ResilientWoodsHole

What is it?

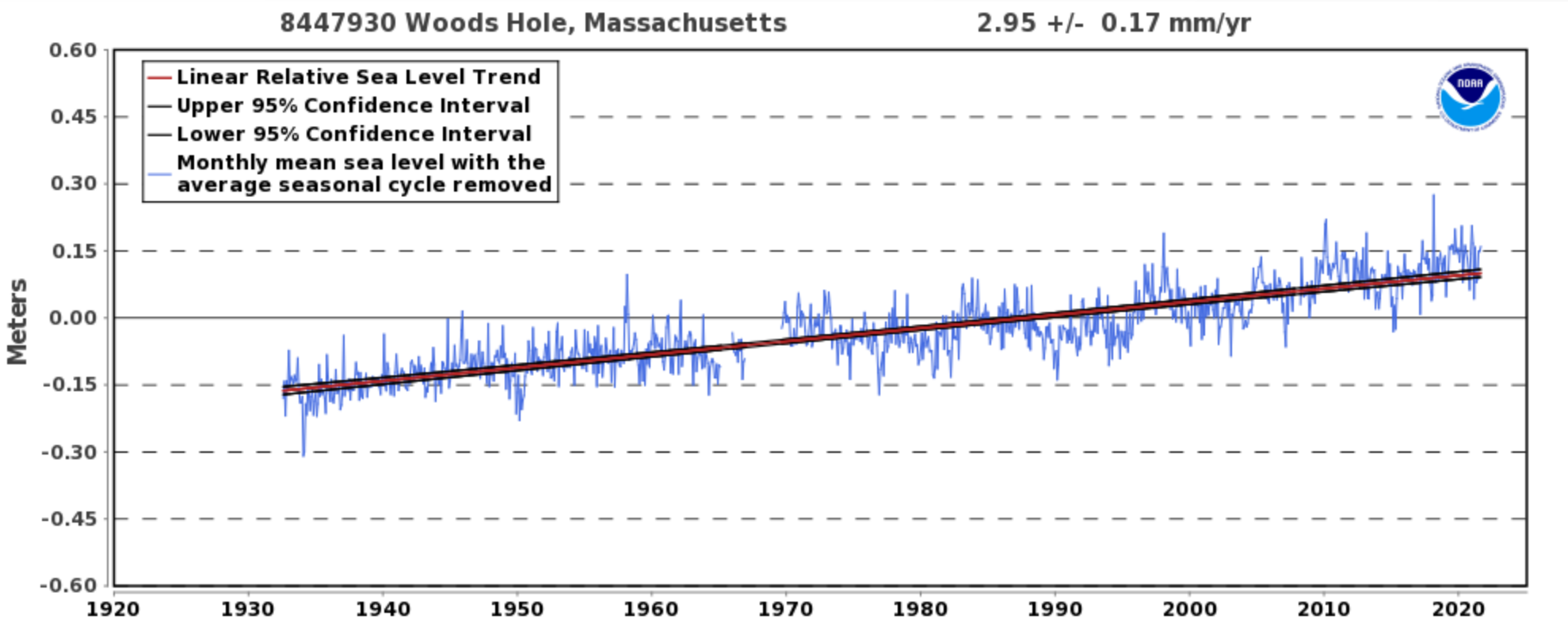
What do we know?

Where are we going?

Joe Famely, Climate & Sustainability Team Lead

Woods Hole Group

A record of sea level rise in Woods Hole



The relative sea level trend is 2.95 millimeters/year with a 95% confidence interval of +/- 0.17 mm/yr based on monthly mean sea level data from 1932 to 2020 which is equivalent to a change of 0.97 feet in 100 years.

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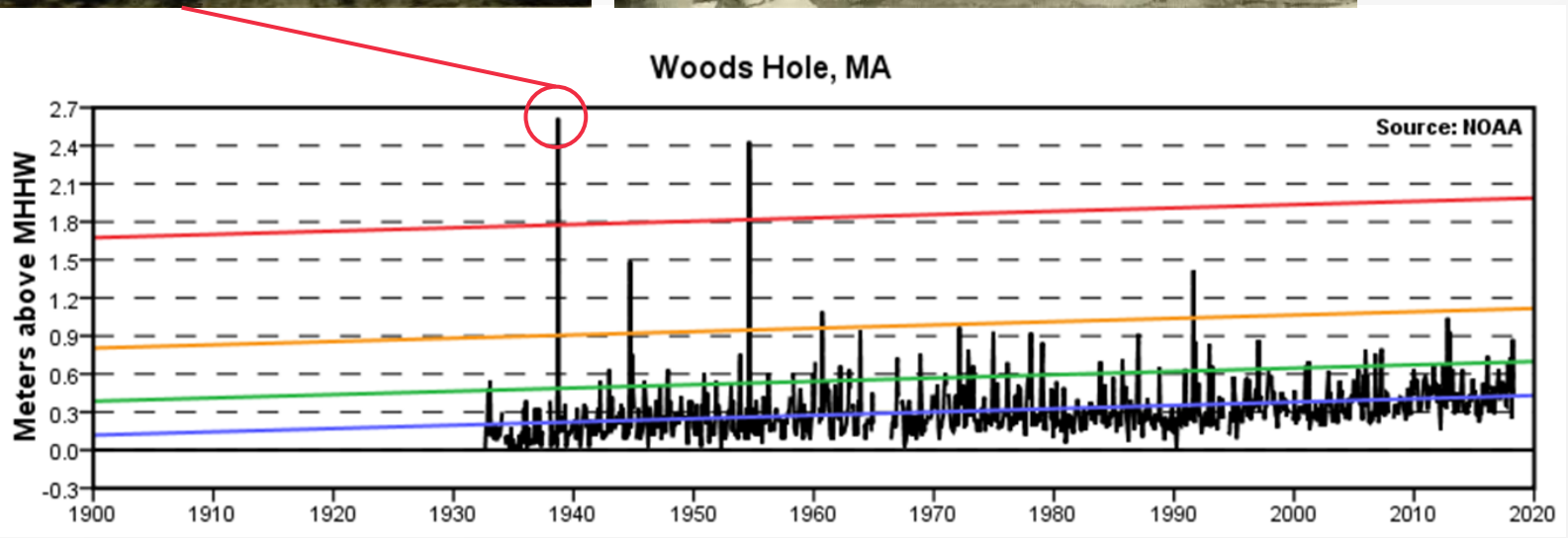
A record of storm impacts in Woods Hole

1938

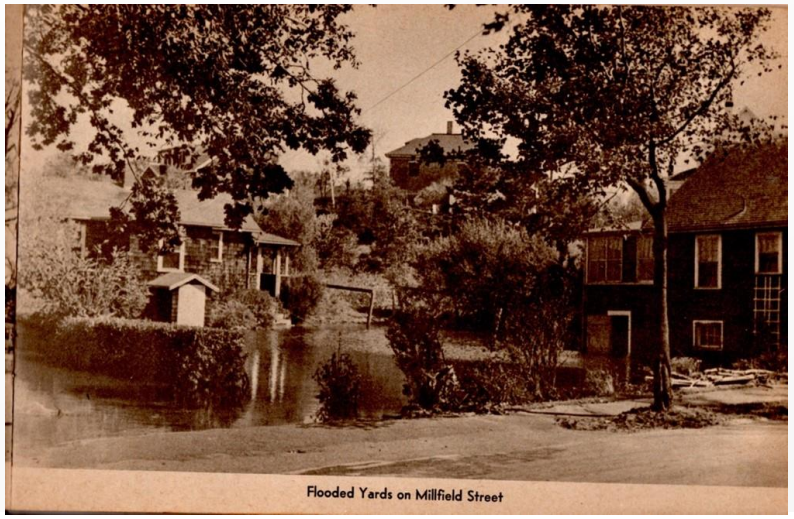
The thundering surf mounting the sea wall near the Bureau of Fisheries residence

Wreckage in Great Harbor at the entrance to Eel Pond, note the damaged foundation of the drawbridge



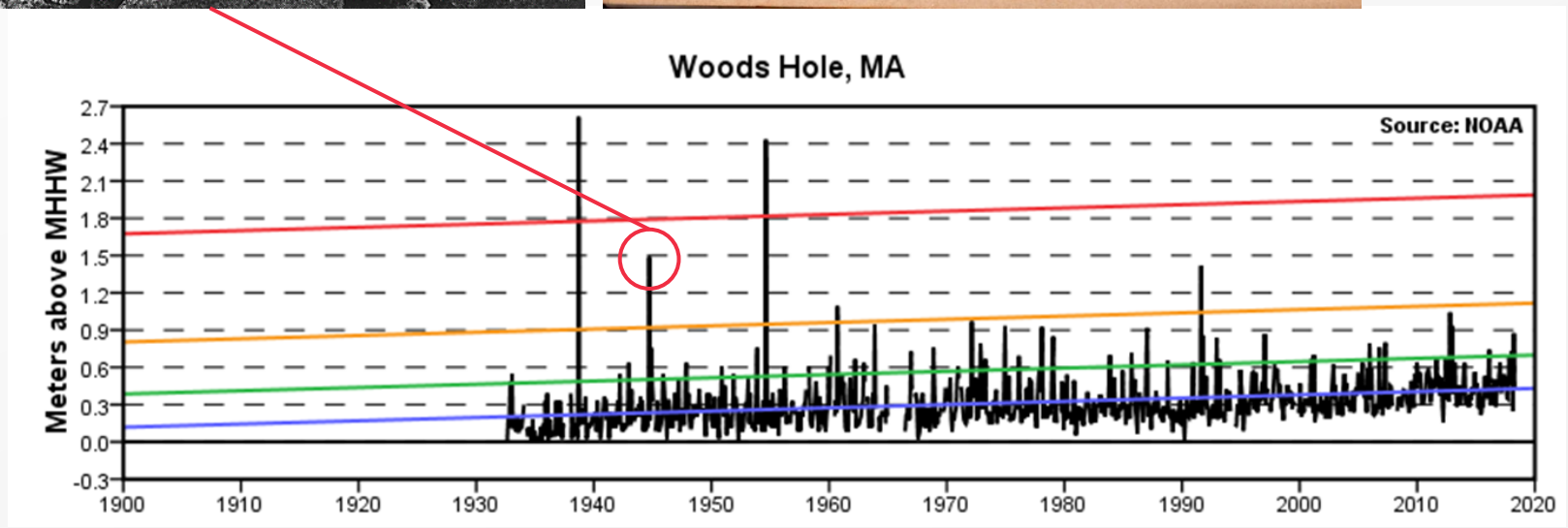
A record of storm impacts in Woods Hole

1944



Wreckage of seawall facing Marine Biological Laboratory (Falmouth Enterprise)

Flooded yards on Millfield Street (West Falmouth Library)



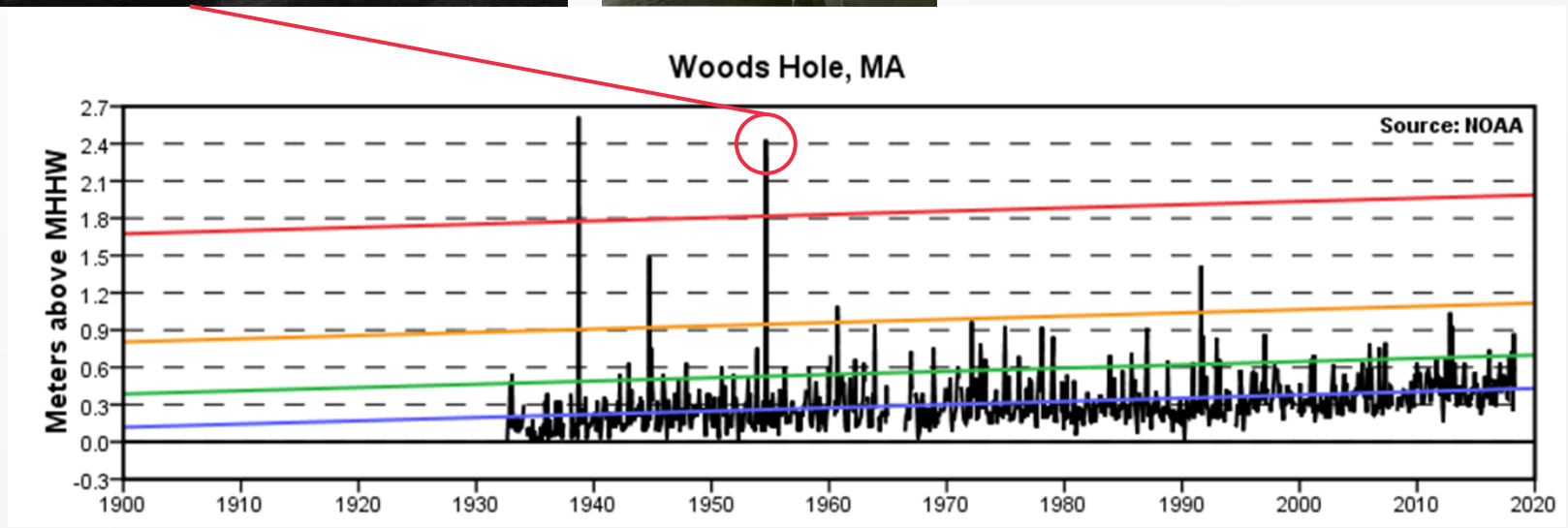
A record of storm impacts in Woods Hole

1954

Flooded Water Street, Fisheries Lab in background

B-11 The Basement of Lillie was flooded again during Hurricane "Carol" Aug, 31, 1954

“Water was up to the bar at the Captain Kidd”

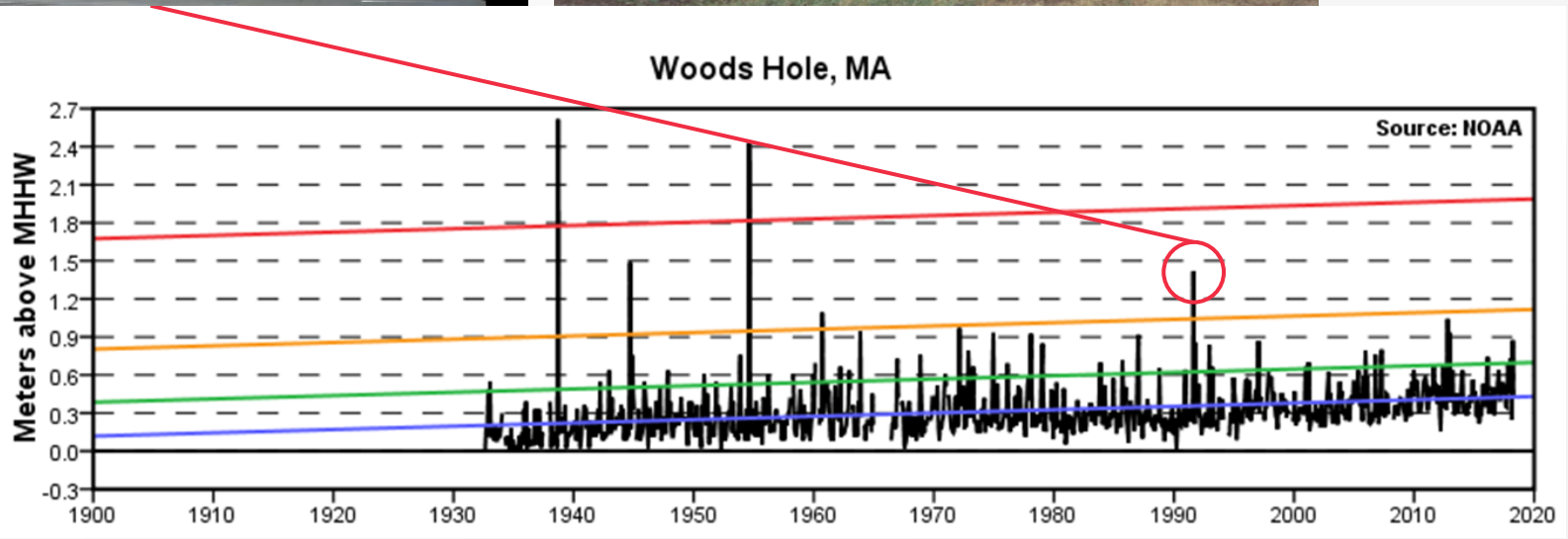


A record of storm impacts in Woods Hole

1991

WHOI video of flooding on Dyer, Iselin and Water St.

Post-storm flooding along Millfield Street



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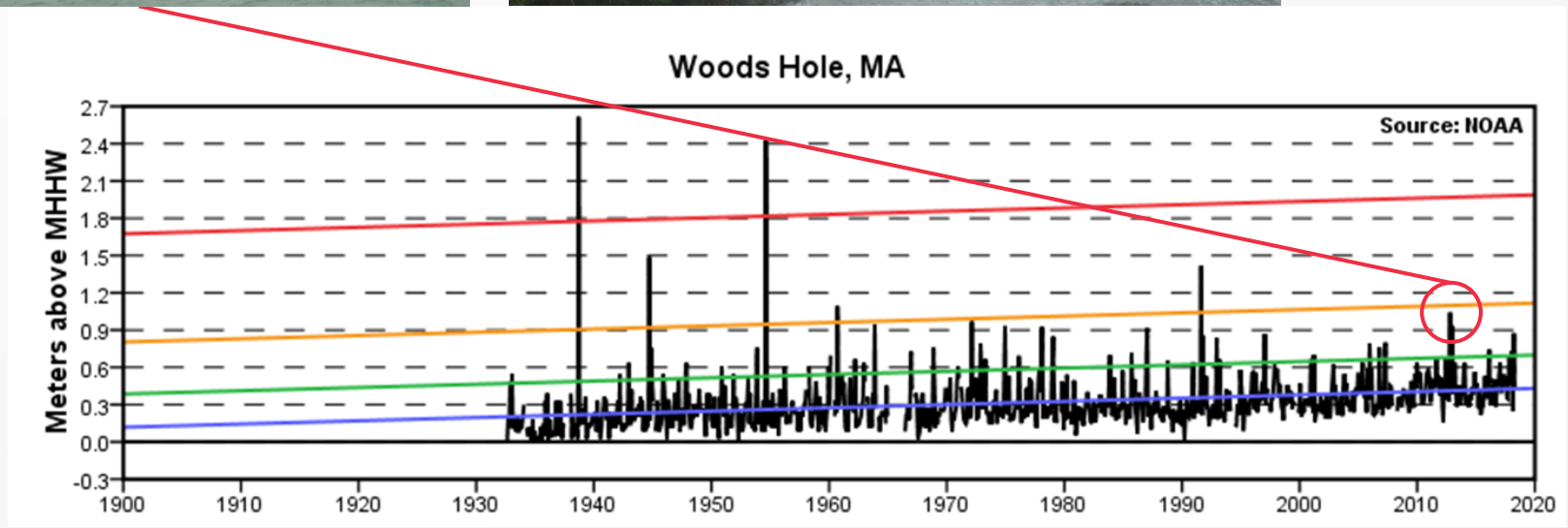
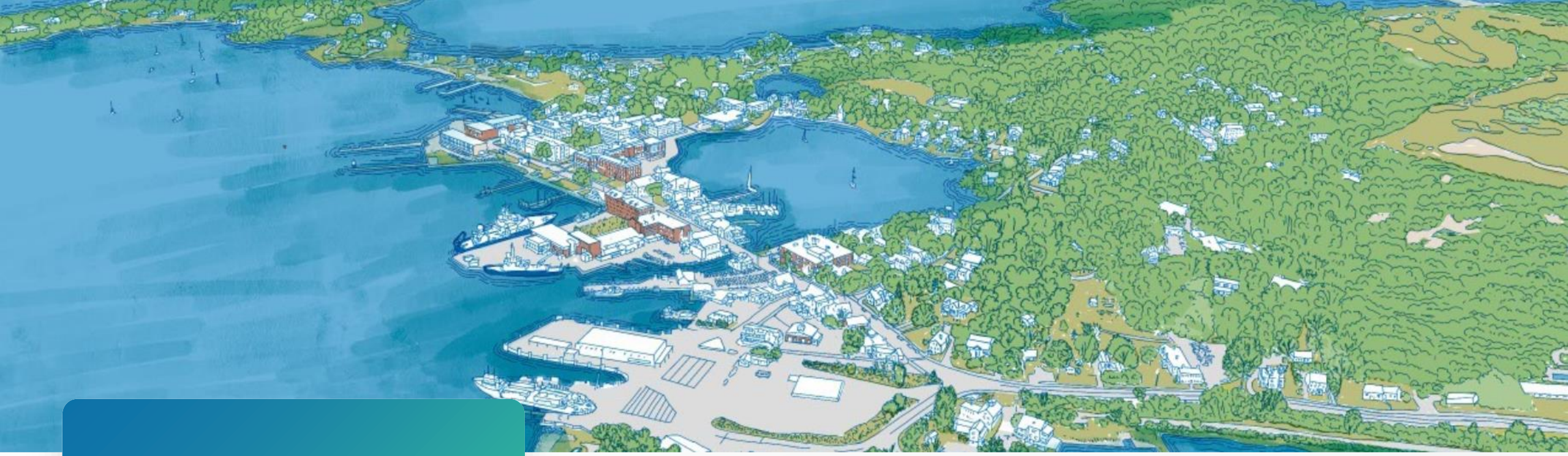
A record of storm impacts in Woods Hole

2012

Wave overtopping at Waterfront Park





ResilientWoodsHole Phase 1

What are the potential impacts of climate change on scientific operations and research in Woods Hole?

