APPENDIX F | HOTSPOT PROFILES

CONNECTING TO THE ONE WATER PLAN

This appendix provides additional detailed information that correlates to the following sections.

CORRELATING SECTIONS AND INFORMATION		
5 Climate Hotspot Identification Process	**5.5 Hotspot Identification and Prioritization**	**App. F** is divided into each Regional Planning District and contains detailed Hotspot Profiles for all 92 distinct hotspots that were identified across Oʻahu. Each profile documents the mapped Risk Scores for water infrastructure, key climate threats, infrastructure and community assets, known issues (e.g., localized flooding), ongoing or planned projects, and potential gaps in the area. These hotspot profiles served as the foundation for the subsequent hotspot prioritization phase.

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LEGEND FOR HOTSPOT PROFILES

<table>
<tr><td colspan="5">Risk Map Legend</td></tr>
<tr><td>Assets with Risk Scores</td><td colspan="4">Very Low Risk Low Risk At Risk High Risk Very High Risk</td></tr>
<tr><td colspan="5">Threat Map Legend (by Threat)</td></tr>
<tr><td rowspan="2">Sea Level Rise Flooding (ft)</td><td>Drainage Backflow</td><td>Groundwater Inundation</td><td>Annual High Wave-Driven Flooding</td><td>Passive Flooding (Connected to Ocean)</td></tr>
<tr><td>0 1 2 3 5 6 7 8 9 10 11 12</td><td>1 2 3 4 5 6 7 8 9 10 11</td><td>0 1 2 3 5 6 7 8 9 10 11 12</td><td>0 1 2 3 4 5 6 7 8 9 10 11</td></tr>
<tr><td>Coastal Erosion Due to Sea Level Rise</td><td colspan="4"></td></tr>
<tr><td>Hurricane</td><td colspan="4">Inundation Height
Up to 3 feet above ground
Up to 6 feet above ground
Greater than 3 feet above ground
Greater than 9 feet above ground</td></tr>
<tr><td>Tsunami</td><td colspan="4">Tsunami Evacuation Zones
Extreme Tsunami Evacuation Zones</td></tr>
<tr><td>100-Year Storm</td><td colspan="4">Digital Flood Insurance Rate Map
A - 1% annual chance floodplains
VE - 1% annual chance coastal floodplain with additional storm</td></tr>
<tr><td>Wildfire</td><td colspan="4">Fire Risk Areas
High
Low
Medium
N/A</td></tr>
</table>

SECTION F.1: NORTH SHORE

F.1.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The North Shore is predominantly rural, with community priorities centered on mālama ʻāina, sustainable development, and placing limits on future growth. Agriculture depends on irrigation from both local and Central Oʻahu systems. Wastewater management remains limited, as most properties rely on cesspools or septic systems. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.1.

F.1.1.1 SPECIFIC LOCATIONS

Several communities and waterways face compounding flood, erosion, and water quality challenges tied to failing infrastructure and low-lying areas.

- In **Waialua-Haleʻiwa**, 40% of cesspools are failing, and they can impact streams and nearshore water quality.
- **Kaiwikoʻele Stream (Waimea River)** poses significant concerns for natural resources and flooding impacts.
- **Portions of Kamehameha Highway** can sometimes be closed during periods of high surf or flooding.
- **Flood-prone areas: Kaiwikoʻele Stream, Paukauila Stream, Kiʻikiʻi Stream, Kaukonahua Stream, Anahulu River, Kaiaka Bay, Waialua Bay**, and the surrounding **regions of Waialua, Haleʻiwa, and Mokulēʻia** are highly vulnerable to flooding and coastal erosion due to their proximity to major waterways and low-lying topography.
- **Lake Wilson** is impacted by water quality issues from effluent, affecting its ecological health and limiting agricultural use for certain crops due to contamination concerns.

F.1.1.2 GENERAL CONCERNS ACROSS THE REGION

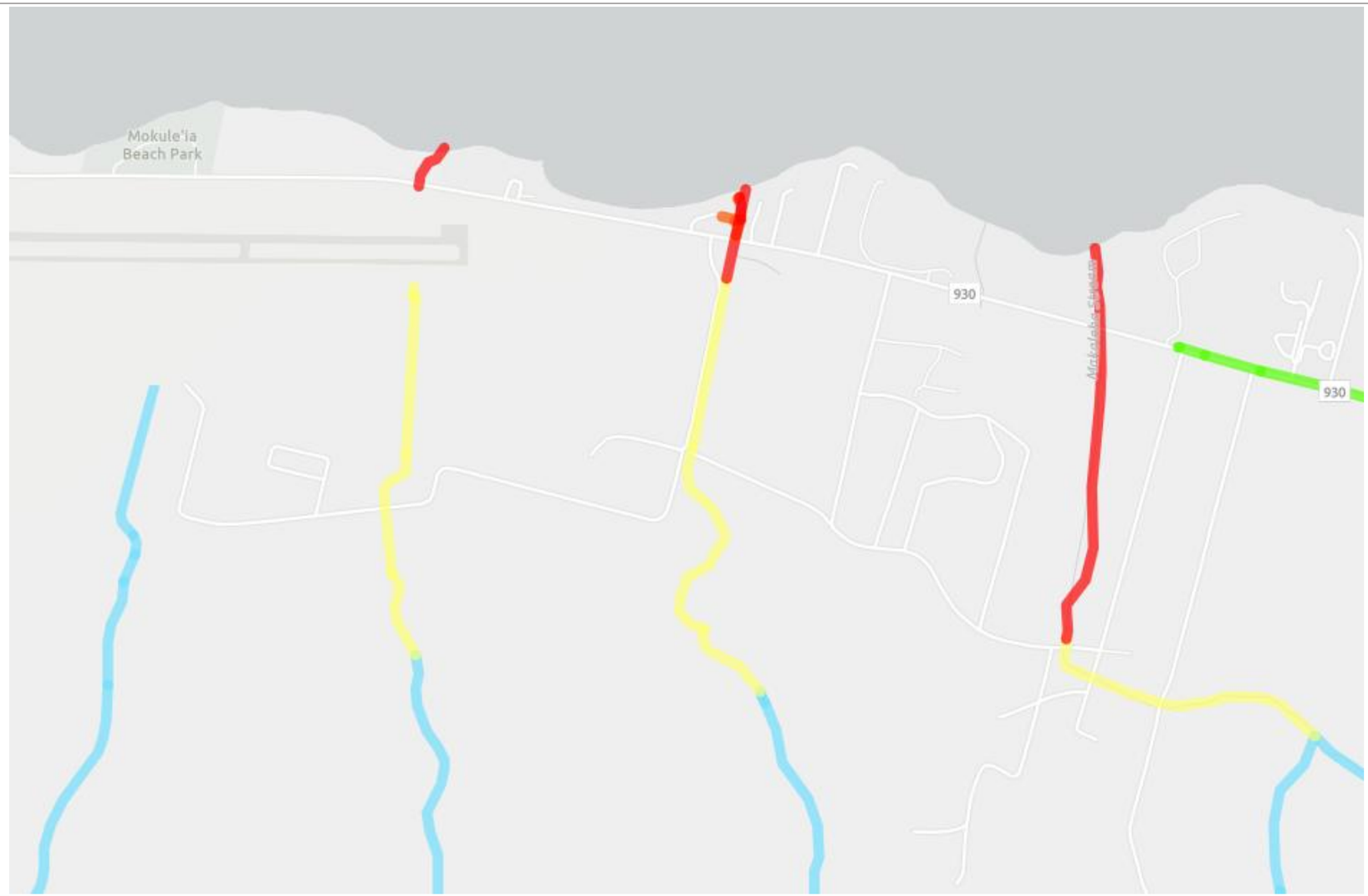
Beyond specific locations, the North Shore faces broader challenges related to erosion, water quality, wastewater infrastructure, and sustainable resource management.

