

Bayside Flooding and Resiliency Information Session

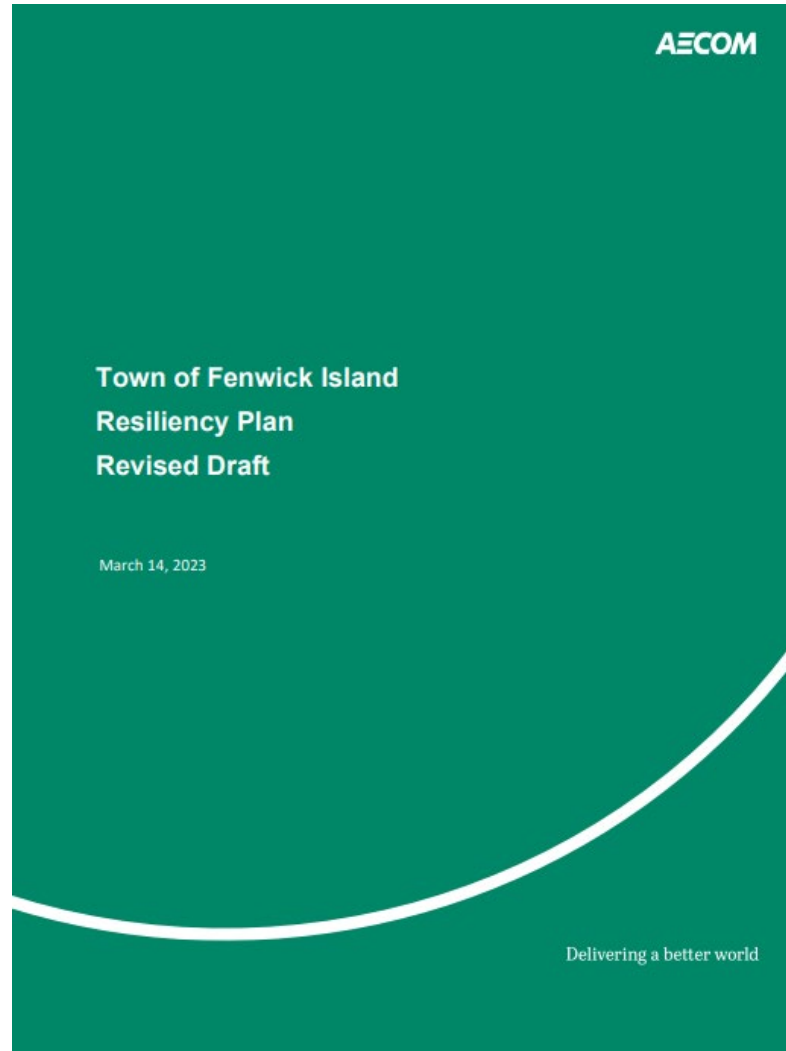
Infrastructure Committee

August 30, 2024

Overview of topics

- Where we left off last August:
 - Revised Resiliency Plan (AECOM)
 - F.I. Comprehensive Plan (Chapter 7, Resiliency)
- What we've been doing 2023-2024
 - Flood and Storm Ordinance Working Group
 - Resiliency Working Group
 - Volunteer survey of bulkheads
 - RFI & RFP for BRIC grant
 - Identification of engineering firms
 - Anatomy of a nuisance flood
 - Some thoughts on a solution
 - FEMA BRIC grant
 - Assess engineering support
 - Work with UDEL and IPA
 - Statement of Work (SOW) documenting built infrastructure