Climate Change Vulnerability Assessment (WHOI/MBL/NOAA)

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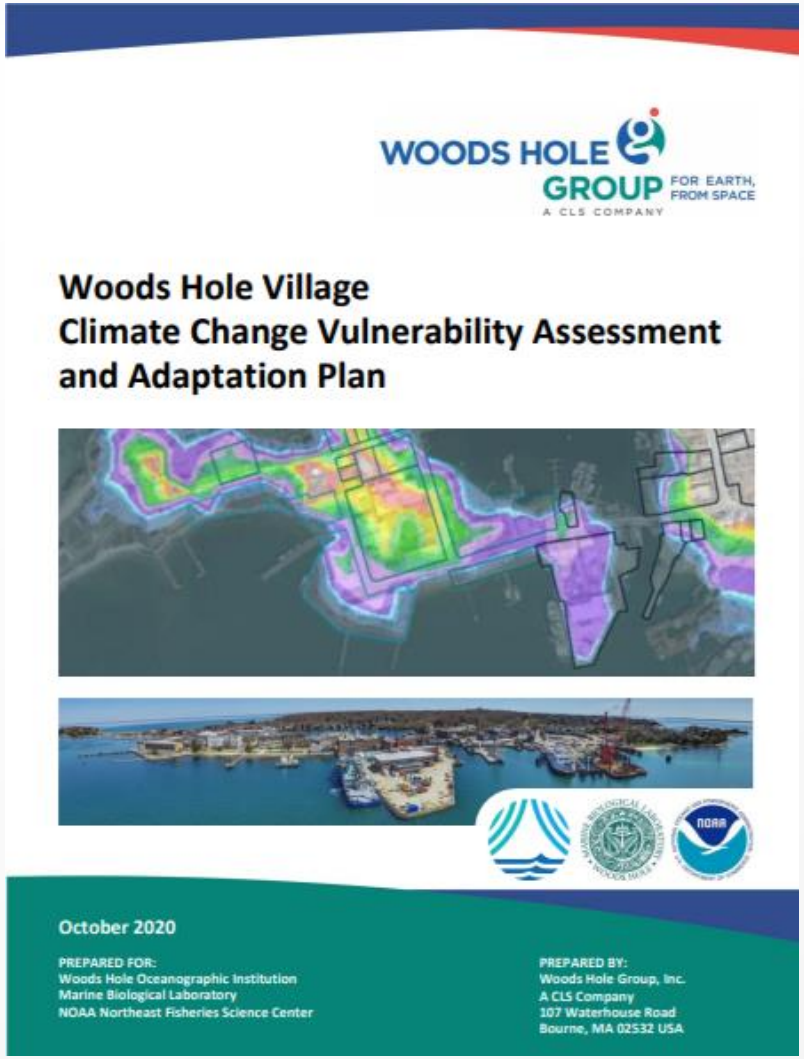
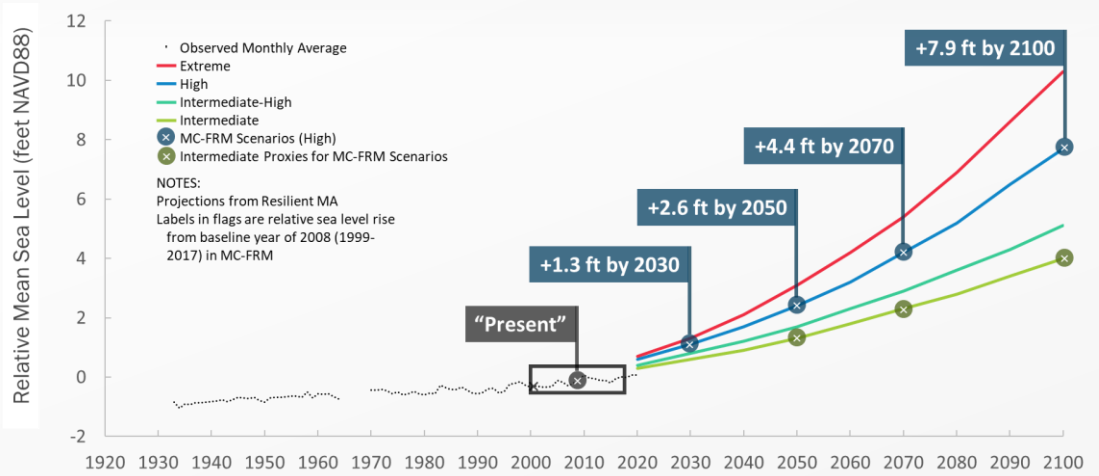
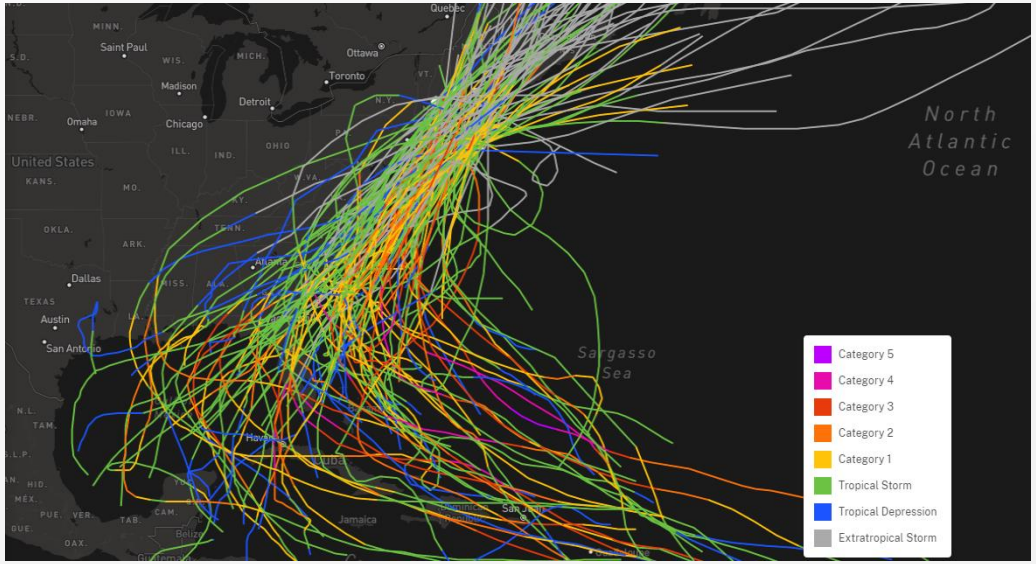
What does the future hold? ResilientWoodsHole Phase 1







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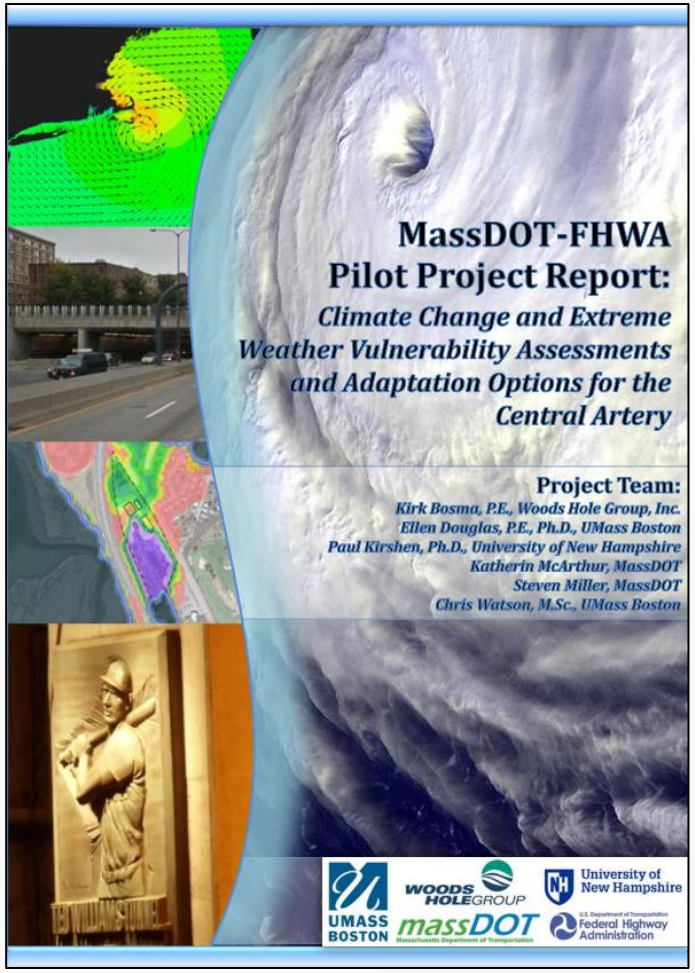
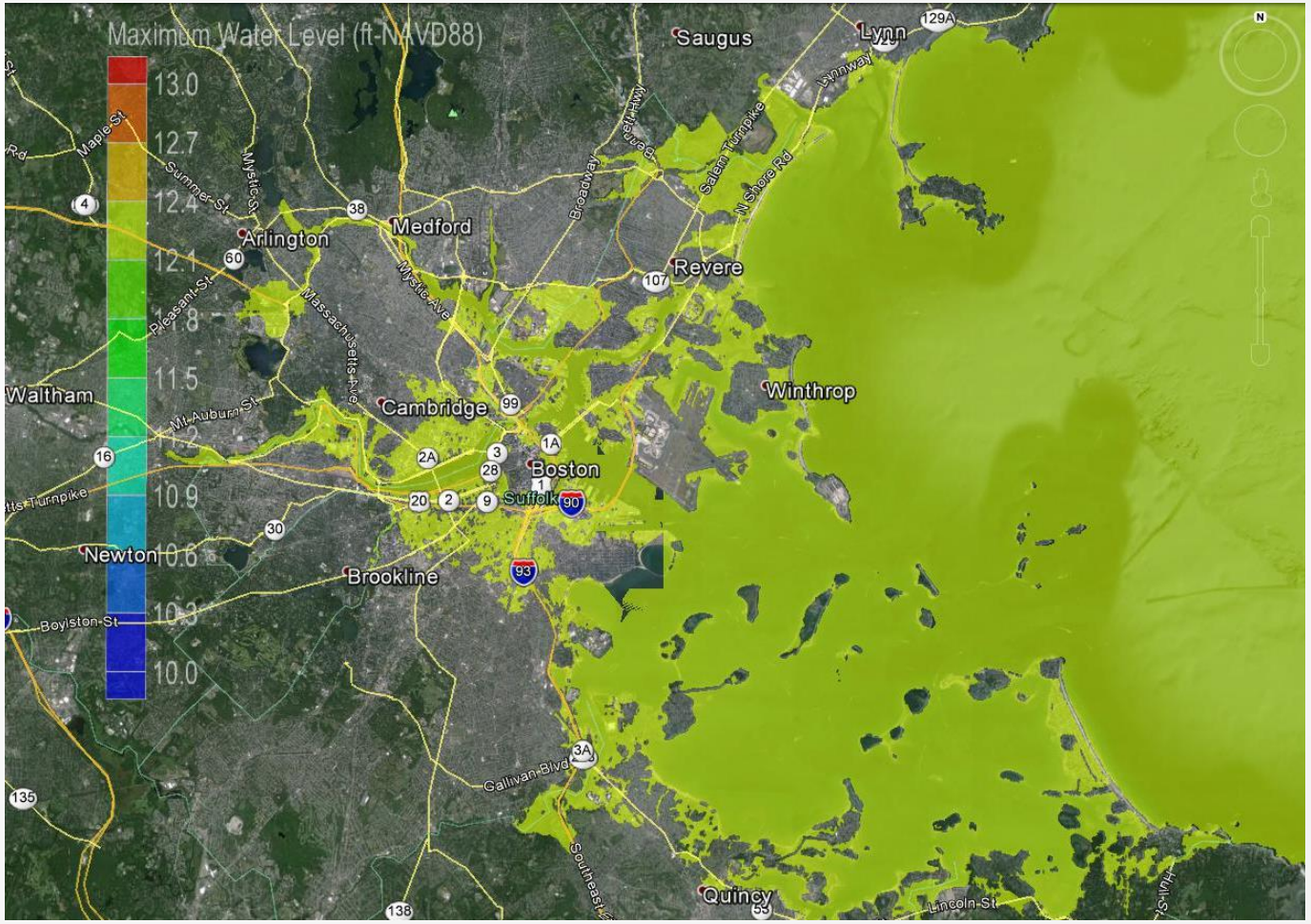
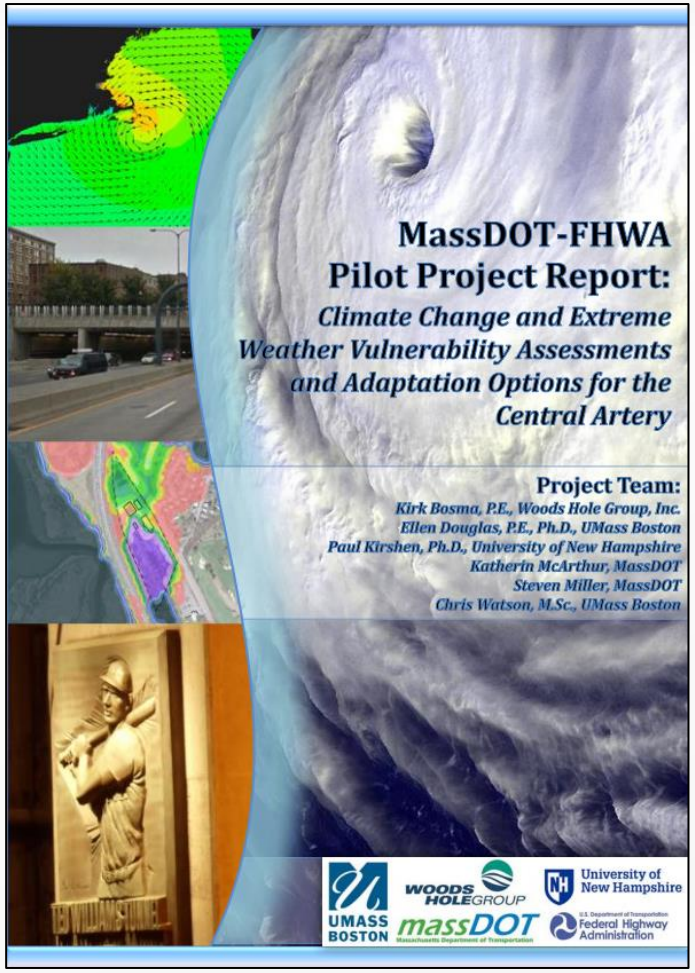
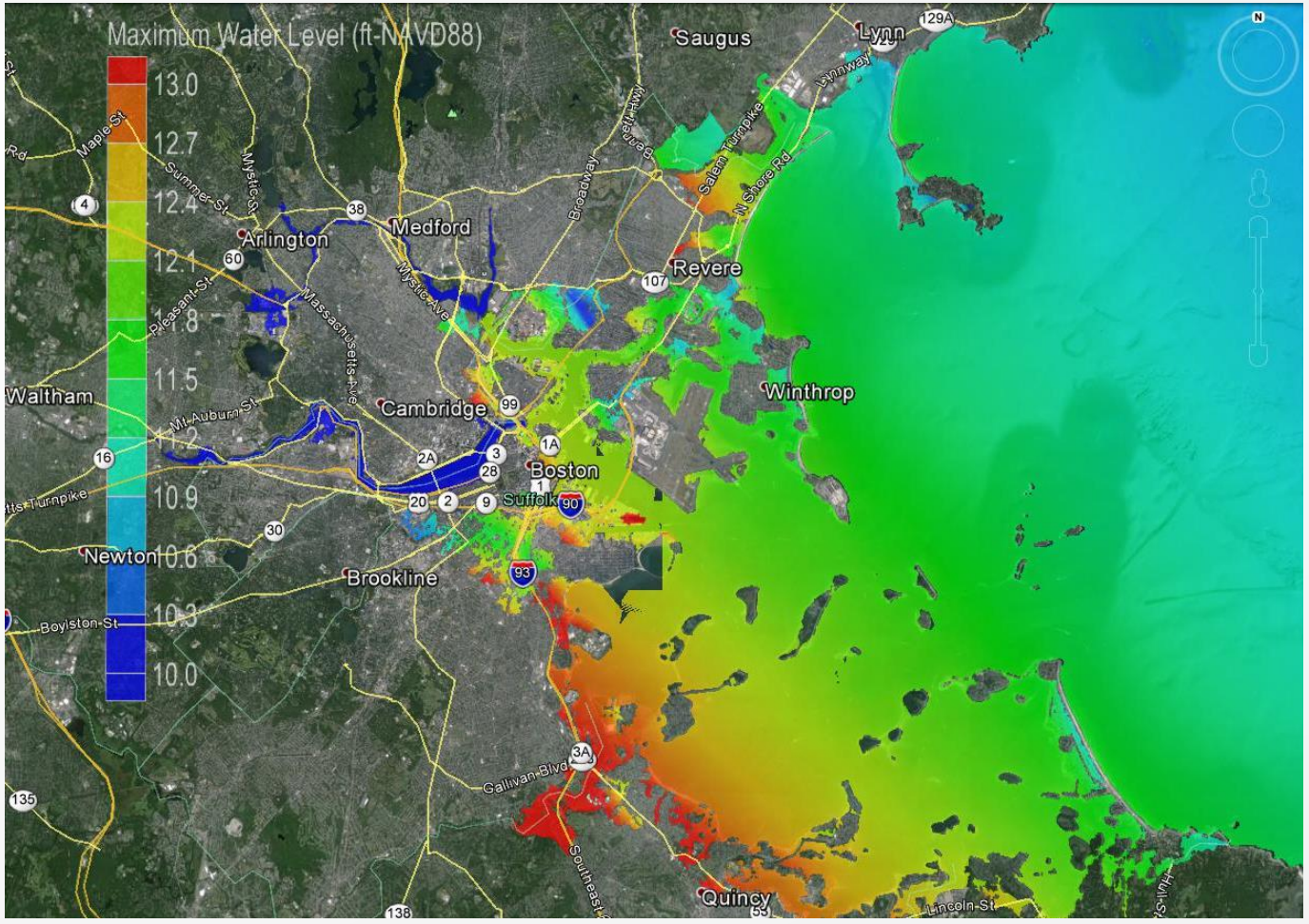
Why Hydrodynamic Modeling? Why Probabilistic?





Why Hydrodynamic Modeling? Why Probabilistic?





Massachusetts Coast Flood Risk Model (MC-FRM)

INPUTS

- SEA LEVEL RISE
- TROPICAL / EXTRA-TROPICAL STORMS
- LANDSCAPE
- ELEVATION
- CHANGING CLIMATE

PROBABILISTIC / HYDRODYNAMIC MODEL

Includes relevant physical processes:
sea level rise, tides, storm surge, wind, wave setup / run-up / overtopping, future climate scenarios

OUTPUTS

- FLOOD PROBABILITY
- FLOOD DEPTH
- FLOOD DURATION
- FLOOD VOLUMES
- FLOOD PATHWAYS
- WINDS
- WAVES
- CURRENTS

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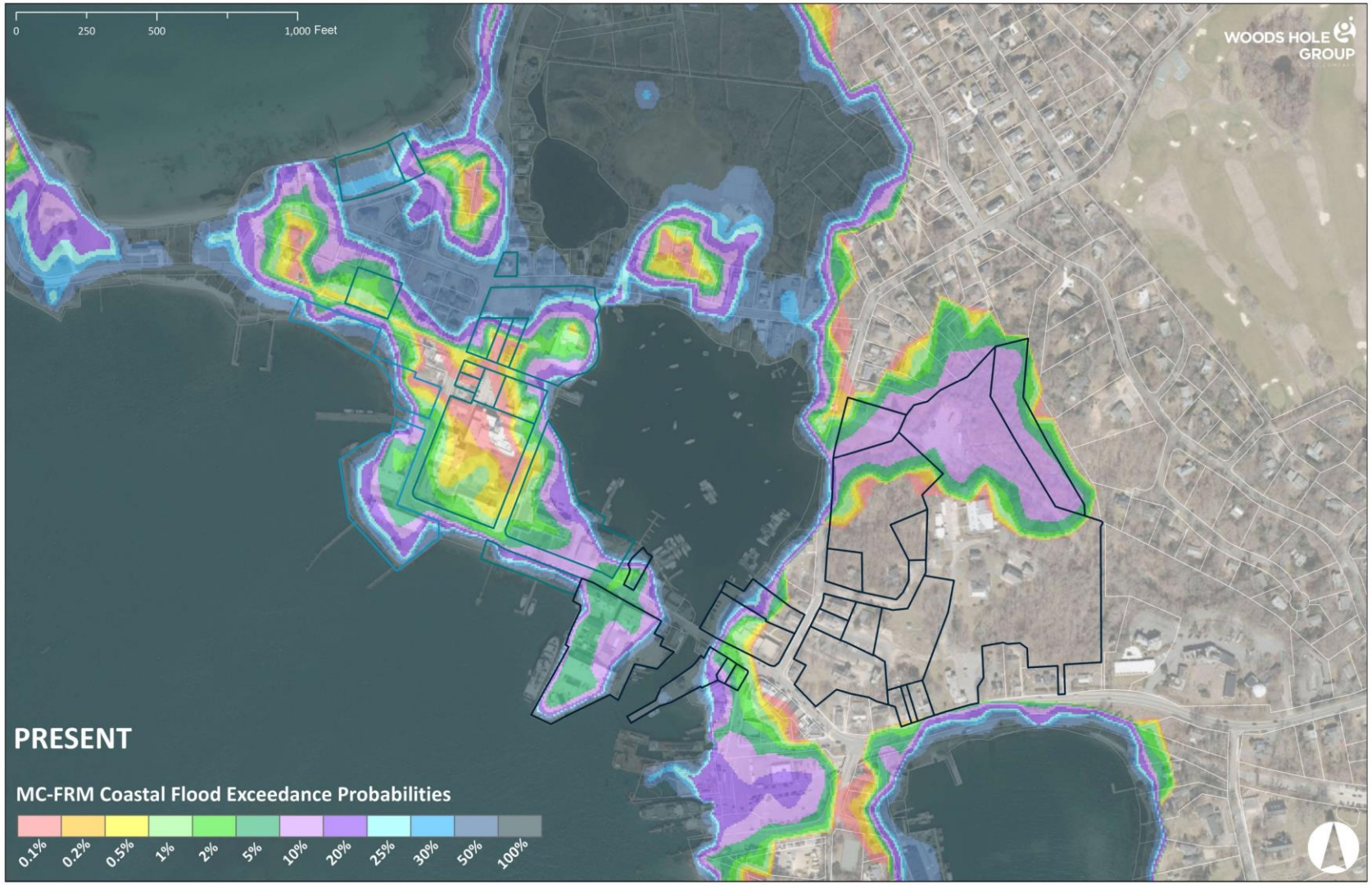
Massachusetts Coast Flood Risk Model (MC-FRM)