- **Soil and coastline erosion** have significant consequences for infrastructure across the region.
- There are **impacts on water quality and quantity** from agriculture, urban development, and current land use.
- Support for **traditional water use and management practices** needs to be applied.
- There needs to be **support for biodiversity, ecosystem services for water filtration**, and flood mitigation.

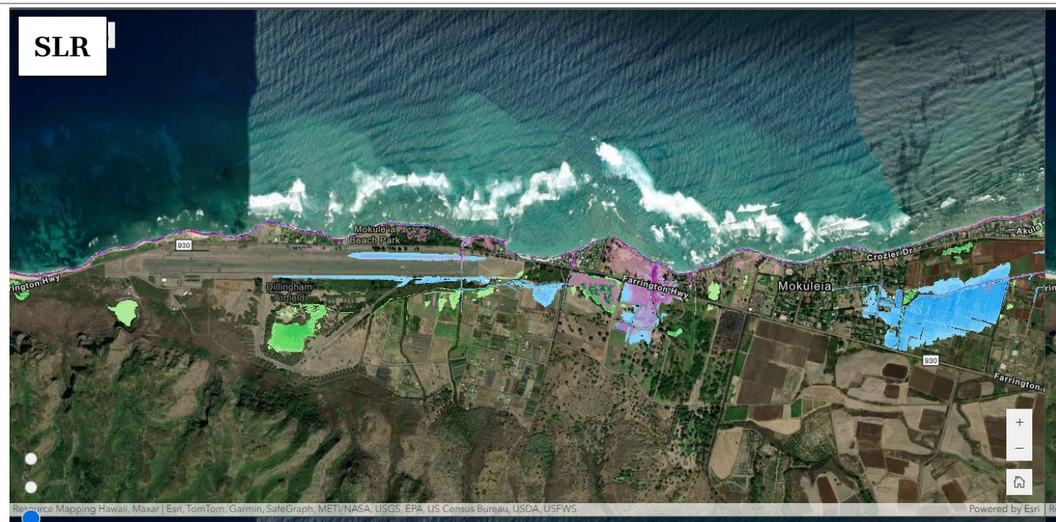
- **Outdated wastewater systems and the prevalence of individual cesspools** across various communities pose risks to water quality and public health. This is a particularly prevalent community concern.
- The community **has rejected the option of an ocean outfall for treated wastewater effluent** due to environmental and economic considerations, indicating a concern for the potential negative impacts on coastal waters.
- There are **concerns about the sustainability of current local irrigation practices**. The Waialua Town Master Plan discusses the **need for better management of water resources** to support agricultural productivity while minimizing environmental impacts.

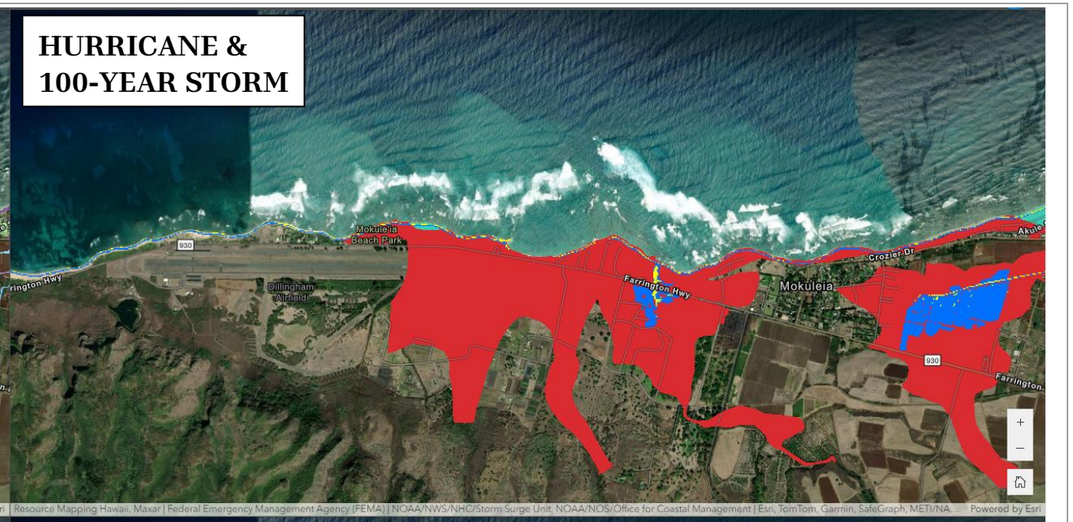
F.1.2 IDENTIFIED HOTSPOTS

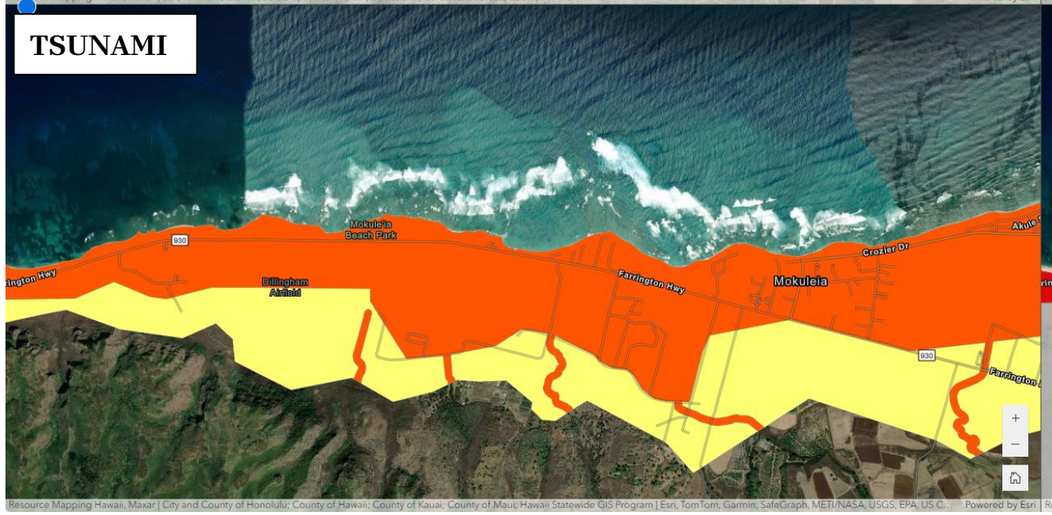
F.1.2.1 MOKULĒʻIA NEAR DILLINGHAM AIRFIELD

