

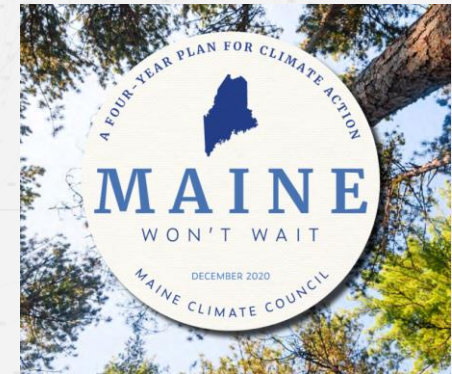
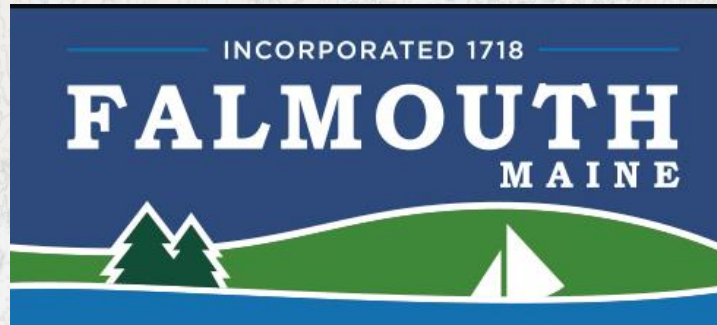
# Falmouth Town Landing Resiliency Study Falmouth, Maine

