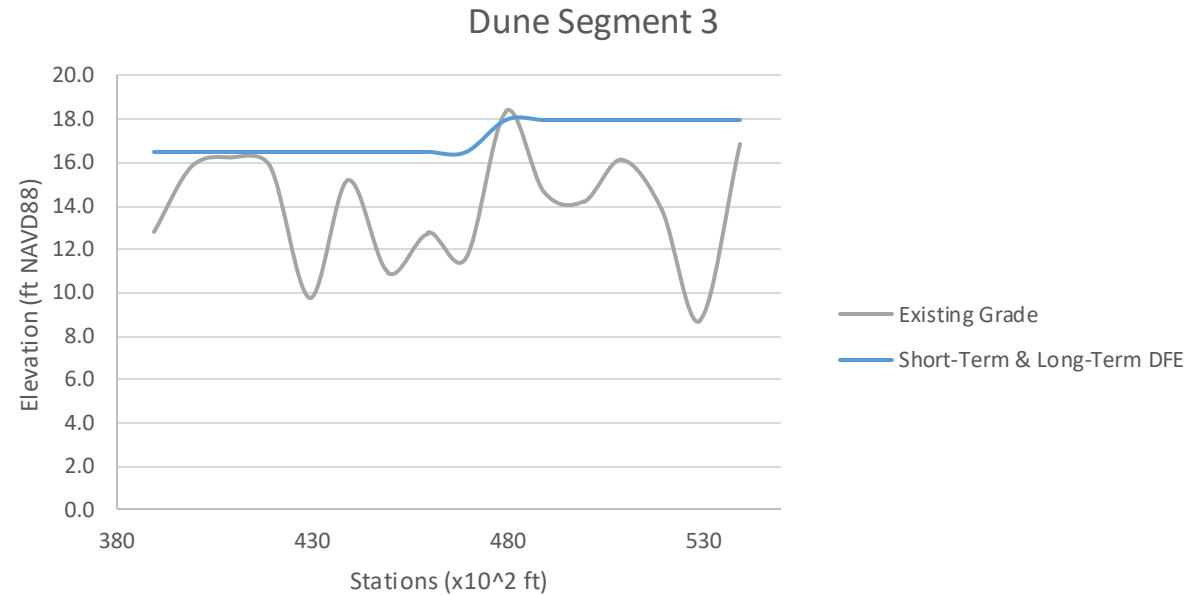
# Dune Road to 5<sup>th</sup> Street – Segment 3 - Bayside



## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables

# Dune Road to 5<sup>th</sup> Street– Segment 3 - Oceanside



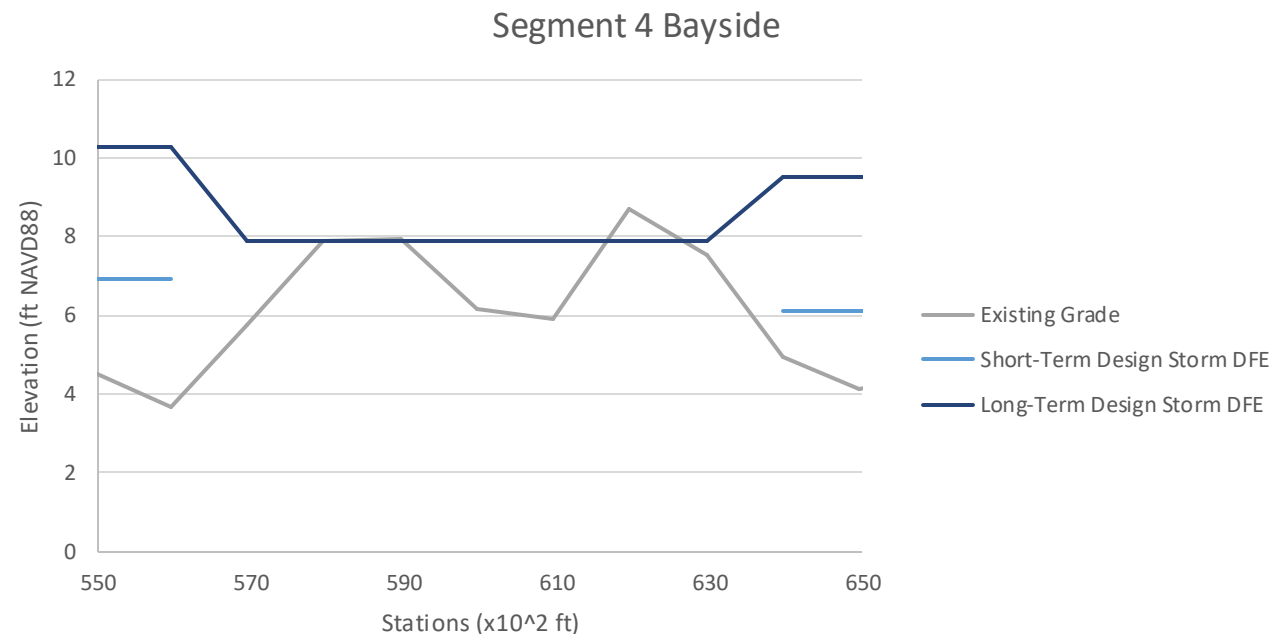
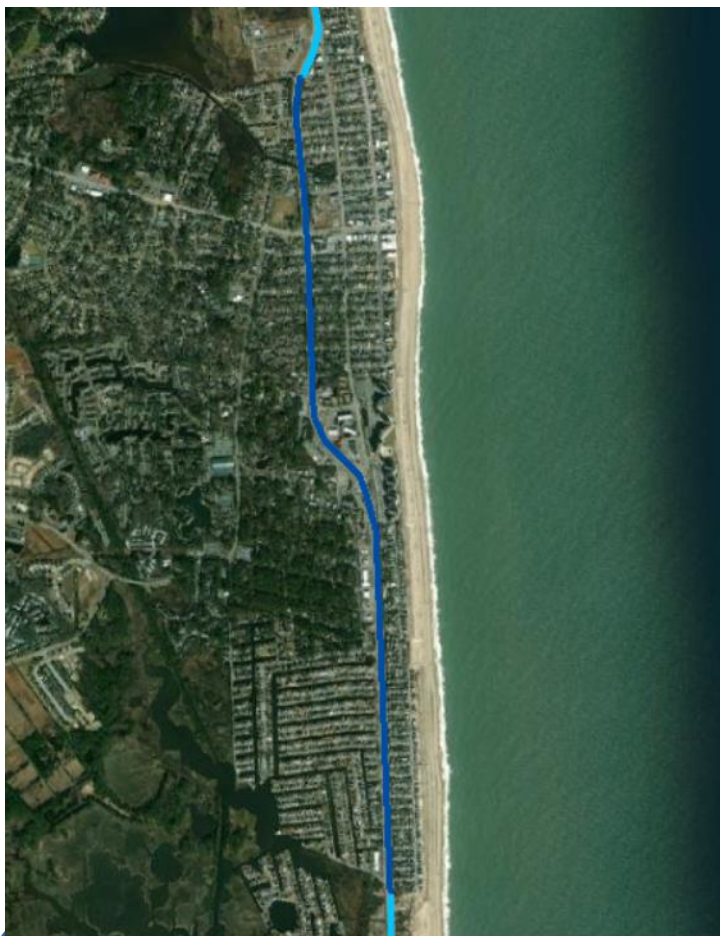
## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Structural Dune





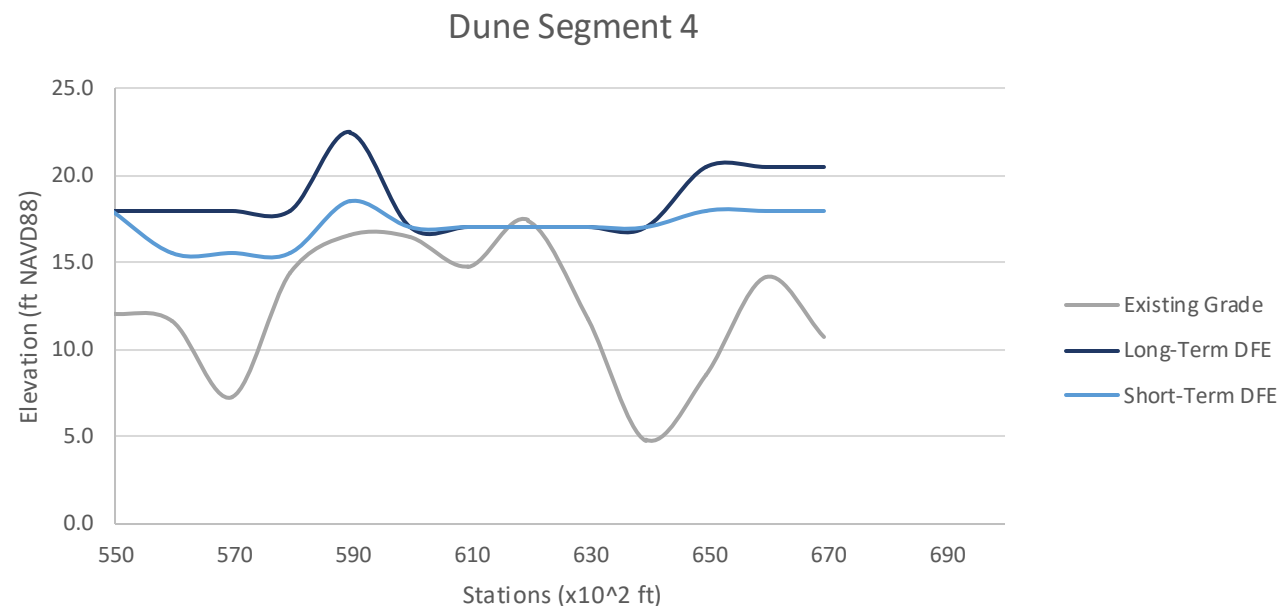
# 5<sup>th</sup> Street to Logan Street– Segment 4 - Bayside



## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables

# 5<sup>th</sup> Street to Logan Street– Segment 4 - Oceanside

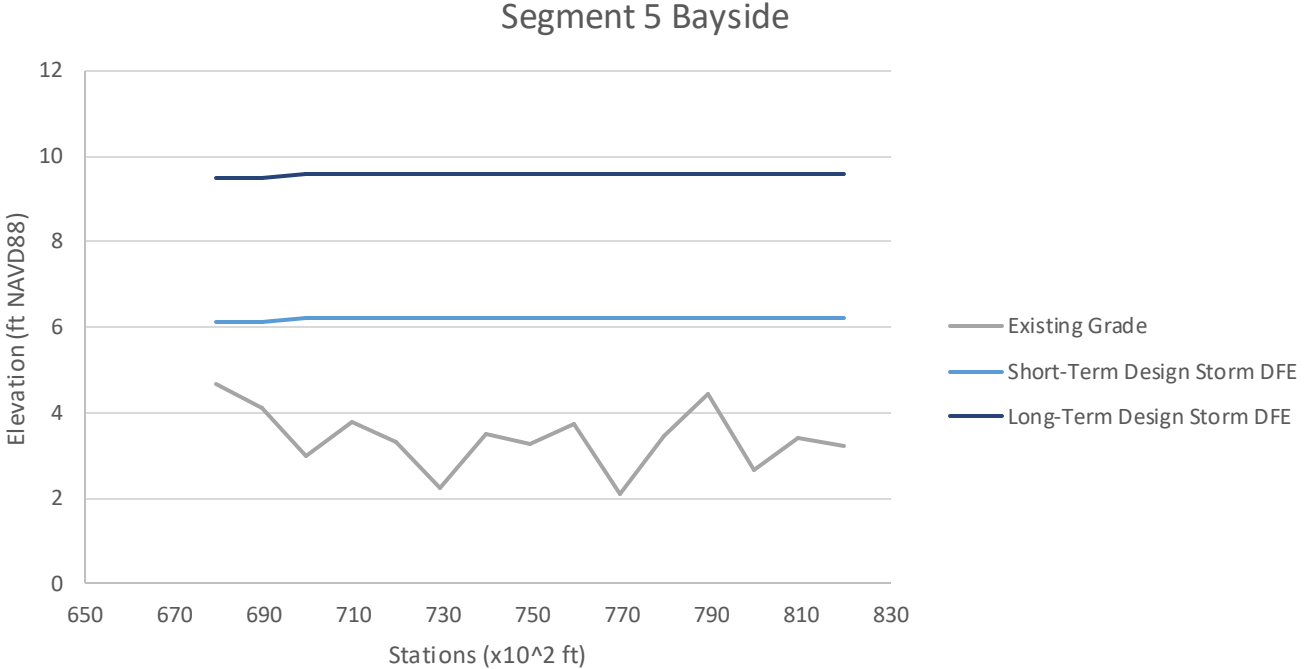
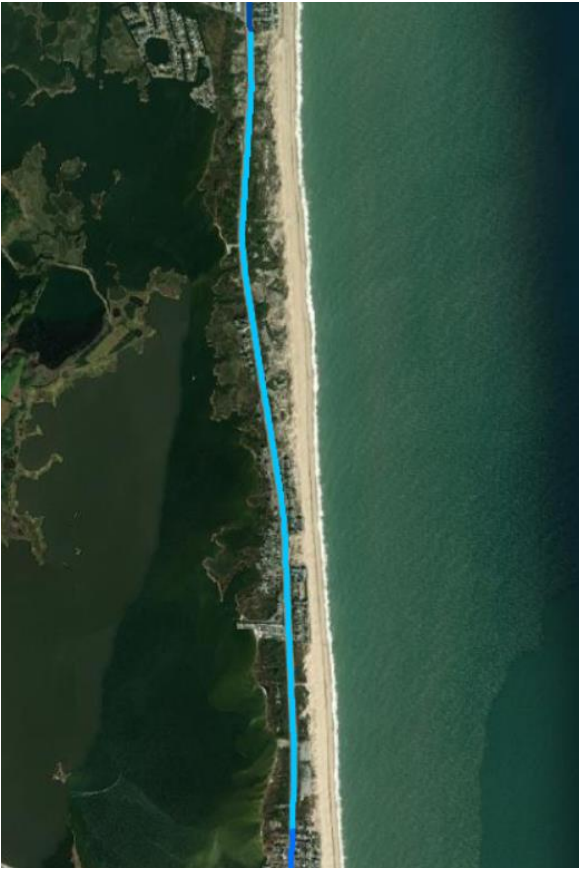


## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Structural Dune



# Logan Street to Lewes Street – Segment 5 - Bayside

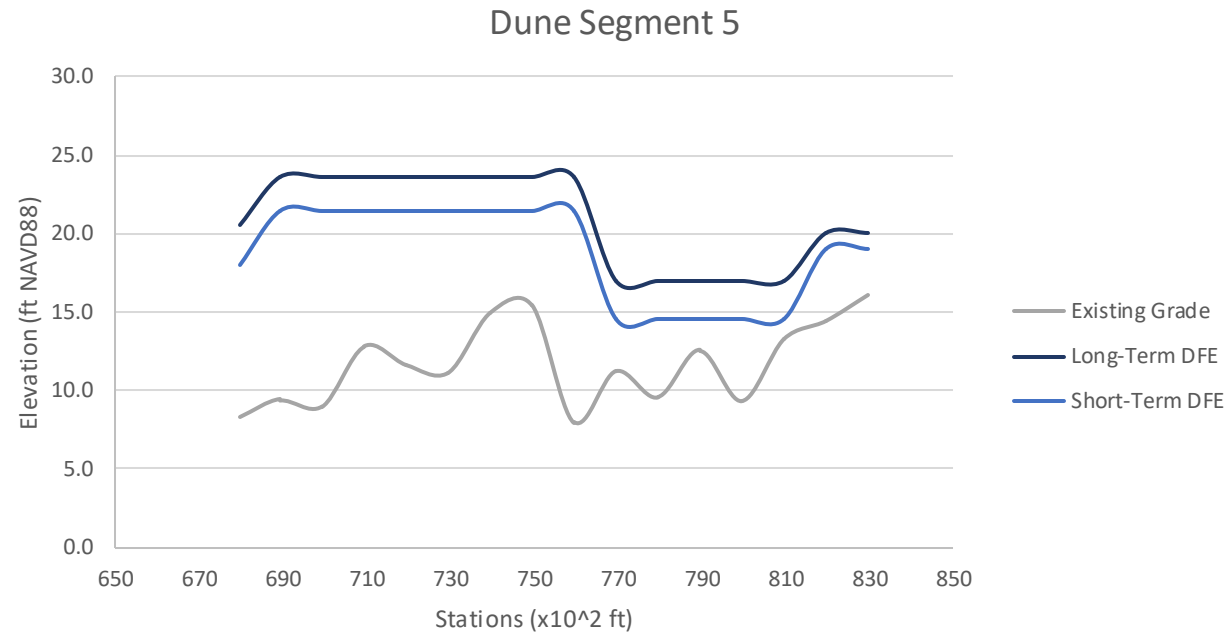


**Potential Flood Mitigation Measures:**

- 1. Raise and regrade (this may be possible for part of this segment)
- 2. Exposed or buried floodwall with deployables