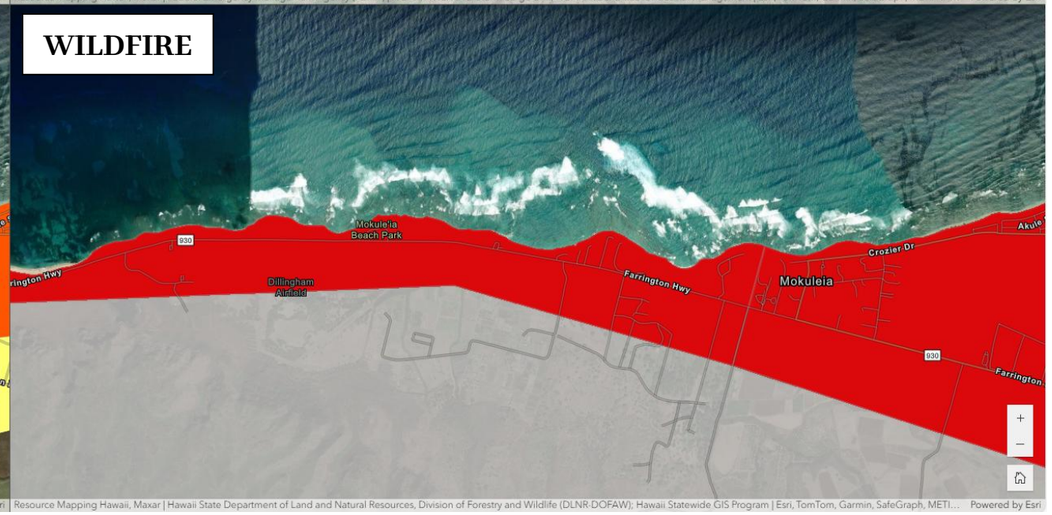
Location Information and Maps	
Location	Mokulēʻia
Risk Score Map	

Threat Maps


SLR
Mokuleia Beach Park
Dillingham Airfield
Farrington Hwy
Mokuleia
Crozier Dr
930
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri

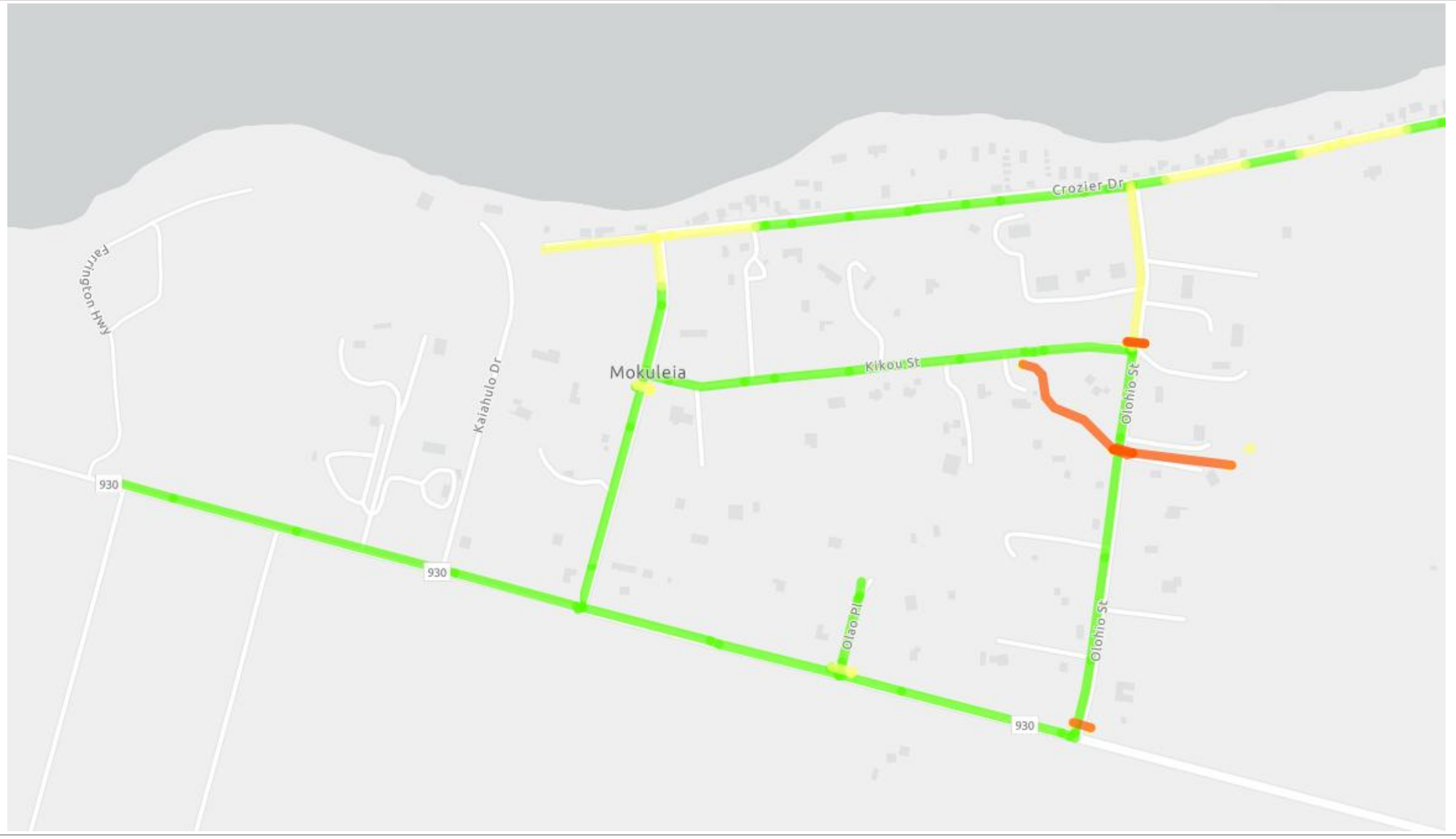

HURRICANE & 100-YEAR STORM
Mokuleia Beach Park
Dillingham Airfield
Farrington Hwy
Mokuleia
Crozier Dr
930
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, METI/NA...
Powered by Esri


TSUNAMI
Mokuleia Beach Park
Dillingham Airfield
Farrington Hwy
Mokuleia
Crozier Dr
930
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US C...
Powered by Esri

