Flood Risk Profile

Islais Creek

Subarea 4-2

Subarea Description

Islais Creek (Subarea 4-2) covers a large portion of the neighborhoods surrounding Islais Creek. It includes the industrial zone surrounding the western portion of Islais Creek, Islais Creek Channel, and the northern section of the Bayview Hunters Point neighborhood north of Palou Avenue. The area contains several critical infrastructure assets, including the Southeast Treatment Plant, as well as multiple transportation storage, maintenance, and operation facilities that serve the entire city.

The Islais Creek shoreline within this subarea is primary an embankment that is partially fortified with rock protection. The upper end of Islais Creek is backed by a transportation structure (Interstate 280).

The primary pathways of flooding are from overtopping of the northern and southern shoreline of Islais Creek, and from the adjacent subareas (Subareas 4-1, 4-3, and 4-4). To address flooding into Subarea 4-2, flood risk reduction strategies are also required for the adjacent subareas.

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Islais Creek

Subarea 4-2

Assets and Landmarks

Maritime

1. Pier 84
2. Islais Creek Marina

Disaster Response

3. Fire Station 49
4. Fire Station 9
5. EWFS Cistern (1)
6. EWFS Pipe Yard
7. Illinois Street
8. Illinois Street Bridge
9. San Francisco Bay Railroad
10. Union Pacific Railroad

Transportation

8. Illinois Street Bridge
9. San Francisco Bay Railroad
10. Union Pacific Railroad
11. Muni T-Line
12. 3rd Street Bridge
13. Marin Yard
14. Islais Creek Division
15. Burke Warehouse

Utilities

Power

16. Bayshore PG&E Substation
17. Photovoltaic System (at the Southeast Treatment Plant)
18. Internal Combustion Engine (at the Southeast Treatment Plant)

Water

19. City Distribution Division (CDD) Yard

Wastewater

20. Southeast Treatment Plant
21. Southeast Lift Station
22. Rankin Pump Station
23. Davidson Pump Station
24. Bruce Flynn Pump Station
25. Islais Creek Transport / Storage Box
26. Channel Force Main
27. Hunter's Point Tunnel
28. Combined Sewer Discharge Outfalls (3)

Flood Risk Profile

Islais Creek

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Assets and Landmarks

Open Space and Ecology

Open Space

29. Bay Trail
30. Bay Water Trail Islais Creek Launch
31. SFMTA and SFPUC Promenade
32. Dogpatch / Miller Memorial Garden
33. Wolfe Lane Community Garden
34. Youngblood-Coleman Playground
35. Selby & Palou Mini Park
36. James Rolph Jr. Playground
37. Potrero del Sol
38. Palou & Phelps Park

Critical Facilities

39. Forensic Service / Traffic Company

Timing of Exposure: Assets and Landmarks

Assets / Landmarks	Flood Scenario	Equivalent Events	Timing: USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
Maritime							
• Pier 84 • Islais Creek Marina	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032
Disaster Response							
• Illinois Street Bridge	24" (8.4 ft. NAVD)	High tide + 24" SLR	>2150	2112	2070	2059	2051
		5-YR + 0" SLR	Today	Today	Today	Today	Today
• Illinois Street • San Francisco Bay Railroad	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032