F.I. Resiliency Plan

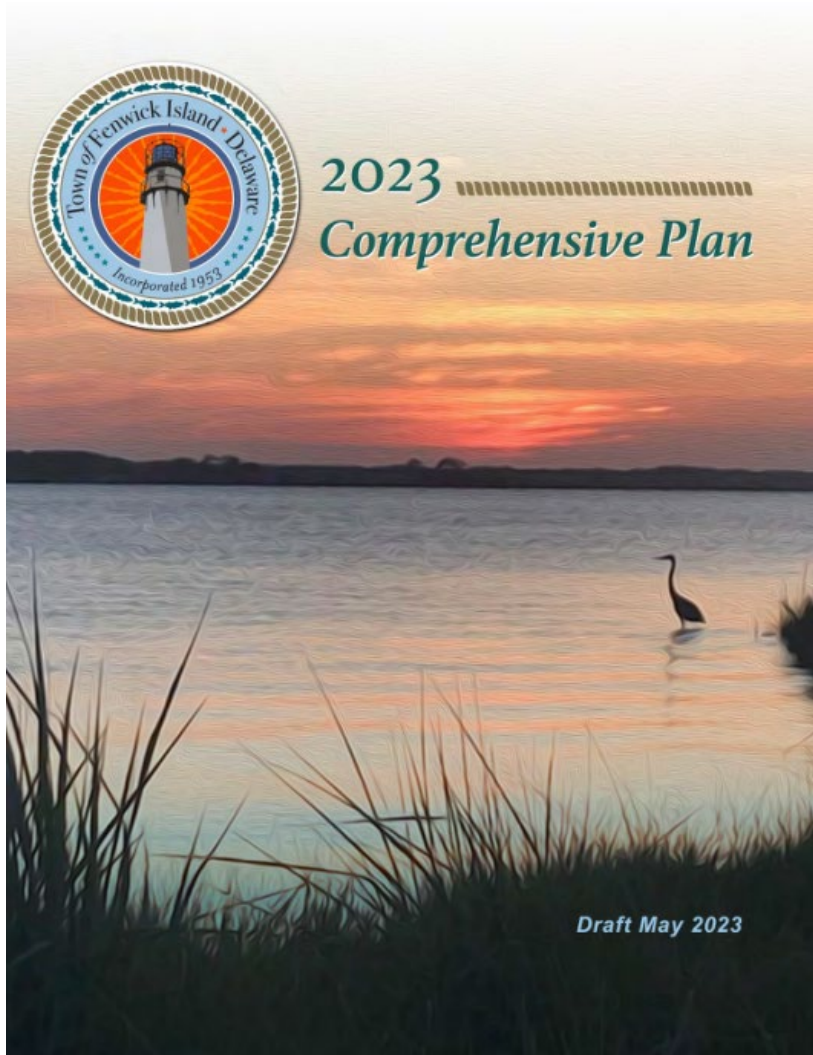


Flood inundation on the bayside of Fenwick Island with water levels exceeding half a foot. Photo Courtesy of WBOC

	HIGH	MEDIUM	LONGER TERM	
Bay	McWilliams	W James	W Indian	Bayside
Bora Bora	Wright	W Houston	W Farmington	Surf
W Georgetown	South Carolina	W Atlantic	Windward	Oyster bay
W Essex	Mermaid		Ebb tide	High Tide
W Dagsboro	Glenn		W Cannon	W Maryland
N Schultz	Madison		W Bayard	Island
S Schultz			Bayard ext	

https://fenwickisland.delaware.gov/files/2023/03/FIResiliencyPlan_031423.pdf

F.I. Comprehensive Plan, draft June 2023



Chapter 7. Resiliency: Sea Level Rise and Coastal Flooding

7.1 Introduction

The Town of Fenwick Island is the southernmost municipality in Sussex County, DE. The average sea level calculation for the town is 7 feet above sea level. Most properties, especially on the west side of SR 1 are no higher than 5 feet above sea level and the lowest level on the bayside is just 1.7 feet above sea level. In contrast, the beach end parking areas, located on the ocean side of town are between 7 to 9 feet above sea level. SR 1, which bisects the town and is roughly the midpoint, averaging 4 feet above sea level.