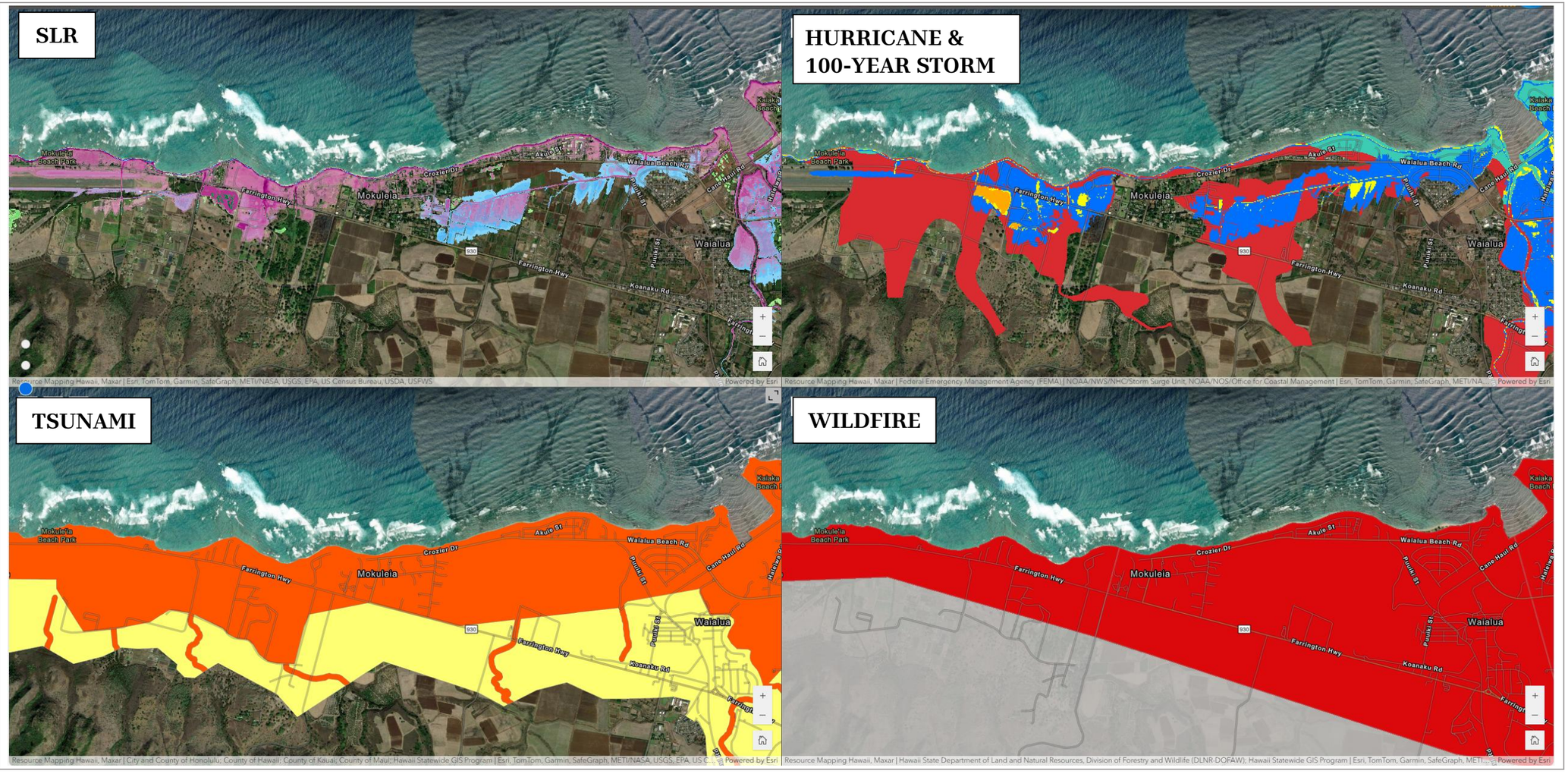

WILDFIRE
Mokuleia Beach Park
Dillingham Airfield
Farrington Hwy
Mokuleia
Crozier Dr
930
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI...
Powered by Esri

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	Kawaihāpai Stream, Pahole Stream, Makaleha Stream, 18 in. SW conduit, Unlined Channels
Water	Lack of water infrastructure
Major Streets	Kawaihāpai stream/Farrington Hwy Bridge, 0.29mi s/Hoʻomana Pl/Farrington Hwy Bridge, Makaleha stream/Farrington Hwy Bridge, Farrington Hwy
Community Assets	Mokulēʻia Beach Park, Dillingham Airfield
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 2 ft LSR • 80% probability of passive flooding at 6 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 3 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Not within a drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for flood and erosion protection and consideration of alternative routes in case of accessibility impacted by flooding