Islais Creek

Subarea 4-2

Timing of Exposure: Assets and Landmarks

Assets / Landmarks	Flood Scenario	Equivalent Events	Timing				
			USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
• Union Pacific Railroad	66" (11.9 ft. NAVD)	High tide + 66" SLR	>2150	>2150	2143	2106	2086
		100-YR + 25" SLR	>2150	2115	2072	2060	2053
• Fire Station 9 • EWFS Pipe Yard	77" (12.9 ft. NAVD)	High tide + 77" SLR	>2150	>2150	>2150	2116	2095
		100-YR + 36" SLR	>2150	2144	2091	2074	2063
• Fire Station 49 • EWFS Cistern (1)	>108"	--	--	--	--	--	--
		--	--	--	--	--	--
Utilities							
• Combined Sewer Discharge Outfalls (3)	24" (8.4 ft. NAVD)	High tide + 24" SLR	>2150	2112	2070	2059	2051
		5-YR + 0" SLR	Today	Today	Today	Today	Today
• Photovoltaic System (Southeast Treatment Plant) • Internal Combustion Engine (Southeast Treatment Plant) • Rankin Pump Station • Davidson Pump Station	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032
• Southeast Treatment Plant • Southeast Lift Station • Bruce Flynn Pump Station	66" (11.9 ft. NAVD)	High tide + 66" SLR	>2150	>2150	2143	2106	2086
		100-YR + 25" SLR	>2150	2115	2072	2060	2053
• Bayshore PG&E Substation • City Distribution Division (CDD) Yard	>108"	--	--	--	--	--	--
		--	--	--	--	--	--
• Islais Creek Transport / Storage Box • Channel Force Main • Hunter's Point Tunnel	--	--	--	--	--	--	--

Islais Creek

Subarea 4-2

Timing of Exposure: Assets and Landmarks

Assets / Landmarks	Flood Scenario	Equivalent Events	Timing: USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
Transportation							
• Illinois Street Bridge • Muni T-Line	24" (8.4 ft. NAVD)	High tide + 24" SLR	>2150	2112	2070	2059	2051
		5-YR + 0" SLR	Today	Today	Today	Today	Today
• 3rd Street Bridge • Marin Yard • Islais Creek Division • San Francisco Bay Railroad	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032
• Burke Warehouse • Union Pacific Railroad	66" (11.9 ft. NAVD)	High tide + 66" SLR	>2150	>2150	2143	2106	2086
		100-YR + 25" SLR	>2150	2115	2072	2060	2053
Open Space and Ecology							
• Bay Trail • Bay Trail Islais Creek Launch • MTA Promenade	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032
• Dogpatch / Miller Memorial Garden • Wolfe Lane Community Garden • Youngblood-Coleman Playground • Selby & Palou Mini Park • James Rolph Jr. Playground • Potrero del Sol • Palou & Phelps Park	>108"	--	--	--	--	--	--
		--	--	--	--	--	--
Critical Facilities							
• Forensic Service / Traffic Company	66" (11.9 ft. NAVD)	High tide + 66" SLR	>2150	>2150	2143	2106	2086
		100-YR + 25" SLR	>2150	2115	2072	2060	2053

Islais Creek

Subarea 4-2

Timing of Exposure: Subarea

Adaptation Focus	Shoreline Type	Flood Scenario	Timing					
			Return	USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
Immediate	--	--	--	--	--	--	--	--
			--	--	--	--	--	--
Tipping Point	Embankment; Engineered	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
			100-YR + 11" SLR	2139	2066	2044	2035	2032
Long Term >2050	Embankment; Engineered	77" (12.9 ft. NAVD)	High tide + 77" SLR	>2150	>2150	>2150	2116	2095
			100-YR + 36" SLR	>2150	2144	2091	2074	2063