# Logan Street to Lewes Street – Segment 5 - Oceanside

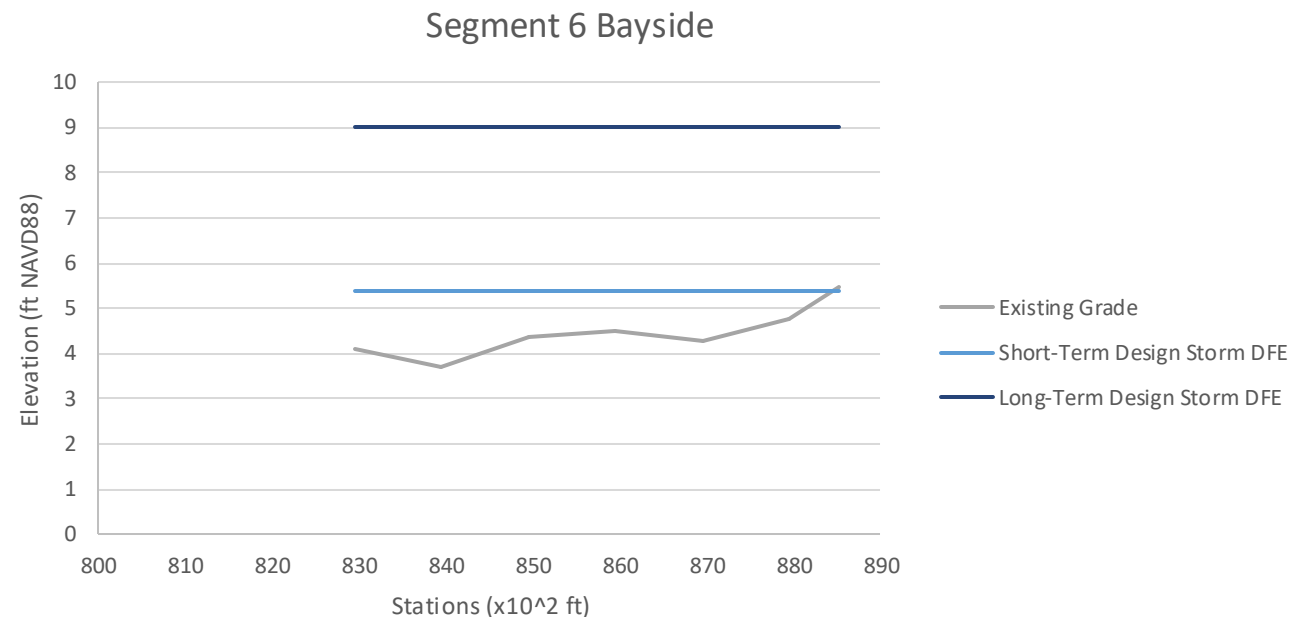
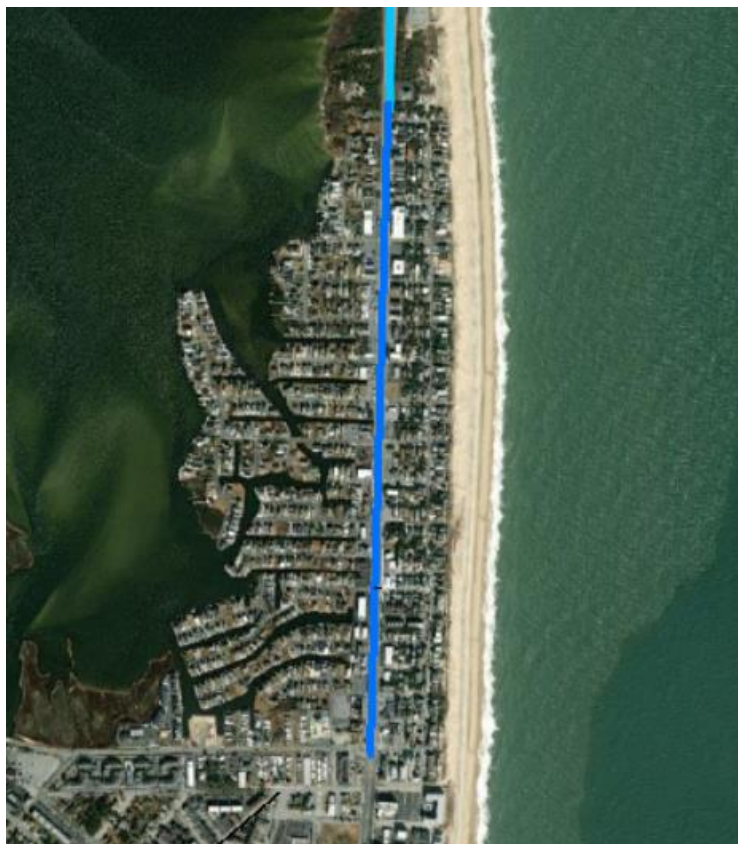


## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables
3. Structural Dune



# Town of Fenwick – Segment 6 - Bayside

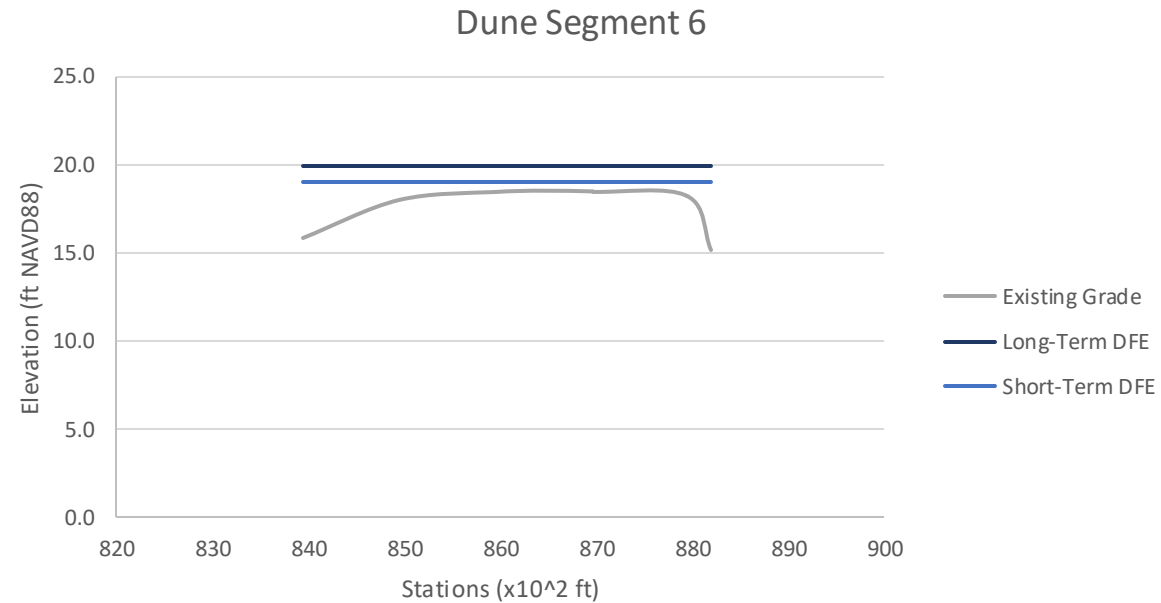


## Potential Flood Mitigation Measures:

1. Raise and regrade (this may be possible for part of this segment)
2. Exposed or buried floodwall with deployables



# Town of Fenwick – Segment 6 - Oceanside



## Potential Flood Mitigation Measures:

1. Exposed or buried floodwall with deployables
2. Structural Dune

# Bayside Summary

## Short Term Risk Group

Structural Segment	Buried or Exposed Floodwall and Deployables	Raise Road	Reroute and Raise Road
1	X	X*	X
2	X	X*	X*
3	X	X*	
4	X	X*	
5	X	X*	
6	X	X*	

## Long Term Risk Group

Structural Segment	Buried or Exposed Floodwall and Deployables	Raise Road	Reroute and Raise Road
1	X	X*	
2	X	X*	
3	X	X*	
4	X	X*	
5	X		
6	X		

*\*Raising the road may be feasible for part of this segment. Further study and survey work are required to determine the bounds of feasibility.*



# Oceanside Summary

## Short Term Risk Group

Structural Segment	Buried or Exposed Floodwall and Deployables	Raise Road	Structural Dune
1	X	X*	X
2	X	X*	X
3	X	X*	X
4	X	X*	X
5	X	X*	X
6	X		X

## Long Term Risk Group

Structural Segment	Buried or Exposed Floodwall and Deployables	Raise Road	Structural Dune
1	X	X*	X
2	X	X*	X
3	X		X
4	X		X
5	X		X
6	X		X

*\*Raising the road may be feasible for part of this segment. Further study and survey work are required to determine the bounds of feasibility.*