Council Update/Preliminary Findings  
July 25, 2022

**Barney Baker, P.E.**  
GEI Consultants, Inc. - Portland, ME  
bbaker@geiconsultants.com (207) 347-2370



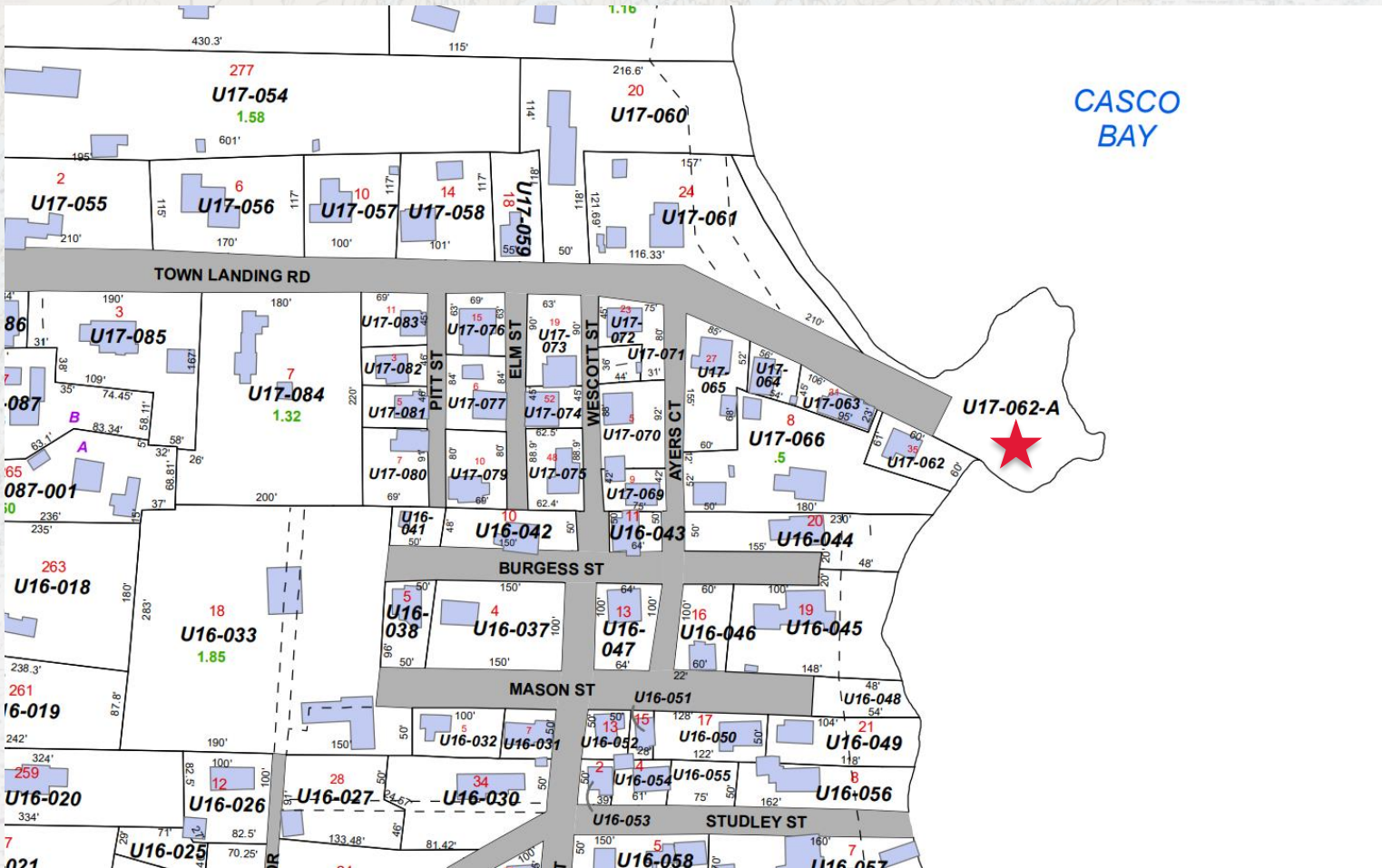
# Project Sponsors



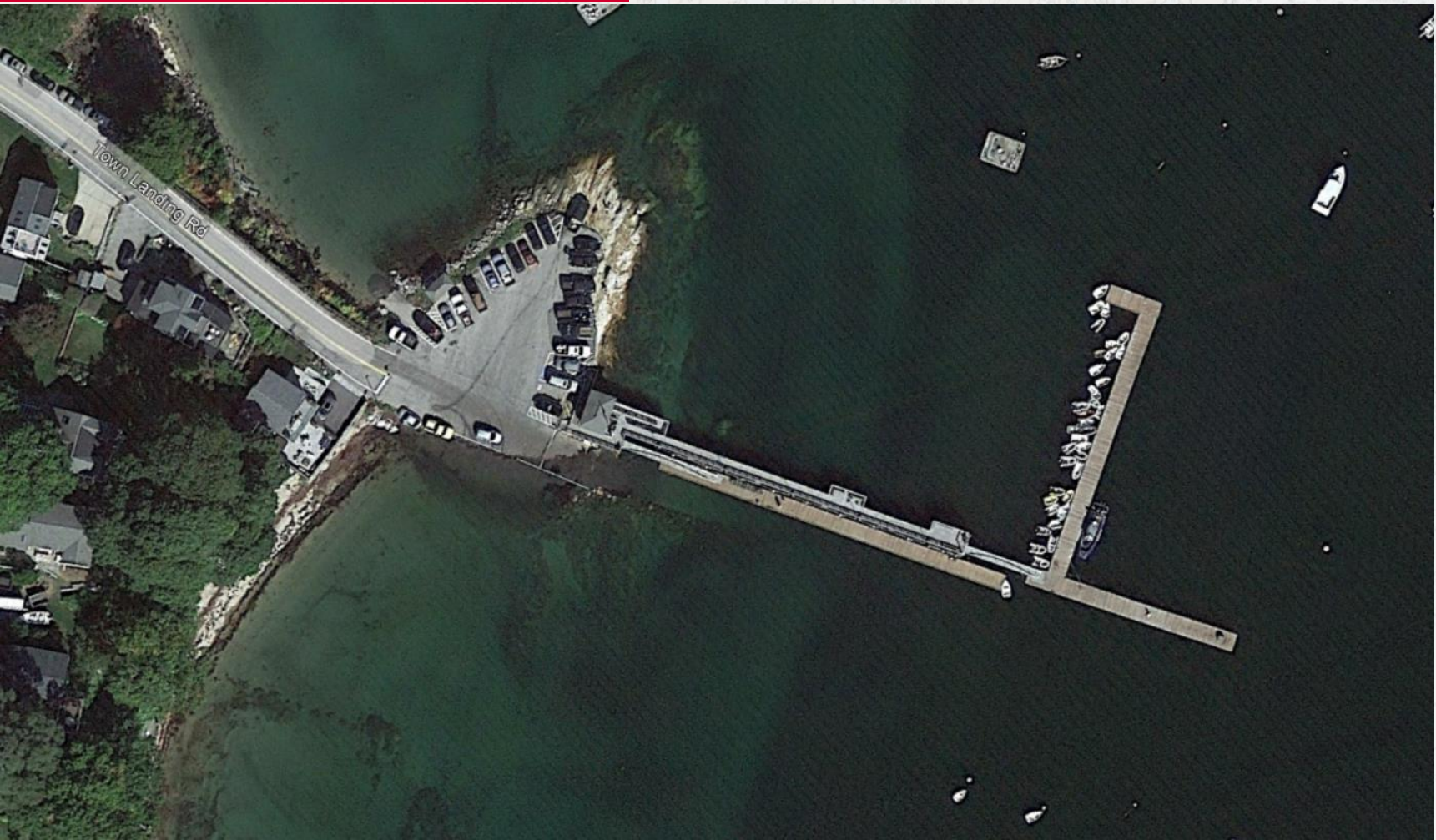
[https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-files/MaineWontWait\\_December2020\\_printable\\_12.1.20.pdf](https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-files/MaineWontWait_December2020_printable_12.1.20.pdf)



# Tax Map



# Google Earth 10/21



# Project Purpose and Goal

- 1. Investigate the resiliency of Falmouth Town Landing with respect to existing use and future use with consideration of climate change and sea level rise.**
- 2. Work with Community stakeholders to investigate and develop resiliency measures and adaptation strategies.**



# Project Timeline

## January

- Project Startup

## February- March

- Field Investigation
- Drone Survey

## April to Present

- Inundation Modeling
- Development of resiliency Options and Adaptation strategies