Draft: 06/16/2023

59

Recommended Directions:

- 1. work with community to determine how to move forward ✓
- 2. maintain public engagement on SLR and climate change ✓
- 3. improve drainage *
- 4. engage with other towns and organizations in Delaware *
- 5. Corps of Engineers: beach replenishment ✓
- 6. prepare for and seek out grant funding ✓ * #
- 7. consider resiliency funding #
- 8. assess potential code updates #
 - ✓ done * working on this #future effort

Infrastructure/C&O Working Group



- Working group formed in February 2024
 - Jon Miller (Architect and Infrastructure Committee)
 - Susan Brennan (Planning Commission)
 - Ann Riley (Charter and Ordinance)
- Purpose: explore the need for improved ordinances with respect to new construction, especially related to lot elevations and building heights
- Goal: provide residents with the best engineering recommendations with respect to resiliency, flood mitigation and the preservation of property values.
- Freeboard increase was introduced about 10 years ago, but It was not implemented properly, and has had unintended consequences
- New construction on bayside lots can benefit from increased lot elevations (adding fill); ordinances would need adjustment
 - Mandatory vs voluntary approaches
 - Revision of freeboard increase to dovetail with desired approach

Resiliency Working Group



Fall 2023

- Ed Bishop, actuary
 - Larry Bortner, mechanical engineer
 - Tim Leahy, construction management
 - George Murphy, marine engineer
 - Jay Ryan, mechanical engineer
 - Tim Bergin, information systems management
- **Synergy:** Planning Commission alerted us about **BRIC** grants
 - **Building Resilient Infrastructure and Communities**
 - **Institute of Public Administration, University of Delaware**
 - **Tasks:**
 - December: Request for Information (RFI)
 - January: Request for Proposal (RFP) **\$\$\$ and tasks**
 - January 30: presentations by 6 engineering firms (Town Hall)
 - February: identification of top firms
 - **Fall: detailed RFP IF we get the grant**
 - **Currently: preparing for the grant**



Noah Lyles, 100-meter champion
Alexandria, VA

Volunteer survey of bulkheads

- Waterfront properties west of SR1:
 - 6 miles of waterfront
 - 400+ properties
 - 240 volunteer manhours
- 334 bulkheads: low 0.98' high 4.06'
 - 78 bulkheads below 2' elevation
 - 17 rip rap
 - 23 boat ramps
 - 13 properties with wetlands (DNREC)
- Bayside Town assets
 - Streets -- 1.2' -- 3.7' elevation (per Simplr)
 - 35 small parcels with riprap/bulkhead (street ends)



