CITY OF
BAINBRIDGE ISLAND

2026 Environmental Conference

Local Government Planning & Action Breakout

Session Agenda
45 Minutes Together

1

Small Group Discussion

2

Kitsap County Presentation

3

City Presentation

Step 1. By Yourself

1 minute

On notecard write:

1. Why you chose this session
2. Any questions you may have

Step 2. In Pairs

6 minutes

Find someone you don’t know:

1. Discuss what you wrote on your card

Step 3. Report Out

10 minutes

Each pair shares

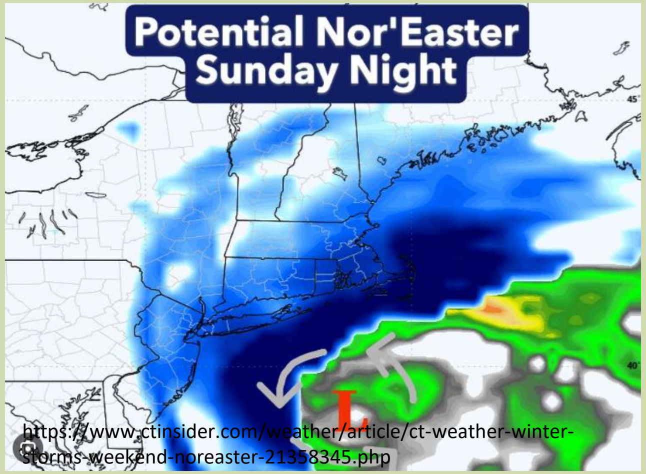
We All Have a Story To Tell

https://www.ctinsider.com/news/article/That-sinking-feeling-No-support-for-flood-wall-6459315.php

https://www.ctinsider.com/shoreline/article/saturday-flood-shoreline-perfect-storm-weather-18608098.php

https://www.nbcconnecticut.com/weather-news/stories/hurricane-sandy-10-years-later/2895856/

https://www.ctpost.com/news/article/fairfield-firefighters-rescue-drivers-storm-water-19516035.php



https://www.ctinsider.com/weather/article/ct-weather-winter-storms-weekend-noreaster-21358345.php

How a Melting Glacier Could Affect Tens of Millions Around the Globe

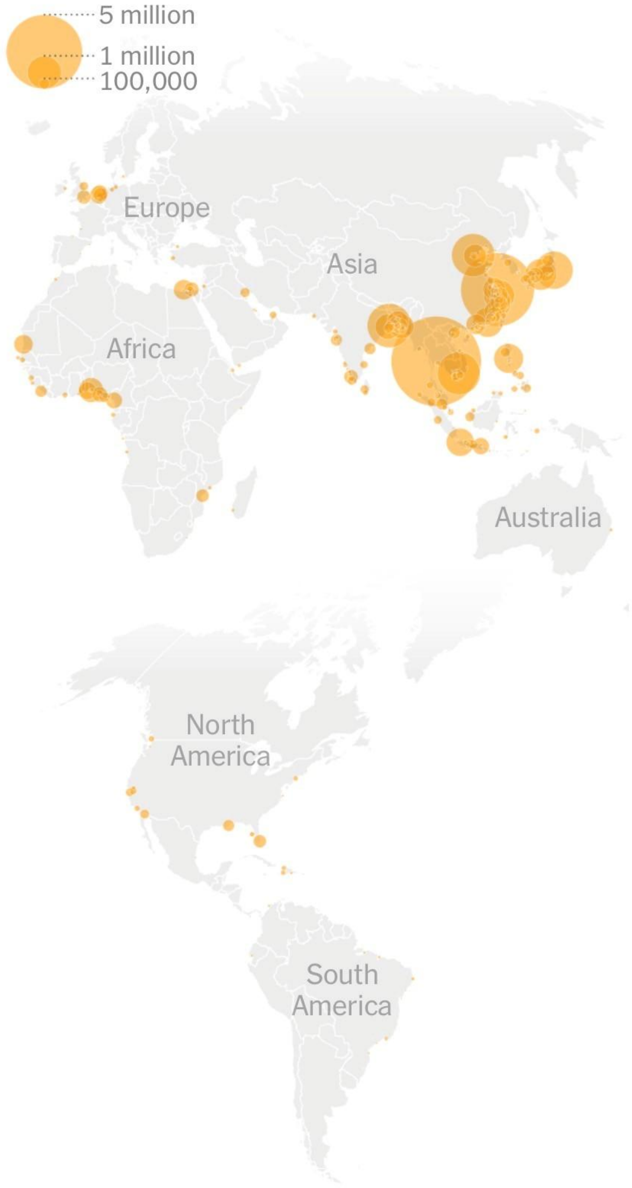
A collapse of the Thwaites Glacier in Antarctica would sharply accelerate sea-level rise in coastal cities.

By Mira Rojanasakul March 17, 2026

Scientists spent the first weeks of the year on an expedition to Antarctica to study Thwaites Glacier, which is melting at an alarming rate. If it breaks apart entirely, it could push up global sea levels by two feet over the course of several decades, affecting tens of millions worldwide, according to a New York Times analysis.

The maps below show some of the coastal cities at risk and populated, low-lying areas that could be threatened if the glacier were to collapse today.

Population within 2 feet of high tide
in cities with over 300,000 residents



Source: New York Times analysis of data from Climate Central CoastalDEM 3.0, Worldpop and Jerry Mitrovica, Harvard University.

Local Government Response

Assess Risk and Map Vulnerability

Protect Critical Infrastructure

- Roads, electrical infrastructure, hospitals, and water systems
- Flood-proof essential buildings (barriers, waterproofing)
- Relocate critical systems out of high-risk zones where possible

Planning and Zoning

- Ban or limit development in high-risk zones
- Require elevated construction for new buildings
- Create buffer zones along coastlines

Upgrade Drainage and Water Systems

- Install pumps and backflow valves
- Improve stormwater drainage capacity

Monitor, Adapt, and Iterate

- Continuously monitor shoreline and flooding data
- Adjust policies and infrastructure over time
- Use adaptive management strategies

Kitsap County

Jim Rogers
Long-Range Planning Supervisor

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BLUE COAST ENGINEERING

DEPARTMENT OF ECOLOGY
State of Washington

KITSAP COUNTY

Sea Level Rise Vulnerability and Risk Assessment

This project was funded under a Shoreline Planning Competitive Grant received by the State of Washington Department of Ecology.