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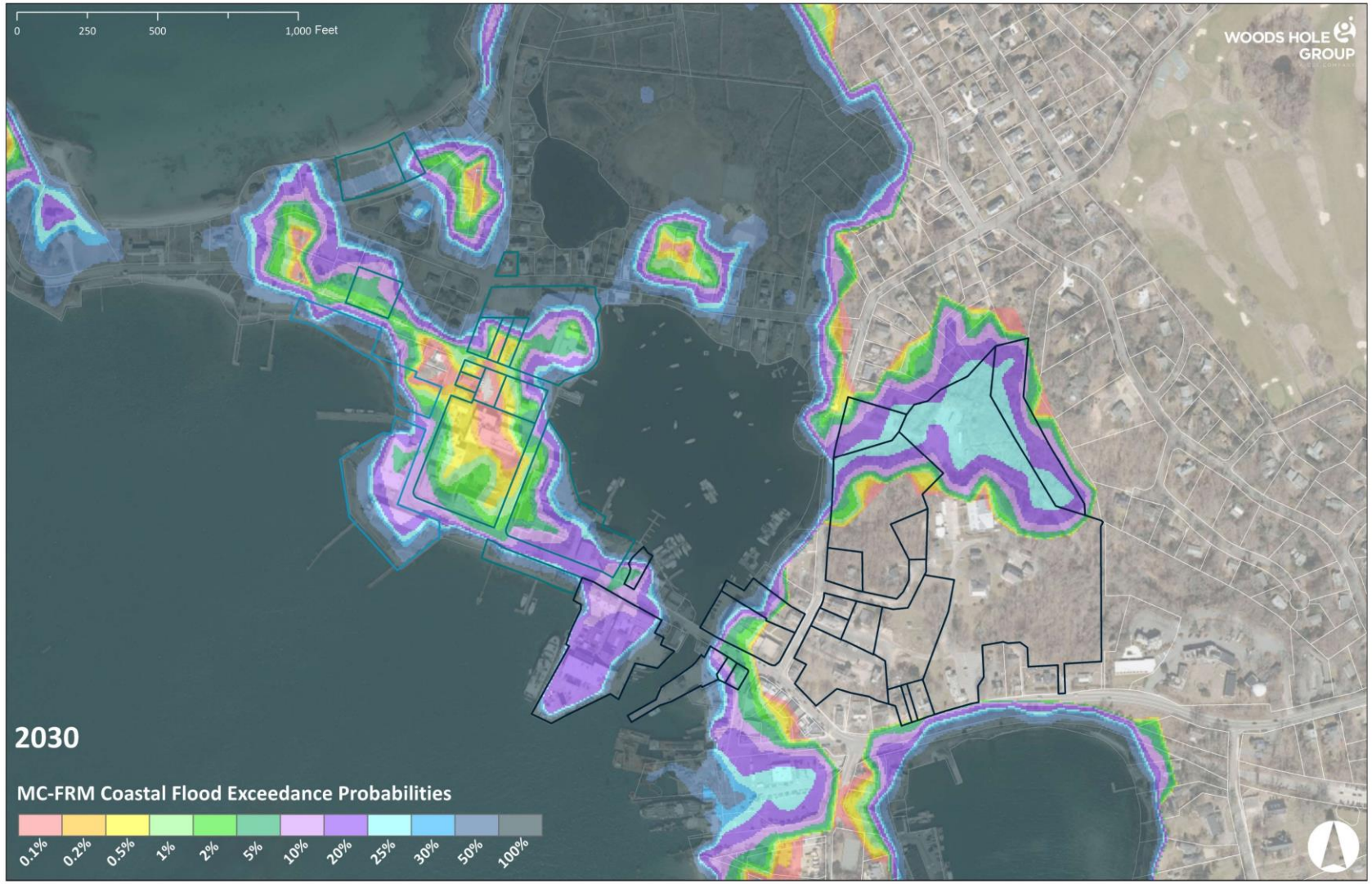
Massachusetts Coast Flood Risk Model (MC-FRM)



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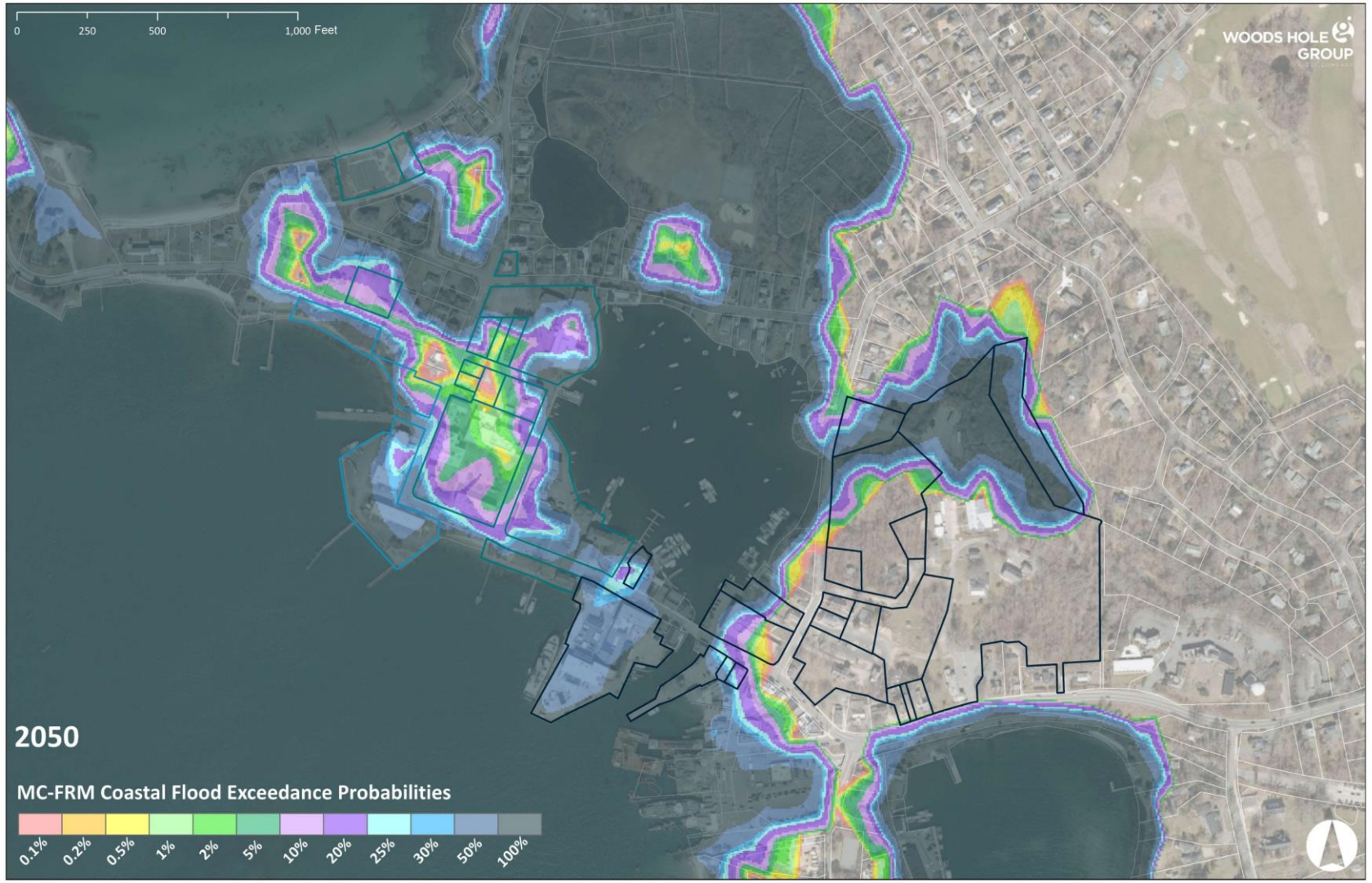
Massachusetts Coast Flood Risk Model (MC-FRM)



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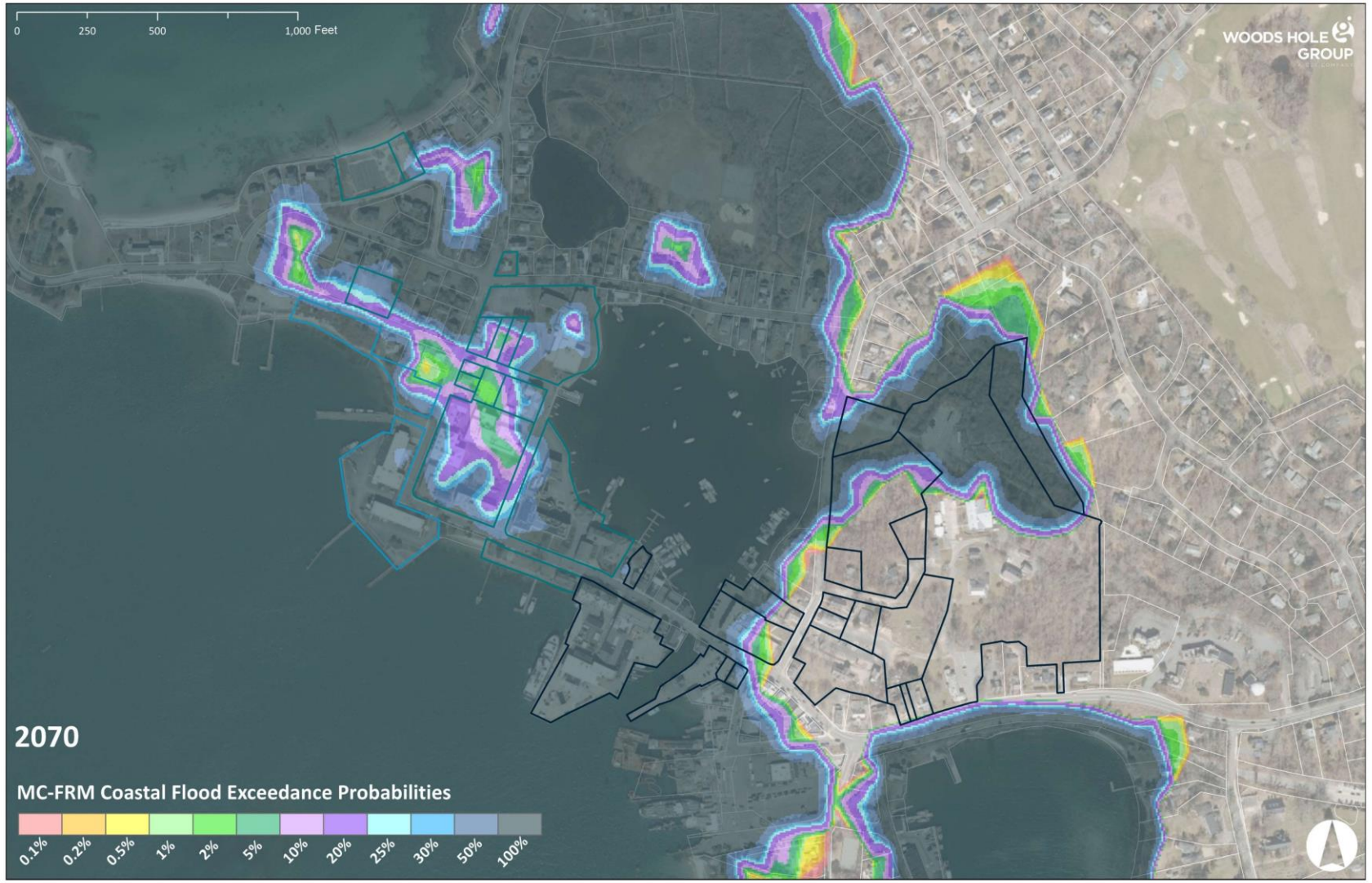
Massachusetts Coast Flood Risk Model (MC-FRM)



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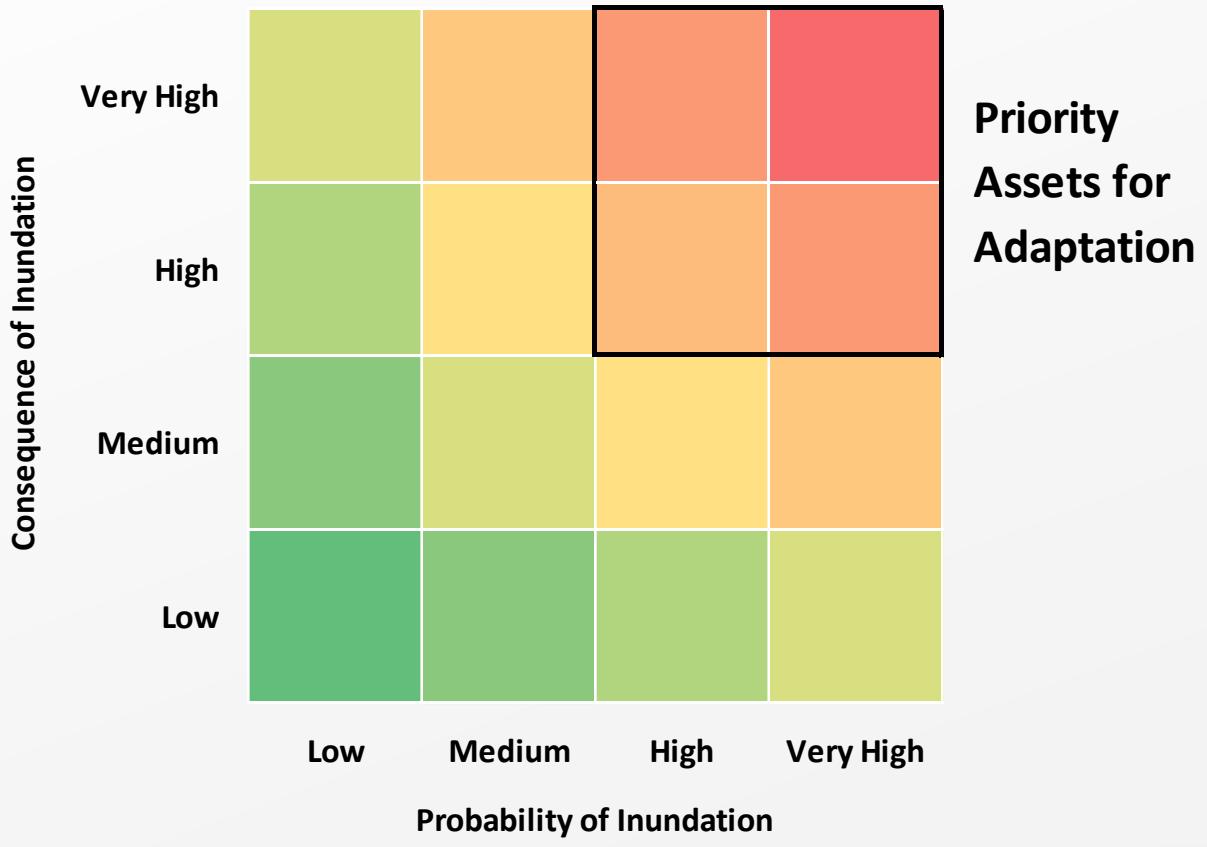
Using MC-FRM to prioritize investments in adaptation over time

Inventory Assets
- Location
- Critical Elevation

Vulnerability / Risk Assessment
- Asset inundation probability
  - Present/2030/2050/2070
- Mission-based consequence scoring
- Asset Risk = Probability * Consequence

Adaptation Planning
- Prioritize High Risk Assets
- Develop Adaptation Strategies



Phase 1 – WHOI/MBL/NOAA Assets CCVA

Climate Vulnerability Assessment – Asset Profile

Iselin

Asset Type: Buildings
Critical Elevation (CE): 6.08 FT. NAVD88
Threshold Description:
North Alvin high bay 130D Door - systems at grade
Room 138 (prior survey)

Probability of Exceedance Summary Table

Probability	Present		2030		2050		2070	
	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE
%	FT. NAVD88	FT.	FT. NAVD88	FT.	FT. NAVD88	FT.	FT. NAVD88	FT.
0.1	10.7	4.62	11.8	5.72	14.5	8.42	16.6	10.52
0.2	10	3.92	11.1	5.02	13.7	7.62	15.7	9.62
0.5	8.8	2.72	10	3.92	12.6	6.52	14.6	8.52
1	8.1	2.02	9.3	3.22	11.8	5.72	13.8	7.72
2	7.4	1.32	8.6	2.52	10.9	4.82	12.9	6.82
5	6.5	0.42	7.7	1.62	9.8	3.72	11.8	5.72
10	5.8	-	7	0.92	9	2.92	10.9	4.82
20	5	-	6.2	0.12	8	1.92	9.9	3.82
25	4.7	-	5.9	-	7.7	1.62	9.6	3.52
30	4.5	-	5.7	-	7.4	1.32	9.3	3.22
50	3.7	-	4.8	-	6.4	0.32	8.3	2.22
100	2.1	-	3.3	-	4.6	-	6.4	0.32

Consequence of Exceedance

	Direct Impacts			Mission Impairment				
	Service Loss Extent	Service Loss Duration	Cost of Damage	Research & Applied Science	Operations & Economic Activity	Education & Outreach	Sum	Consequence Score
Scores	4	4	3	3	4	2	20	83

Risk of Exceedance

Time horizon	Probability of Exceedance	Consequence Score	Risk Score	Risk Rank
Present	5	83	417	8/36
2030	20		1667	4/36
2050	50		4167	-
2070	100		8333	-

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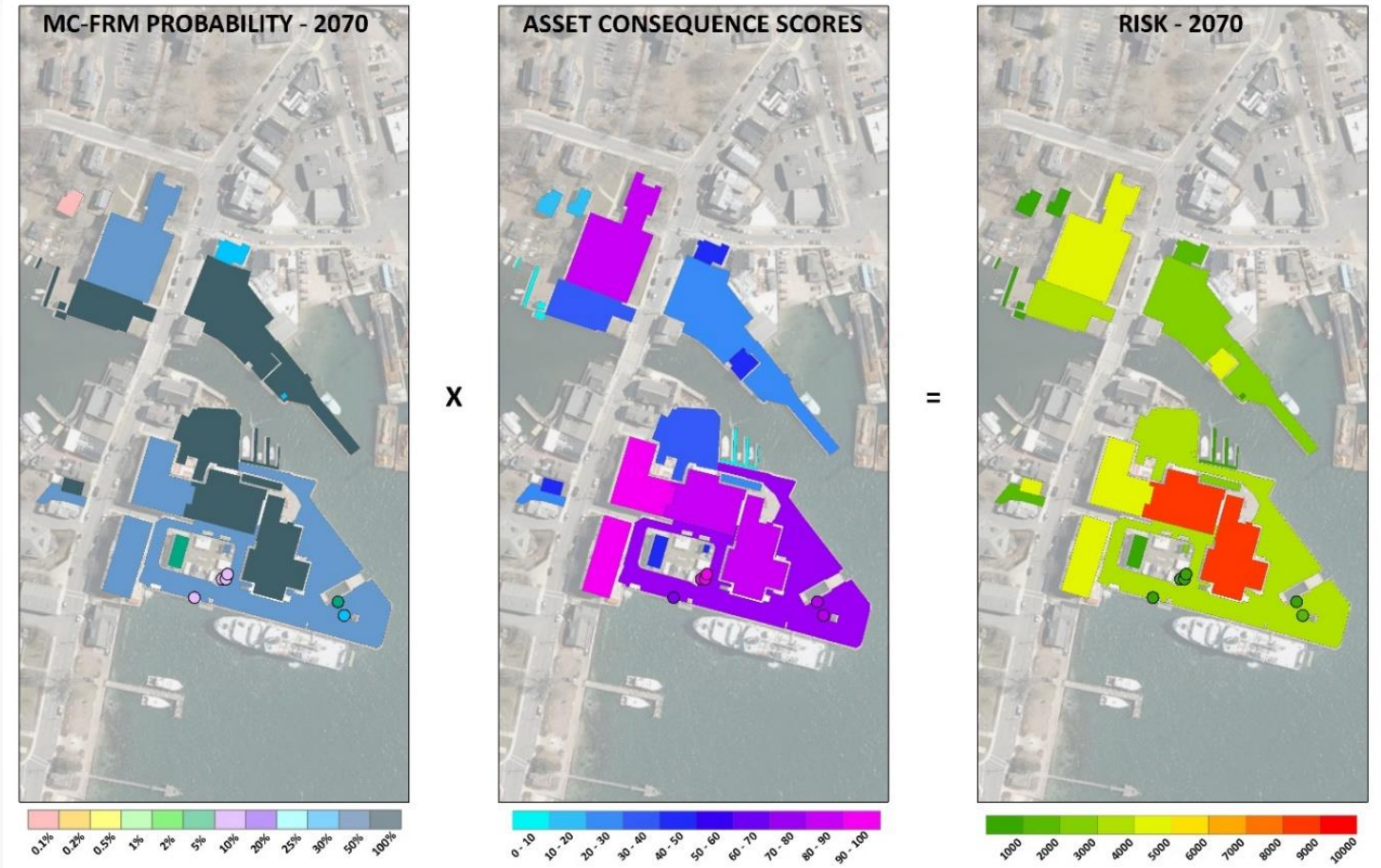