Nuisance flooding: 42 Ebb Tide Cove

Taken by Nuwan Seneviratne, 1004 N. Schultz, Jan. 7, 2024, 6 am to 10 am



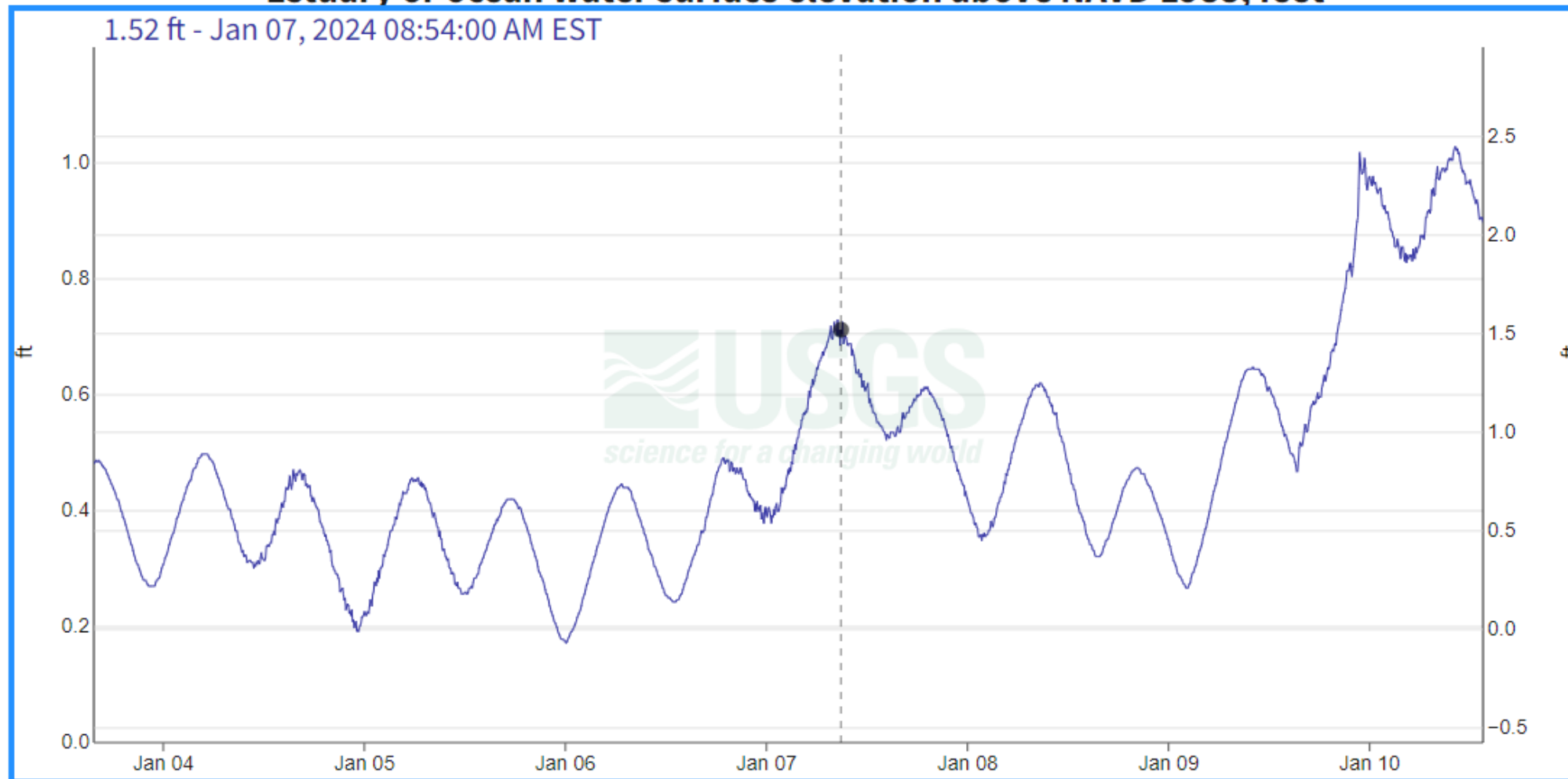
- using graph zoom -

Little Assawoman Bay at Fenwick Island, DE - 01484701

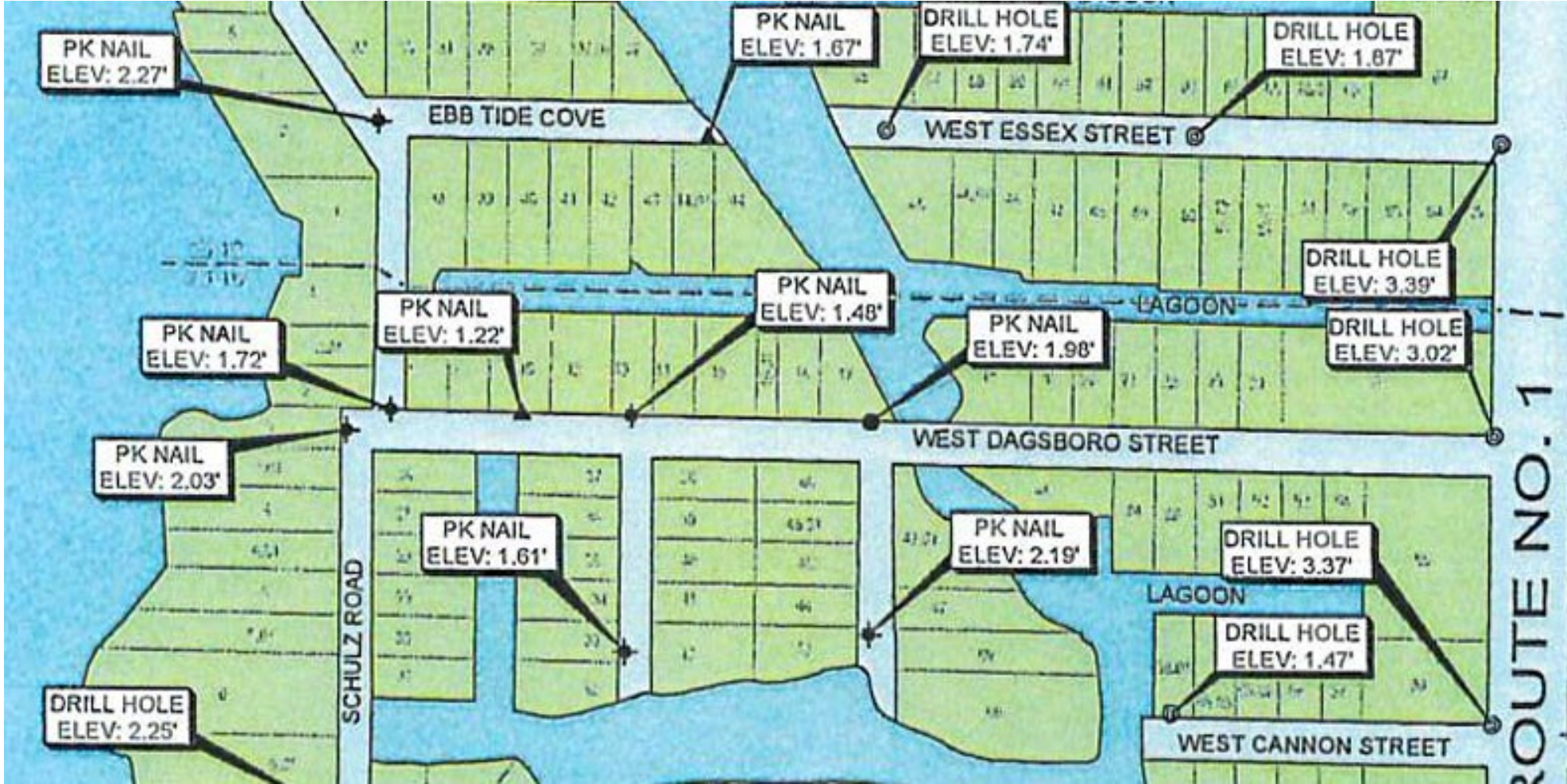
January 1, 2024 - January 10, 2024

Gage height, feet

Estuary or ocean water surface elevation above NAVD 1988, feet



Anatomy of a nuisance flood (Simpler Survey)



42 Ebb Tide Cove bulkhead is 1.6'

All bulkheads were not created equal! 42 Ebb Tide Court is 1.4' (16.8 inches)

40 Ebb Tide Court 2.4' (28.8 inches)



45 Dagsboro Street 2.2' (26.4 inches)



What does the data tell us?

- Tide on January 7, 2024: 1.52 feet or 18.24 inches
- Tide on January 9th was 2.32 feet or 27.84 inches
- 42 Ebb Tide bulkhead 16.8 inches
- Dagsboro at N. Schultz is 20.64 inches*
- Ebb Tide at Schultz 27.24 inches*
- Dagsboro at S. Schultz 24.6 inches*
- * per Vertical Benchmark Project (Simpler Survey, 2013)