Agenda

- **Vulnerability Assessment Results**
- **Draft Adaptation Strategies**
- **Recommended Next Steps**

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SLR Projections	90% Certainty	50% Certainty	1% Certainty
2050	0.5 ft	1 ft	1.5 ft
2100	1.5 ft	2.5 ft	5.0 ft

Location	50-yr Return Flood (90% Certainty		50-yr Return Flood (50% Certainty		50-yr Return Flood (1% Certainty)	
	2050	2100	2050	2100	2050	2100
Shorelines not in an inlet	3.5 ft	4.5 ft	4.0 ft	5.5 ft	4.5 ft	8.0 ft
Dyes Inlet	3.5 ft	4.5 ft	4.0 ft	5.5 ft	5.0 ft	8.5 ft
Sinclair Inlet	4.0ft	5.0 ft	4.5 ft	6.0 ft	5.0 ft	8.5 ft
Agate Pass	4.0 ft	5.0 ft	4.5 ft	6.0 ft	5.0 ft	8.5 ft
Port Gamble	4.0 ft	5.0 ft	4.5 ft	6.0 ft	5.0 ft	8.5 ft
Liberty	4.0 ft	5.0 ft	4.5 ft	6.0 ft	5.5 ft	9.0 ft

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Assessment

Exposure
Likelihood to be inundated/ damaged?

Adaptive Capacity
Ability to cope with, or be made resilient to, inundation?

Vulnerability
High, Medium, Low

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Exposure Criteria

Exposure Ranking	Description
High *– likely to be exposed sooner*	Asset may be inundated by coastal flooding (SLR or 50-year return extreme flood) by 2050 with a 90% or 50% probability.
Medium	Asset may be inundated by coastal flooding (SLR or 50-year return extreme flood) by 2050 with a 1% probability, or by 2100 with a 90% probability.
Low *-less likely to be exposed*	Asset may be inundated by coastal flooding (SLR or 50-year return extreme flood) by 2100 with a 50% or 1% probability

+4.0-4.5 ft above MHHW

+4.5-5.5 ft above MHHW

+8.0-9.0 ft above MHHW

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Vulnerability Matrix

Exposure \ Adaptive Capacity	High	Medium	Low
High	Medium Vulnerability	High Vulnerability	High Vulnerability
Medium	Low Vulnerability	Medium Vulnerability	High Vulnerability
Low	Low Vulnerability	Low Vulnerability	Medium Vulnerability

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List of Assets

Type of Asset				
Transportation	**Structures**	**Utilities Infrastructure**	**Environmental**	**Land Use**
Roads and Transportation	Coastal Buildings	Coastal On-Site Septic Systems[7]	Beaches	Agricultural Land/Farmland
Airports	Police Stations	Group A and B Water Systems	Marinas and Boat Ramps	Brownfield Sites/Landfills/Toxic Cleanup Sites
	Fire Stations	PSE Substations	Wetlands	Parks
	Historic and Cultural Sites	Sewer Districts/Water Treatment Plants		Shellfish/Seafood Industrial Facilities
	Hospitals	Stormwater Facilities		
	Libraries			
	Schools			

