



Subarea Description

Cargo Way (Subarea 4-3) is a mostly industrial area located on Bay fill that includes piers and seawall lots with a small wetland and adjacent upland area. Critical infrastructure assets include the Intermodal Cargo Transfer Facility operated by the San Francisco Bay Railroad, maritime services including dry bulk cargo ship loading, and two concrete batch plants that are the city's sole providers of concrete.

The southern shoreline of Islais Creek within this subarea has several shoreline types, including embankments with varying degrees of rock protection, engineered bulkheads and structures on piles, and bayfront marsh (Pier 94 wetlands).

The primary pathways of flooding are from overtopping of the engineered southern Islais Creek shoreline near the 3rd Street Bridge and the Illinois Street Bridge, and further east along Seawall Lot 352. Shoreline overtopping initially results in inundation contained within the subarea boundary; however, increasing water levels allow flooding to connect with Subarea 4-2 and subsequently Subarea 4-4. Flood risk reduction strategies in this subarea will eventually require coordination with the adjacent subareas.



Basemap Credits (all maps): © Mapbox, © OpenStreetMap



Assets and Landmarks



Maritime

- | | |
|--|---------------------------------------|
| 1. Maritime Maintenance Facility (Pier 90) | 5. Seawall Lot 352 |
| 2. Industrial and Cargo Ship Loading (Pier 92) | 6. 3rd Street / Cargo Way Triangle |
| 3. Seawall Lot 344 East | 7. Intermodal Cargo Transfer Facility |
| 4. Seawall Lot 344 West | |



Disaster Response

- | | |
|----------------------------------|---|
| 8. Illinois Street | 12. Large Vessel Berth (Pier 92) |
| 9. Fire Station 25 | 13. Debris Removal Staging Area (Seawall Lot 344/352) |
| 10. EFWS Fireboat Manifold | 14. San Francisco Bay Railroad |
| 11. EFWS Suction Connections (2) | |



Transportation

- | | |
|--------------------------------|----------------------------|
| 8. Illinois Street | 16. Muni T-Line |
| 14. San Francisco Bay Railroad | 17. 3 rd Street |
| 15. Muni Station (Backlands) | |



Utilities

Wastewater

- 18. Booster Pump Station
- 19. Combined Sewer Discharge Outfalls (2)



Open Space and Ecology

Open Space

- | | |
|-------------------------------|--------------------|
| 20. Bay Trail / Blue Greenway | 23. Gateway Park |
| 21. Islais Creek Park | 24. Fireman's Park |
| 22. Islais Plaza | |

Ecology

- 25. Pier 94 Wetlands



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							
<ul style="list-style-type: none"> Seawall Lot 352 	36" (9.5 ft. NAVD)	High tide +36" SLR	>2150	2144	2091	2074	2063
		50-YR + 0" SLR	Today	Today	Today	Today	Today
<ul style="list-style-type: none"> Maritime Maintenance Facility (Pier 90) Industrial and Cargo Ship Loading (Pier 92) Seawall Lot 344 East Intermodal Cargo Transfer Facility 	48" (10.2 ft. NAVD)	High tide +48" SLR	>2150	>2150	2113	2088	2073
		100-YR + 7" SLR	2088	2048	2032	2025	2023
<ul style="list-style-type: none"> Seawall Lot 344 West 3rd Street / Cargo Way Triangle 	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							
<ul style="list-style-type: none"> EFWS Suction Connections (2) 	24" (8.4 ft. NAVD)	High tide + 24" SLR	>2150	2112	2070	2059	2051
		5-YR + 0" SLR	Today	Today	Today	Today	Today
<ul style="list-style-type: none"> San Francisco Bay Railroad 	48" (10.2 ft. NAVD)	High tide + 48" SLR	>2150	>2150	2113	2088	2073
		100-YR + 7" SLR	2088	2048	2032	2025	2023
<ul style="list-style-type: none"> Illinois Street Fire Station 25 EFWS Fireboat Manifold 	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032