## Fall 2022

- Stakeholder review
- Final report



# Town Landing Users

## 1. FALMOUTH PUBLIC SAFETY

- HARBORMASTER OFFICE
- MARINE RESPONSE VESSEL

## 2. WORKING WATERFRONT

- COMMERCIAL FISHING
- SHELLFISH HARVESTERS
- BOAT LAUNCHING AND HAULING
- DIVE SERVICES
- PUMPOUT

## 3. TOWN/PUBLIC WATERFRONT ACCESS

- BOATING FACILITIES (LARGEST MOORING FIELD IN THE STATE)
- KAYAKING/PADDLE BOARDS
- BEACH ACCESS
- LIMITED PARKING



# Resiliency Overview



# Site Inundation



# Elevation Comparison

<b>Project Elevations (By Datum)</b>		
<b>Elevation</b>	<b>NAVD88</b>	<b>Notes</b>
	<b>Feet</b>	
<b>Maine Climate Council Prepare to Manage</b>	24	MCC 2070 BFE + 5.0-FT
<b>Maine Climate Council Commit to Manage</b>	21.4	MCC 2070 BFE + 2.4-FT
<b>FEMA Base Flood (1%)</b>	19	Zone VE, Preliminary 4.14.2017
<b>Pier Deck Elevation</b>	10.33	GEI Drone Survey
<b>FEMA FIS Stillwater with Wave Sr (1%)</b>	10.3	Cumberland County Effective 8.30.2019
<b>FEMA FIS Stillwater (1%)</b>	8.9	Cumberland County Effective 8.30.2019
<b>Highest Annual Tide</b>	6.7	2018 ME DEP (Falmouth Foreside)
<b>MHHW</b>	4.5	NG.NOAA.gov Tidal BM 8418015
<b>MHW</b>	4.0	
<b>Mean Tide Level</b>	-0.5	
<b>MLW</b>	-5.1	
<b>MLLW</b>	-5.4	



# Nuisance Flooding

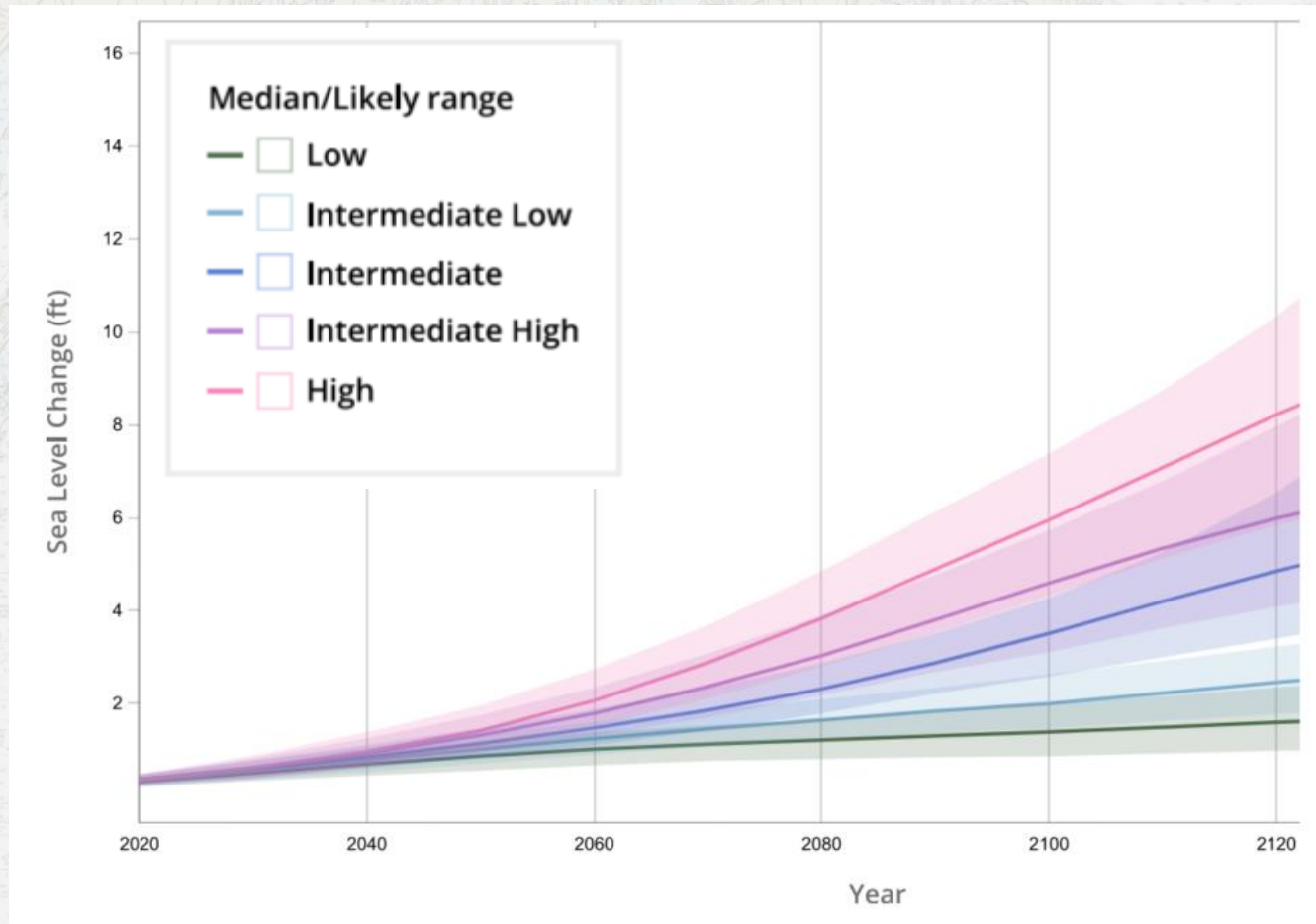
Site Location	Feature / Event	Feature Elevation (NAVD88 FT)	FEMA MODEL (NAVD88 FT)				Maine Climate Council Predicted Sea Level Rise (FT)								
			Base Flood	Stillwater Inundation			Average Inundation Per Day (hours)								
				10 Year	100 year	500 year	Existing Conditions	COMMIT to Manage (C2M)				PREPARE to Manage (P2M)			
				Current	2030 (0.8 ft)	2050 (1.5 ft)		2070 (2.4 ft)	2100 (3.9 ft)	2030 (1.4 ft)	2050 (3.0 ft)	2070 (5.0 ft)	2100 (8.8 ft)		
Town Landing	Main Ramp Flooded	7.0	19	8.0	8.9	9.5	0.003	0.04	0.2	0.95	4.4	0.17	2	7.3	14.1
	Parking Lot Flooded/ Pier Submerged	10.0					0	0	0	0.0003	0.05	0	0.003	0.5	8.9
	Harbormaster Office Flooded	14.3					0	0	0	0	0	0	0	0	0