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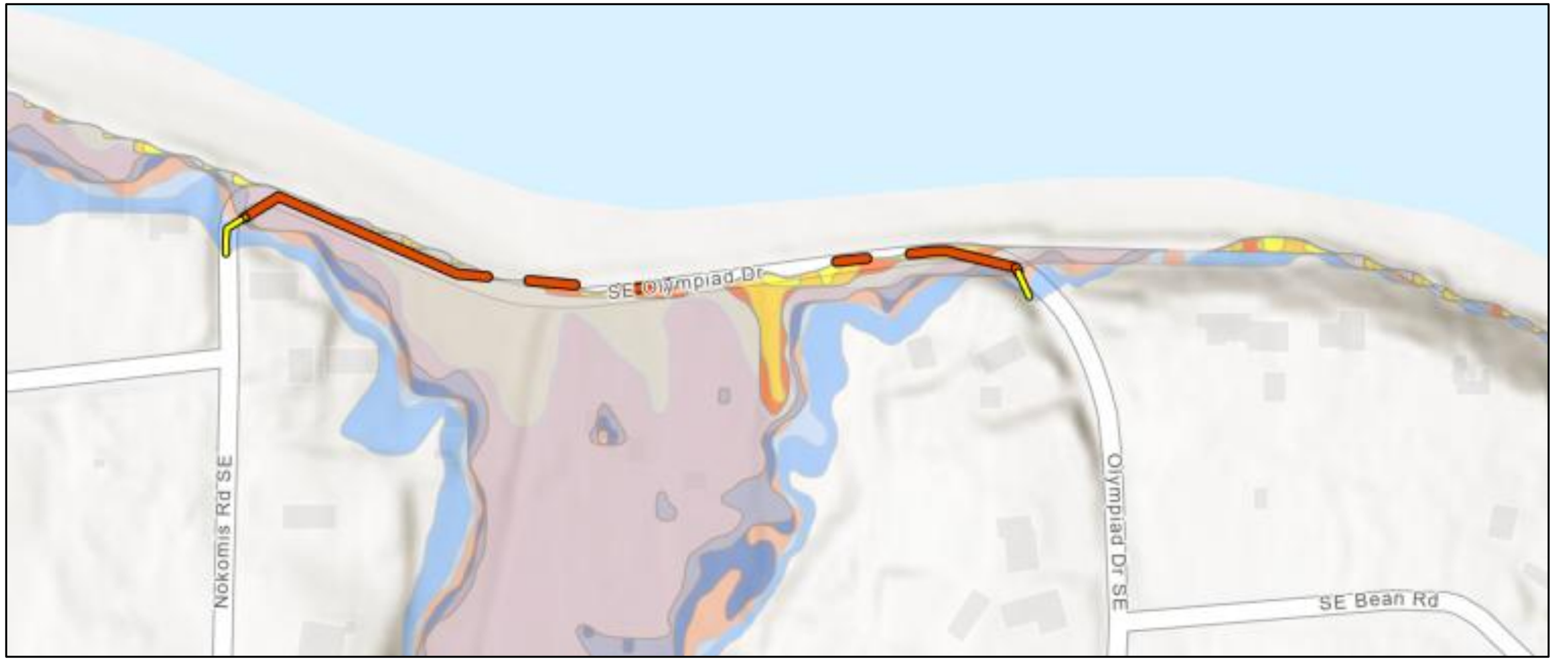
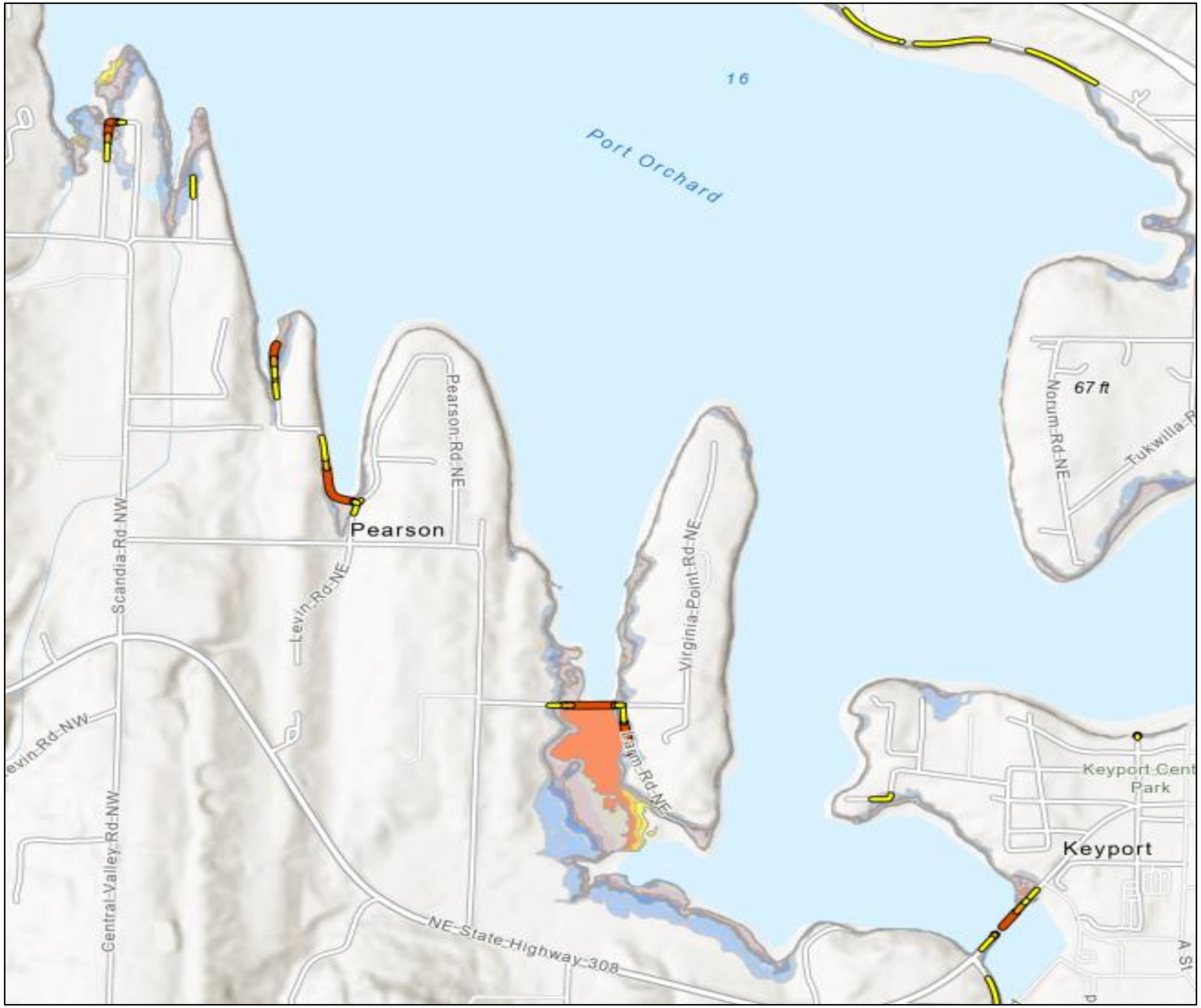
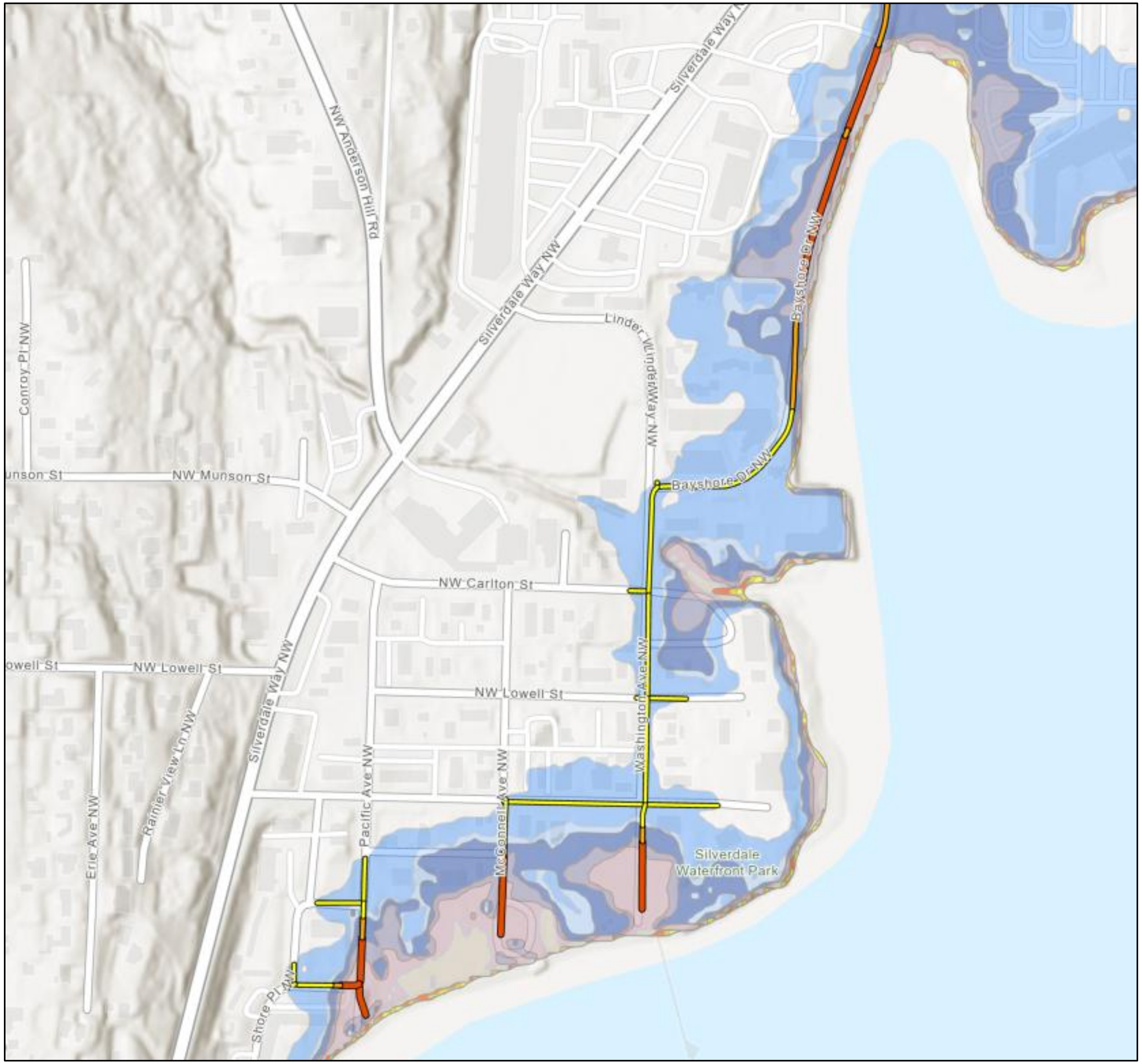