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
<ul style="list-style-type: none"> Debris Removal Staging Area (Seawall Lot 344/352) 	96" (14.5 ft. NAVD)	High tide + 96" SLR	>2150	>2150	>2150	2131	2110
		100-YR + 55" SLR	>2150	>2150	2125	2096	2078
<ul style="list-style-type: none"> Large Vessel Berth (Pier 92) 	--	--	--	--	--	--	--



Utilities

<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> Booster Pump Station 	66" (12.0 ft. NAVD)	High tide + 66" SLR	>2150	>2150	2143	2106	2086
		100-YR + 11" SLR	>2150	2115	2072	2060	2053



Transportation

<ul style="list-style-type: none"> San Francisco Bay Railroad 	48" (10.2 ft. NAVD)	High tide + 48" SLR	>2150	>2150	2113	2088	2073
		100-YR + 7" SLR	2088	2048	2032	2025	2023
<ul style="list-style-type: none"> Muni T-Line Muni Station (Backlands) 3rd Street Illinois Street 	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032



Open Space and Ecology

<ul style="list-style-type: none"> Bay Trail / Blue Greenway Islais Creek Park Islais Plaza Gateway Park Fireman's Park 	52" (10.8 ft. NAVD)	High tide + 52" SLR	>2150	>2150	2120	2092	2076
		100-YR + 11" SLR	2139	2066	2044	2035	2032
<ul style="list-style-type: none"> Pier 94 Wetlands 	--	--	--	--	--	--	--