# Next Steps

- Finalize report of the findings, (Summer 2023)
- Meet with Towns, (Summer 2023)
- Prioritize segments and mitigation alternatives, (Fall 2023)
- Identify and submit grant applications to advance the study recommendations into projects for design. (End of 2023)



# How to Stay Involved

Visit

Visit the study's website, <https://de.gov/sr1coastalcorridor>



Complete

Complete the comment form and include your email address



**SR1 COASTAL CORRIDOR RESILIENCY STUDY**

# Questions and Answers



**SRT COASTAL CORRIDOR RESILIENCY STUDY**

# **Thank you for joining the Online Informational Meeting!**

The next presentation will begin at 6:00pm.



**SRT COASTAL CORRIDOR RESILIENCY STUDY**



# Study Area – Dewey Beach to North Bethany Beach



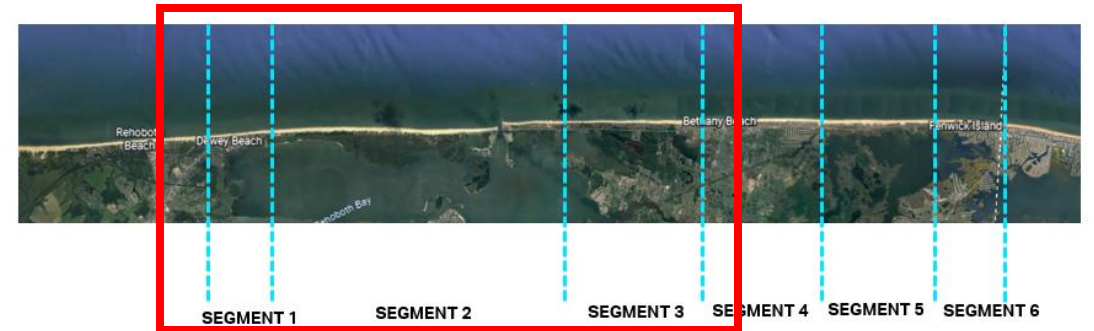
SEGMENT 1



SEGMENT 2



SEGMENT 3



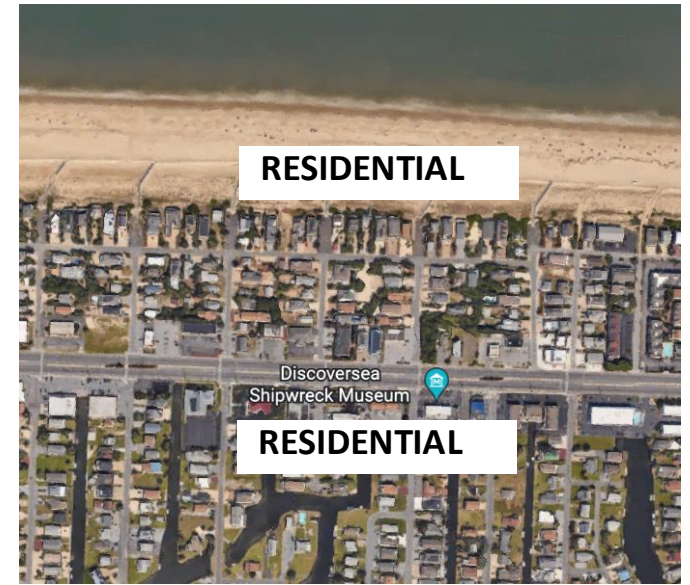
# Study Area – Bethany Beach to Maryland