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Phase 1 – WHOI/MBL/NOAA Assets CCVA

Climate Vulnerability Assessment – Asset Profile

Lillie Laboratory

Asset Type: Buildings
Critical Elevation (CE): 5.17 FT. NAVD88
Threshold Description:
Loading dock slab entry from 2017 ELV CERT
Additional CEs:
Lillie Fuel Tank (5.30 FT. NAVD88), Lillie/MRC Junction Box (9.33 FT. NAVD88),
Lillie Transformer (9.89 FT. NAVD88), Lillie/MRC Meter Box (11.37 FT. NAVD88)

Probability of Exceedance Summary Table

	Present		2030		2050		2070	
Probability	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE
%	FT. NAVD88	FT.	FT. NAVD88	FT.	FT. NAVD88	FT.	FT. NAVD88	FT.
0.1	10.6	5.4	11.7	6.5	14.3	9.2	16.6	11.4
0.2	9.8	4.6	11.0	5.8	13.5	8.4	15.7	10.5
0.5	8.9	3.7	10.0	4.8	12.5	7.3	14.6	9.4
1	8.2	3.0	9.3	4.1	11.6	6.5	13.8	8.6
2	7.5	2.3	8.6	3.4	10.8	5.7	12.9	7.7
5	6.5	1.3	7.7	2.5	9.7	4.5	11.8	6.6
10	5.8	0.6	7.0	1.8	8.9	3.7	10.9	5.7
20	5.0	-	6.2	1.0	7.9	2.8	9.9	4.7
25	4.7	-	5.9	0.7	7.6	2.4	9.6	4.4
30	4.5	-	5.7	0.5	7.3	2.1	9.3	4.1
50	3.7	-	4.8	-	6.3	1.2	8.3	3.1
100	2.1	-	3.3	-	4.6	-	6.4	1.2

Consequence of Exceedance

	Direct Impacts			Mission Impairment				
	Service Loss Extent	Service Loss Duration	Cost of Damage	Research & Applied Science	Operations & Economic Activity	Education & Outreach	Sum	Consequence Score
Scores	4	4	4	4	4	3	23	96

Risk of Exceedance

Time horizon	Probability of Exceedance	Consequence Score	Risk Score	Risk Rank
Present	10	96	958	6/54
2030	30		2875	3/54
2050	50		4792	2/54
2070	100		9583	1/54

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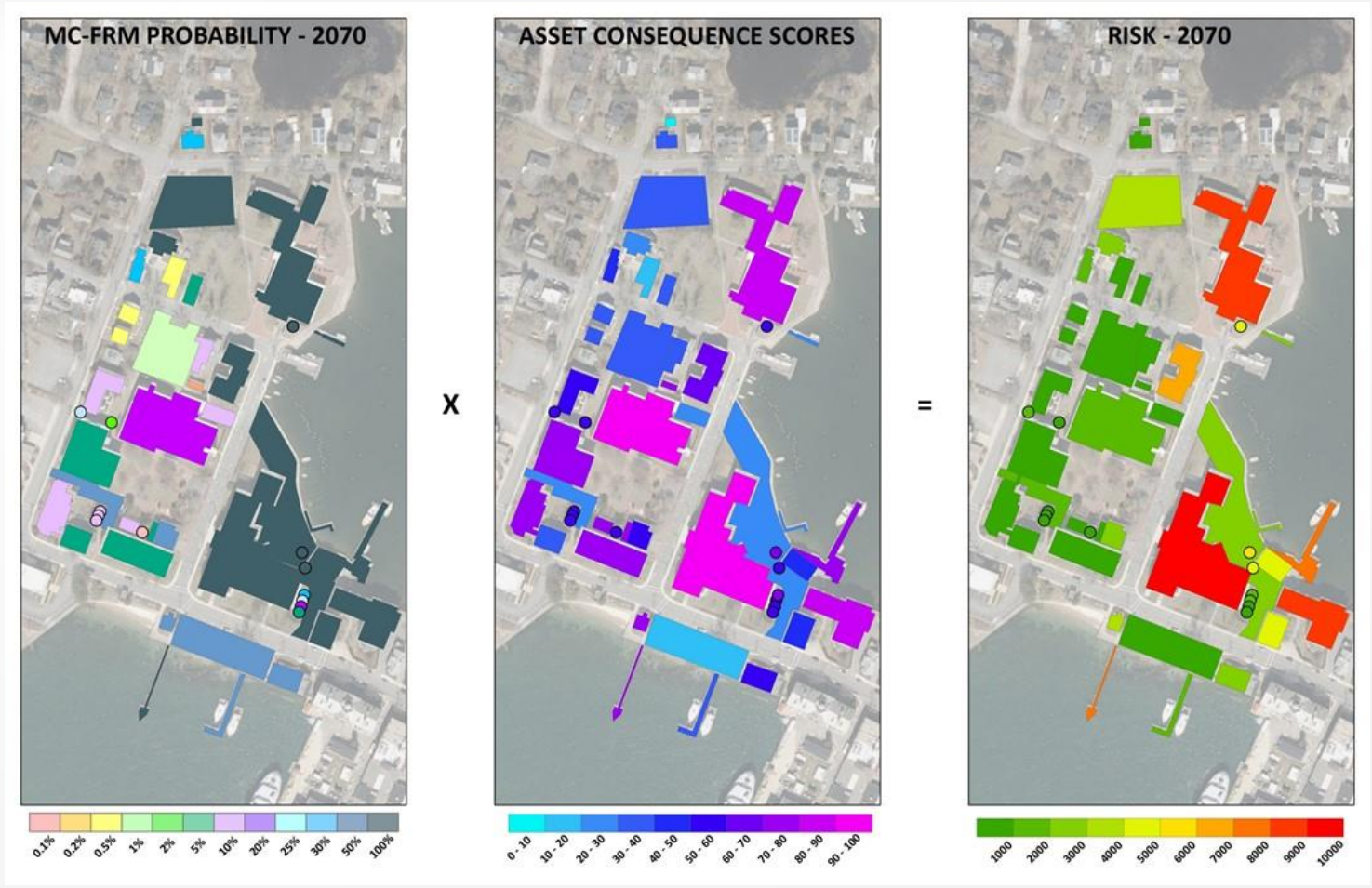

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Phase 1 – WHOI/MBL/NOAA Assets CCVA

Climate Vulnerability Assessment – Asset Profile

Gear Shed

Asset Type: Buildings
Critical Elevation (CE): 5.09 FT. NAVD88
Threshold Description:
Grade at bay door (LiDAR)

Probability of Exceedance Summary Table

Probability	Present		2030		2050		2070	
	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE	Flood Elevation	Depth Over CE
%	FT. NAVD88	FT.	FT. NAVD88	FT.	FT. NAVD88	FT.	FT. NAVD88	FT.
0.1	10.7	5.61	11.8	6.71	14.5	9.41	16.6	11.51
0.2	10	4.91	11.1	6.01	13.7	8.61	15.7	10.61
0.5	8.8	3.71	10	4.91	12.6	7.51	14.6	9.51
1	8.1	3.01	9.3	4.21	11.8	6.71	13.8	8.71
2	7.4	2.31	8.6	3.51	10.9	5.81	12.9	7.81
5	6.5	1.41	7.7	2.61	9.8	4.71	11.8	6.71
10	5.8	0.71	7	1.91	9	3.91	10.9	5.81
20	5	-	6.2	1.11	8	2.91	9.9	4.81
25	4.7	-	5.9	0.81	7.7	2.61	9.6	4.51
30	4.5	-	5.7	0.61	7.4	2.31	9.3	4.21
50	3.7	-	4.8	-	6.4	1.31	8.3	3.21
100	2.1	-	3.3	-	4.6	-	6.4	1.31

Consequence of Exceedance

	Direct Impacts			Mission Impairment				
	Service Loss Extent	Service Loss Duration	Cost of Damage	Research & Applied Science	Operations & Economic Activity	Education & Outreach	Sum	Consequence Score
Scores	2	4	4	3	3	1	17	71

Risk of Exceedance

Time horizon	Probability of Exceedance	Consequence Score	Risk Score	Risk Rank
Present	10	71	708	3/27
2030	30		2125	2/27
2050	50		3542	3/27
2070	100		7083	2/27

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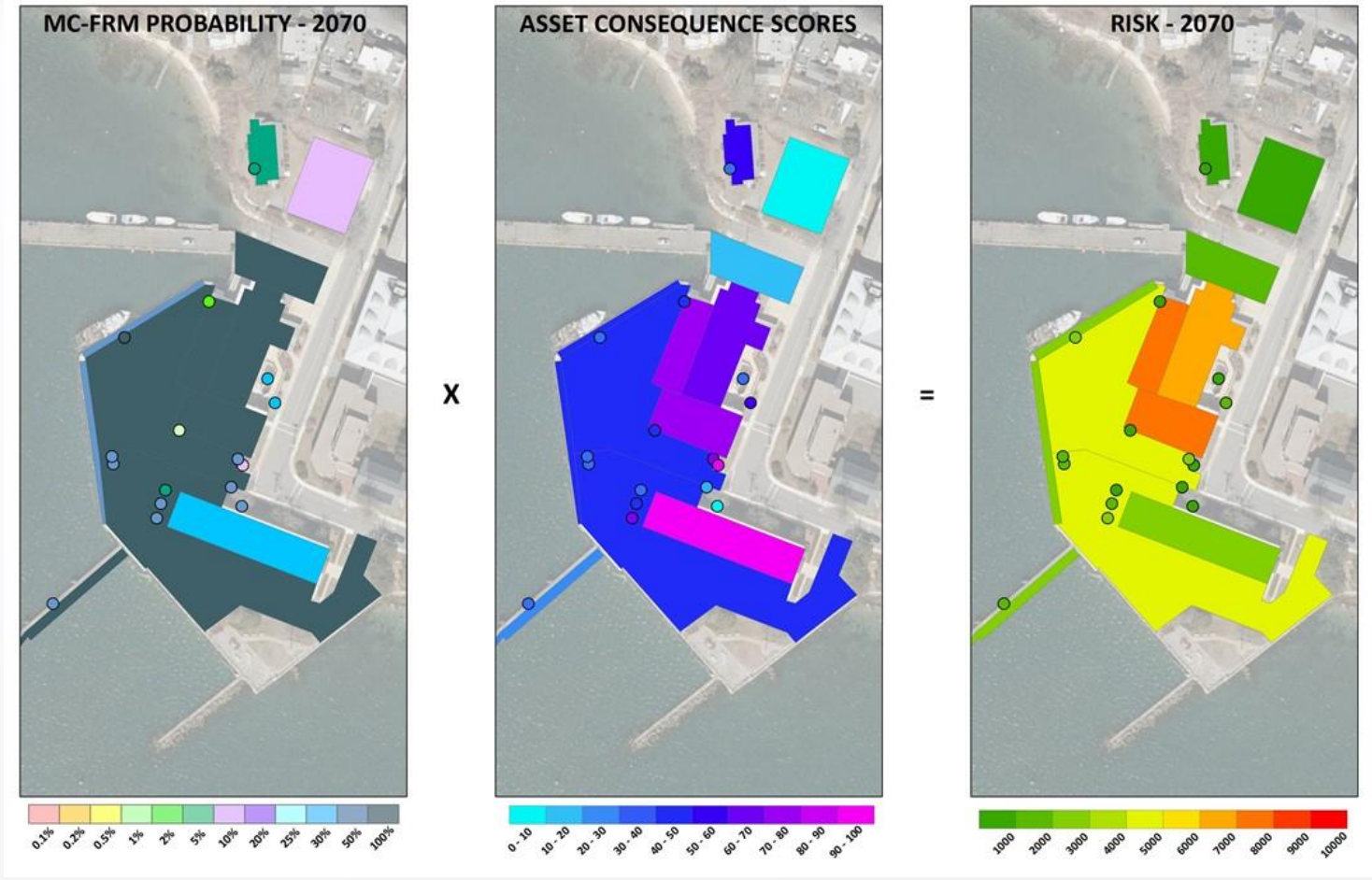

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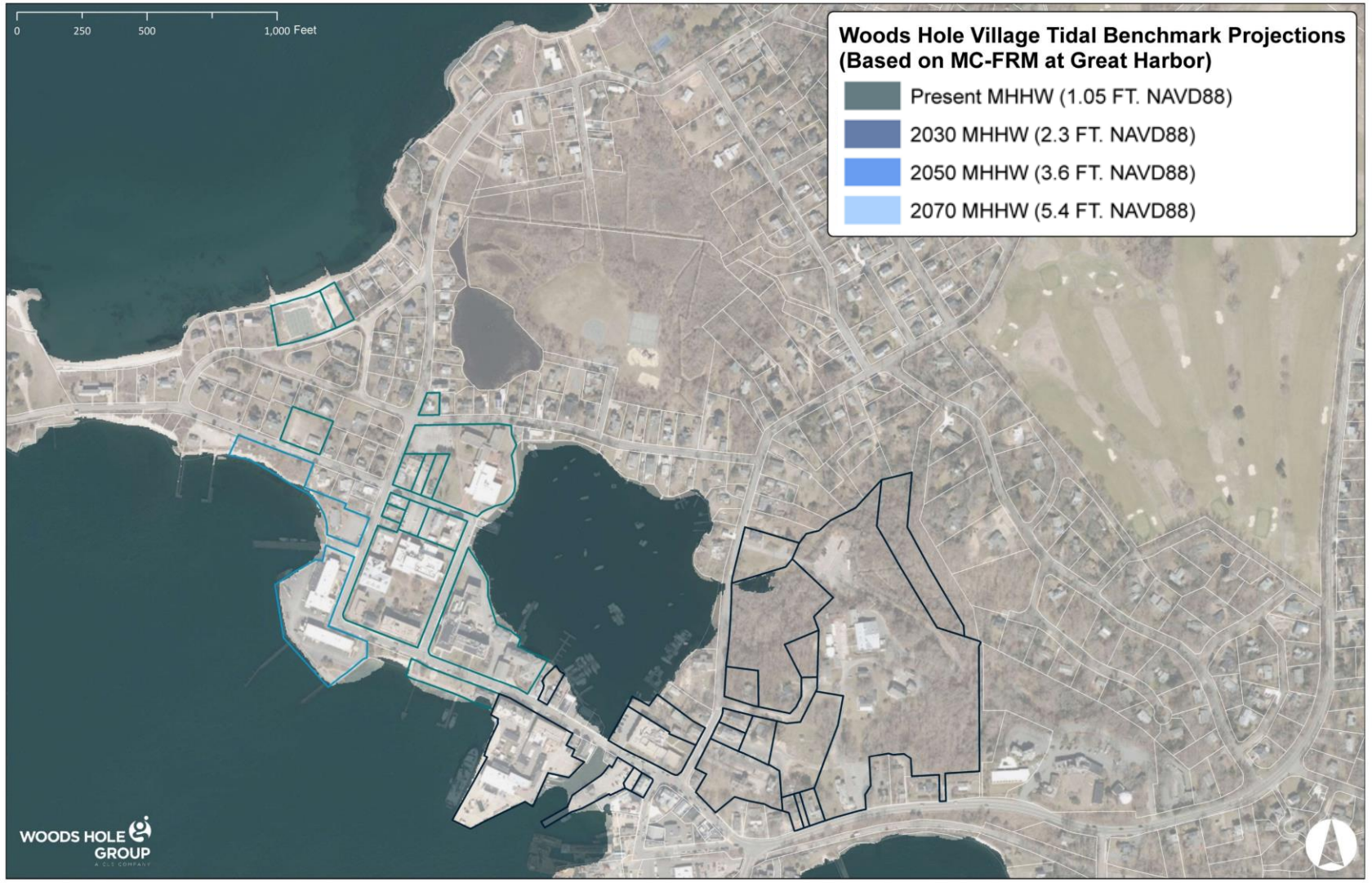
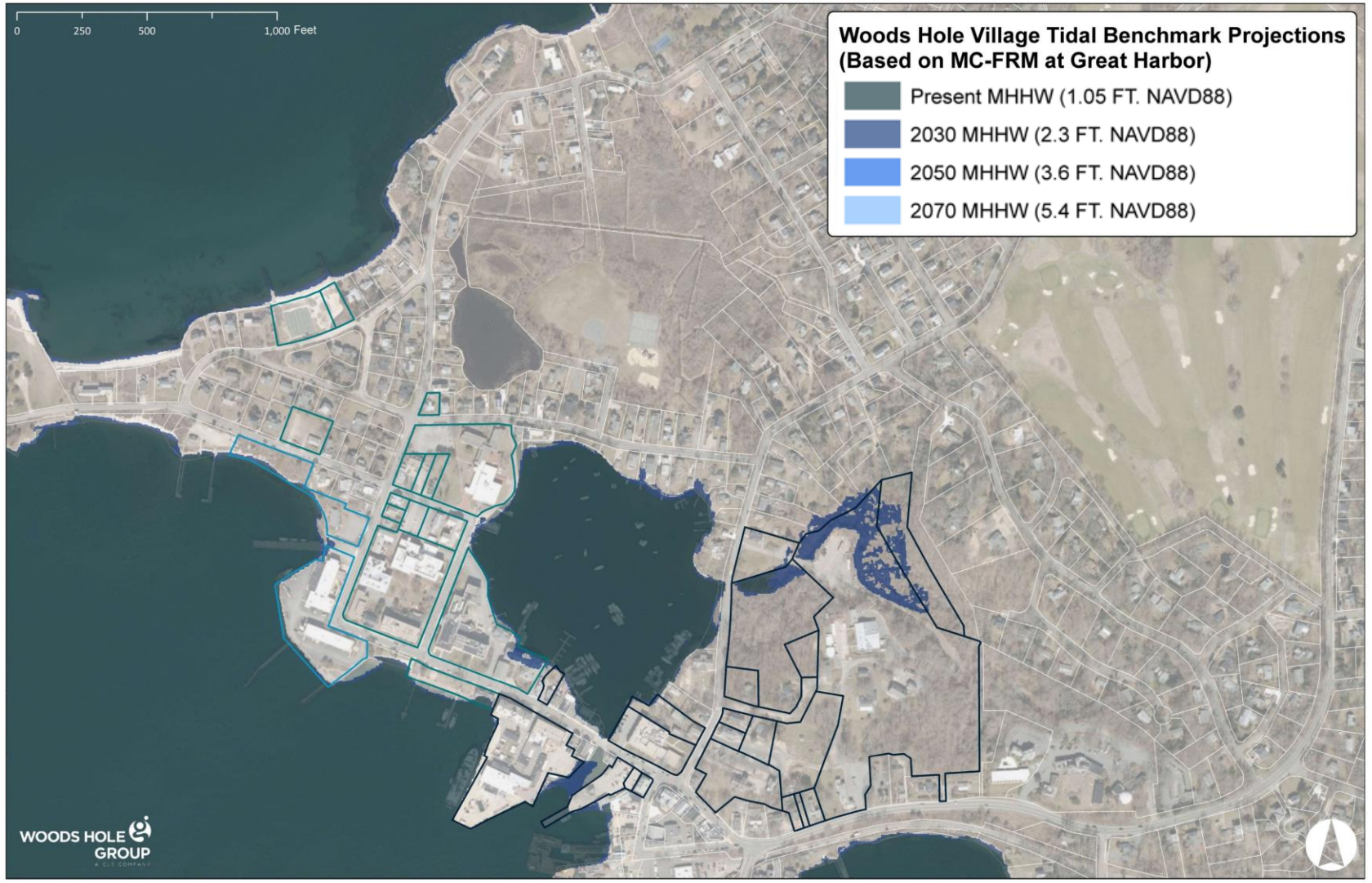
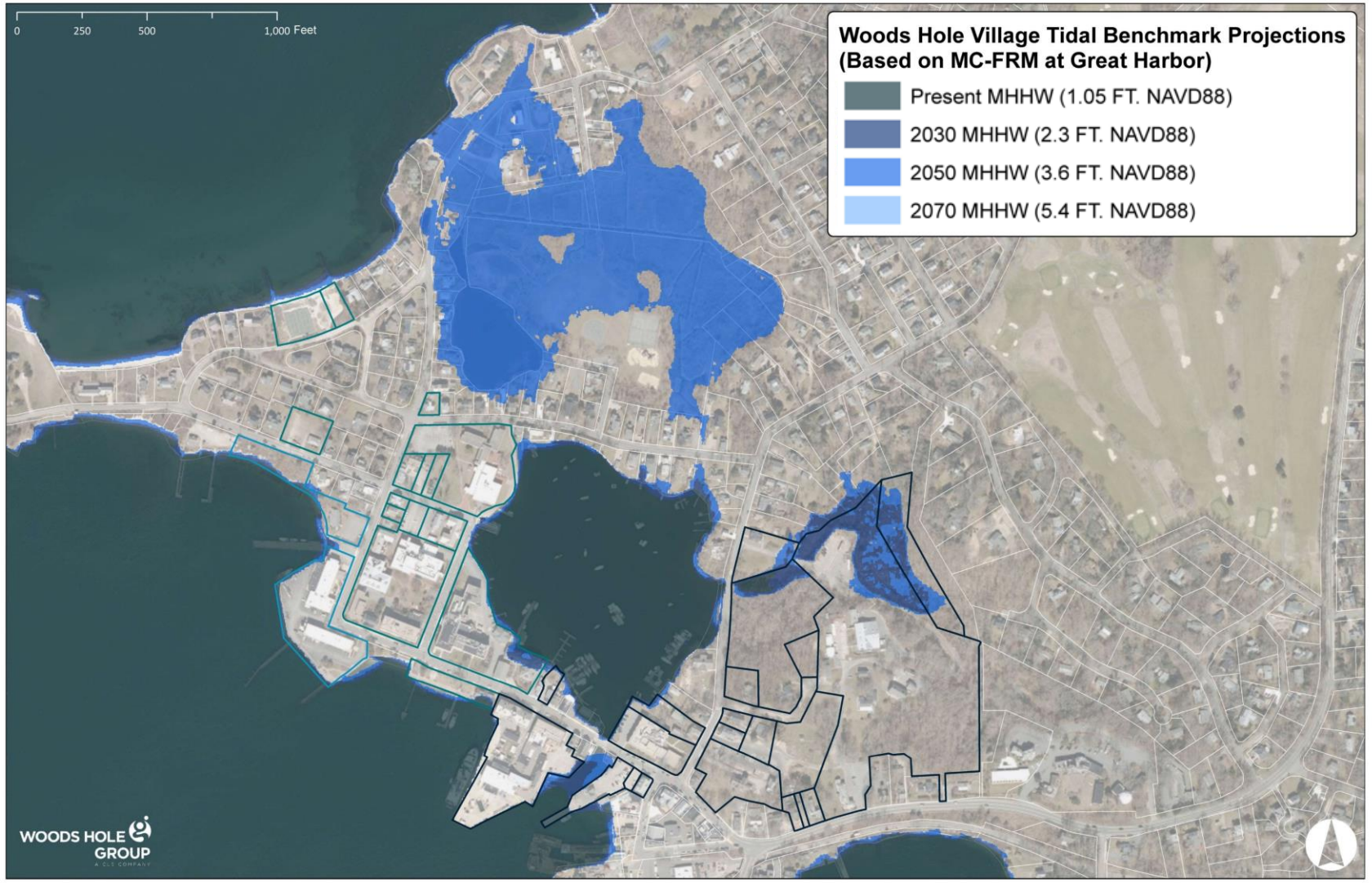
Phase 1 – Nuisance Flooding