1.2.2 MOKULĒʻIA

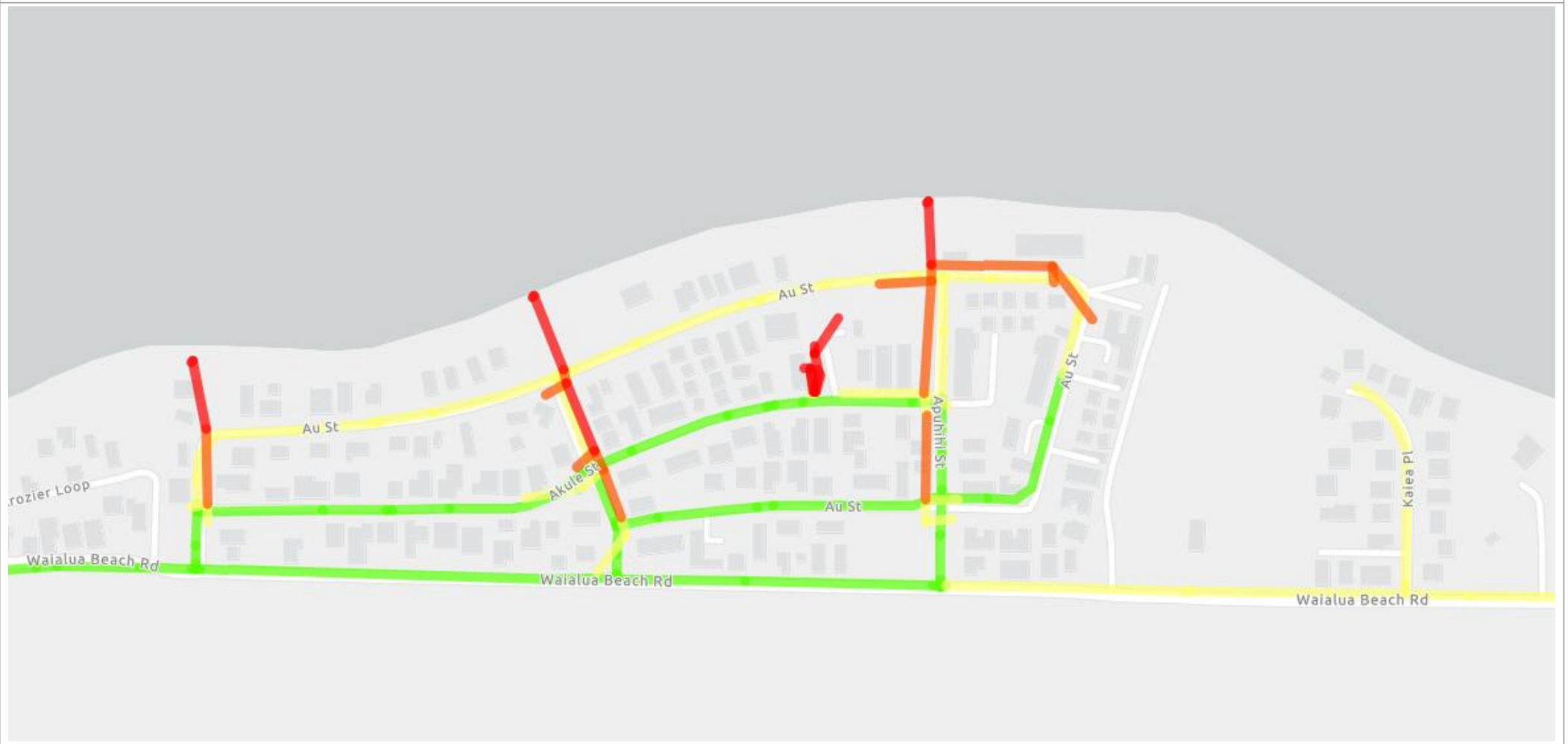
Location Information and Maps	
Location	Mokulēʻia
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
HURRICANE & 100-YEAR STORM
TSUNAMI
WILDFIRE
Mokuleia
Waialua
Farrington Hwy
Crozier Dr
Akule St
Walalua Beach Rd
Puuiki St
Cane Haul Rd
Koanaku Rd
930
Mokuleia Beach Park
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS | Powered by Esri
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, METI/NA... | Powered by Esri
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US C... | Powered by Esri
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, MET... | Powered by Esri

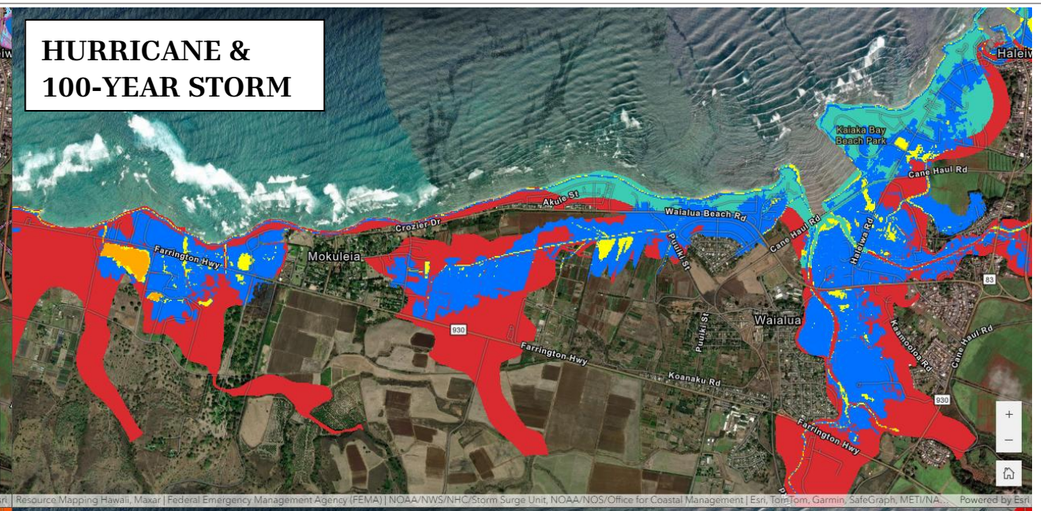
Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	18 in./30 in./36 in. SW conduits, unlined SW channel
Water	High risk water mains
Major Streets	Farrington Hwy, Crozier Dr, Olohio St
Community Assets	Polo Beach, Mokulēʻia Beach
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 4 ft SLR • 80% probability of passive flooding at 7 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 4 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• None identified
Potential Gaps	• Potential need for flood and erosion protection measures (flooding impacts may occur more during mid- and long-term planning horizons)