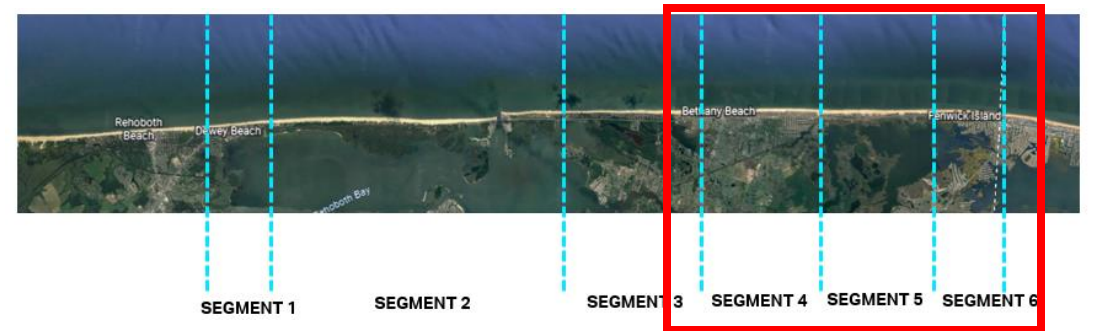
SEGMENT 4



SEGMENT 5

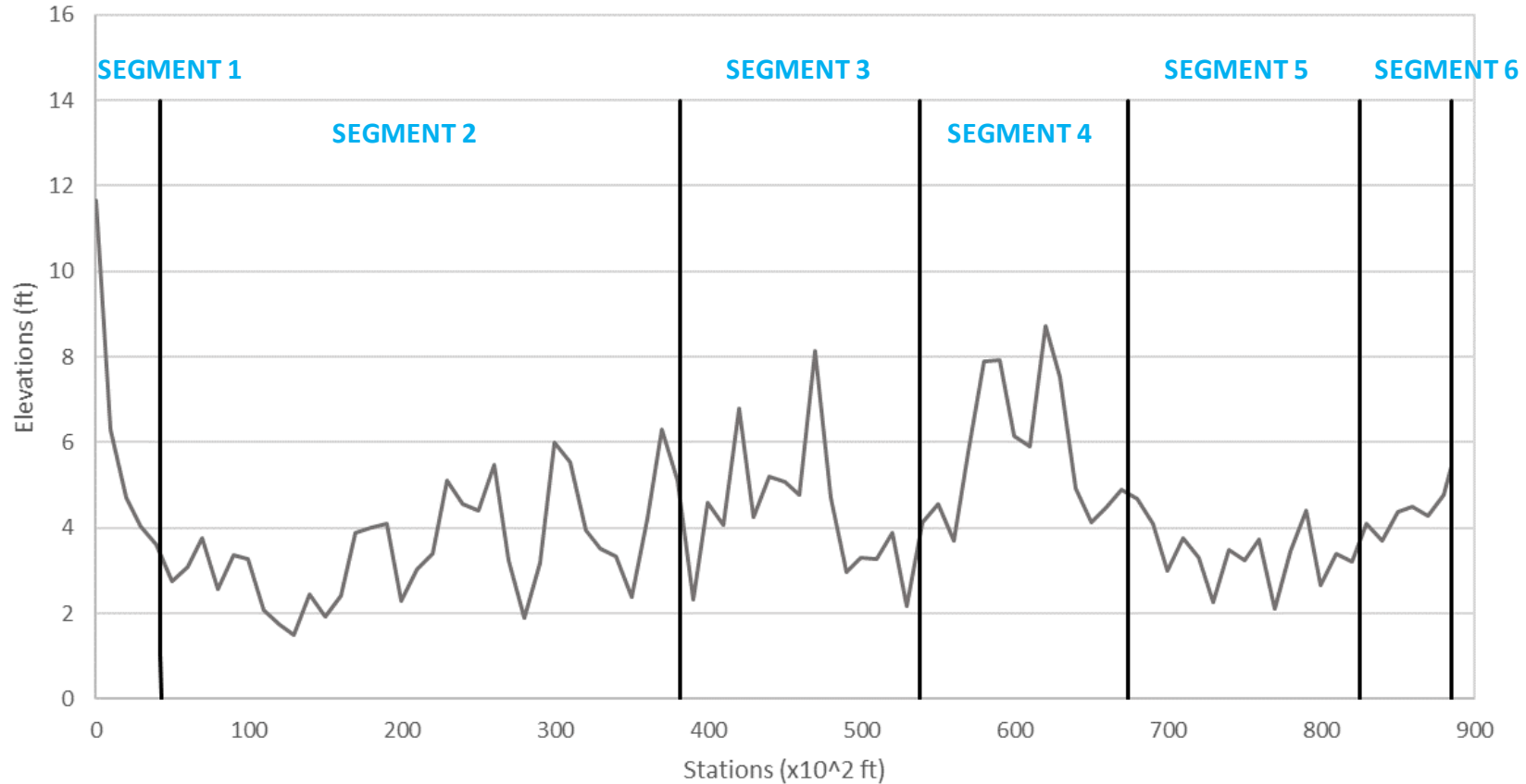


SEGMENT 6



# Study Area – Existing Elevations

SR1 Bayside Average Grade



NOTE: ELEVATIONS ARE PRELIMINARY AND BASED ON LIDAR DATA