Exposure likelihood of roads in the Southworth area

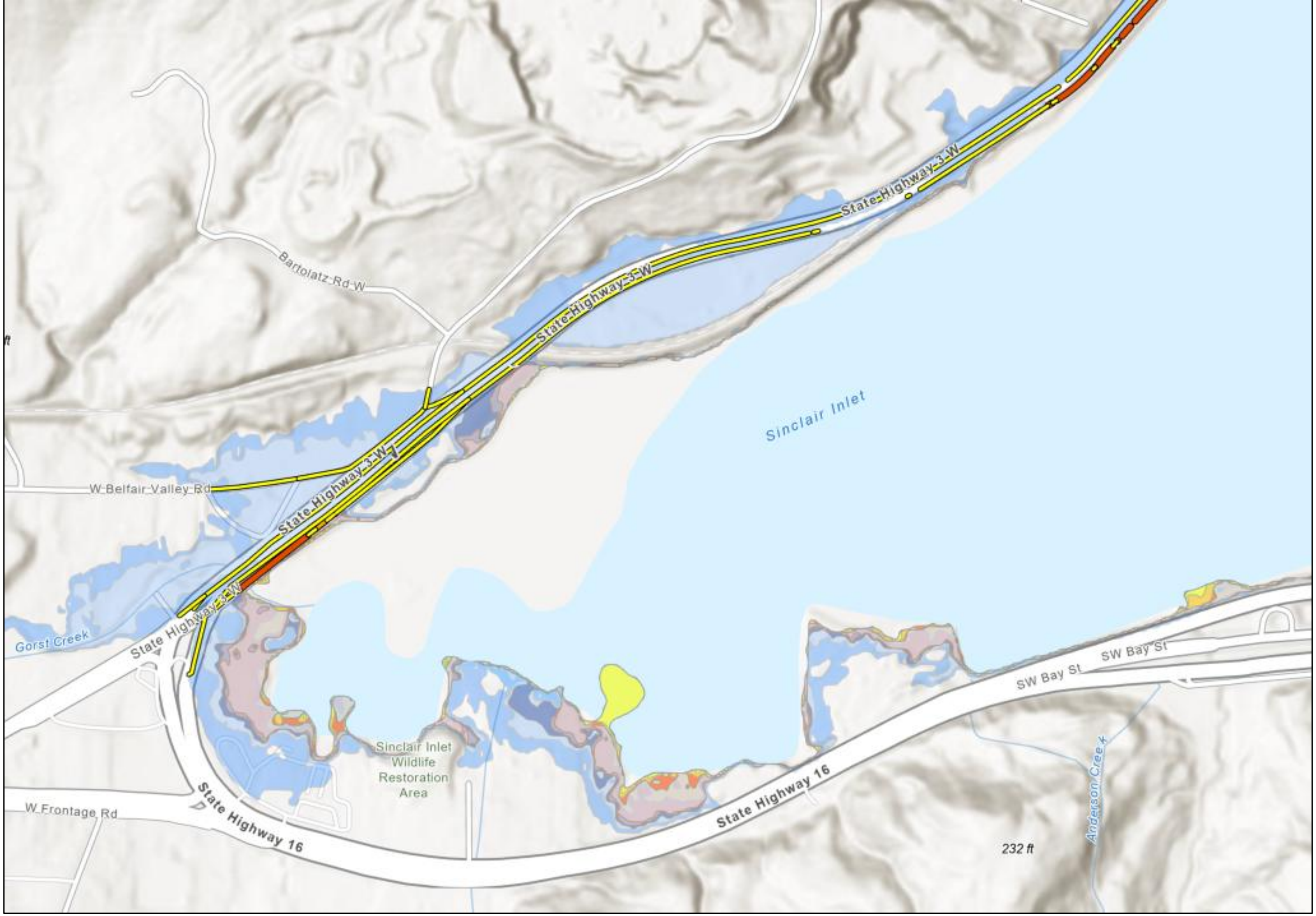
Exposure likelihood of roads in the Keyport area



Exposure likelihood of roads in the Silverdale area



Exposure likelihood of roads in the Gorst area



Coastal Buildings

Type of Asset	Exposure	Adaptive Capacity	Vulnerability
Buildings	1,190 buildings are likely to be inundated by a coastal flooding (SLR or 50-year return extreme flood) by 2050 with a 90% or 50% probability. **(Exposure = High)**	Mitigation measures for buildings may require significant improvements to increase resilience from SLR and flooding impacts. Adaptations are possible, but cost is a challenge. **(Adaptive Capacity = Low)**	**High**
	260 buildings are expected to be inundated by a coastal flooding (SLR or 50-year return extreme flood) by 2050 with a 1% probability, or by 2100 with a 90% probability. **(Exposure = Medium)**	Mitigation measures for buildings may require improvements to increase resilience from temporary flooding impacts in the near term. Adaptations are possible, but cost is a challenge. Long-term planning efforts may be required as structures are redeveloped or replaced. **(Adaptive Capacity = Medium)**	**Medium**
	1,090 buildings are expected to be inundated by a coastal flooding (SLR or 50-year return extreme flood) by 2100 with a 50% or 1% probability. **(Exposure = Low)**	*See above* **(Adaptive Capacity = Medium)**	**Low**