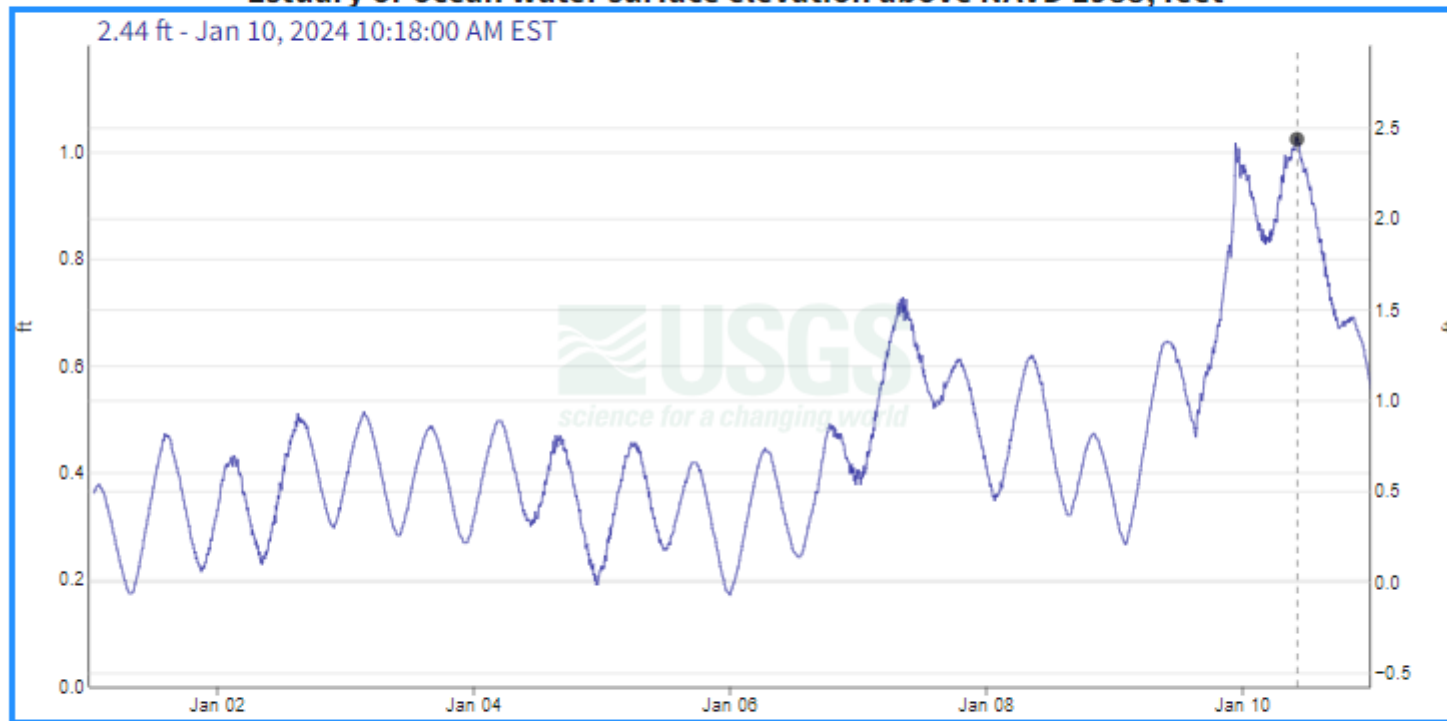


Little Assawoman Bay at Fenwick Island, DE - 01484701

January 1, 2024 - January 10, 2024

Gage height, feet

Estuary or ocean water surface elevation above NAVD 1988, feet



IMPORTANT Data may be [provisional](#)

[Show legend](#) ▾

	Value	Status	Time
● Selected	2.44 ft	Approved	Jan 10, 2024
● Estuary or ocean water ...			10:18:00 AM EST

1004 N. Schultz on Jan 9, 2024 2.58 ft. (30.96 in.)



9:38:01 AM

Nest



Tides equal to or above 2 feet

Number of tides equal to or above 2 feet														
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
2014		1	0	1	1					3				6
2015														0
2016	1									2				3
2017	2									1				3
2018			2							1	1			4
2019										2	1			3
2020		1												1
2021		2								3				5
2022										2		2		4
2023									2	1		1		4
													10 years:	33

We are a coastal community –
...we will always be at sea level....