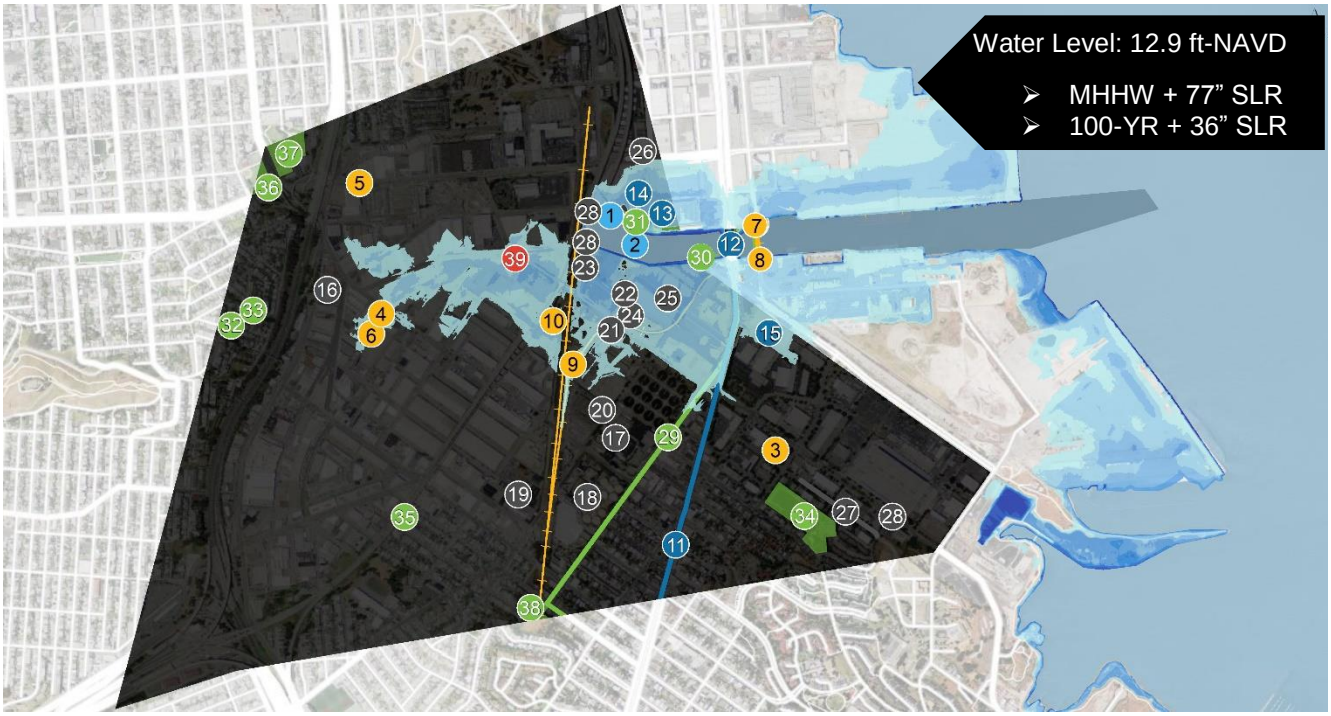
Flood Progression

Substantial Flood Risk (Tipping Point)

Islais Creek

Subarea 4-2

Long-Term Flood Risk (>2050)



The following describes the progression of potential extreme tide and sea level rise flooding, along with a brief discussion of the assets that will be impacted within Subarea 4-2.

Flood Scenario	Assets	Consequences				
High tide + 12" SLR	**1-YR + 0" SLR**	**USACE Low**	**USACE Int.**	**OPC Most Likely**	**USACE High**	**OPC 1:200**
		Today	Today	Today	Today	Today
Water Level Elevation: 7.4 ft. NAVD88	--	--				
		--				
High tide + 24" SLR	**5-YR + 0" SLR**	**USACE Low**	**USACE Int.**	**OPC Most Likely**	**USACE High**	**OPC 1:200**
		Today	Today	Today	Today	Today
Water Level Elevation: 8.4 ft. NAVD88		**Disaster Response**				

The Illinois Street Bridge will be impacted. This is a drawbridge that crosses the Islais Creek channel and connects the Hunter's Point / Bayview and Central Waterfront / Dogpatch neighborhoods. It was completed in 2006 and primarily serves to provide