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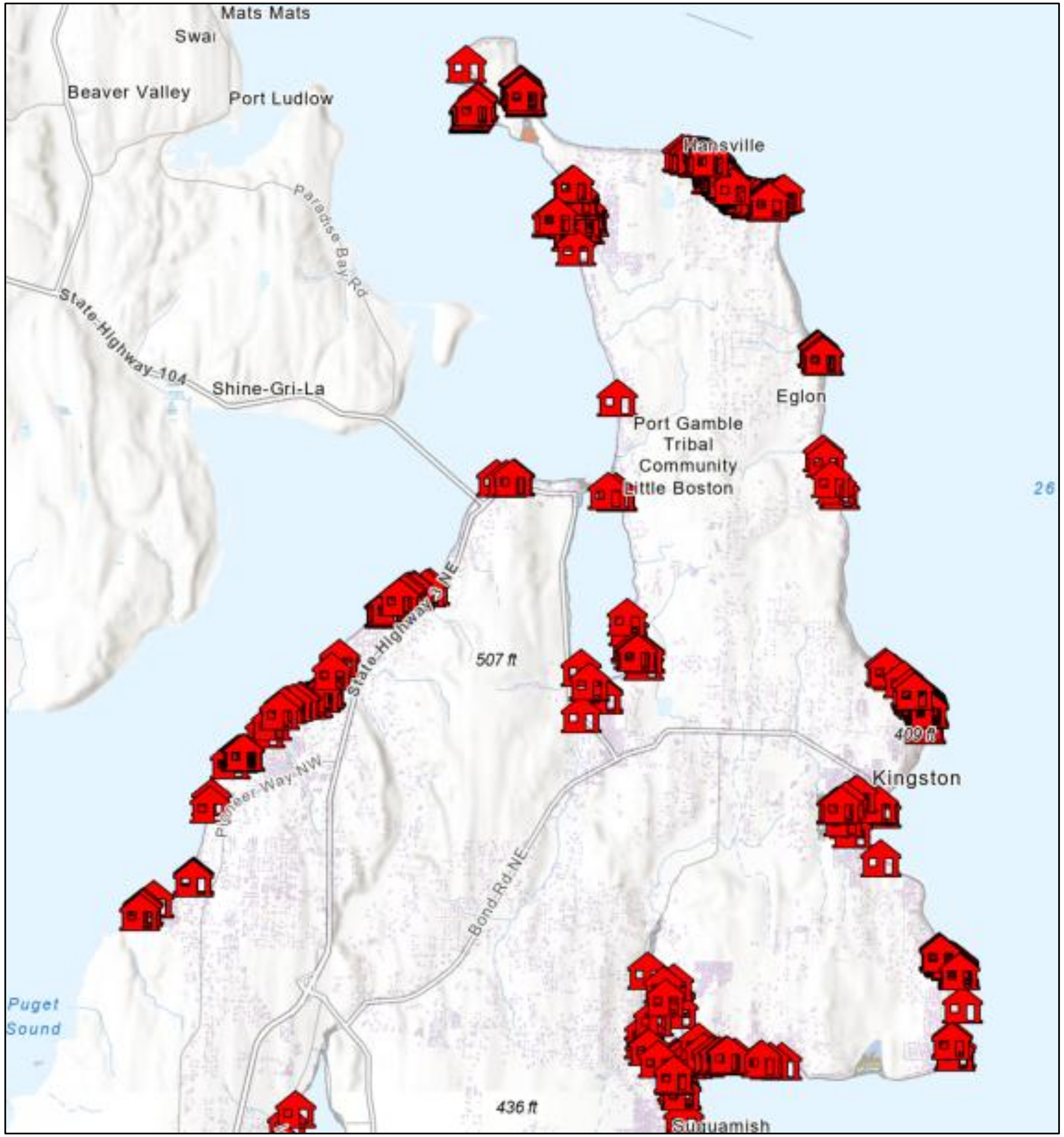

Structures with an exposure likelihood by 50-Yr return frequency flood by 2050 with 50% certainty.

Residences and detached garages marked as 2 structures so duplicate markers are likely.

Adaptation Strategies

- Consider requiring assessments or reports to include sea-level rise projections for potentially impacted properties.
- Review development setbacks near geologically hazardous areas.
- Limit redevelopment or expansion of existing legal non-conforming structures in vulnerable locations.
- Require special considerations when permitting critical infrastructure and facilities.
- Develop and implement a repetitive loss program.
- Consider more detailed mapping of Channel Migration Zones.
- Consider the anticipated climate change impacts in the design of habitat restoration efforts.

Adaptation Strategies

- Consider further evaluating the anticipated impacts to commercial water-dependent industries.
- Consider incentivizing passive management strategies.
- Encourage alternatives to hard shoreline stabilization measures.
- Provide support for education opportunities about raising vulnerable structures and identify incentives or funding opportunities, when available.
- Incentivize community flood control and adaptation strategies.
- Prioritize transportation connectivity and resiliency.
- Evaluate existing stormwater infrastructure and conduct maintenance, where needed.

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Recommended Next Steps

- Expand on the findings of these reports and begin implementing resiliency strategies to protect assets and infrastructure in the future.
- Consider seeking grant opportunities for financial support to replace the aging infrastructure, particularly in areas most vulnerable.
- Quantify exposure of forage fish beaches to see where beaches could experience possible coastal squeeze
- Consider revisions to plans or development regulations, such as those recommended in Section 6.0, to improve the resilience of new or redeveloped properties and reduce the risk of damage or loss.
- Identify areas where channel migration is a concern and apply a detailed CMZ delineation methodology to inform future hazards, integrated flood management, and restoration efforts.

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Recommended Next Steps

- Develop Community Plans for residential areas most at risk (e.g. Hansville).
- A future study could be conducted to identify areas most at risk of saltwater intrusion and evaluate the interactions of existing conditions with future sea level rise projections for targeted areas.
- Contact systems managers of Group B water systems that are identified as vulnerable to bring awareness of potential exposure hazards and plan for mitigation measures.
- Develop an informational tool that allows residents to conduct a high-level self-assessment of their vulnerability through a series of guided questions and prompts. The tool could link to the County's ArcGIS StoryMap to help users identify their level of exposure.
- Work with Washington State Department of Ecology to identify ways to streamline permitting for certain resiliency strategies and update codes respectively to allow for improved implementation.

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City of Bainbridge Island

Laura Ryser
Climate & Sustainability Manager

Bainbridge Island Reports

City Bainbridge Climate Website -----> Adaptation & Resilience

2024 Sea Level Rise Story Map

- models future flooding scenarios anticipating 2 and 5 feet of sea-level rise
- 8 feet of sea-level rise for certain City infrastructure like roads and pumps for the sewer system