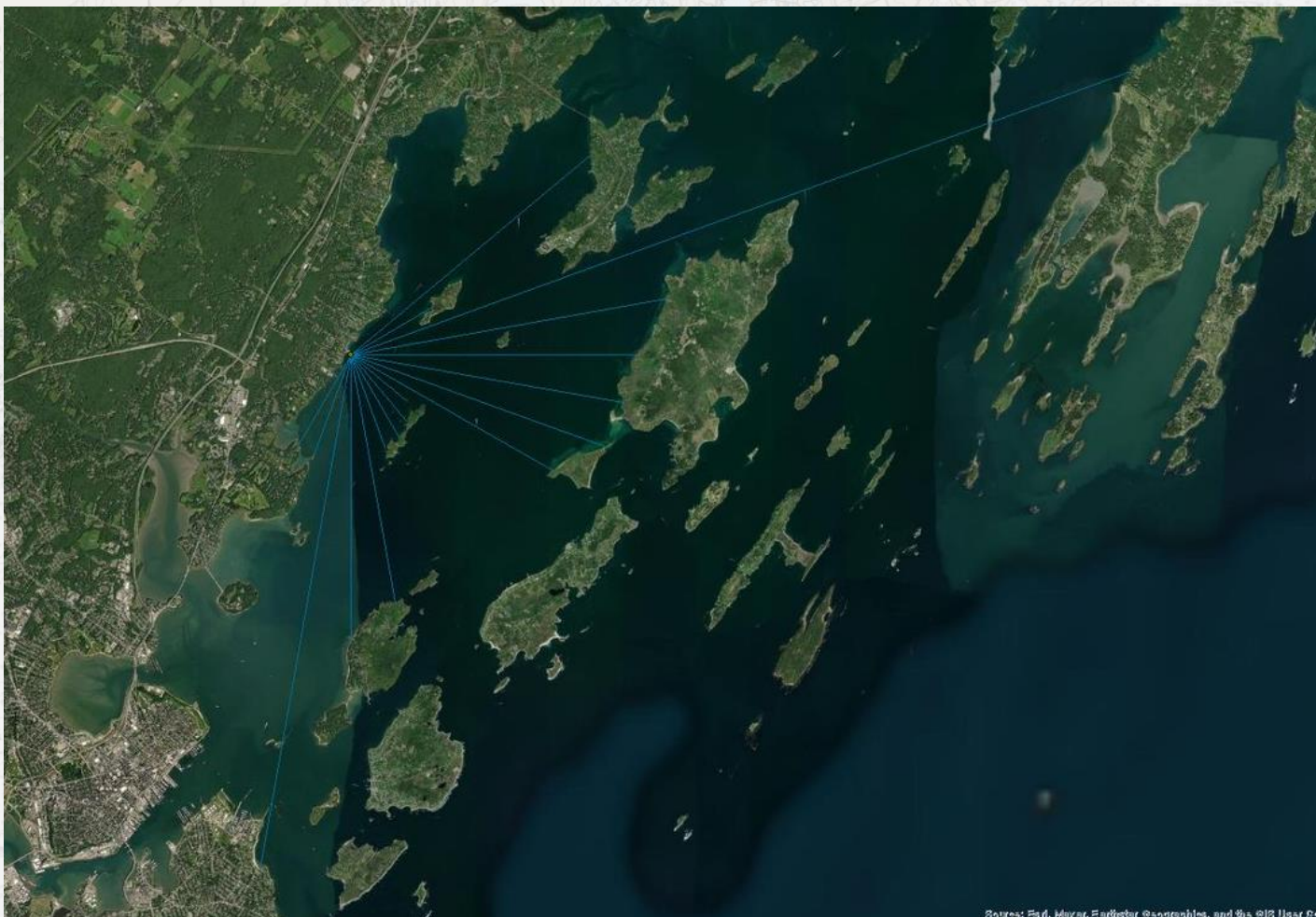
# FEMA Flood Mapping



# Sea Level Rise



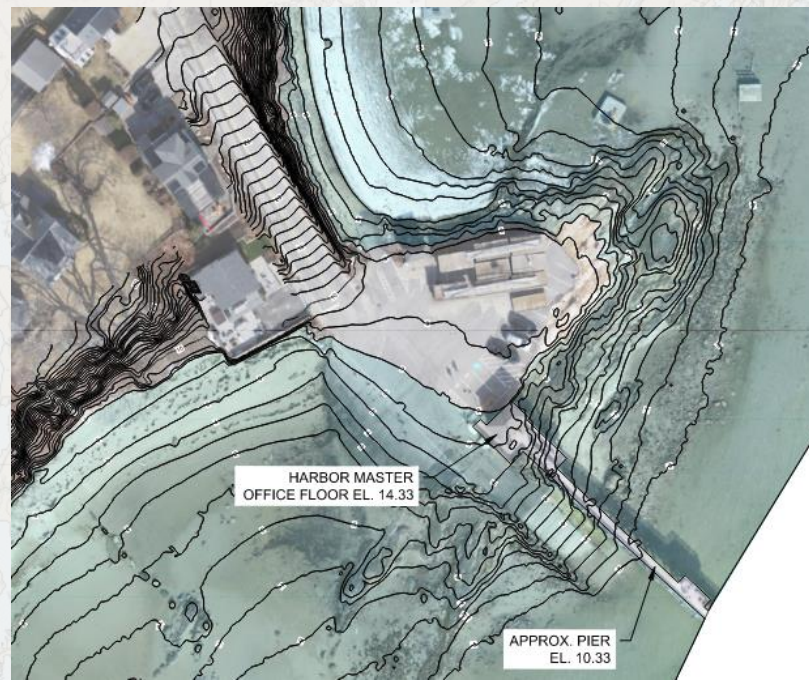
# Wave Exposure



Source: Esri, Maxar, Earthstar ©satellite, and the GIS User Com



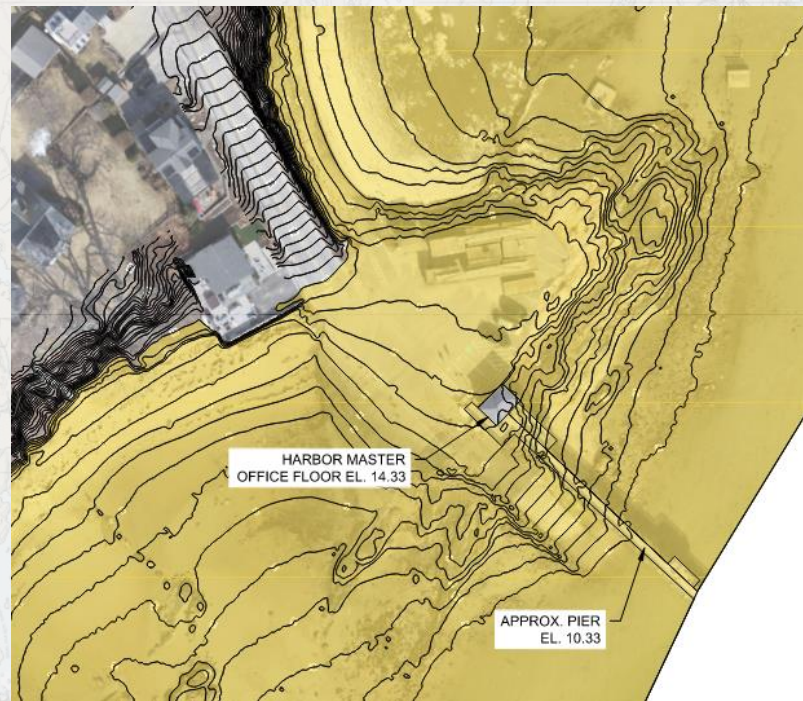
# Inundation at Elev. 7



Water Condition	Elevation Reference (NAVD88, ft)		Existing Water Elevation, ft	SLR Projection							
				2030 C2M	2030 P2M	2050 C2M	2050 P2M	2070 C2M	2070 P2M	2100 C2M	2100 P2M
				0.8 feet	1.4 feet	1.5 feet	3.0 feet	2.4 feet	5.0 feet	3.9 feet	8.8 feet
Stillwater + Waves	Storms	0.20%	9.5	11.2	12.3	12.4	13.9	13.3	15.9	14.8	19.7
		1%	8.9	10.6	11.5	11.6	13.1	12.5	15.1	14.0	18.9
		2%	8.6	10.3	11.0	11.1	12.6	12.0	14.6	13.5	18.4
		10%	8.0	9.7	10.3	10.4	11.9	11.3	13.9	12.8	17.7
Stillwater	HAT		6.7	7.5	8.1	8.2	9.7	9.1	11.7	10.6	15.5
	MHHW		4.5	5.3	5.9	6.0	7.5	6.9	9.5	8.4	13.3
	MHW		4.0	4.8	5.4	5.5	7.0	6.4	9.0	7.9	12.8
	MSL		-0.5	0.3	0.9	1.0	2.5	1.9	4.5	3.4	8.3
	MLW		-5.1	-4.3	-3.7	-3.6	-2.1	-2.7	-0.1	-1.2	3.7
	MLLW		-5.4	-4.6	-4.0	-3.9	-2.4	-3.0	-0.4	-1.5	3.4