Flood Scenario	Assets	Consequences
		railroad and heavy truck access to Piers 90-96, while also relieving congestion on Third Street. The bridge includes two vehicle traffic lanes, a shared centerline railroad track, and separate bicycle / pedestrian lanes. The lower portion of the bridge could experience submergence during present-day high tides. There is limited redundancy for bridges. Although inland roadways can provide alternative routes for light vehicle traffic, there are limited routes for heavy truck traffic, and no alternate routes for the railroad corridors or routes that could provide redundancy for street traffic, including Islais Creek Bridge.
		Utilities The higher Bay water levels may reduce the gravity-driven flow of excess combined wastewater and stormwater from the transport / storage boxes to the Bay. This impact is only of concern during intense and prolonged rainfall events that exceed the capacity of the large underground transport / storage boxes that ring the city. This could result in an increase in localized flooding in low-lying areas.
		Transportation The Muni T-Line crossing the Illinois Street Bridge will be impacted. The Muni T-Line is track-based public transit and cannot be rerouted.

High tide + 36” SLR	50-YR + 0” SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		Today	Today	Today	Today	Today
Water Level Elevation: 9.4 ft. NAVD88	--	--				
		--				

High tide + 48” SLR	100-YR + 7” SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		2094	2050	2034	2026	2024
Water Level Elevation: 10.2 ft. NAVD88	--	--				
		--				

Flood Risk Profile

Islais Creek

Subarea 4-2

Flood Scenario	Assets	Consequences				
High tide + 52" SLR	100-YR + 11" SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		2139	2066	2044	2035	2032

Water Level Elevation: 10.8 ft. NAVD88

Maritime

Pier 52 and the Islais Creek Marina will be impacted. Pier 52 is a wooden pier in poor condition. It serves as a wave attenuator to the adjacent public boat launch, which is the City's only tailored boat launch.

Disaster Response

Illinois Street will be impacted, resulting in increased traffic and congestion for the surrounding transit network. Illinois Street also serves as a truck route for providing heavy truck access to Piers 90-96.

A portion of the San Francisco Bay Railroad Connection is inundated. For over a decade, the Port has contracted with the railroad to provide railroad services and rail terminal operations. It hauls soils and other cargos to and from the railyard for interchange with Union Pacific Railroad via the Caltrain.

Utilities

Flooding would create impacts to streetlights and overhead transmission lines. If the streetlights are flooded for a short period, limited damage would occur, and would remain functioning. However, if streetlights are flooded for a prolonged period, the electrical infrastructure is likely to fail, causing the streetlight to be inoperable. The overhead lines and utility poles would also be impacted and vulnerable.

The Photovoltaic system and an internal combustion engine at the Southeast Treatment Plant will also be inundated.

Transportation

The impacts to transportation quickly become citywide in scale. The approaches to both bridges across Islais Creek (the 3rd Street Bridge and the Illinois Street Bridge) will be inundated, with cascading consequences to goods movement to and from Pier 90-96 via both the rail line and heavy truck traffic across the Illinois Street Bridge, public transportation across the 3rd Street Bridge via the Muni T-Line, and pedestrian, bicycle, and vehicle traffic in and out of Bayview.

Islais Creek

Subarea 4-2

Flood Scenario	Assets	Consequences
		Two SFMTA facilities would be impacted, including the Marin Yard and Islais Creek Division. SFMTA's ability to store, maintain, repair, and refuel Muni buses would be impaired if these facilities were inundated. Disruption to these facilities could impact citywide transit usage.
		Open Space and Ecology A portion of the Bay Trail and the landside portion of the Bay Trail Islais Creek Launch will also be impacted. The SFMTA and SFPUC Promenade will be impacted.