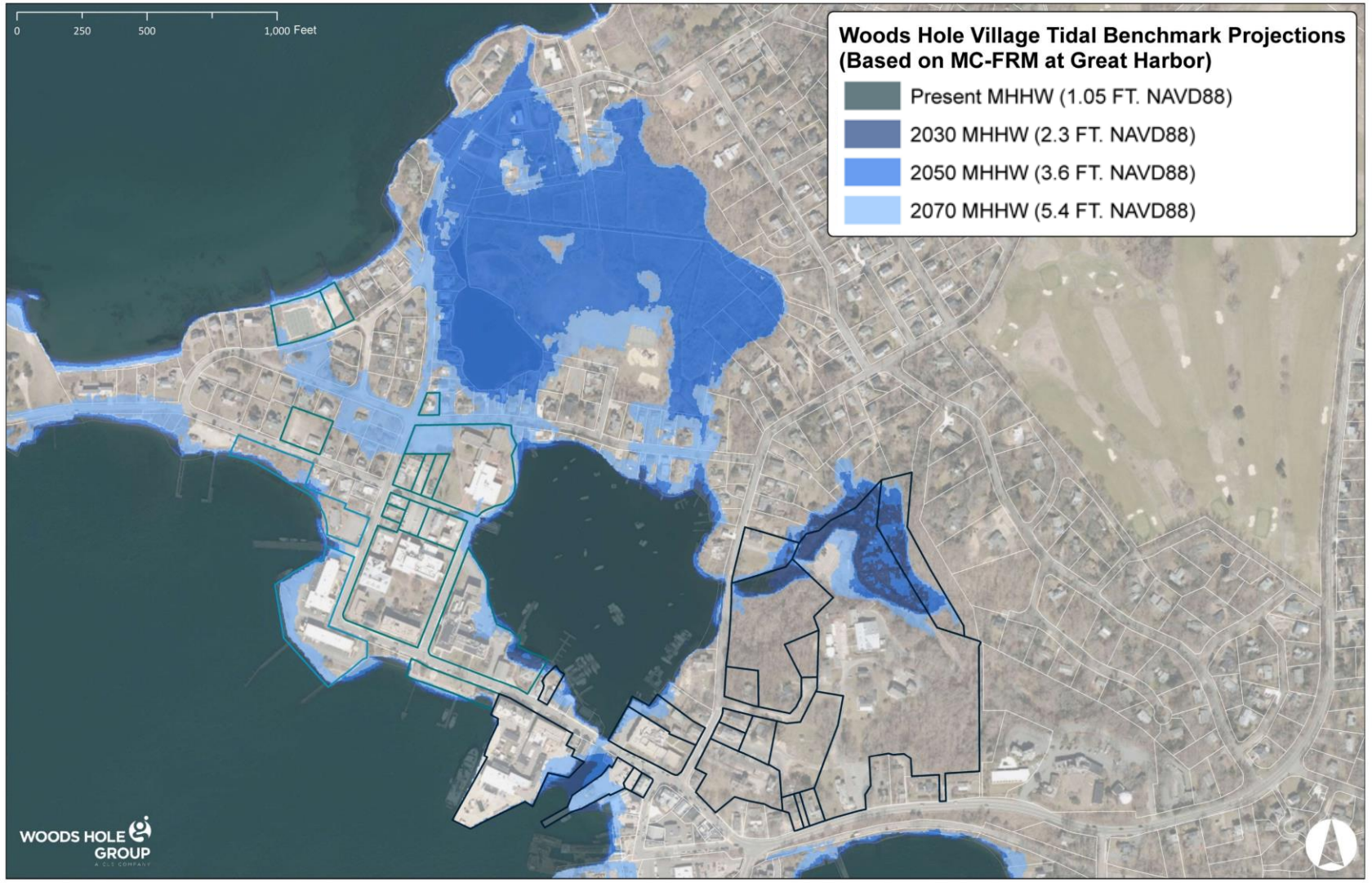
Phase 1 – Nuisance Flooding



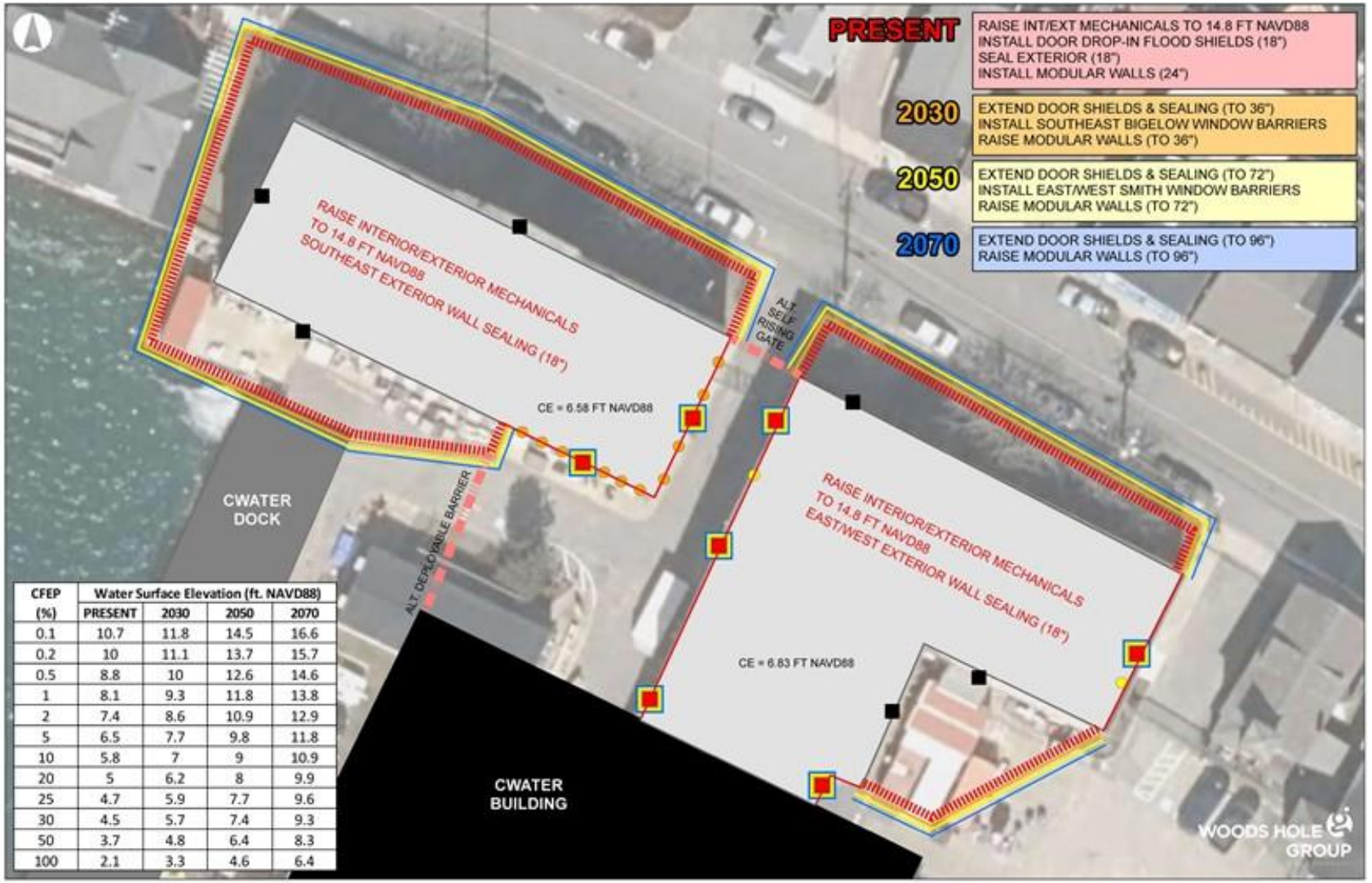
Phase 1 – Nuisance Flooding



Phase 1 – Nuisance Flooding



Phase 1 – WHOI/MBL/NOAA District Adaptations



CFEP	Water Surface Elevation (ft. NAVD88)			
(%)	PRESENT	2030	2050	2070
0.1	10.7	11.8	14.5	16.6
0.2	10	11.1	13.7	15.7
0.5	8.8	10	12.6	14.6
1	8.1	9.3	11.8	13.8
2	7.4	8.6	10.9	12.9
5	6.5	7.7	9.8	11.8
10	5.8	7	9	10.9
20	5	6.2	8	9.9
25	4.7	5.9	7.7	9.6
30	4.5	5.7	7.4	9.3
50	3.7	4.8	6.4	8.3
100	2.1	3.3	4.6	6.4

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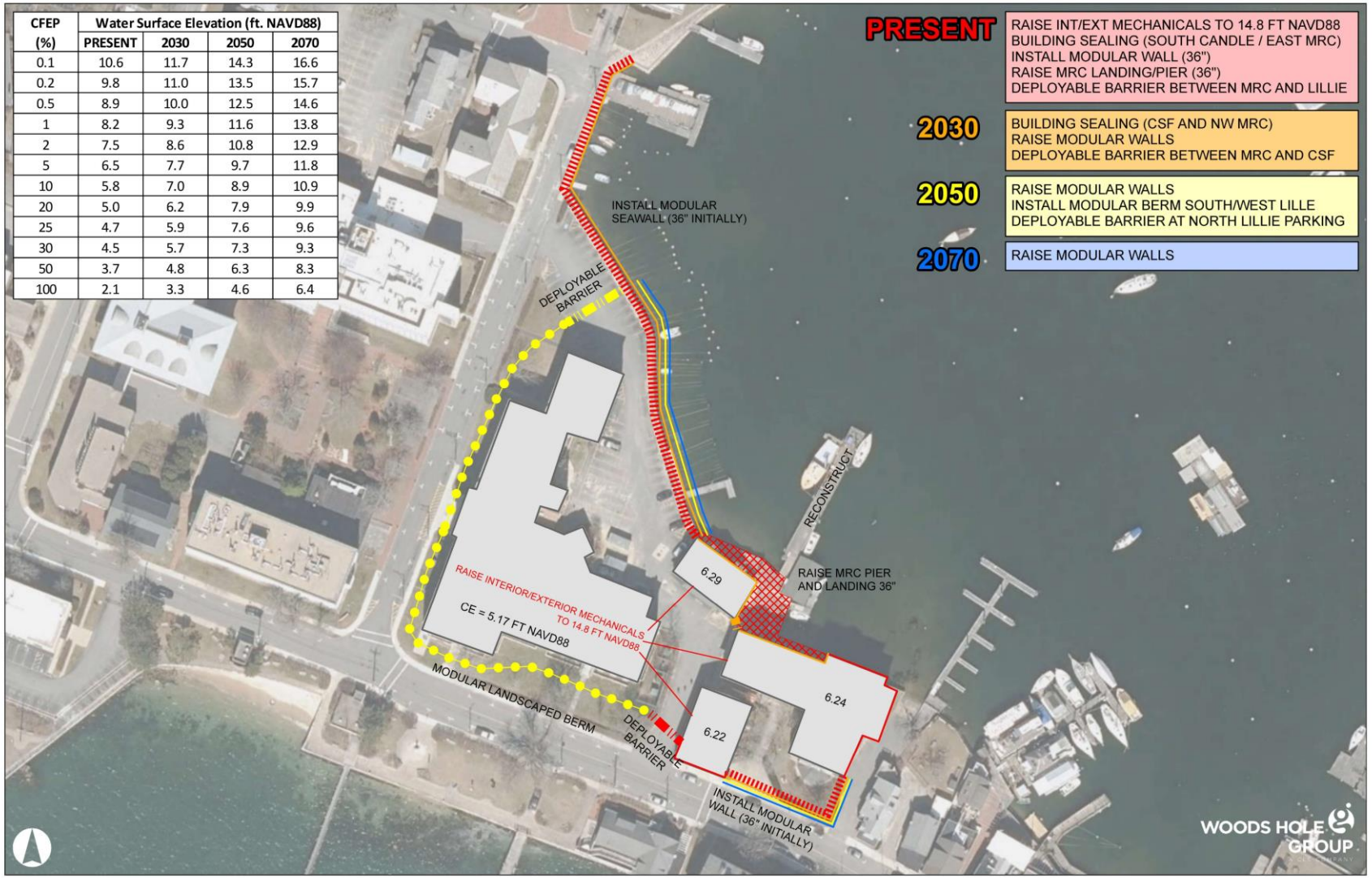
Phase 1 – WHOI/MBL/NOAA District Adaptations

CFEP	Water Surface Elevation (ft. NAVD88)			
(%)	PRESENT	2030	2050	2070
0.1	10.6	11.7	14.3	16.6
0.2	9.8	11.0	13.5	15.7
0.5	8.9	10.0	12.5	14.6
1	8.2	9.3	11.6	13.8
2	7.5	8.6	10.8	12.9
5	6.5	7.7	9.7	11.8
10	5.8	7.0	8.9	10.9
20	5.0	6.2	7.9	9.9
25	4.7	5.9	7.6	9.6
30	4.5	5.7	7.3	9.3
50	3.7	4.8	6.3	8.3
100	2.1	3.3	4.6	6.4



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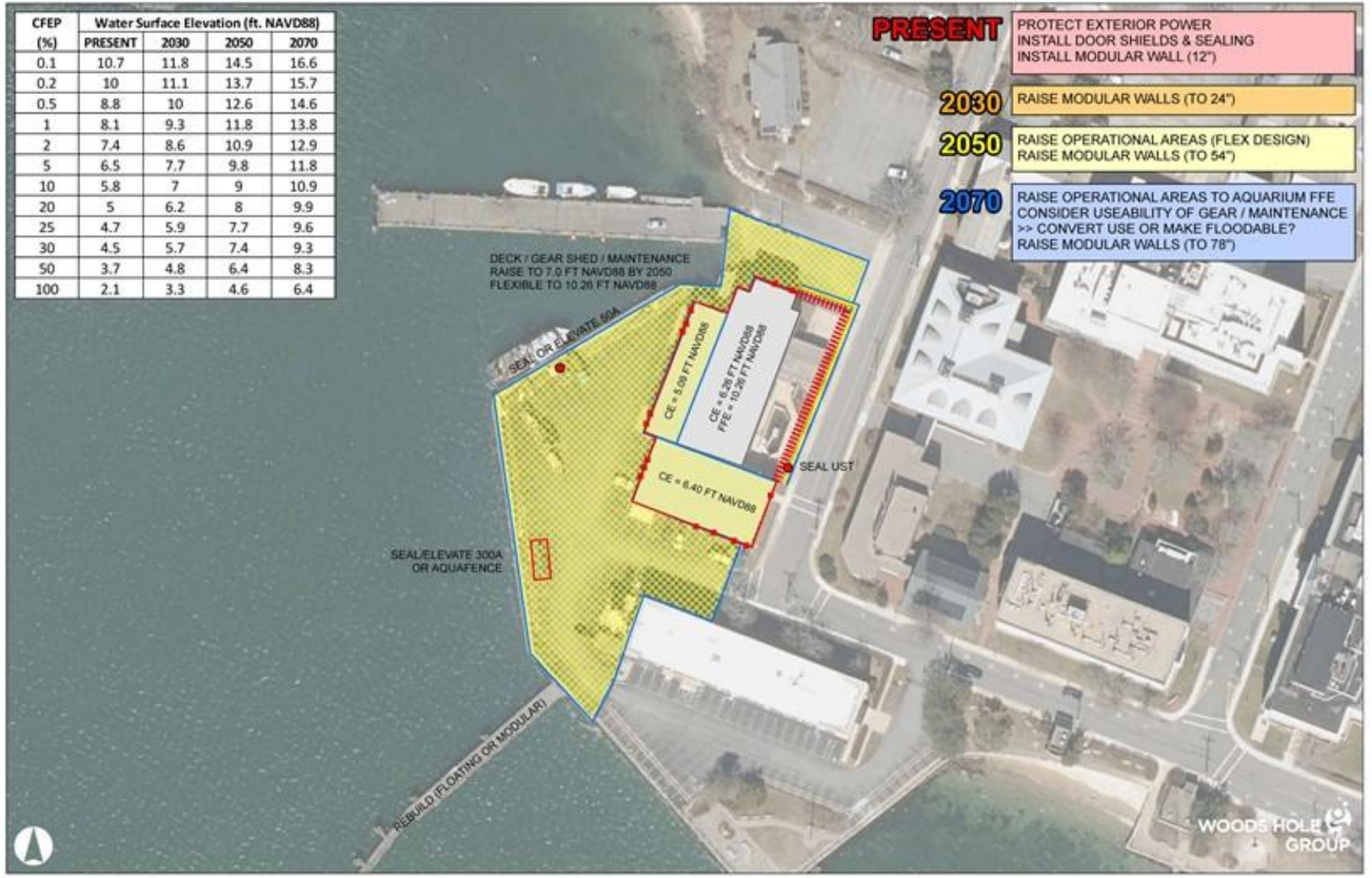
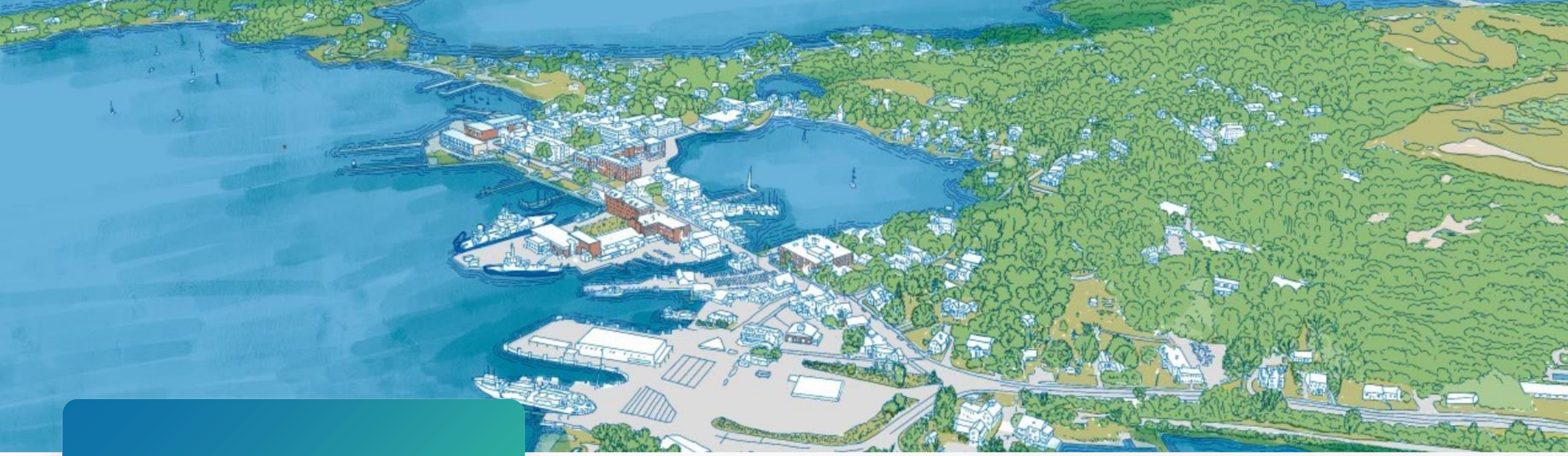
Phase 1 – WHOI/MBL/NOAA District Adaptations

CFEP	Water Surface Elevation (ft. NAVD88)			
(%)	PRESENT	2030	2050	2070
0.1	10.7	11.8	14.5	16.6
0.2	10	11.1	13.7	15.7
0.5	8.8	10	12.6	14.6
1	8.1	9.3	11.8	13.8
2	7.4	8.6	10.9	12.9
5	6.5	7.7	9.8	11.8
10	5.8	7	9	10.9
20	5	6.2	8	9.9
25	4.7	5.9	7.7	9.6
30	4.5	5.7	7.4	9.3
50	3.7	4.8	6.4	8.3
100	2.1	3.3	4.6	6.4





ResilientWoodsHole Phase 2

What are the potential impacts of climate change on the broader Woods Hole community?