2024 City of Bainbridge Island Sea-Level Rise Vulnerability and Risk Assessment

2024 Improving Resilience Report

2019 Sea Level Rise on Bainbridge Island – A Preliminary Assessment

2016 Bainbridge Island Climate Impact Assessment

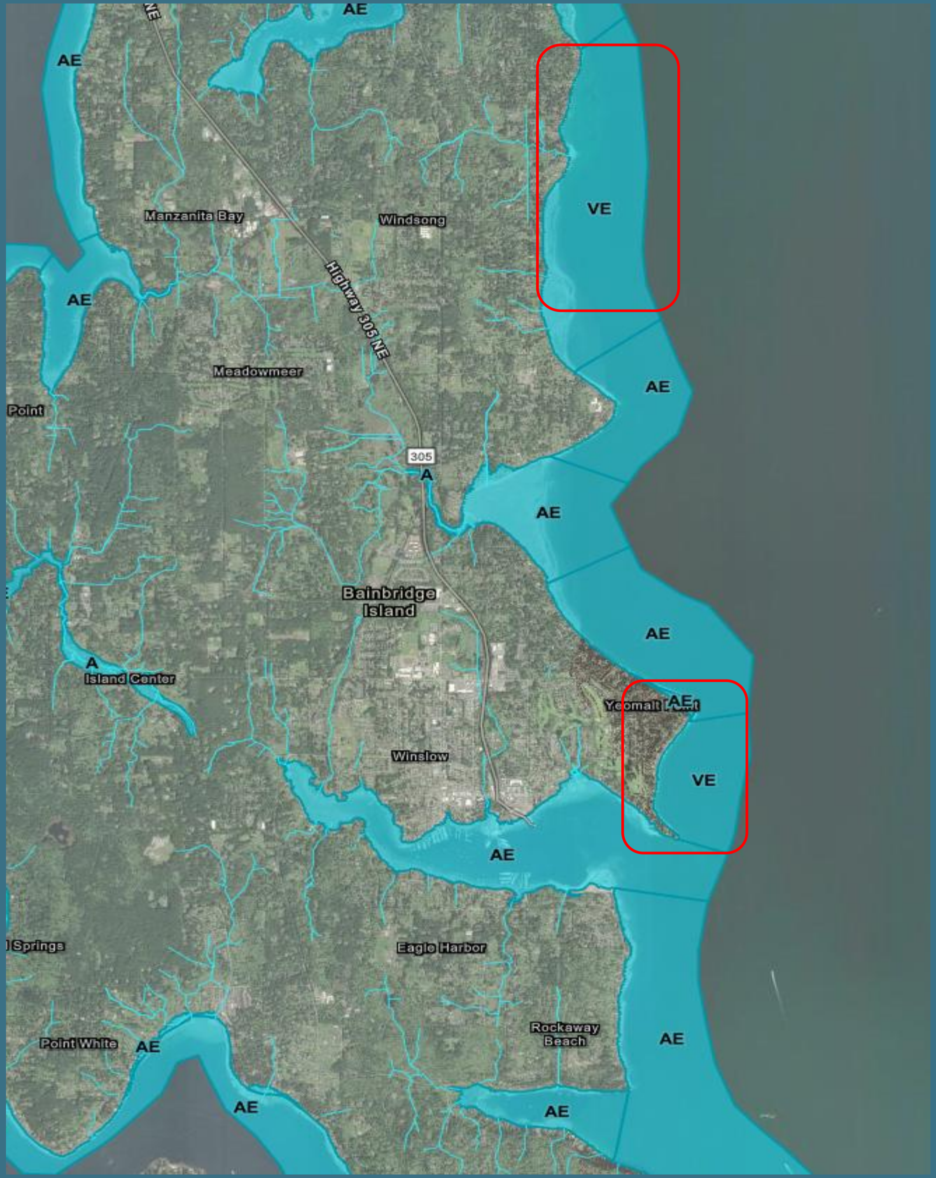
Analysis Conducted…
Calculates various emissions scenarios &

Relies on wave and water level modeling for sea-level rise projections

Projections Show…
Hazard zones showing potential future extent of flooding

Hazard zones can be viewed in the Sea-Level Rise in Bainbridge Island StoryMap online.

The 100-year flood today is likely to occur annually - 10 years with 2 feet of sea-level rise



Sea-level rise is expected to shift the waters around Bainbridge Island upward and landward during all tidal levels

If no sea level rise

- During the 100-year coastal storm 14,100 linear feet (2.7 miles) of road are exposed to flooding

With 2 feet of sea-level rise, the modeling shows

- 9,374 linear feet (1.8 miles) of road would be exposed annually - **meaning a substantial increase in the flooding frequency for many roads**

Under this condition, roads like Point White Drive, Eagle Harbor Drive, Hawley Way, Yeomalt Point Drive, Manitou Beach Drive, Point Monroe Drive, and Crystal Springs Drive will be overtopped

With 5 feet of sea-level rise

- 24,900 linear feet (4.7 miles) of roads are exposed to flooding during a 100-year coastal storm

The combination of higher water levels and erosion will cause a reduction in the width of beaches, allowing coastal storms and waves to reach further inland

Some of the most vulnerable areas and municipal assets include:

- Winslow Wastewater Treatment Plant
- Wastewater lift stations (Sunday Cove #5, Lovell #6, and Wing Point #7
- Manitou Beach Dr, Euclid Ave, Point Monroe Dr, Point White Dr, Yeomalt Point Dr, Hawley Way, Eagle Harbor Dr, Crystal Spring Dr, Rolling Bay Walk and other infrastructure supporting coastal development along Crystal Springs Drive NE, Hedley Spit/Point Monroe, Manitou Beach, Hawley Cove, and Lynwood Center, as well as beach access points along these roads.

Impacts to Natural Systems

- Higher sea-levels will also **increase erosion of beaches and bluffs** and increase wave attack at the toe of coastal bluffs, resulting in smaller buffers between assets and the water.

- Sea-level rise is expected to **reduce available nearshore habitat** for forage fish (e.g., surf smelt, sand lance, Pacific herring), shellfish (e.g., Dungeness crab), and shorebirds and seabirds.

- While beaches and wetlands are largely tolerant of fluctuating water levels, **those that have been heavily degraded or modified may be less likely to cope with increased water depths.**

- Some habitats may be able to shift inland or upland as sea-level rises, particularly in areas where their migration is not blocked by shoreline armoring, coastal development (e.g., bulkheads, roads), or bluffs. However, **this is unlikely in areas with coastal roads and shoreline armoring, which restrict the ability of habitats to shift inland.**

City Projects

Yeomalt Emergency Drainage Repairs

- Installed a tidal valve on a stormwater outfall to prevent upland flooding during excessive high tides

Full Redesign of the Wing Point Sewer Pump Station

- Designing options to move out of a tidal zone that is impacted by sea level rise

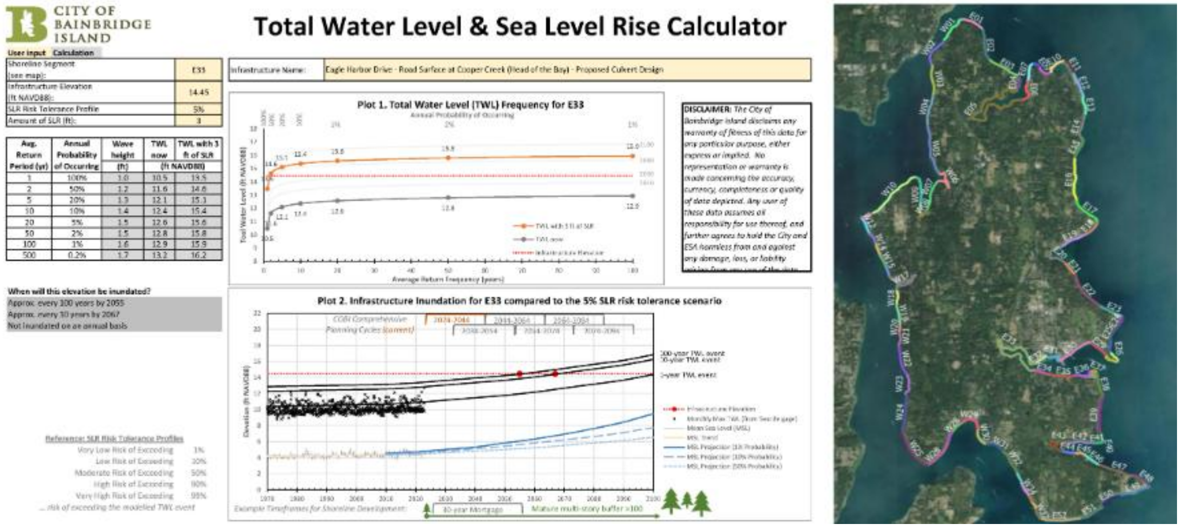
FEMA BRIC Grant – Manitou Beach Dr. Pilot

- Run a pilot for community engagement on how addressing roadway that meet significant treatment. What are options for relocating roadways? How do residents feel about this?