High tide + 66" SLR	100-YR + 25" SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		>2150	2115	2072	2060	2053
Water Level Elevation: 11.9 ft. NAVD88		**Disaster Response** A portion of the Union Pacific Railroad will be impacted. The railroad serves as a conduit to move goods and materials from vessels to the regional railroad system and is critical to the City's emergency response and recovery plan.				
		Utilities The Bruce Flynn Pump Station and Southeast Lift Station are inundated, significantly impacting the conveyance of stormwater and wastewater to and from the Southeast Treatment Plant. The 70-mgd Southeast Lift Station serves the Islais Creek, Yosemite, Sunnydale, and Mariposa watersheds during both dry and wet weather. The 110-mgd Bruce Flynn wet-weather pump station also serves these watersheds to meet greater stormwater demands during rainfall events. Localized flooding could occur if either of these pump stations are impacted by floodwaters, particularly in lower-lying areas. Several facilities at the SFPUC Southeast Treatment Plant could be exposed to coastal floodwaters. Flooding is limited to the northern corner of the plant, which includes the Southeast Lift Station, Headworks Facilities, and Primary Sedimentation Facilities. New facilities under construction as part of the Sewer System Improvement Program are being constructed to be resilient to potential sea level rise and coastal flood hazards.				
		Transportation In addition to the Union Pacific Railroad, the Burke Warehouse will be impacted. This is the primary location for overhead line repairs for the electric trolley system. Disruption to this facility could impact citywide transit usage.				

Islais Creek

Subarea 4-2

Flood Scenario	Assets	Consequences
		Critical Facilities Both the Police Department's Traffic Company (i.e., motorcycle police) and the Forensic Services (i.e., crime laboratory) will be impacted. These services play major roles in earthquakes and disasters, as well as providing public safety services daily.

High tide + 77" SLR	100-YR + 36" SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		>2150	2144	2091	2074	2063
Water Level Elevation: 12.9 ft. NAVD88		**Disaster Response** The pipe yard for the Emergency Firefighting Water System is inundated. Fire Station 9 is inundated. This fire station is also part of Battalion 10, further impacting emergency response times in this neighborhood.				

High tide + 84" SLR	100-YR + 43" SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		>2150	>2150	2104	2083	2069
Water Level Elevation: 13.4 ft. NAVD88	--	**--** --				

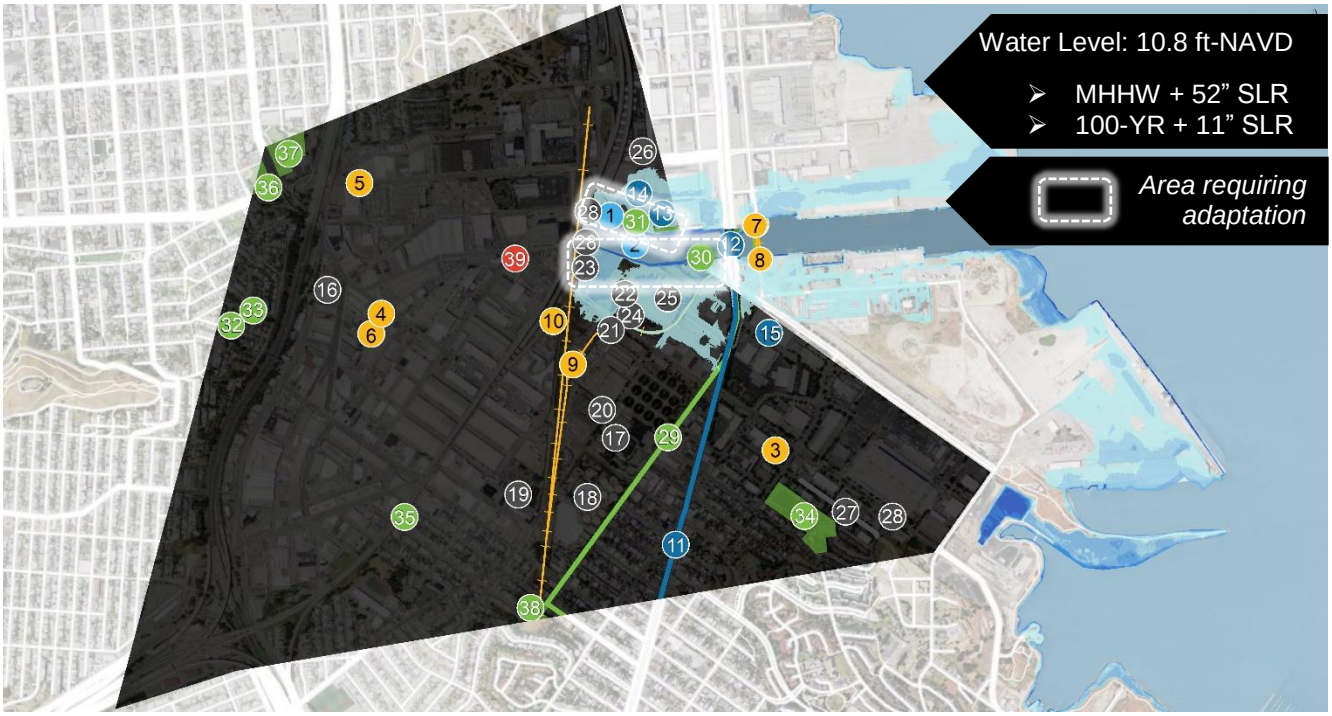
High tide + 96" SLR	100-YR + 55" SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		>2150	>2150	2125	2096	2078
Water Level Elevation: 14.4 ft. NAVD88	--	**--** --				