Extended Climate Change Vulnerability Assessment (Woods Hole residential community, businesses, roadways, lifelines), supplemental adaptation planning (WHOI/MBL/NOAA) and initial outreach.

WOODS HOLE GROUP
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Phase 2 – Extended CCVA review of Town infrastructure

Woods Hole Drawbridge Hut

Critical Elevation: 4.8 ft NAVD88

Threshold Description:

Rear bulkhead; the critical elevation was obtained through a field-survey conducted by the Town.

Probability of Exceedance Summary Table

% Probability	Present		2030		2070	
	Flood Elevation	Depth Above Critical Elev.	Flood Elevation	Depth Above Critical Elev.	Flood Elevation	Depth Above Critical Elev.
0.1	11.5	6.8	12.2	7.4	17.1	12.3
0.2	10.7	5.9	11.4	6.6	16.2	11.4
0.5	10.0	5.3	10.8	6.0	15.4	10.6
1	9.1	4.3	9.9	5.1	14.3	9.6
2	8.4	3.6	9.2	4.5	13.5	8.7
5	7.7	2.9	8.6	3.8	12.7	7.9
10	6.7	1.9	7.6	2.9	11.6	6.8
20	5.8	1.1	6.9	2.1	10.7	5.9
25	5.0	0.2	6.1	1.3	9.7	5.0
30	4.7	dry	5.8	1.0	9.4	4.6
50	4.5	dry	5.6	0.8	9.1	4.3
100	3.6	dry	4.8	dry	8.1	3.3

Consequence of Exceedance

	Area of Service Loss	Duration of Service Loss	Cost of Damage	Impacts to Public Safety	Impacts to Economic Activities	Impacts to Public Health & Environ.	Consequence Score
Scores	3	3	3	3	4	1	57

Risk of Exceedance

Time horizon	Probability of Exceedance	Consequence Score	Risk Score	Weight	Composite Risk Score	Composite Risk Rank
Present	25	57	1417	0.5	2692	78; 45 (w/o roads)
2030	50	57	2833	0.3		
2070	100	57	5667	0.2		

Woods Hole Sewer Lift Station Wet Well

Critical Elevation: 8.3 ft NAVD88

Threshold Description:

Top of tank; the critical elevation was obtained through a field-survey conducted by the Town.

Probability of Exceedance Summary Table

% Probability	Present		2030		2070	
	Flood Elevation	Depth Above Critical Elev.	Flood Elevation	Depth Above Critical Elev.	Flood Elevation	Depth Above Critical Elev.
0.1	11.5	3.1	11.9	3.6	17.0	8.7
0.2	10.7	2.3	11.2	2.9	16.1	7.7
0.5	10.0	1.6	10.6	2.3	15.3	7.0
1	9.0	0.7	9.7	1.4	14.3	5.9
2	8.3	dry	9.1	0.8	13.4	5.1
5	7.6	dry	8.4	0.1	12.6	4.3
10	6.6	dry	7.5	dry	11.5	3.2
20	5.8	dry	6.8	dry	10.6	2.3
25	5.0	dry	6.1	dry	9.7	1.4
30	4.7	dry	5.8	dry	9.4	1.0
50	4.5	dry	5.6	dry	9.1	0.7
100	3.6	dry	4.8	dry	8.1	dry

Consequence of Exceedance

	Area of Service Loss	Duration of Service Loss	Cost of Damage	Impacts to Public Safety	Impacts to Economic Activities	Impacts to Public Health & Environ.	Consequence Score
Scores	3	2	2	1	2	4	47

Risk of Exceedance

Time horizon	Probability of Exceedance	Consequence Score	Risk Score	Weight	Composite Risk Score	Composite Risk Rank
Present	1	47	47	0.5	560	126; 89 (w/o roads)
2030	5	47	233	0.3		
2070	50	47	2333	0.2		

Park Road Sewer Lift Station

Critical Elevation: 4.6 ft NAVD88

Threshold Description:

Top of raised tank; the critical elevation was obtained through a field-survey conducted by the Town.

Probability of Exceedance Summary Table

% Probability	Present		2030		2070	
	Flood Elevation	Depth Above Critical Elev.	Flood Elevation	Depth Above Critical Elev.	Flood Elevation	Depth Above Critical Elev.
0.1	14.1	9.5	15.4	10.7	20.4	15.8
0.2	13.1	8.5	14.4	9.8	19.2	14.6
0.5	12.4	7.7	13.6	9.0	18.3	13.7
1	11.3	6.7	12.5	7.9	16.9	12.3
2	10.5	5.8	11.7	7.0	15.9	11.3
5	9.6	5.0	10.8	6.2	14.9	10.2
10	8.5	3.9	9.7	5.0	13.5	8.8
20	7.6	3.0	8.8	4.1	12.4	7.7
25	6.6	2.0	7.8	3.2	11.2	6.5
30	6.3	1.7	7.4	2.8	10.7	6.1
50	6.0	1.4	7.1	2.5	10.4	5.7
100	4.9	0.3	6.1	1.4	9.1	4.5

Consequence of Exceedance

	Area of Service Loss	Duration of Service Loss	Cost of Damage	Impacts to Public Safety	Impacts to Economic Activities	Impacts to Public Health & Environ.	Consequence Score
Scores	2	2	2	1	1	3	37

Risk of Exceedance

Time horizon	Probability of Exceedance	Consequence Score	Risk Score	Weight	Composite Risk Score	Composite Risk Rank
Present	100	37	3667	0.5	3667	32; 13 (w/o roads)
2030	100	37	3667	0.3		
2070	100	37	3667	0.2		

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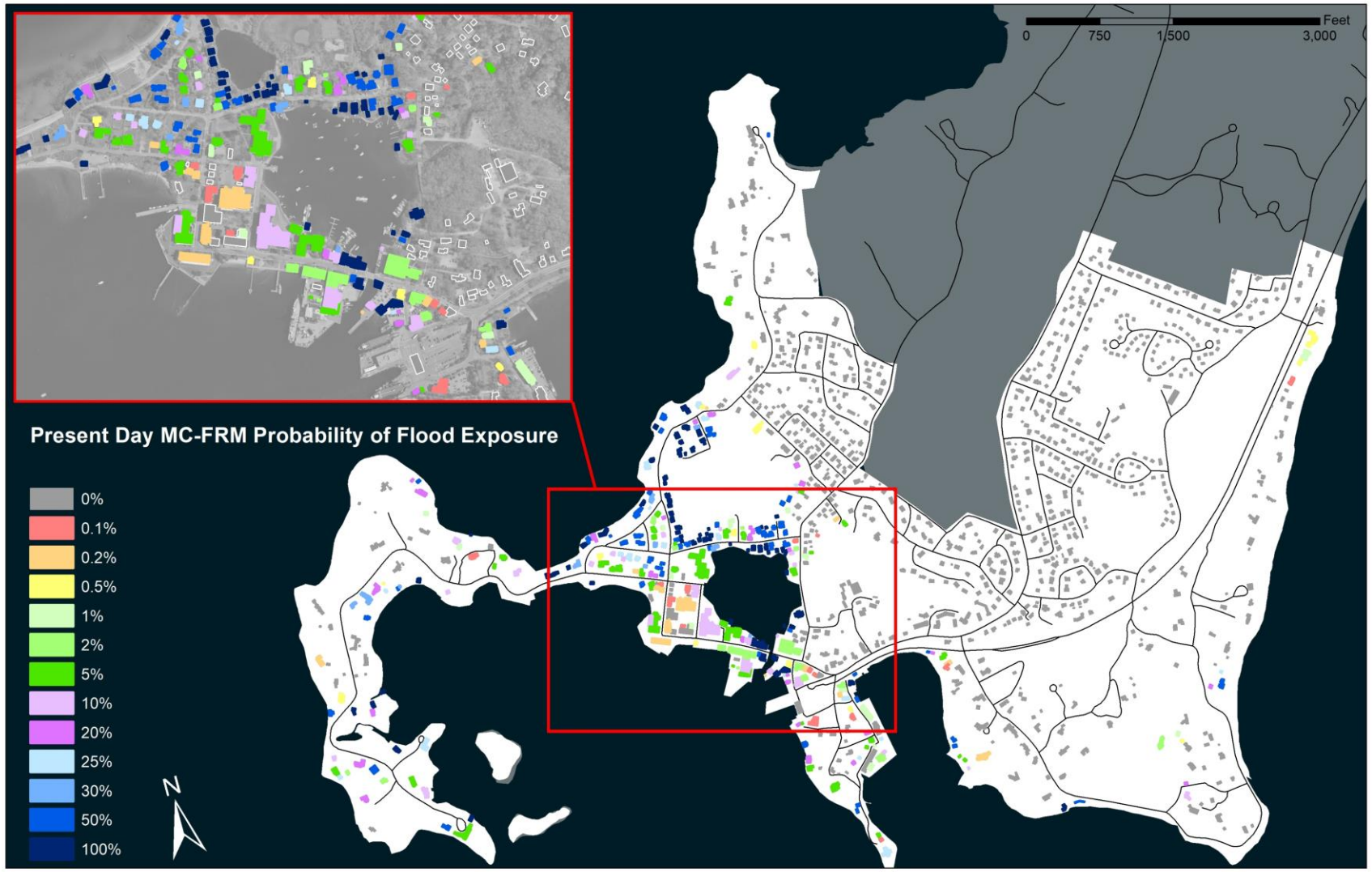
A CLS COMPANY

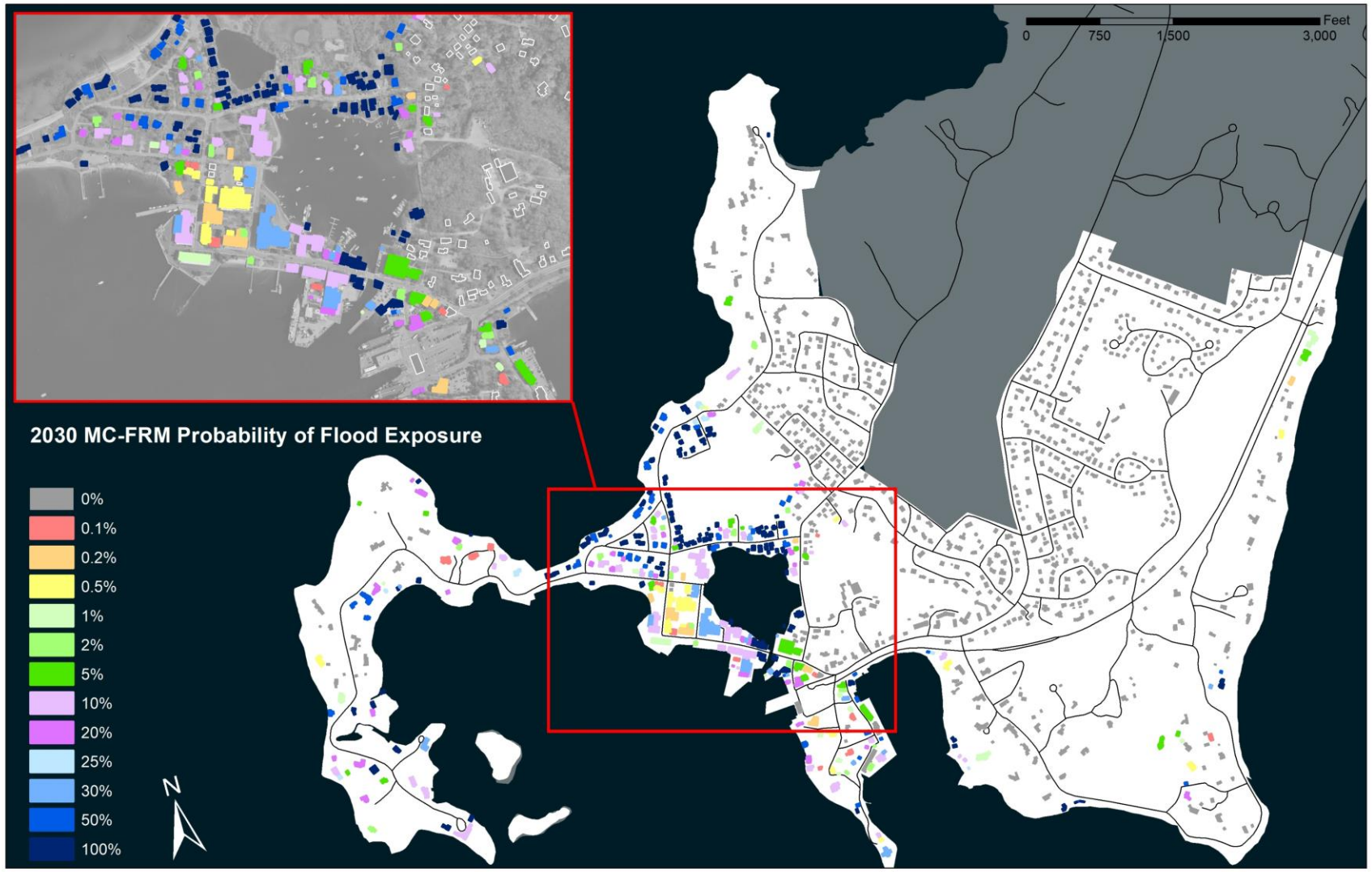
Phase 2 – Extended CCVA Structures



Vulnerable at Present 1%	
Residential	220/879
WHOI-NOAA-MBL	27/153
Business	14/24
Non-Profit	6/19
Lifelines	10/14

WOODS HOLE GROUP
A CLS COMPANY

Phase 2 – Extended CCVA Structures



Vulnerable at 2030 1%	
Residential	238/879
WHOI-NOAA-MBL	31/153
Business	15/24
Non-Profit	7/19
Lifelines	10/14

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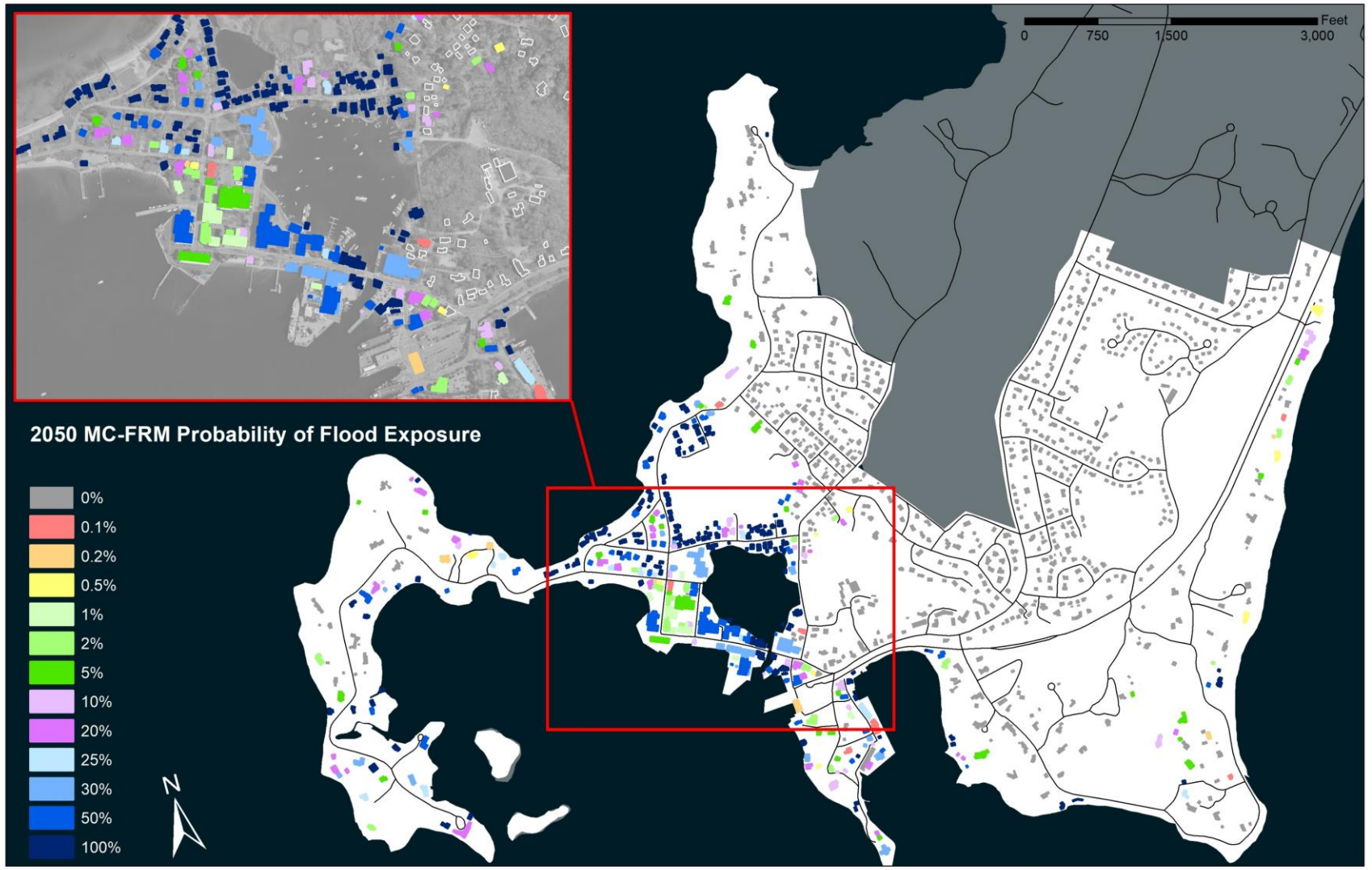
Phase 2 – Extended CCVA Structures



Vulnerable at 2050 1%	
Residential	257/879
WHOI-NOAA-MBL	44/153
Business	17/24
Non-Profit	7/19
Lifelines	11/14

WOODS HOLE GROUP
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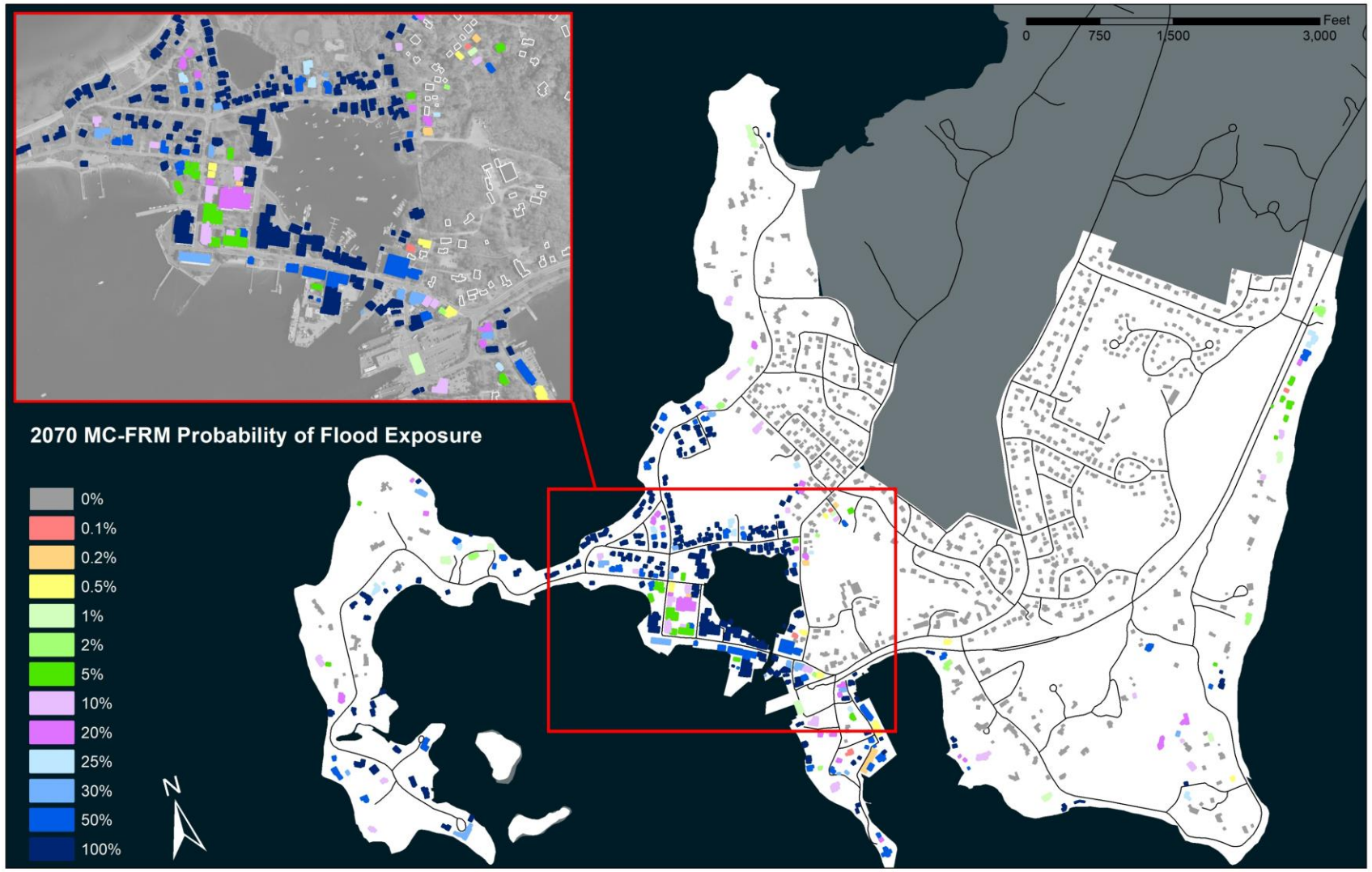
Phase 2 – Extended CCVA Structures