# Inundation at Elev. 10



Water Condition	Elevation Reference (NAVD88, ft)		Existing Water Elevation, ft	SLR Projection							
				2030 C2M	2030 P2M	2050 C2M	2050 P2M	2070 C2M	2070 P2M	2100 C2M	2100 P2M
				0.8	1.4	1.5	3.0	2.4	5.0	3.9	8.8
			feet	feet	feet	feet	feet	feet	feet	feet	
Stillwater + Waves	Storms	0.20%	9.5	11.2	12.3	12.4	13.9	13.3	15.9	14.8	19.7
		1%	8.9	10.6	11.5	11.6	13.1	12.5	15.1	14.0	18.9
		2%	8.6	10.3	11.0	11.1	12.6	12.0	14.6	13.5	18.4
		10%	8.0	9.7	10.3	10.4	11.9	11.3	13.9	12.8	17.7
Stillwater	HAT		6.7	7.5	8.1	8.2	9.7	9.1	11.7	10.6	15.5
	MHHW		4.5	5.3	5.9	6.0	7.5	6.9	9.5	8.4	13.3
	MHW		4.0	4.8	5.4	5.5	7.0	6.4	9.0	7.9	12.8
	MSL		-0.5	0.3	0.9	1.0	2.5	1.9	4.5	3.4	8.3
	MLW		-5.1	-4.3	-3.7	-3.6	-2.1	-2.7	-0.1	-1.2	3.7
	MLLW		-5.4	-4.6	-4.0	-3.9	-2.4	-3.0	-0.4	-1.5	3.4



# Inundation at Elev. 14.3



Water Condition	Elevation Reference (NAVD88, ft)		Existing Water Elevation, ft	SLR Projection							
				2030 C2M	2030 P2M	2050 C2M	2050 P2M	2070 C2M	2070 P2M	2100 C2M	2100 P2M
				0.8 feet	1.4 feet	1.5 feet	3.0 feet	2.4 feet	5.0 feet	3.9 feet	8.8 feet
Stillwater + Waves	Storms	0.20%	9.5	11.2	12.3	12.4	13.9	13.3	15.9	14.8	19.7
		1%	8.9	10.6	11.5	11.6	13.1	12.5	15.1	14.0	18.9
		2%	8.6	10.3	11.0	11.1	12.6	12.0	14.6	13.5	18.4
		10%	8.0	9.7	10.3	10.4	11.9	11.3	13.9	12.8	17.7
Stillwater	HAT		6.7	7.5	8.1	8.2	9.7	9.1	11.7	10.6	15.5
	MHHW		4.5	5.3	5.9	6.0	7.5	6.9	9.5	8.4	13.3
	MHW		4.0	4.8	5.4	5.5	7.0	6.4	9.0	7.9	12.8
	MSL		-0.5	0.3	0.9	1.0	2.5	1.9	4.5	3.4	8.3
	MLW		-5.1	-4.3	-3.7	-3.6	-2.1	-2.7	-0.1	-1.2	3.7
	MLLW		-5.4	-4.6	-4.0	-3.9	-2.4	-3.0	-0.4	-1.5	3.4