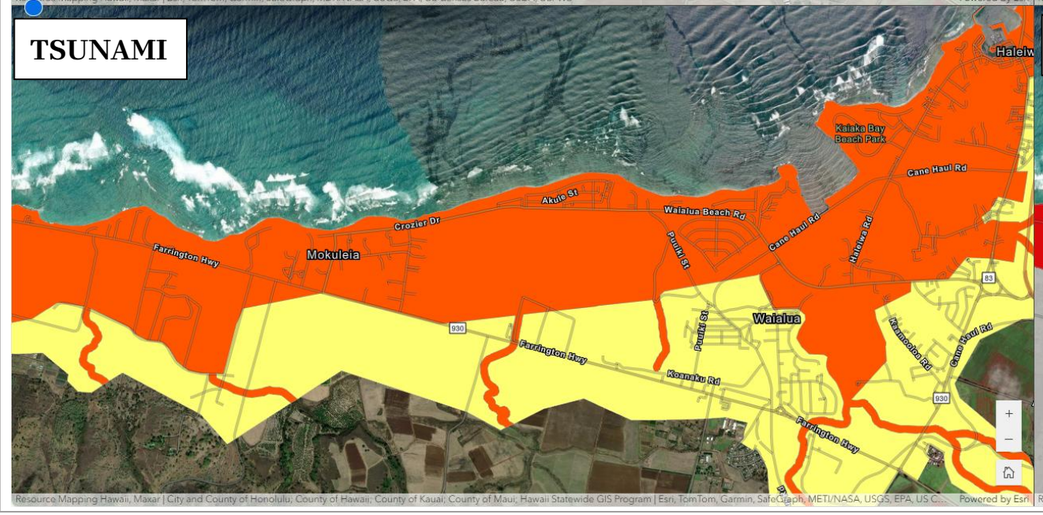
1.2.3 WAIALUA BEACH RD

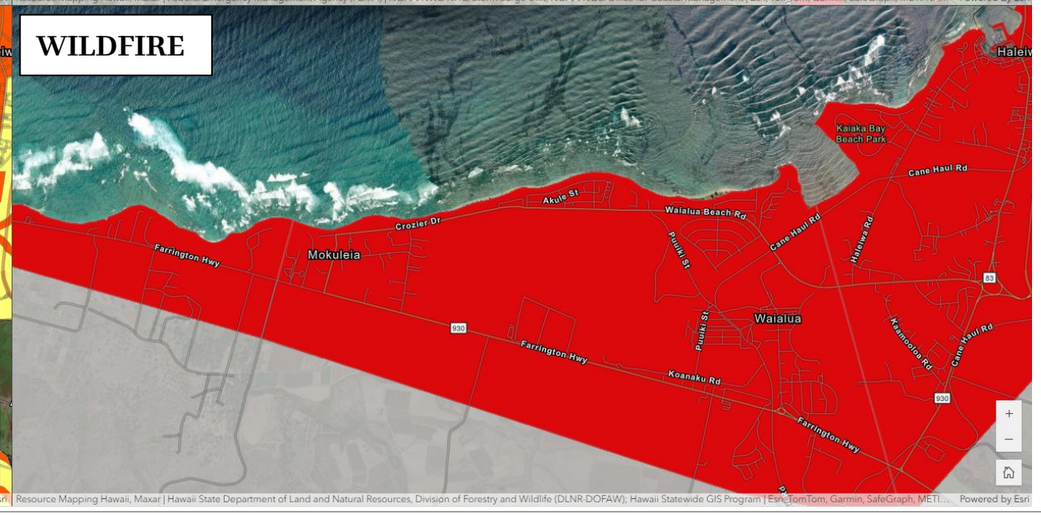
Location Information and Maps	
Location	Waialua
Risk Score Map	

Threat Maps


SLR
Mokuleia
Waialua
Farrington Hwy
Crozier Dr
Akule St
Waialua Beach Rd
Cane Haul Rd
Kaiaka Bay Beach Park
Puuiki St
Hunkwa Rd
Kamanoulu Rd
Oahu Sand Rd
Koanaku Rd
930
83
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri


HURRICANE &
100-YEAR STORM
Mokuleia
Waialua
Farrington Hwy
Crozier Dr
Akule St
Waialua Beach Rd
Cane Haul Rd
Kaiaka Bay Beach Park
Puuiki St
Hunkwa Rd
Kamanoulu Rd
Oahu Sand Rd
Koanaku Rd
930
83
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, METI/NA...
Powered by Esri


TSUNAMI
Mokuleia
Waialua
Farrington Hwy
Crozier Dr
Akule St
Waialua Beach Rd
Cane Haul Rd
Kaiaka Bay Beach Park
Puuiki St
Hunkwa Rd
Kamanoulu Rd
Oahu Sand Rd
Koanaku Rd
930
83
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US C...
Powered by Esri


WILDFIRE
Mokuleia
Waialua
Farrington Hwy
Crozier Dr
Akule St
Waialua Beach Rd
Cane Haul Rd
Kaiaka Bay Beach Park
Puuiki St
Hunkwa Rd
Kamanoulu Rd
Oahu Sand Rd
Koanaku Rd
930
83
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI...
Powered by Esri

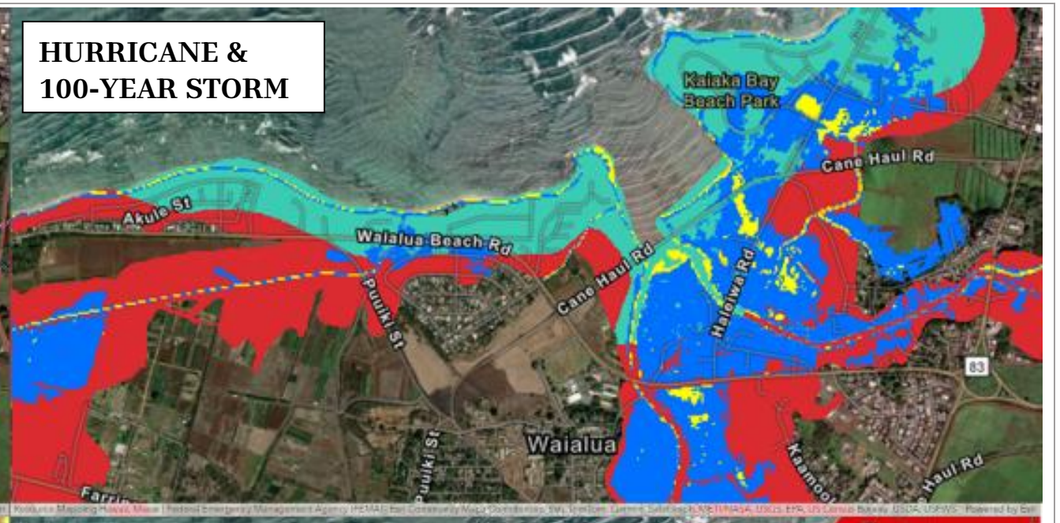
Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	18 in./24 in./30 in./36 in./42 in. SW conduits
Water	High risk water mains
Major Streets	Waialua Beach Rd
Community Assets	ʻĀweoweo Beach Park, Dole Private Beach
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 3 ft SLR • 80% probability of passive flooding at 6 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 4 conditions
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Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Need for a drainage master plan for the Waialua watershed to address erosion and flood protection concerns. Conduct public outreach and education programs that explain the potential for flooding and efforts to minimize the effects of flooding.
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for flood protection measures (may be more immediate given complete inundation during current 100-year storm)