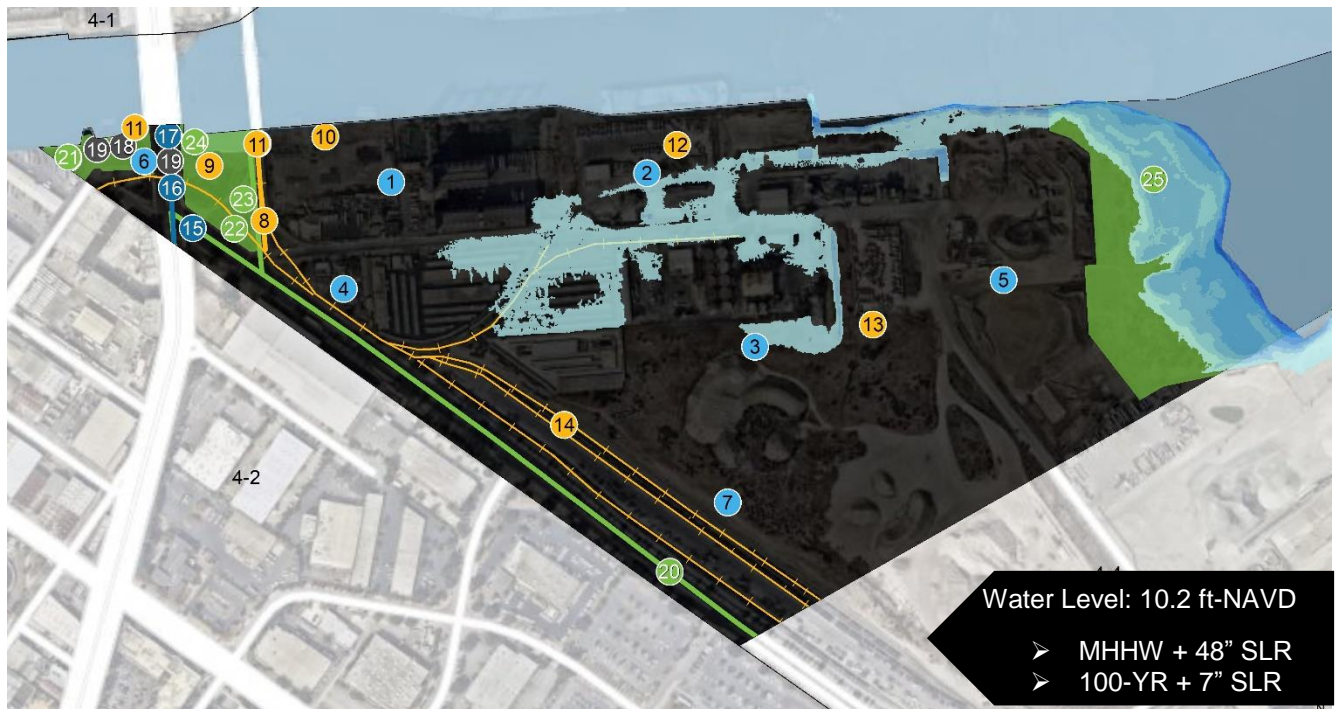


Timing of Exposure: Subarea

Adaptation Focus	Shoreline Type	Flood Scenario	Timing					
			Return	USACE Low	USACE Inter.	OPC Most Likely	USACE High	OPC 1-in-200
Immediate	Embankment	48" (10.2 ft. NAVD)	High tide + 48" SLR	>2150	>2150	2113	2088	2073
			100-YR + 7" SLR	2088	2048	2032	2025	2023
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