Vulnerable at 2070 1%	
Residential	281/879
WHOI-NOAA-MBL	44/153
Business	18/24
Non-Profit	7/19
Lifelines	12/14

WOODS HOLE GROUP
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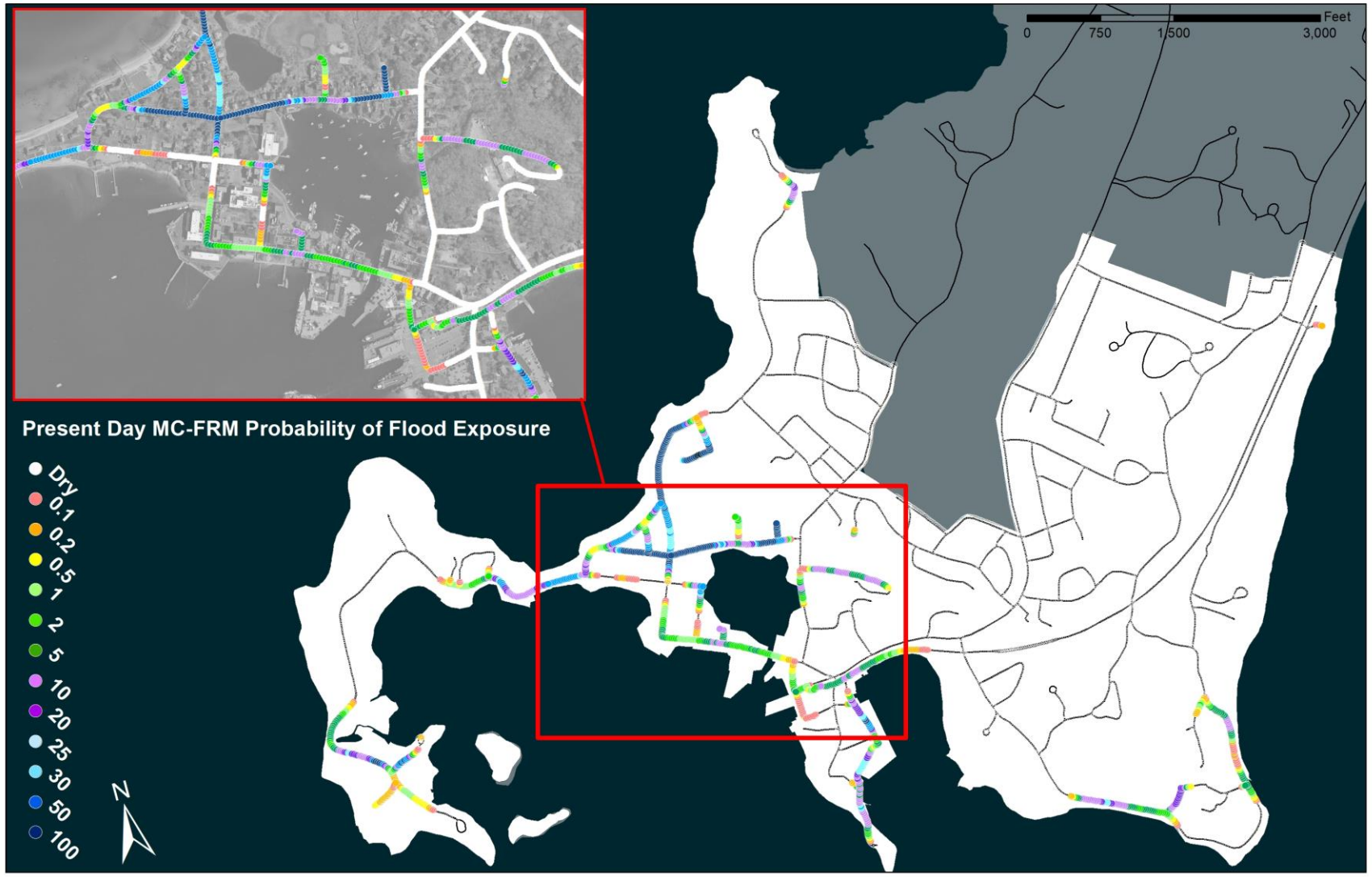
Phase 2 – Extended CCVA Roadways



Vulnerable at Present 1%
3.5/20.6 miles

WOODS HOLE GROUP
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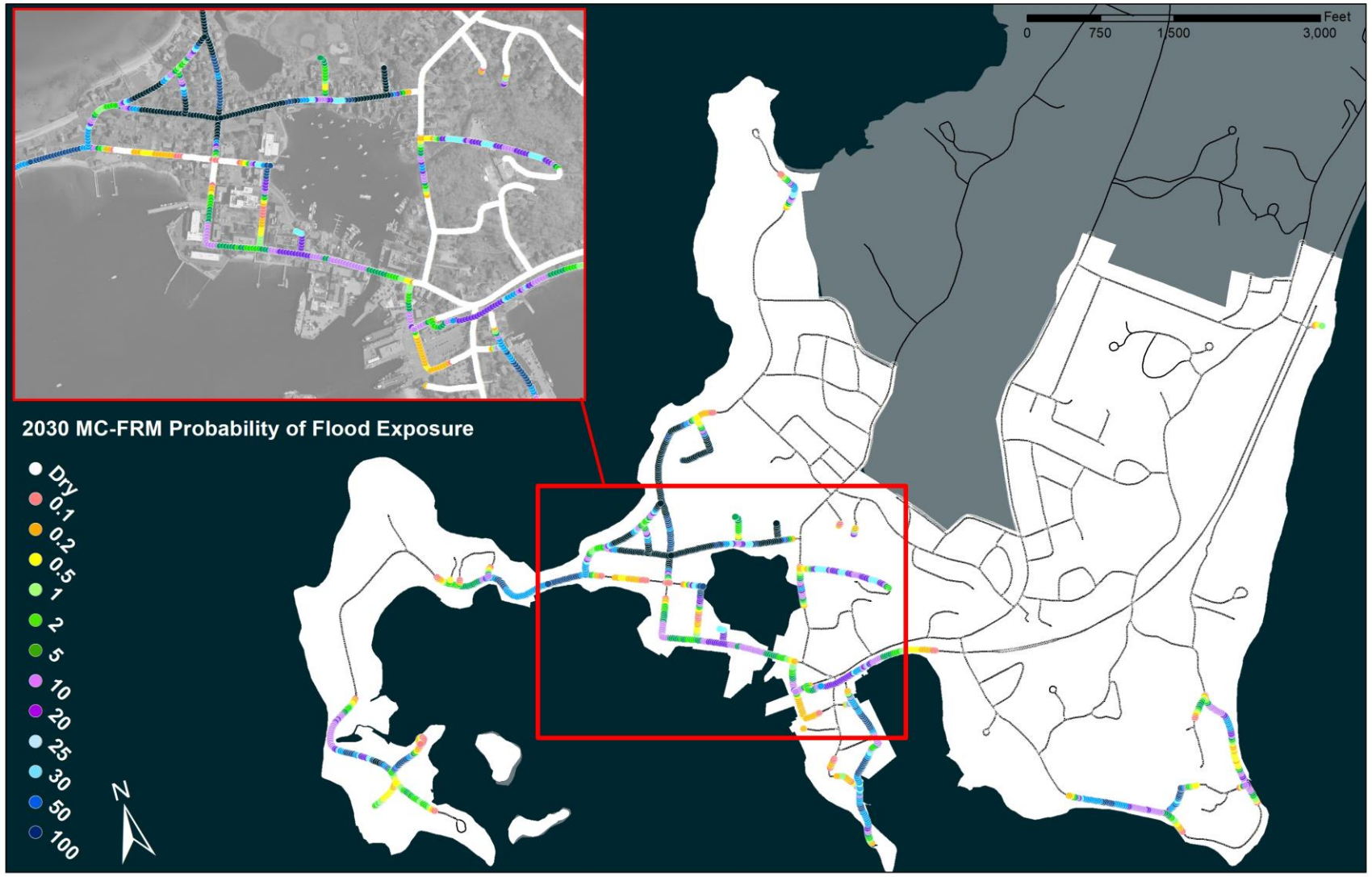
Phase 2 – Extended CCVA Roadways



Vulnerable at 2030 1%
4.0/20.6 miles

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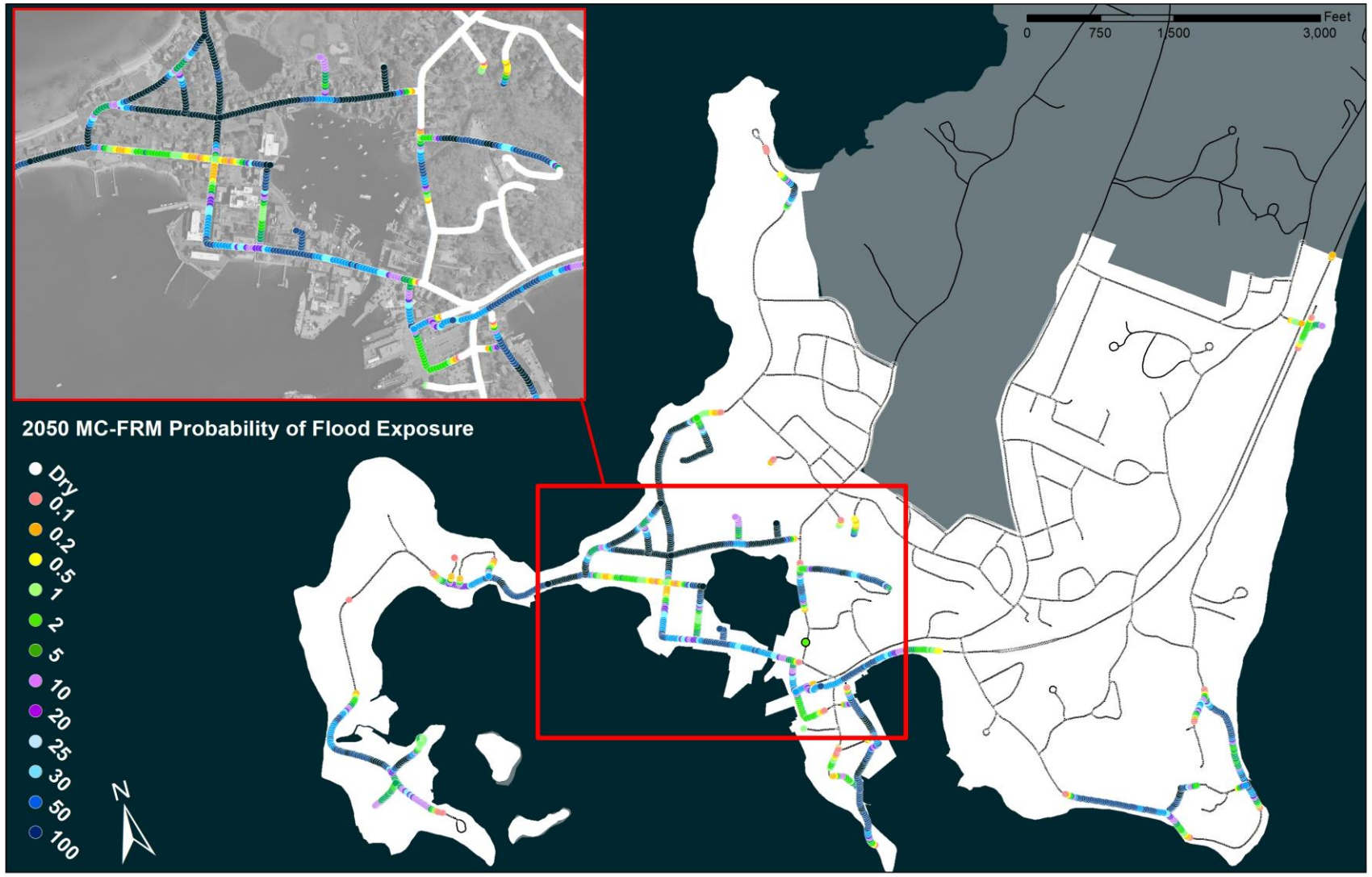
Phase 2 – Extended CCVA Roadways



Vulnerable at 2050 1%
4.9/20.6 miles

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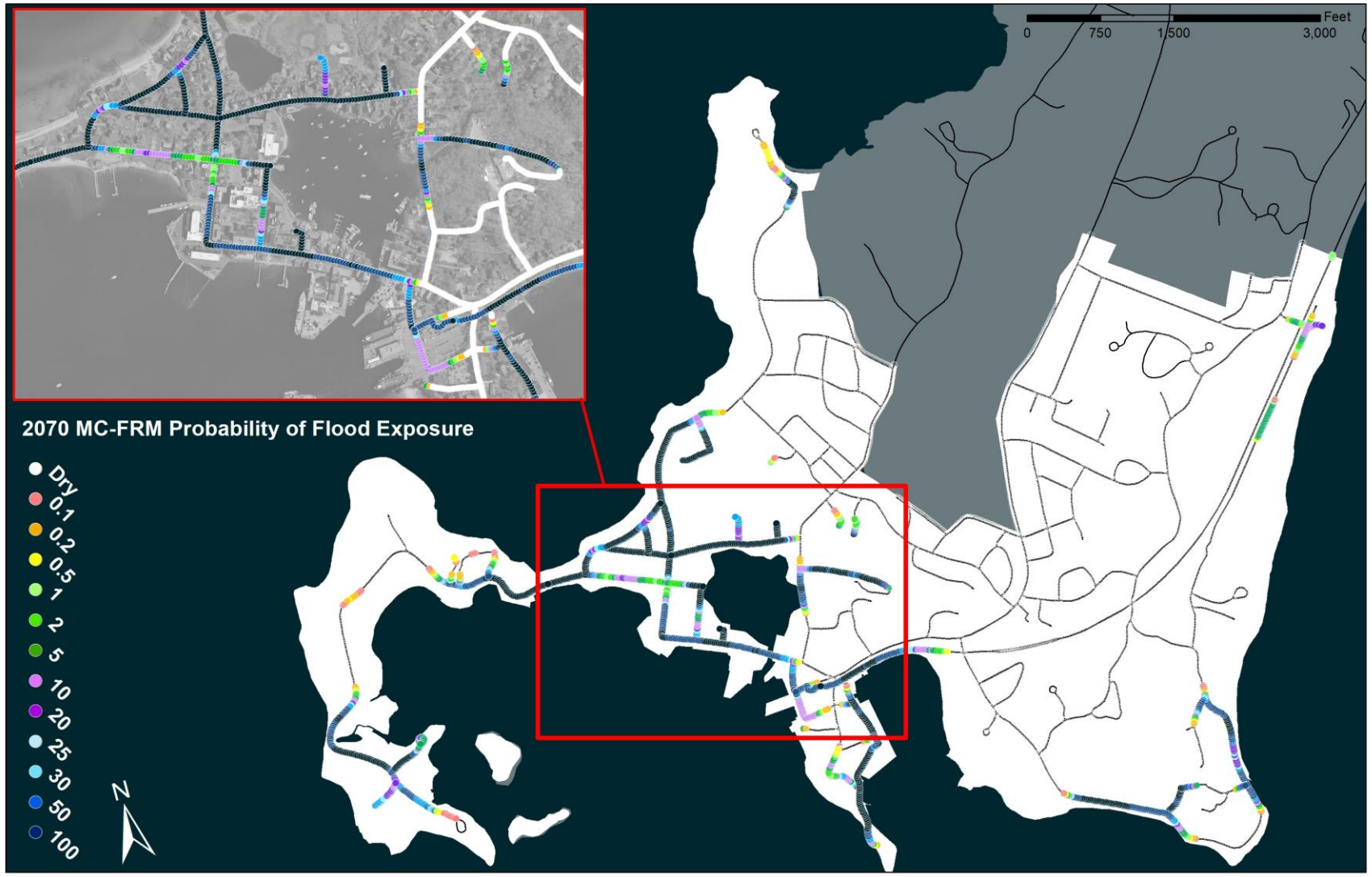
Phase 2 – Extended CCVA Roadways



Vulnerable at 2070 1%
5.4/20.6 miles

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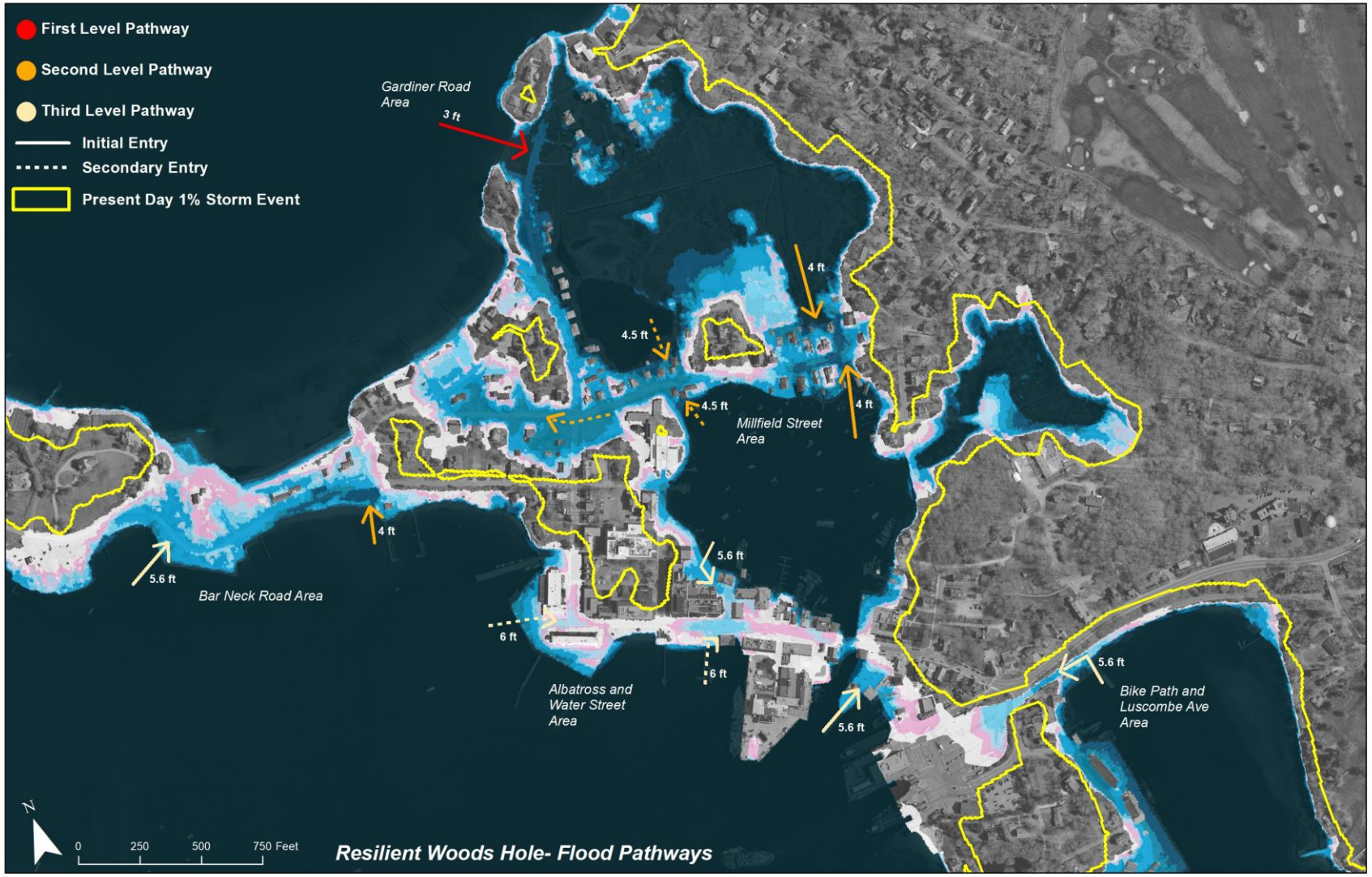
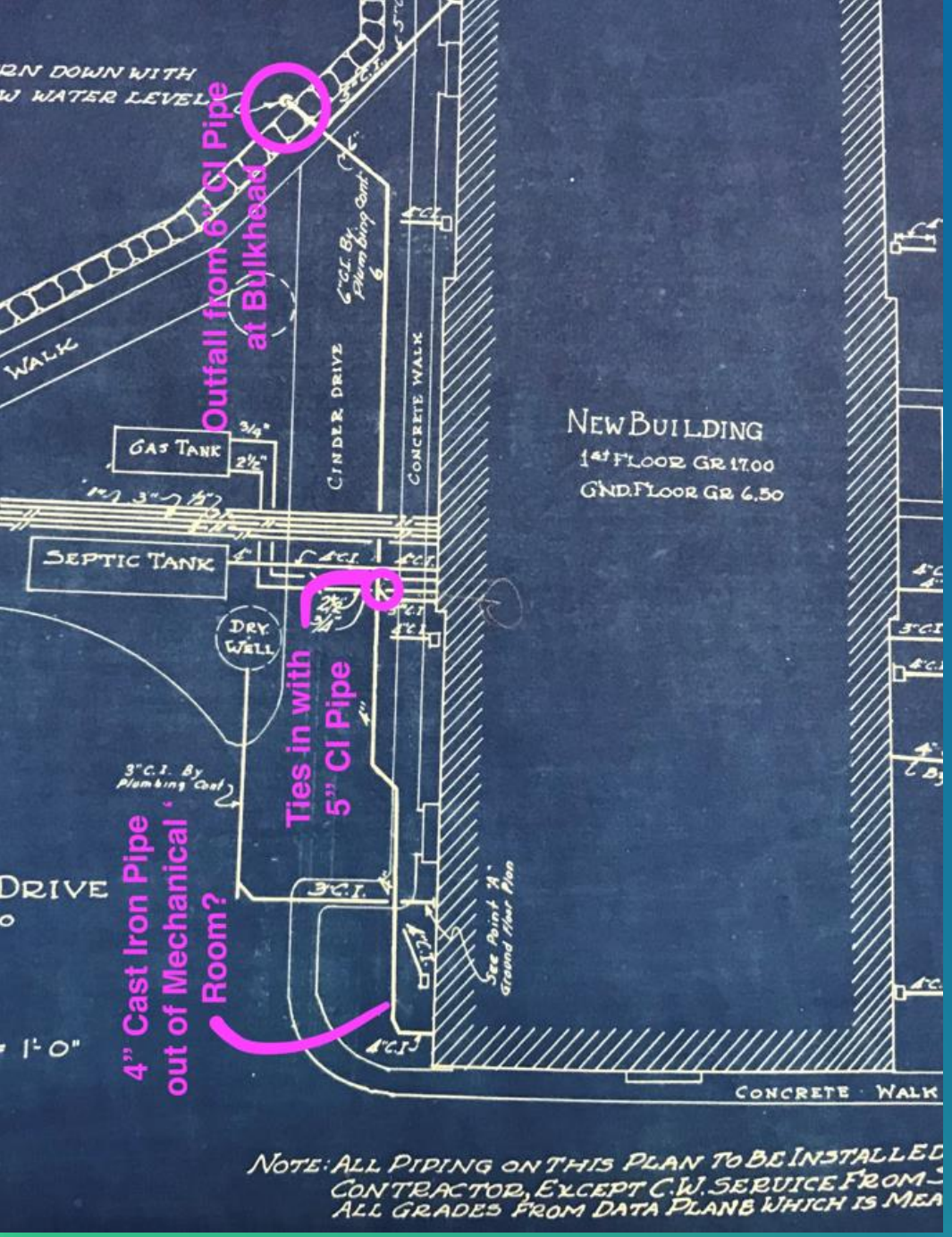
Phase 2 – Flood Pathways Analysis