# Resiliency Options

## 1. Do NOTHING

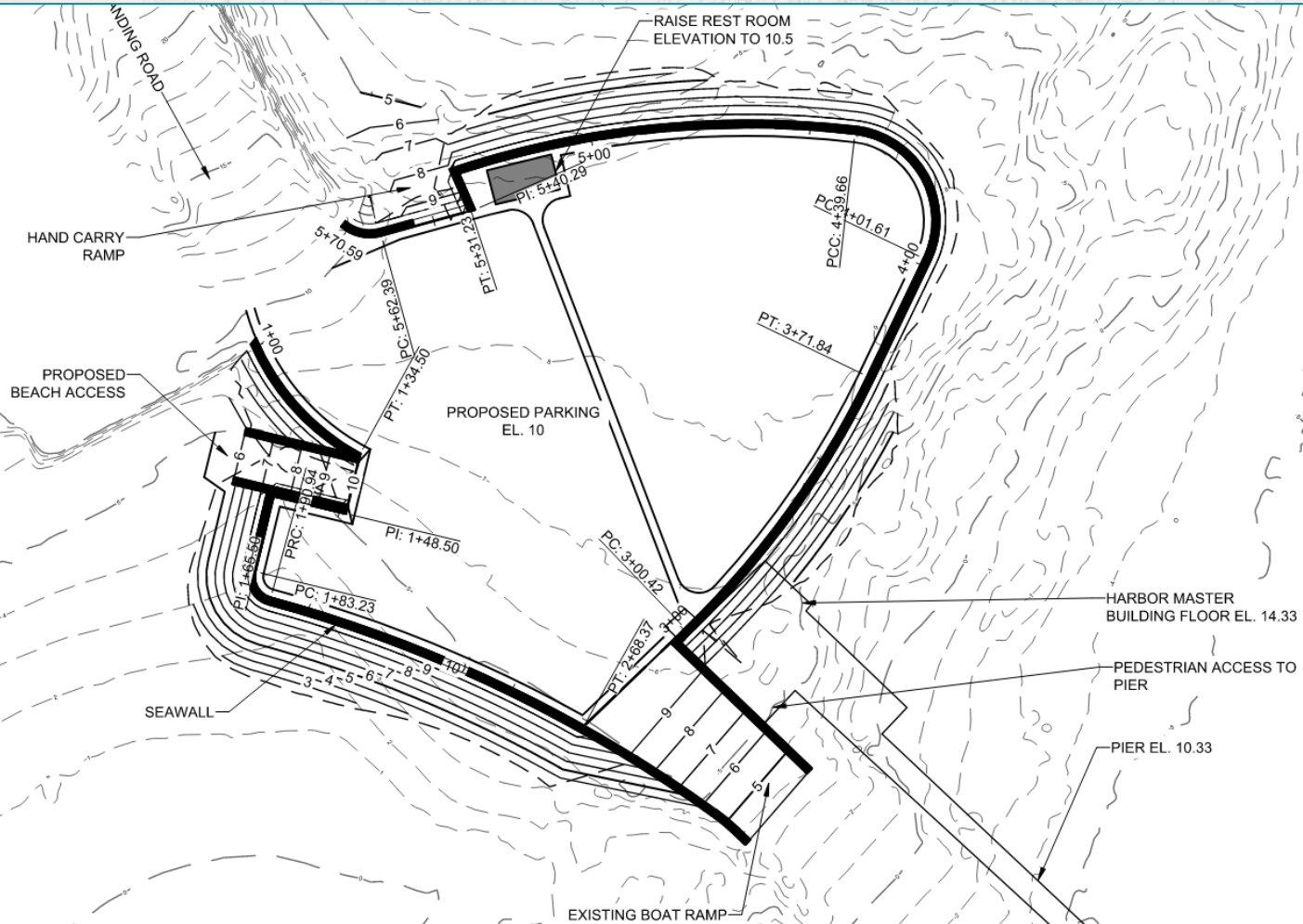
- Reduced use of Facility due to flooding.
- Increased maintenance due to storm damage.