West Eagle Harbor Beach Sewer Project

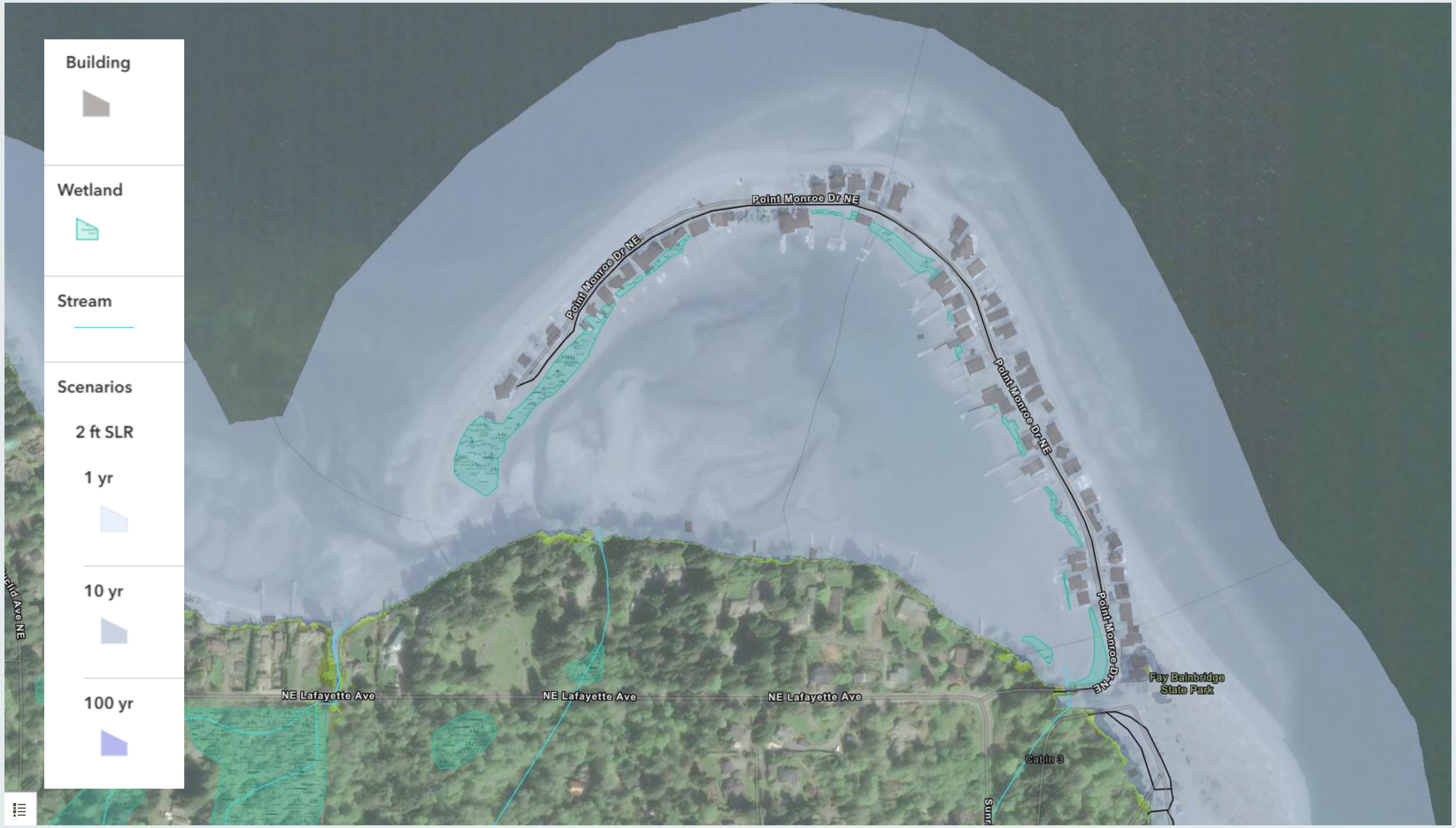
- Closing a sewer main in beach and replacing with an upland system. Relocating two sewer pump stations out of the future predicted flood zone.

Sea Level Rise Calculator



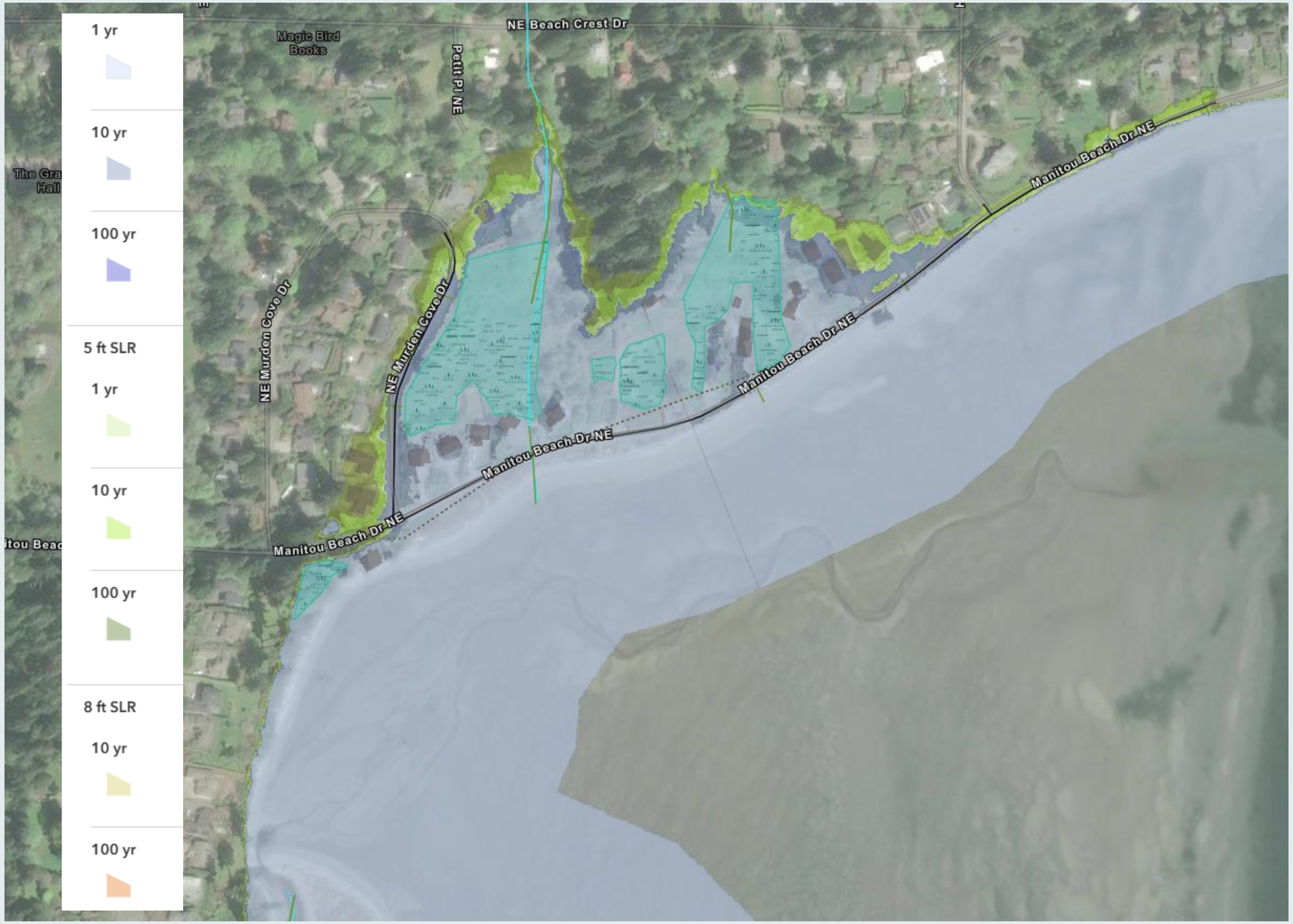
- Tells the City where infrastructure is specifically prone to future flooding
- Helps to understand how project designs should change