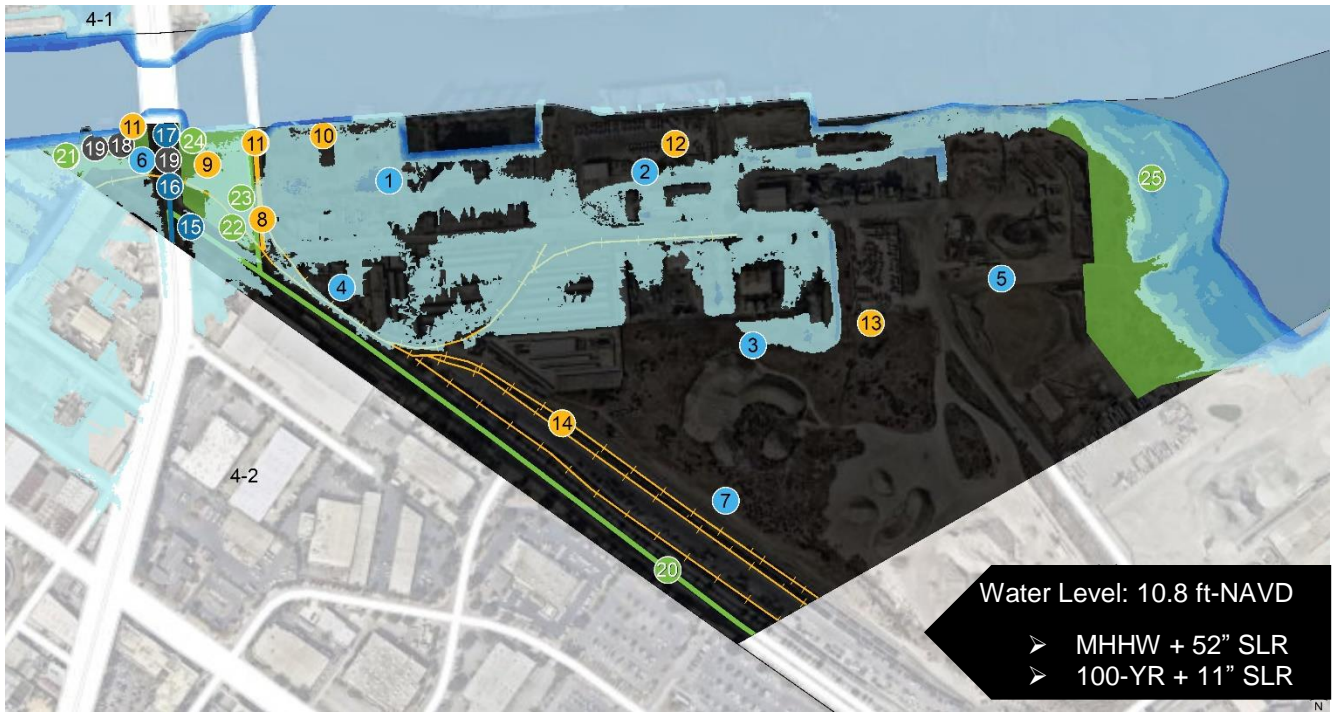
Flood Progression

Immediate Flood Risk

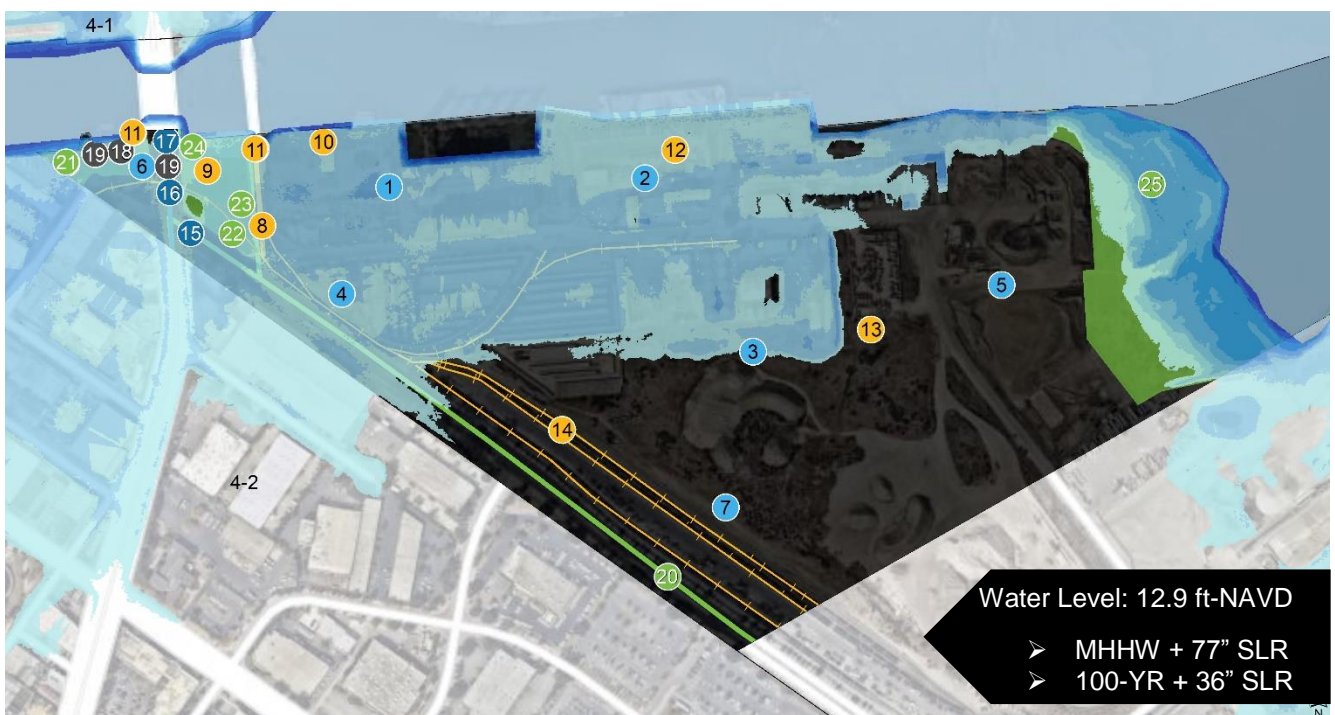




Substantial Flood Risk (Tipping Point)



Long-Term Flood Risk (>2050)






Cargo Way

Subarea 4-3



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 4-3.