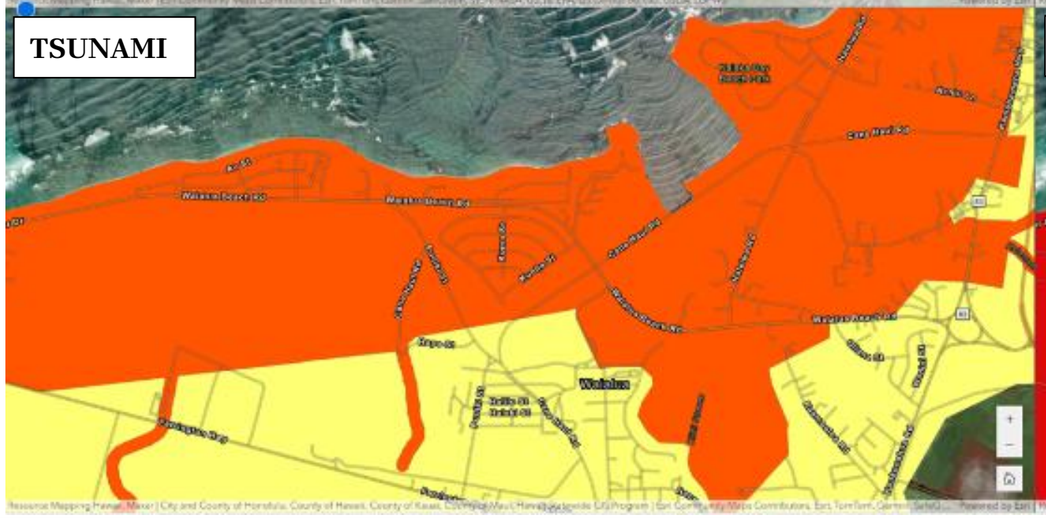
1.2.4 KAIAKA BAY BEACH

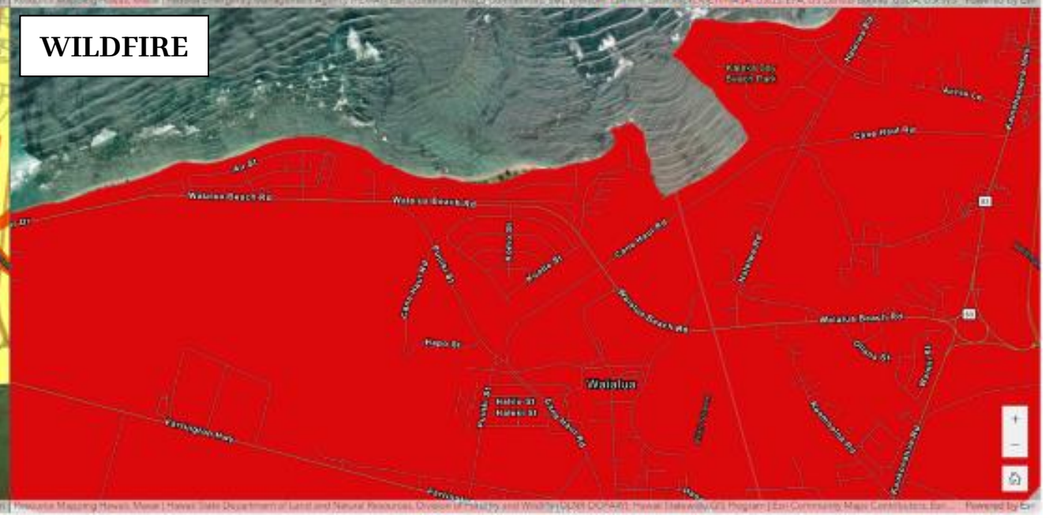
Location Information and Maps	
Location	Waialua
Risk Score Map	

Threat Maps


SLR

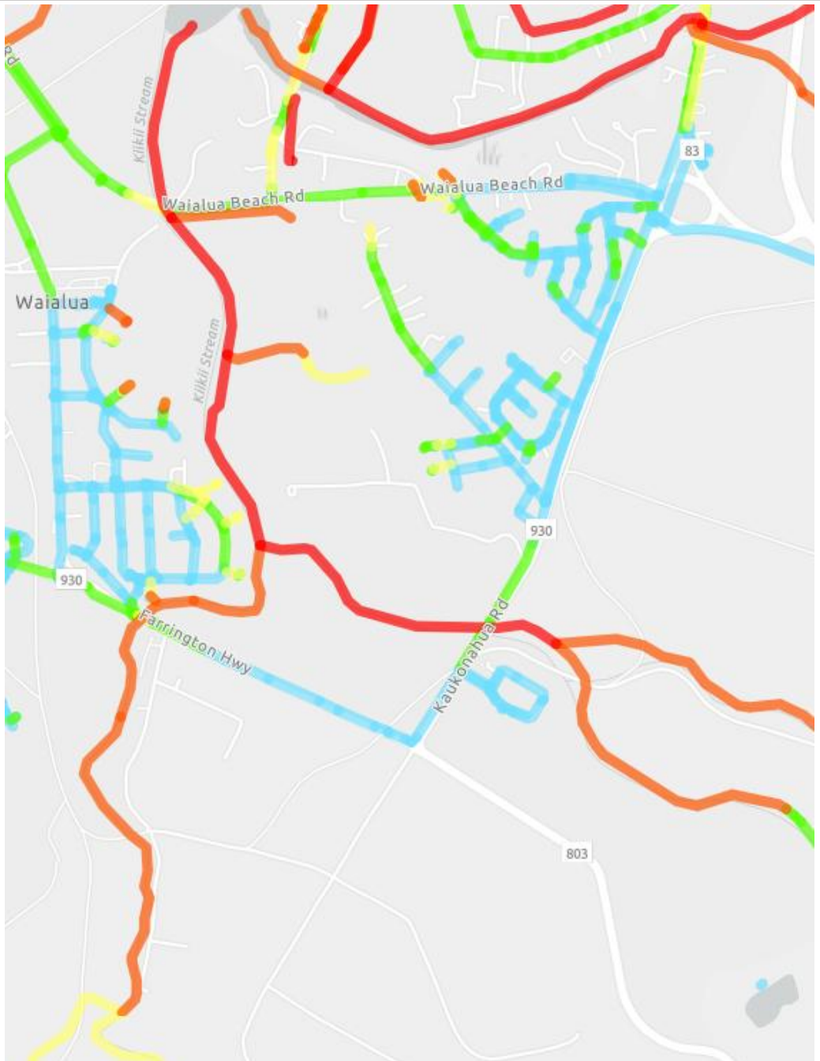

HURRICANE &
100-YEAR STORM
Kaiaka Bay Beach Park
Cane Haul Rd
Akule St
Waialua Beach Rd
Puuiki St
Haleiwa Rd
Waialua
83