Point Monroe



All of Point Monroe is already in the FEMA 100-year flood zone and is very vulnerable to increased flooding due to sea level rise.

Manitou Beach Road

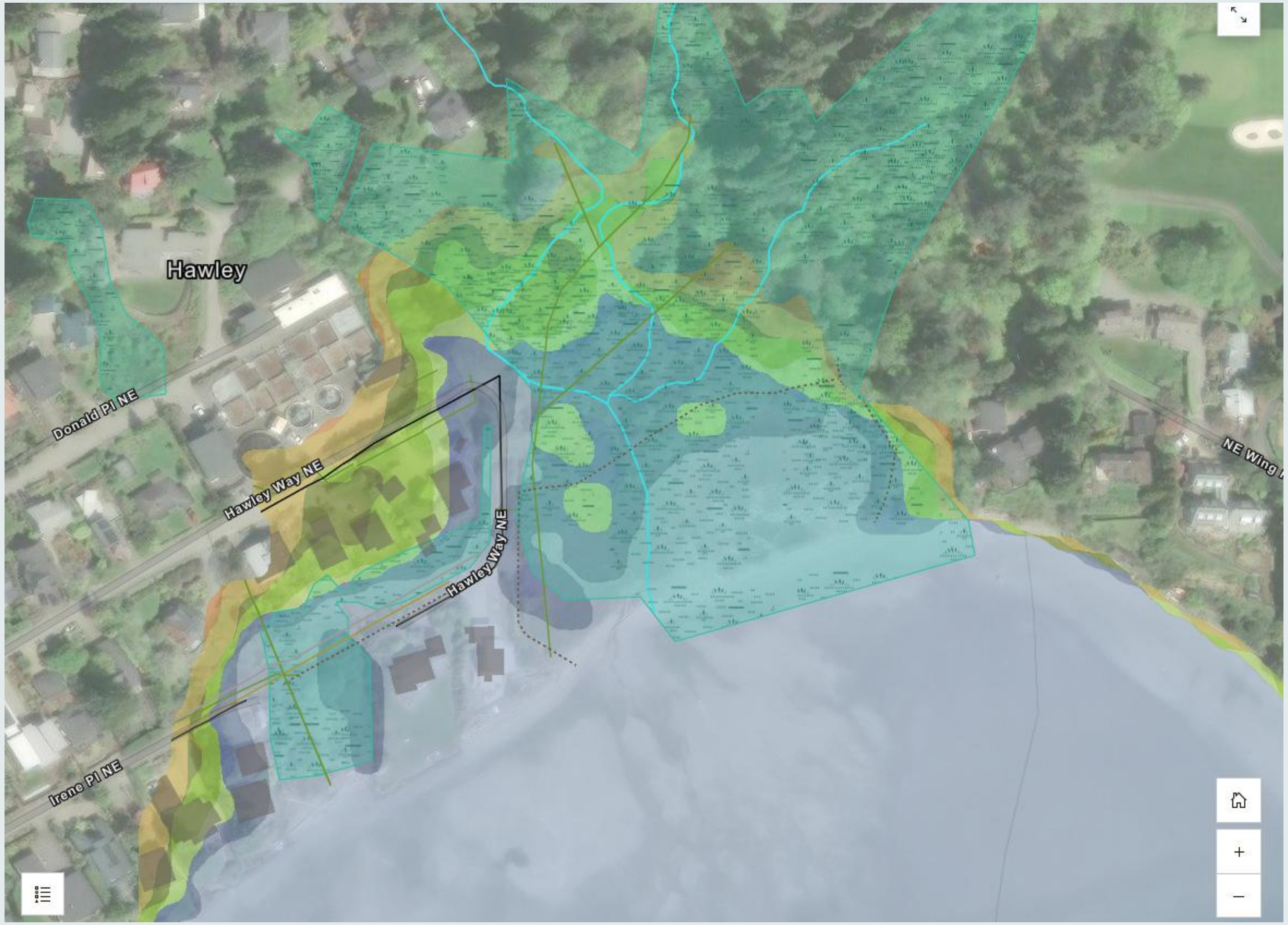


With 2 feet of sea-level rise, the modeling shows that the 1-year flood event would overtop approximately 1,800 linear feet of Manitou Beach Drive and 10 storm drain culverts and outfalls.

Yeomalt Point

Under 2 feet of sea-level rise, the modeling shows that the 1-year event overtops approximately 620 linear feet of NE Yeomalt Point Drive and inundates 8 storm drain culverts and outfalls, 19 sewer and wastewater valves and hydrants.

Wastewater Treatment Plant & Hawley Cove



During the 1-year event with 2 feet sea-level rise, water levels inundate 325 linear feet of Hawley Way NE, including 4.5 acres of delineated wetland, 2 storm drain culverts and outfalls, and 14 sewer valves

Lovell Ave Lift Station

With 2 feet of sea-level rise, the modeling shows that the 1-year event flood affects one outfall and 10 sewer manholes and the Lower Lovell PS lift station.

Crystal Springs Drive

Under 2 feet of sea-level rise, the 1-year event overtops approximately 660 linear feet of Crystal Springs Drive and inundates 15 storm drain culverts and outfalls

Discussion