Flood Scenario	Assets	Consequences				
		USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
High tide + 12" SLR	1-YR + 0" SLR	Today	Today	Today	Today	Today
Water Level Elevation: 7.5 ft. NAVD88	--	--	--	--	--	--
High tide + 24" SLR	5-YR + 0" SLR	Today	Today	Today	Today	Today
Water Level Elevation: 8.5 ft. NAVD88		Disaster Response				
		Two fire suction connections (part of the Emergency Firefighting Water System, EFWS) that allow fire engines to draw water from the Bay for fire suppression are inundated. Suction connections become unusable if they are inundated, primarily due to limitations related to fire truck access.				
		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.				
High tide + 36" SLR	50-YR + 0" SLR	Today	Today	Today	Today	Today
Water Level Elevation: 9.5 ft. NAVD88		Maritime				
		Seawall Lot 352 experiences inundation from overtopping along the Pier 94 Wetlands area. Seawall Lot 352 hosts Hanson Aggregates, which provides sand import and processing.				



Flood Scenario	Assets	Consequences				
		USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
High tide + 48" SLR	100-YR + 7" SLR	2088	2048	2032	2025	2023

Water Level Elevation: 10.2 ft. NAVD88



Maritime

The shoreline is overtopped along the south side of Islais Creek. The flooding impacts the Port's Pier 90 (maintenance facility), Pier 92's industrial and cargo ship loading facilities, as well as the Intermodal Cargo Transfer Facility. Seawall Lot 344 East (Pier 90-96 Backlands) is also impacted.



Disaster Response

A portion of the San Francisco Bay Railroad 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 line where it can then be transferred to other regions of the United States.



Transportation

A portion of the San Francisco Bay Railroad is inundated.

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

Water Level Elevation: 10.8 ft. NAVD88



Maritime

The 3rd Street / Cargo Way Triangle is inundated. This area contains the Booster Pump Station.

Seawall Lot 344 West is inundated.



Disaster Response

One EFWS fireboat manifold will be inundated. Fireboats may still be able to make a secure connection to the manifold even if it is inundated. If the fireboats cannot make a connection, and the emergency firefighting water system loses pressure, the system may become unusable.

Fire station 25 and a portion of Illinois Street will also be inundated.



Flood Scenario	Assets	Consequences
----------------	--------	--------------



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.



Transportation

The Muni T-Line and Muni Backlands station on 3rd Street near the 3rd Street Bridge will be inundated. Illinois Street and 3rd Street will also experience inundation.



Open Space and Ecology

This scenario results in impacts to open space and shoreline access, including Islais Creek Park, Islais Plaza, Gateway Park, and a portion of the Bay Trail.

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: 12.0 ft. NAVD88



Utilities

The Booster Pump Station located at the 3rd Street/Cargo Way Triangle will be inundated. The 110-mgd pump station conveys treated effluent from the Southeast Treatment Plant to the Bay through the Southeast Bay Outfall. The treated effluent could increase the amount of localized flooding if this pump station is impacted by Bay floodwaters.