High tide + 108" SLR	100-YR + 67" SLR	USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
		>2150	>2150	2145	2107	2087
Water Level Elevation: 15.4 ft. NAVD88	--	**--** --				

Islais Creek

Subarea 4-2

Adaptation Focus: Tipping Point



Shoreline Characteristics	Shoreline Overtopping					Timing of Impact (100-YR)				
Classification	Avg. Elev.	Avg. Depth (ft)	Max Depth (ft)	Length (ft)	%	USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
Embankment; Engineered	8.9 ft. NAVD	1.7	2.9	2,000	66.0%	2139	2066	2044	2035	2032

Flood Pathways

- Overtopping occurs over a broad stretch of the Islais Creek shoreline, allowing for flooding to reach inland areas but is constrained within the industrial area east of Interstate 280. Overtopping occurs over both natural and hardened shoreline segments. Along the northern shoreline, overtopping occurs between Interstate 280 and the 3rd Street Bridge. The southern shoreline would experience overtopping over a longer portion of the shoreline.
- Low-lying pathways adjacent to the shoreline allow floodwaters to enter from the surrounding subareas.

Shoreline Focus

- Most of the critical assets in this subarea are located near the southern edge of Islais Creek. Initial measures could focus on the southern shoreline to address impacts to these critical assets; however, adaptation measures are required for both the northern and southern shoreline to address transportation/mobility vulnerabilities due to impacts to the 3rd Street and Illinois Street Bridge.