## 2. ADAPTATION

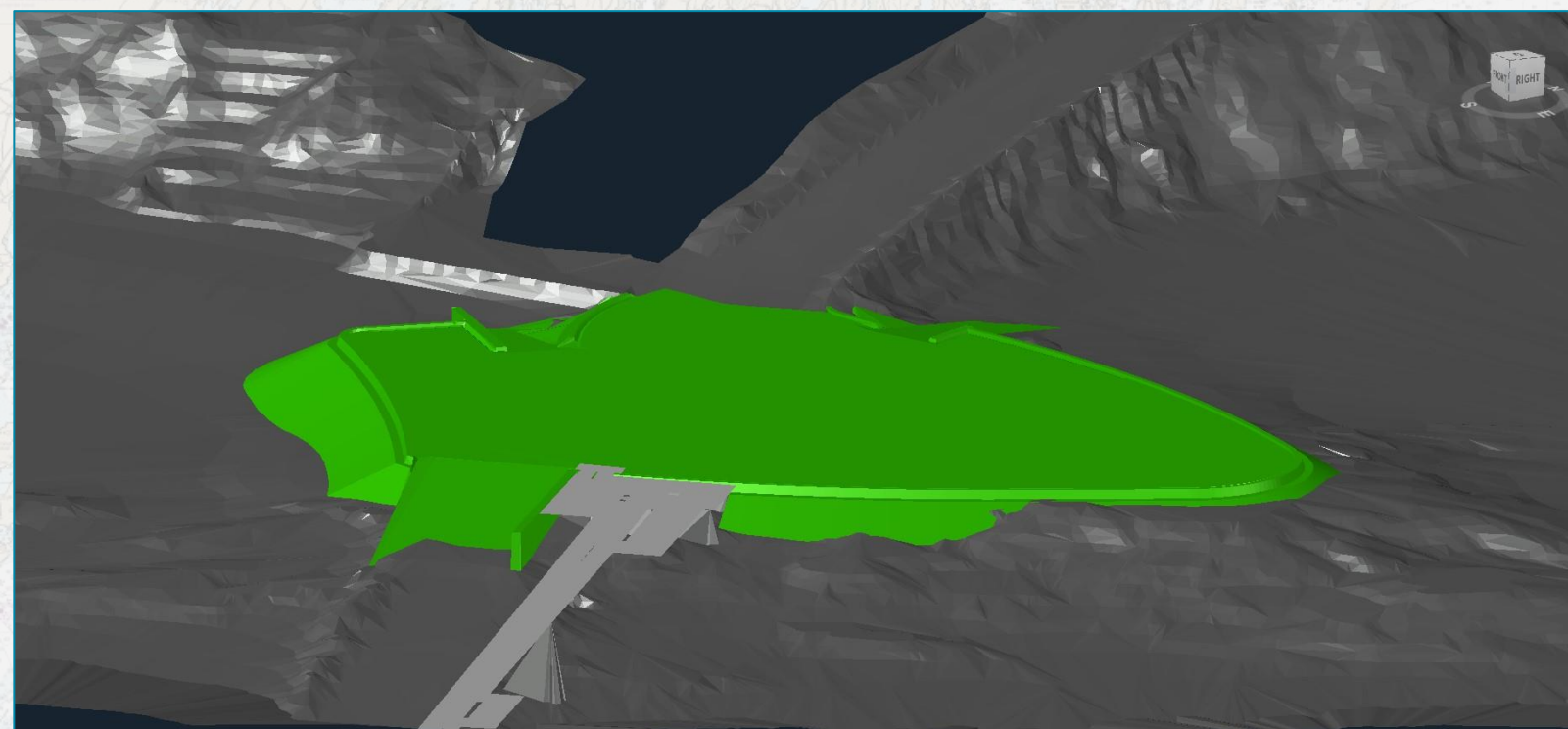
- RAISE GRADE WITH SEAWALL AND FILL
- RELOCATE FACILITIES TO HIGHER GROUND



# Adaptation Solution?



# Adaptation Solution?



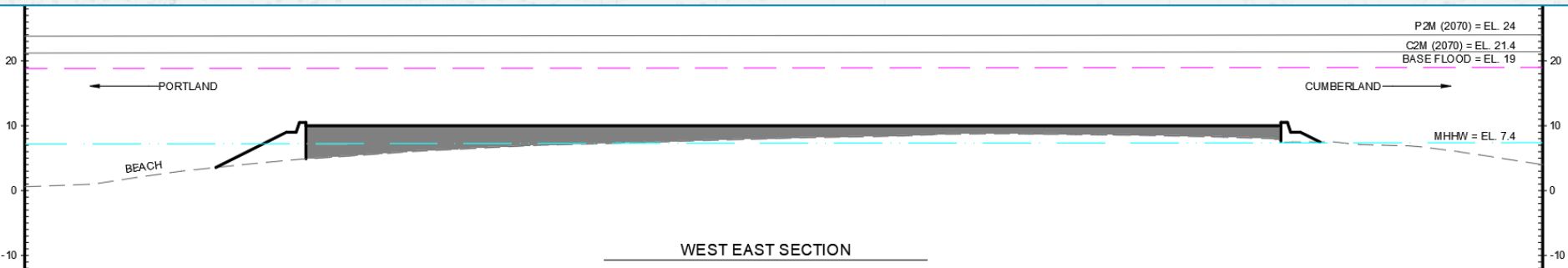
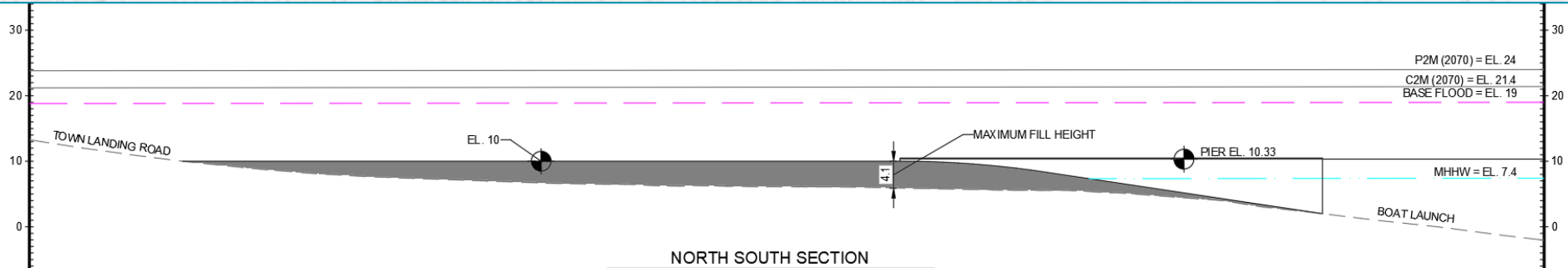
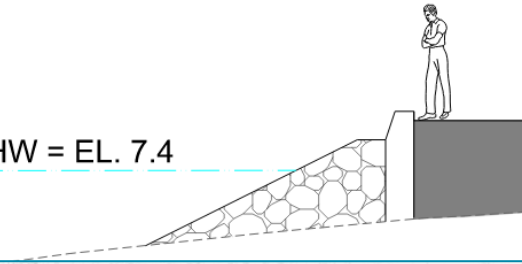
# Adaptation Solution?

P2M (2070) = EL. 24

C2M (2070) = EL. 21.4

BASE FLOOD = EL. 19

MHHW = EL. 7.4



# THANK YOU!

Barney Baker P.E.  
Coastal Practice Leader  
207-347-2370  
bbaker@geiconsultants.com

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