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

--


--

--

Cargo Way

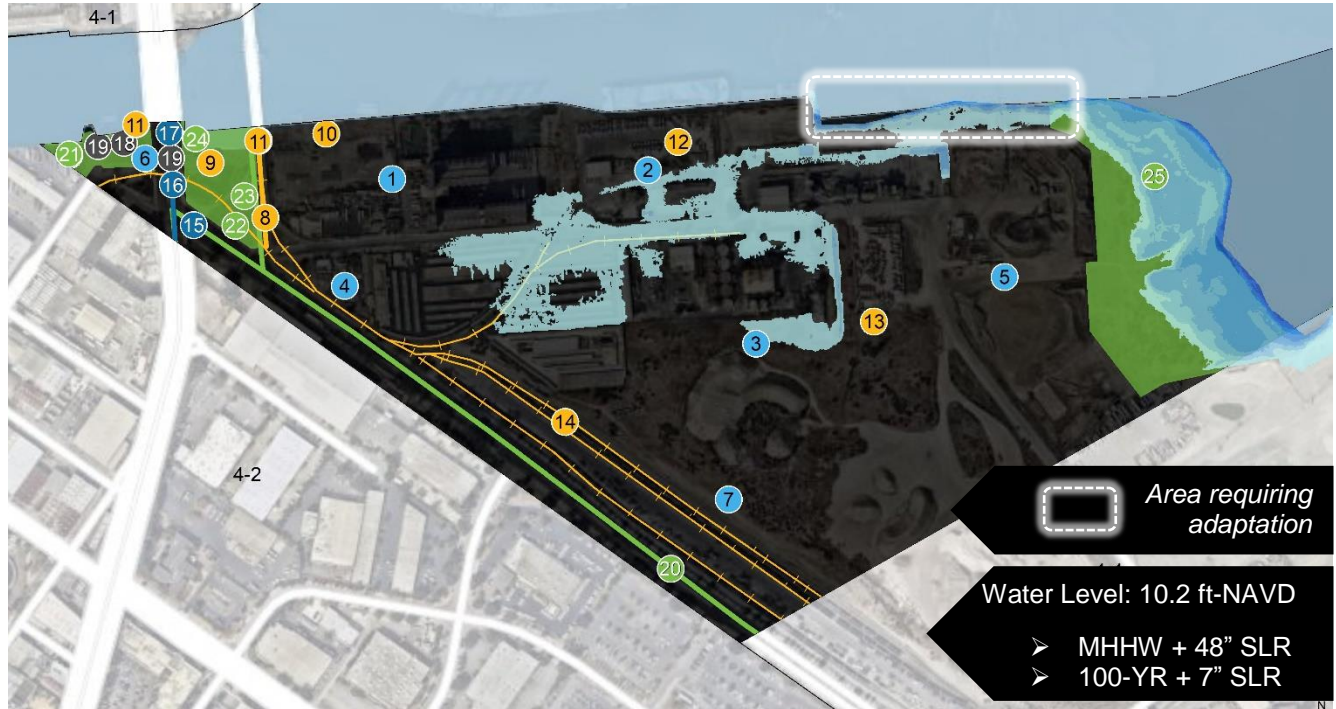
Subarea 4-3



Flood Scenario	Assets	Consequences				
		USACE Low	USACE Int.	OPC Most Likely	USACE High	OPC 1:200
High tide + 84" SLR	100-YR + 43" SLR	>2150	>2150	2104	2083	2069
Water Level Elevation: 13.5 ft. NAVD88	--	--	--			
High tide + 96" SLR	100-YR + 55" SLR	>2150	>2150	2125	2096	2078
Water Level Elevation: 14.5 ft. NAVD88		Disaster Response				
		The Debris Removal Staging Area located at Seawall Lot 344/352 will be impacted.				
High tide + 108" SLR	100-YR + 67" SLR	>2150	>2150	2145	2107	2087
Water Level Elevation: 15.5 ft. NAVD88	--	--	--			



Adaptation Focus: Immediate



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
Embankment	9.2 ft. NAVD	0.6	1.8	650	11.6%	2088	2048	2032	2025	2023

Flood Pathways

- Overtopping occurs over a short stretch of a non-engineered portion of the Islais Creek shoreline adjacent to Seawall Lot 352 and the Pier 94 wetlands.
- Overtopping of this shoreline allows flooding to traverse west across Seawall Lot 352 into the southern portion of Pier 92 (industrial and cargo ship loading facilities), also inundating portions of the Intermodal Cargo Transfer Facility and Seawall Lot 344-East.
- Flooding is contained the subarea boundary.