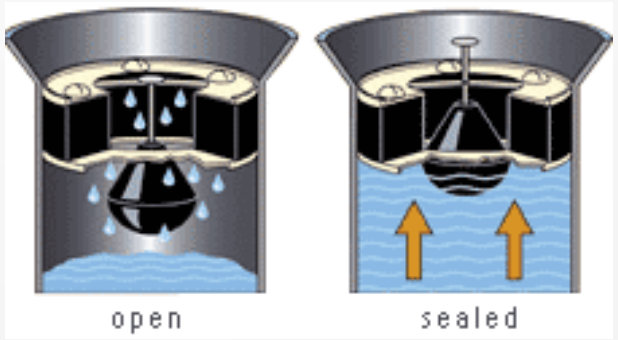


WHOI Bigelow

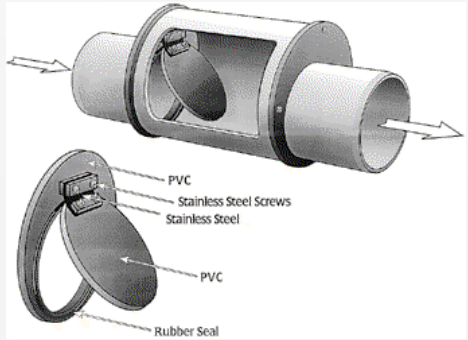
3 drain lines to Iselin Dock bulkhead <MLLW

Install check valves or backflow preventers

Keep surge from backing up into boiler/chiller room, lab, and corridor



https://drain-net.com/shop-by-product/spill-flooding-containment/product/drain-backflow-preventer-3



https://www.jerman.com/backflowpreventers/lchkva1.htm

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MBL Seawater Pumphouse

Door to below grade pumps

48” high door barrier and exterior façade sealing

0.5%>0% / 2%>0% / 10%>0.5% / 50%>2%

floodproofing.com

floodproofing.com

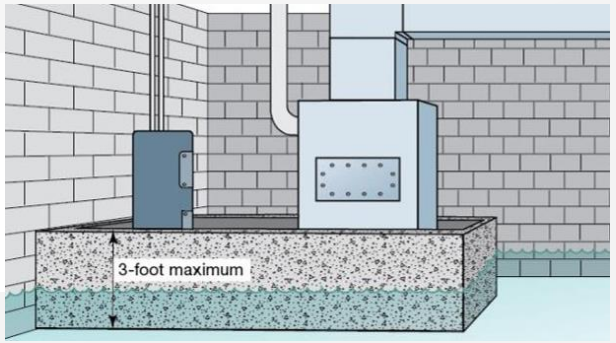
NOAA Fisheries Aquarium

Vent from Aquarium basement 14” above Gear Shed floor

36” high deployable barrier or masonry wall in Gear Shed

5%>1% / 10%>2% / 50%>10% / 100%>50%

floodproofing.com



https://emilms.fema.gov/is_0279a/groups/60.html

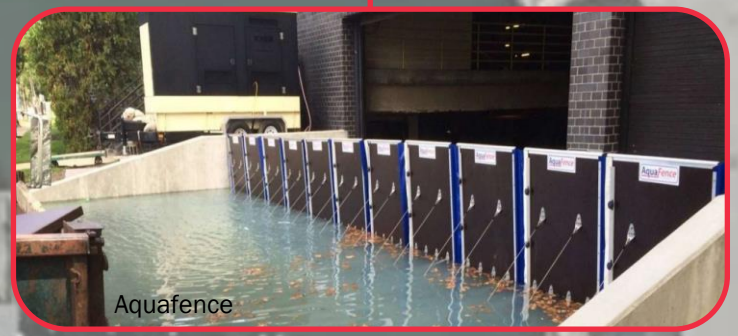
Redfield Laboratory

alternative a

tie-in to high ground >

7.3 FT NAVD88

Deployable barriers
(~275 ft.)



Top of existing wall = 11.3 FT NAVD88

%	Water Surface Elevation (FT NAVD88)			
	Present	2030	2050	2070
0.1	10.6	11.7	14.3	16.6
0.2	9.8	11.0	13.5	15.7
0.5	8.9	10.0	12.5	14.6
1	8.2	9.3	11.6	13.8
2	7.5	8.6	10.8	12.9
5	6.5	7.7	9.7	11.8
10	5.8	7.0	8.9	10.9
20	5.0	6.2	7.9	9.9
25	4.7	5.9	7.6	9.6
30	4.5	5.7	7.3	9.3
50	3.7	4.8	6.3	8.3
100	2.1	3.3	4.6	6.4

Redfield Laboratory

alternative b

Elevated berm park
11.3 FT
NAVD88

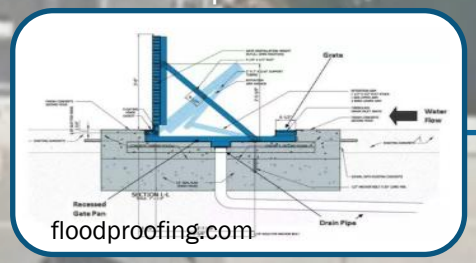
tie-in to high ground>

7.3 FT NAVD88

Level pond side of parking lot to Redfield grade

~4 ft wall to match existing

passive barrier



Top of existing wall = 11.3 FT NAVD88

%	Water Surface Elevation (FT NAVD88)			
	Present	2030	2050	2070
0.1	10.6	11.7	14.3	16.6
0.2	9.8	11.0	13.5	15.7
0.5	8.9	10.0	12.5	14.6
1	8.2	9.3	11.6	13.8
2	7.5	8.6	10.8	12.9
5	6.5	7.7	9.7	11.8
10	5.8	7.0	8.9	10.9
20	5.0	6.2	7.9	9.9
25	4.7	5.9	7.6	9.6
30	4.5	5.7	7.3	9.3
50	3.7	4.8	6.3	8.3
100	2.1	3.3	4.6	6.4

%	Water Surface Elevation (FT NAVD88)			
	Present	2030	2050	2070
0.1	10.6	11.7	14.3	16.6
0.2	9.8	11.0	13.5	15.7
0.5	8.9	10.0	12.5	14.6
1	8.2	9.3	11.6	13.8
2	7.5	8.6	10.8	12.9
5	6.5	7.7	9.7	11.8
10	5.8	7.0	8.9	10.9
20	5.0	6.2	7.9	9.9
25	4.7	5.9	7.6	9.6
30	4.5	5.7	7.3	9.3
50	3.7	4.8	6.3	8.3
100	2.1	3.3	4.6	6.4

<tie-in to high ground

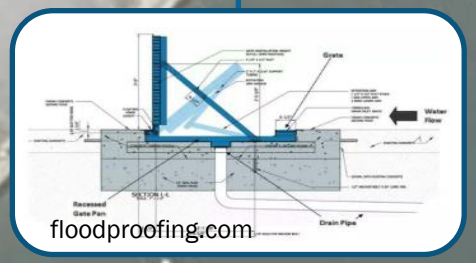
11.6 FT NAVD88 berm walkway

11.6 FT NAVD88 terraced area

5.3 FT NAVD88

Elevate sidewalk to Swope grade

7.6 FT NAVD88



passive barrier

walkovers

~4 ft parapet wall

Swope/Ebert

alternative a

%	Water Surface Elevation (FT NAVD88)			
	Present	2030	2050	2070
0.1	10.6	11.7	14.3	16.6
0.2	9.8	11.0	13.5	15.7
0.5	8.9	10.0	12.5	14.6
1	8.2	9.3	11.6	13.8
2	7.5	8.6	10.8	12.9
5	6.5	7.7	9.7	11.8
10	5.8	7.0	8.9	10.9
20	5.0	6.2	7.9	9.9
25	4.7	5.9	7.6	9.6
30	4.5	5.7	7.3	9.3
50	3.7	4.8	6.3	8.3
100	2.1	3.3	4.6	6.4

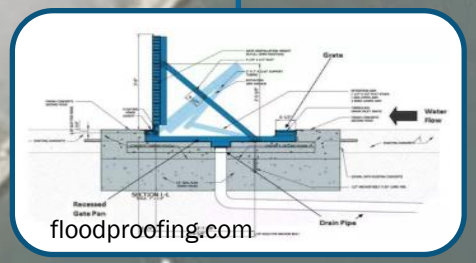
<tie-in to high ground

11.6 FT NAVD88 berm walkway

11.6 FT NAVD88 terraced area

5.3 FT NAVD88

7.6 FT NAVD88



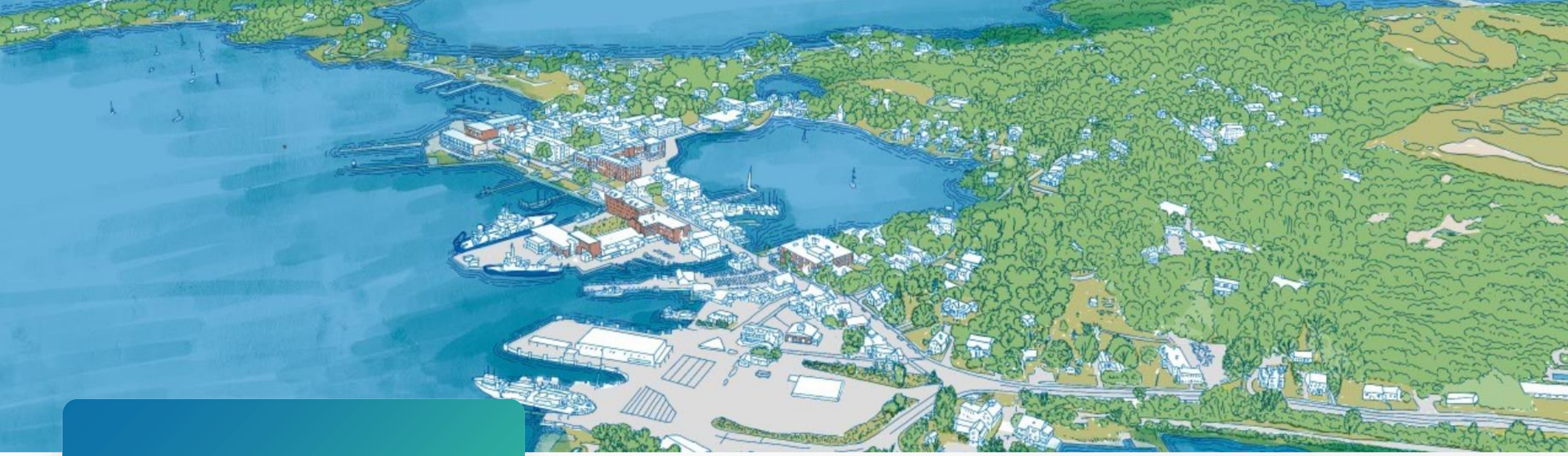
passive barrier

terraced harborwalk to 11.6 FT NAVD88
tapered back to Swope grade

Climate Ready South Boston

Swope/Ebert

alternative b



ResilientWoodsHole Phase 3

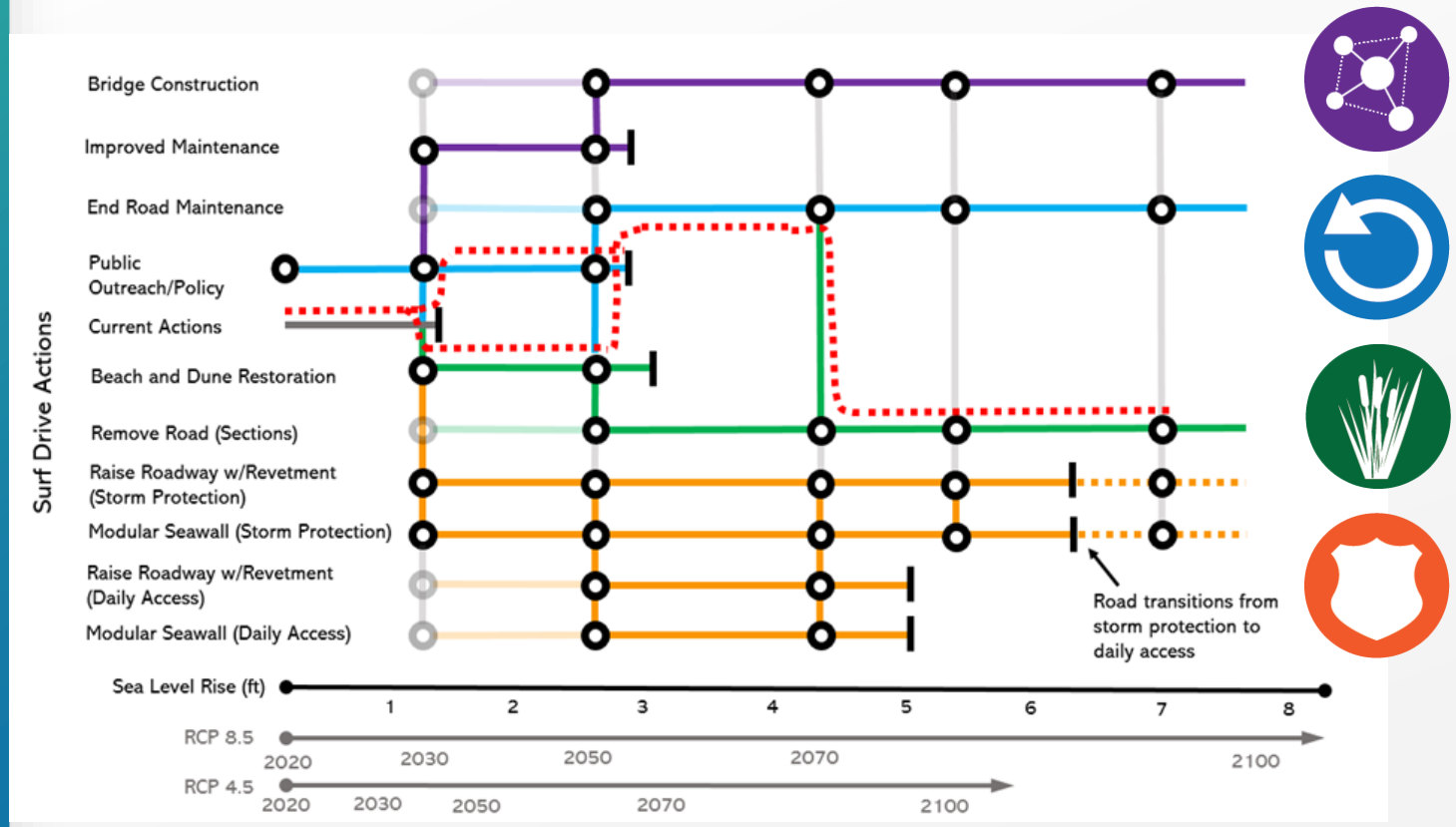
How can we work together to ensure the future of our vibrant and productive seaside community?

Comprehensive phased strategy for Woods Hole Village that integrates resilient design concepts and community visioning.

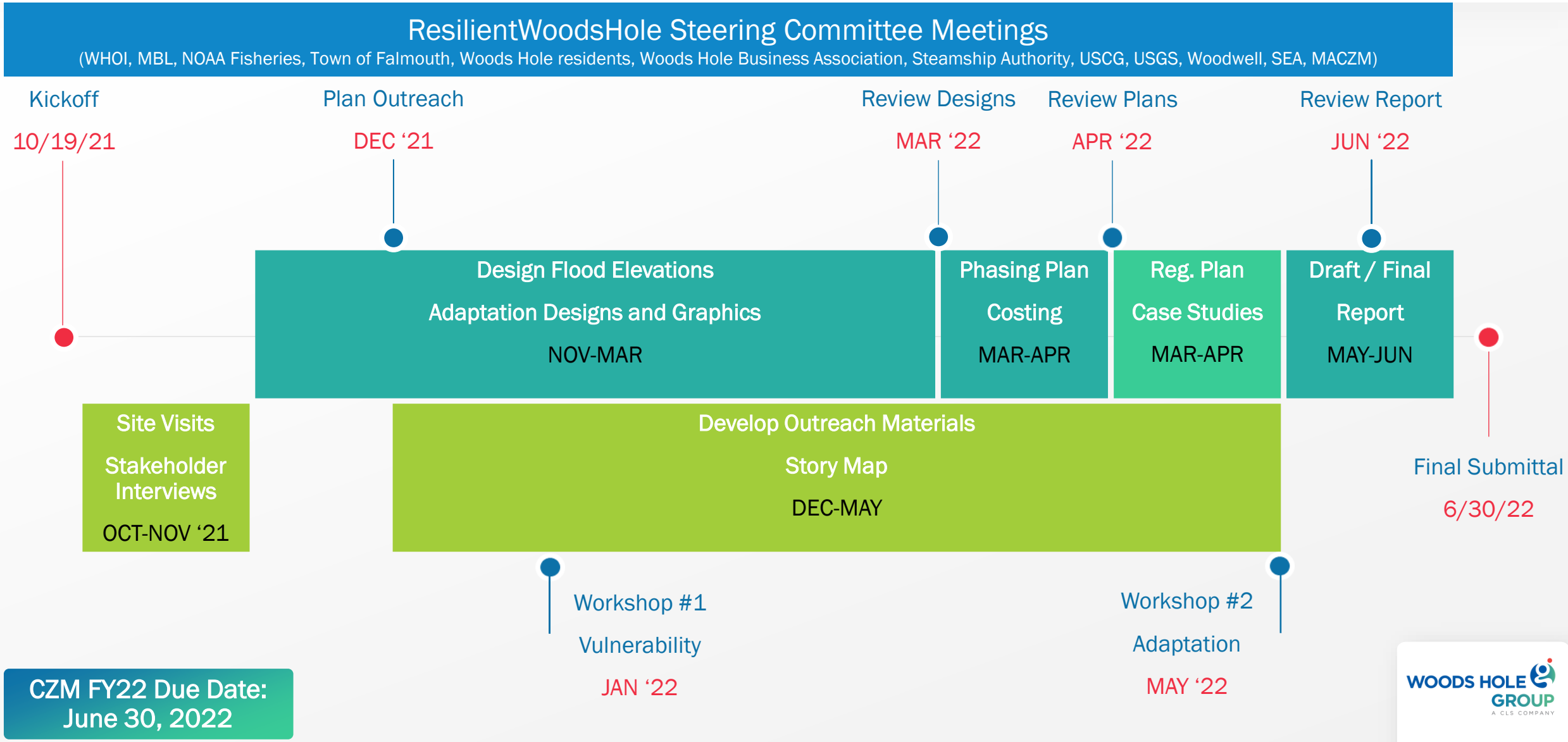
WOODS HOLE GROUP
A CLS COMPANY

Phase 3 - Goals

1. Develop community-wide **understanding of local climate impacts**.
2. Build effective **partnerships** for Village planning and visioning.
3. Develop **short-, mid-, and long-term climate adaptation actions** across strategic themes.
4. Identify key **thresholds and transition points**, based on adaptive management
5. Chart **dynamic adaptation pathways** that optimize community outcomes over time, based on community preferences and scientific projections.



Phase 3 – Process



Phase 3 - Stakeholder Interviews/Survey

How should we respond coastal flooding in the Village? What does a Resilient Woods Hole look like to you?

What makes Woods Hole Woods Hole?

- places, activities, functions, uses

Where in Woods Hole is coastal flooding already an issue?

Which important aspects of Woods Hole are place-specific, which can shift over time and maintain their importance?

What isn't in Woods Hole now that should be?

Goal of Stakeholder Interviews

Gauge community preferences to inform thematic adaptation designs and transfer points in dynamic adaptation pathways

Stakeholder survey coming soon!

WOODS HOLE GROUP
A CLS COMPANY

Thank you

Joseph Famely

Climate & Sustainability Team Lead

Woods Hole Group

jfamely@woodsholegroup.com

508-495-6220