1004 N. Schultz – ground level



1311 Bora Bora

Lot raised 2' prior to construction







- Property: 50' by 150'
- Contractor did initial grading and built bulkhead (\$10K)
- Landscaper built a **berm** in rear, additional bulkheading and graded the property (\$20K)
- Addition of fill dirt, sand and grading
- Heavy use of gravel, mulch, plants, grass and trees!!

Many choices to make

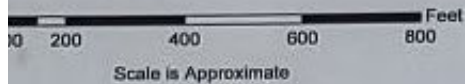


December 17, 2023



Stormwater Management System (SMS)

- Every engineering company we interfaced with in the bidding process, identified the creation of an SMS as a critical component of a resilient community.
- An SMS is a well-engineered collection of parts, which must work in unison, to solve Fenwick's drainage problems.
- At present, we have a collection of drains -- some installed by the Town of Fenwick Island and some by property owners.
- The Stormwater Infrastructure Inventory (2013) has not been maintained and does not identify all drains in the town.
- It is critical to document our as-built-environment before we can plan for improvements.



Town of Fenwick Island Stormwater Infrastructure Inventory

November 2013

URS
 28485 DuPont Boulevard
 Millsboro, DE 19966
 Tel: 302-933-0200
 Fax: 302-933-0320

Data Source:
 *Parcel Data provided by Sussex County
 Mapping & Addressing, 2012
 *Roads provided by DelDOT
 *Municipal Boundaries provided by Delaware
 Office of State Planning Coordination

1004 N. Schultz



Legend

■ Inlet	— Closed Storm Drain Size & Material Vary
⊙ Manhole	— Culvert with Open Channel
◆ Outlet with Plain End (43)	— 4" Perf PVC Drain
◆ Outlet with Tide Gate (33)	— 8" Perf ADS Drain
● Perf PVC	— 6" Perf PVC Drain
▲ Private SW Management	▭ Town Boundary
◆ Unknown Outfall Location	▭ Parcels



*Unknown Outfall Location

*Outlet with Tide Gate (33)

Quiz: what do these photos have in common?



WHAT IF..?

- # Cooperative examination of drains
- Town information doesn't reflect recent construction
 - Used cameras to look at some pipes and drains
 - Some had been changed and did not flow where it was thought
 - Some were completely clogged!
 - Town maintaining 44 back-flow preventers
 - Budgeted to replace 6-8 per year
 - 7 need replacement as of March 2024
 - Collaborative effort in remediation/cleaning/improvement
 - Obtain better documentation of existing drains!

Questions ?



While we wait for grant

- Keep momentum going
- Knowledge that our current data could be improved
- Council approved \$30,000
- Two tasks
 - Define data gaps
 - Start inspections of current conditions and begin to get a true picture of current conditions
- Continue community engagement
- Straughan Environmental awarded contract

Improve our town asset info

- Flood protection (Bulkheads and riprap)
- Storm drainage (Pipes and outfalls)

Build a database



Straughan Environmental

- Woman owned company of scientists, engineers, and planners with 90+ employees. Based in Columbia, MD
- Provides custom environmental solutions for resiliency concerns associated with sea level rise and climate change
- Over 100 environmental and climate change projects in the Mid-Atlantic region
- Relationships with UD / Sea Grant /Inland Bays/DNREC/DelDot
- Example projects/solutions...



HESCO Barrier



Living Shorelines



Rain Gardens



Next Steps

- Continue work group with new members
- Complete current conditions report
- Maintain back flow preventers and replace as needed
- Provide in house mapping - approach defines recently
- Obtain BRIC Award!
 - Concept designs, projects on priority streets by mid -2025
- Research grants with UD
- Consider planning for Resiliency Fund
- Collaborate with OC, S. Bethany, Bethany, Dewey, Lewes
- Continue community education and data collection

Questions or follow-up?

- Susan Brennan: sbrennan@fenwickisland-de.gov
- Tim Bergin: tbergin@american.edu
- Jay Ryan: jayryan6@yahoo.com
- Tim Leahy: tpleahy76@gmail.com