Shoreline Focus

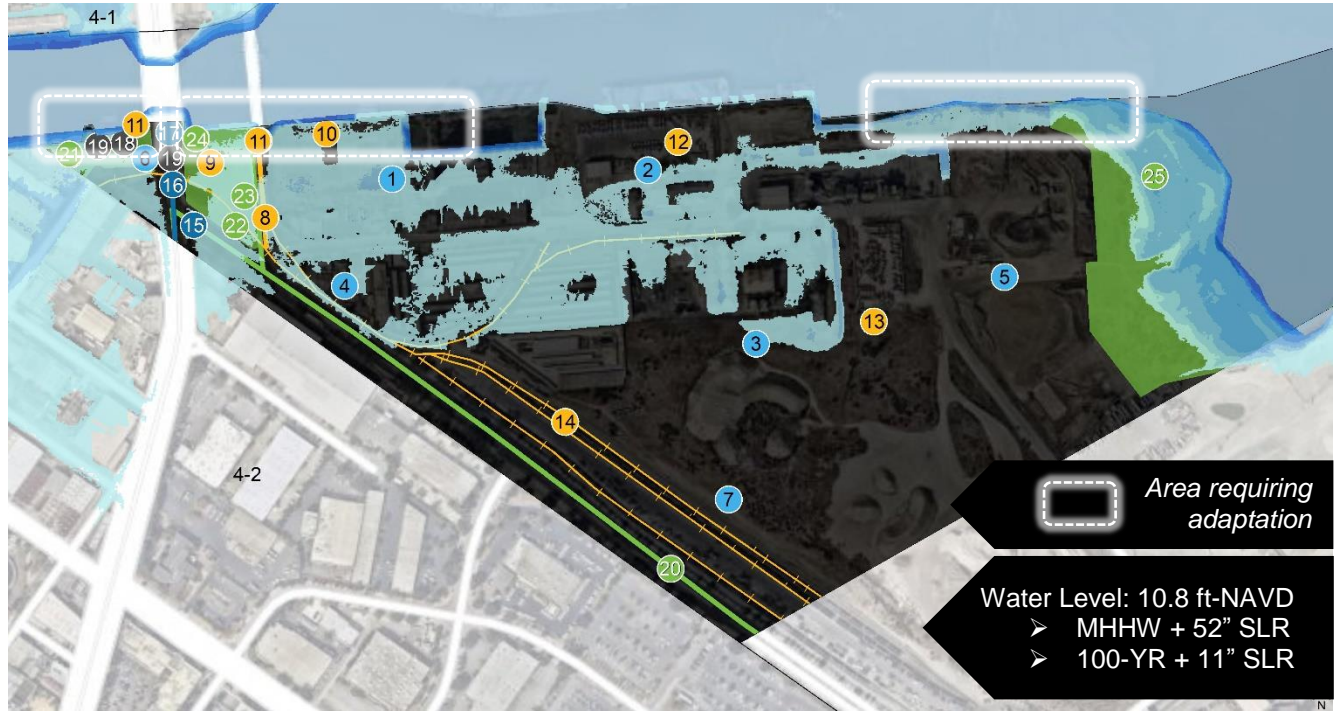
- Initial adaptation measures in this subarea could focus on the Islais Creek shoreline edge along Seawall Lot 352 where overtopping occurs.

Adaptation Considerations

- The available open space at Seawall Lot 352 may provide an opportunity for adaptation measures that can be set back from the shoreline edge.



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
Engineered	9.8 ft. NAVD	0.6	2.1	2,589	46.0%	2139	2066	2044	2035	2032

Flood Pathways

- Overtopping occurs over a stretch of non-engineered shoreline adjacent to Seawall Lot 352 and the Pier 94 wetlands at the Bay edge. Overtopping allows flooding to traverse west across Seawall Lot 352 into the southern portion of Pier 92 and areas further west including the Intermodal Cargo Transfer Facility and Seawall Lot 344-East. Flooding connects to other inundated areas within this subarea.
- Overtopping also occurs over the engineered shoreline adjacent to the 3rd Street Bridge and Illinois Street Bridge, resulting in floodwaters reaching Cargo Way. Flooding comingles with Subarea 4-2.