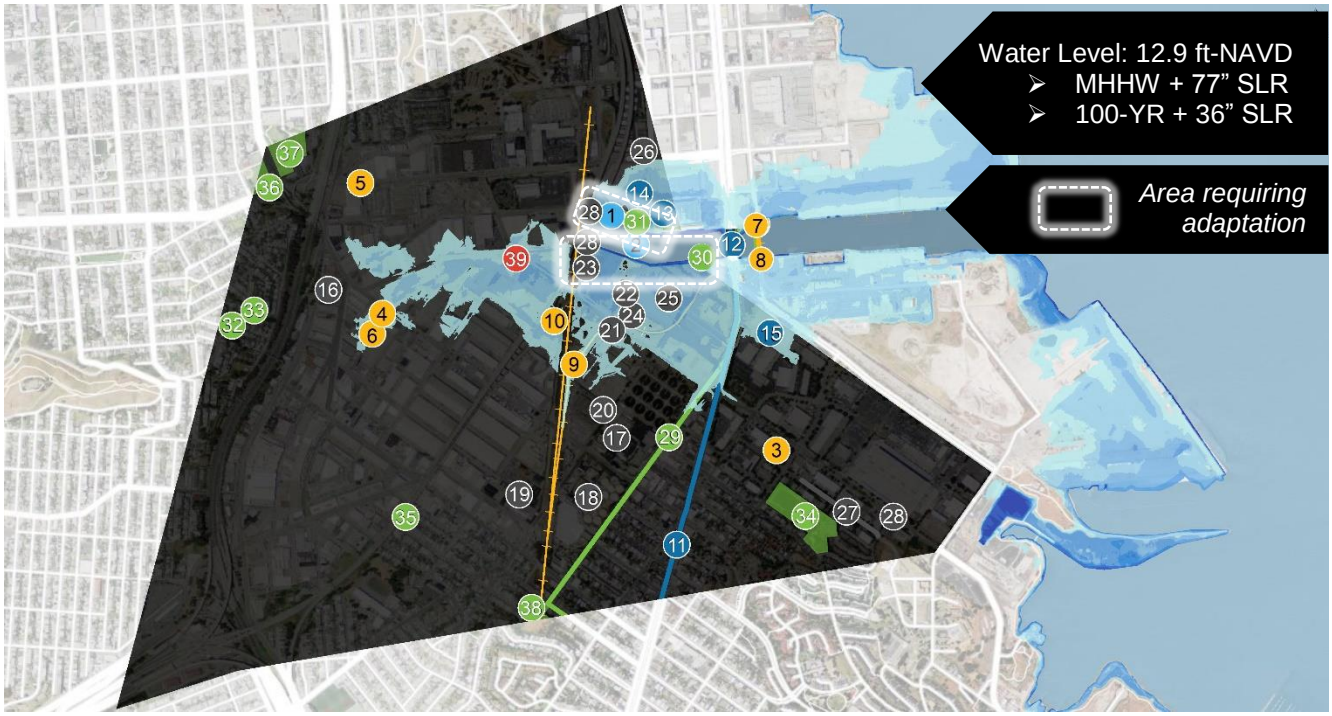
Adaptation Considerations

- Adaptation measures to reduce flood risk to this subarea is required for most of the Islais Creek shoreline, including the shoreline within the adjacent subareas (Subareas 4-1, 4-3, and 4-4).

Islais Creek

Subarea 4-2

Adaptation Focus: Long-Term >2050



Shoreline Characteristics	Shoreline Overtopping					Timing of Impact (100-YR)				
Classification	Avg. Elev.	Avg. Depth (ft)	Max Depth (ft)	Length (ft)	%	USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
Embankment; Engineered	9.6 ft. NAVD	3.2	5.0	2,499	82.5%	>2150	2144	2091	2074	2063

Flood Pathways

- Overtopping occurs over a broad stretch of the Islais Creek shoreline, allowing for flooding to reach inland area
- There are low-lying areas adjacent to the Islais Creek shoreline that allow overtopping in adjacent Subareas 4-1, 4-3, and 4-4 to reach this subarea.
- Flooding reaches industrial and commercial areas west of Interstate 280 via a low-lying segment of the railway used by Caltrain.

Shoreline Focus

- Most of the critical assets in this subarea are located near the southern edge of Islais Creek. Initial measures could focus on the broad stretch of the southern shoreline; however, adaptation measures are required for both the northern and southern shoreline to address transportation/mobility vulnerabilities due to impacts to the 3rd Street and Illinois Street Bridge.
- Adaptation of the Islais Creek shoreline will also address the flood pathway over the Caltrain railway that can allow flooding to reach areas behind Interstate 280.

Adaptation Considerations

- Adaptation measures to reduce flood risk within this subarea are required over most of the Islais Creek shoreline, including the shoreline within the adjacent Subareas 4-1, 4-3, and 4-4.
- The average depth of overtopping during this timeline is 3.2 feet, with a maximum of 5.0 feet. Adaptation measures to address this severity of flooding need to consider the narrow footprint available between the existing shoreline edge and the structures along the shoreline. Relocation of some facilities may be required.