Shoreline Focus

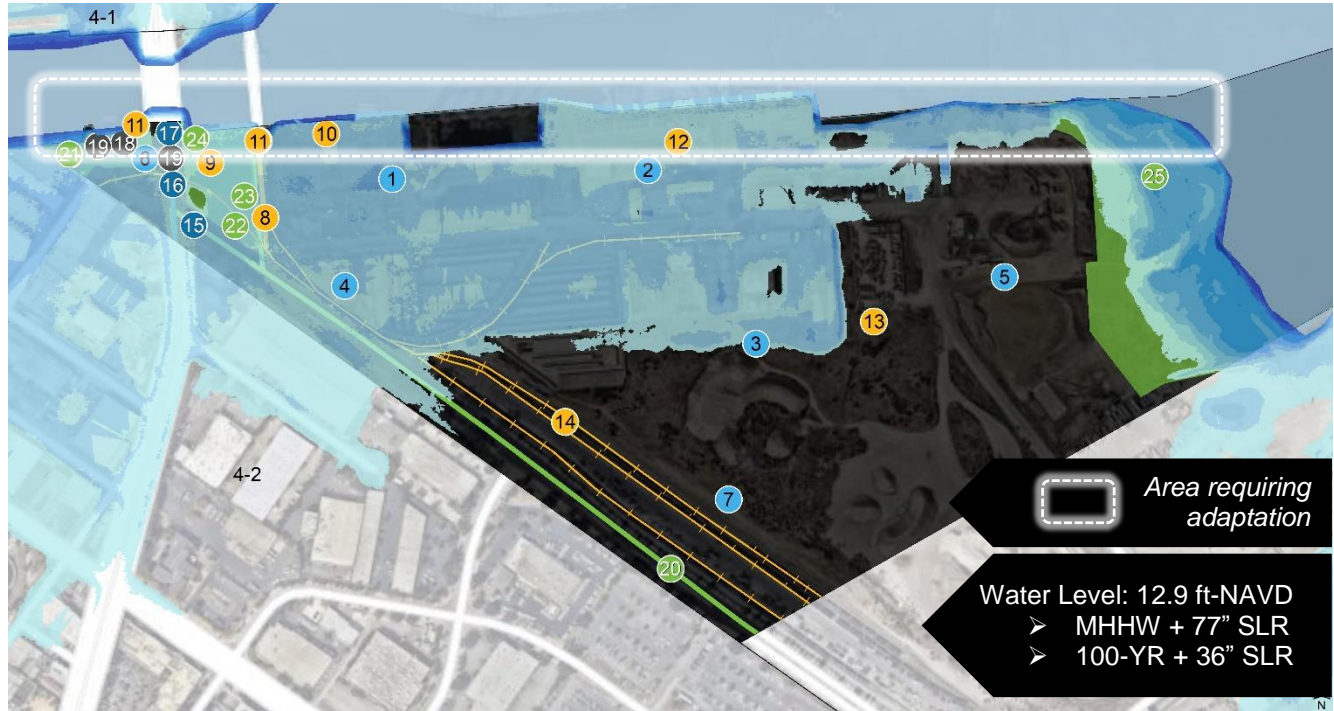
- Initial adaptation measures in this subarea could focus on the Islais Creek shoreline edge along Seawall Lot 352 where overtopping occurs.

Adaptation Considerations

- The available open space at Seawall Lot 352 may provide an opportunity for adaptation measures that can be set back from the shoreline edge.



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
Embankment; Engineered	10.3 ft. NAVD	2.3	4.1	5,602	99.5%	>2150	2144	2091	2074	2063

Flood Pathways

- Overtopping occurs over most of the shoreline, resulting in significant inundation of the inland areas.
- Flooding connects with inundation from the adjacent Subarea 4-2.
- With water levels higher than this scenario, flooding would also connect with the Subarea 4-4 to the south.

Shoreline Focus

- Adaptation measures to address flooding are needed over most of the shoreline to minimize flood risk within this subarea (and adjacent Subarea 4-2). The shoreline is engineered with a vertical structure or hardened with riprap.

Adaptation Considerations

- Adaptation measures to reduce flood risk within this subarea may reduce the severity of inundation in the adjacent Subarea 4-2 Subarea. However, measures are likely required across the entire Islais Creek shoreline across both subareas.