TSUNAMI
Waialua

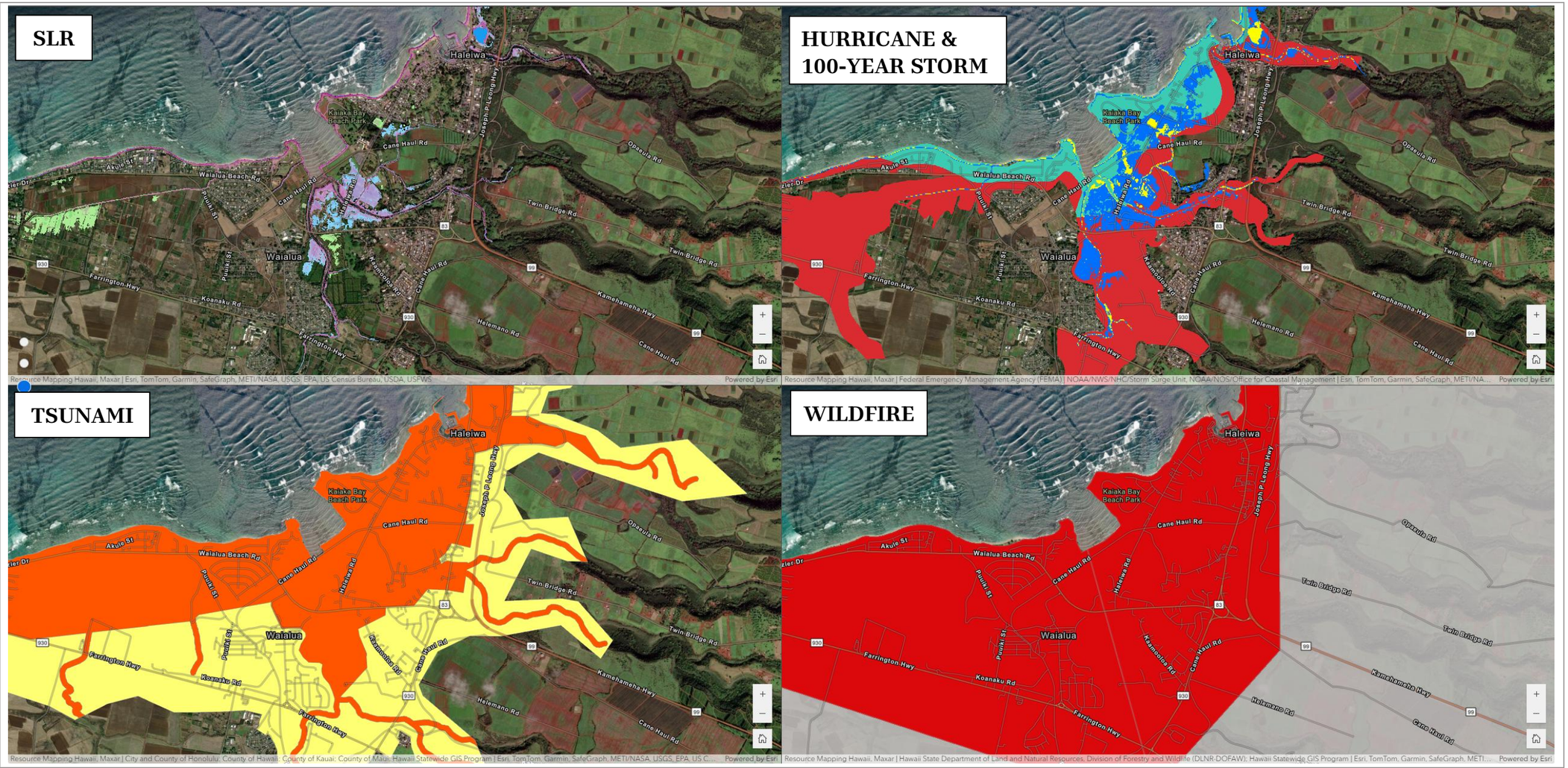

WILDFIRE
Waialua

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	ʻĀweoweo stream,18 in./24 in./30 in./36 in./42 in. SW conduits, unlined channels
Water	High risk water mains
Major Streets	Waialua Beach Rd, Cane Haul Rd
Community Assets	Kaiaka Bay Beach, protected Kaiaka Bay, nearby Waialua Elementary
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 2 ft SLR • 80% probability of passive flooding at 6 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 3 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Within dam evacuation zone (Wahiawa Dam) • Need for a drainage master plan for the Waialua watershed to address erosion and flood protection concerns. Conduct public outreach and education programs that explain the potential for flooding and efforts to minimize the effects of flooding. • Kaiaka Bay noted as being flood prone
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for flood protection measures (may be more immediate given complete inundation during current 100-year storm)

1.2.5 WAIALUA

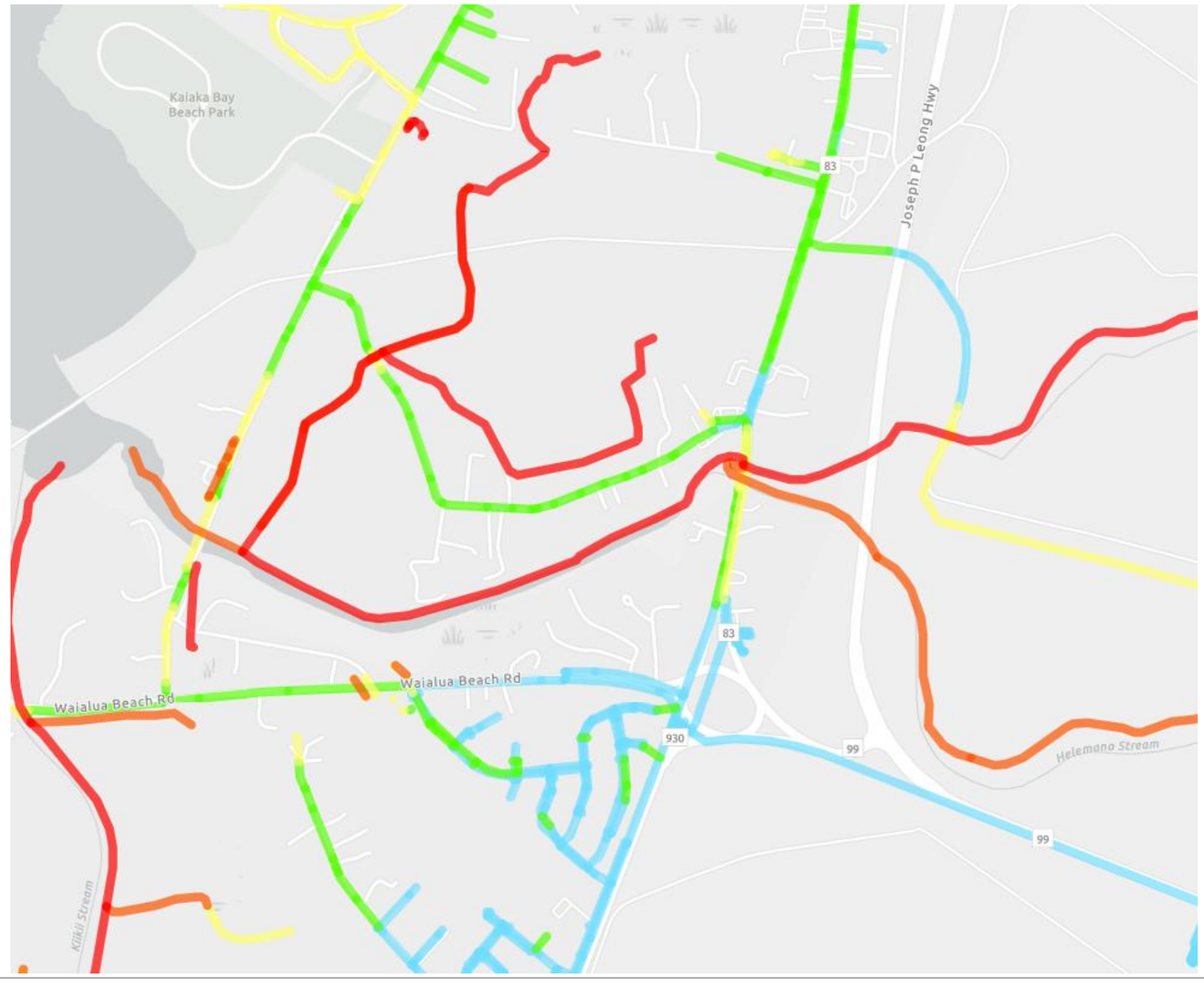
Location Information and Maps	
Location	
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps

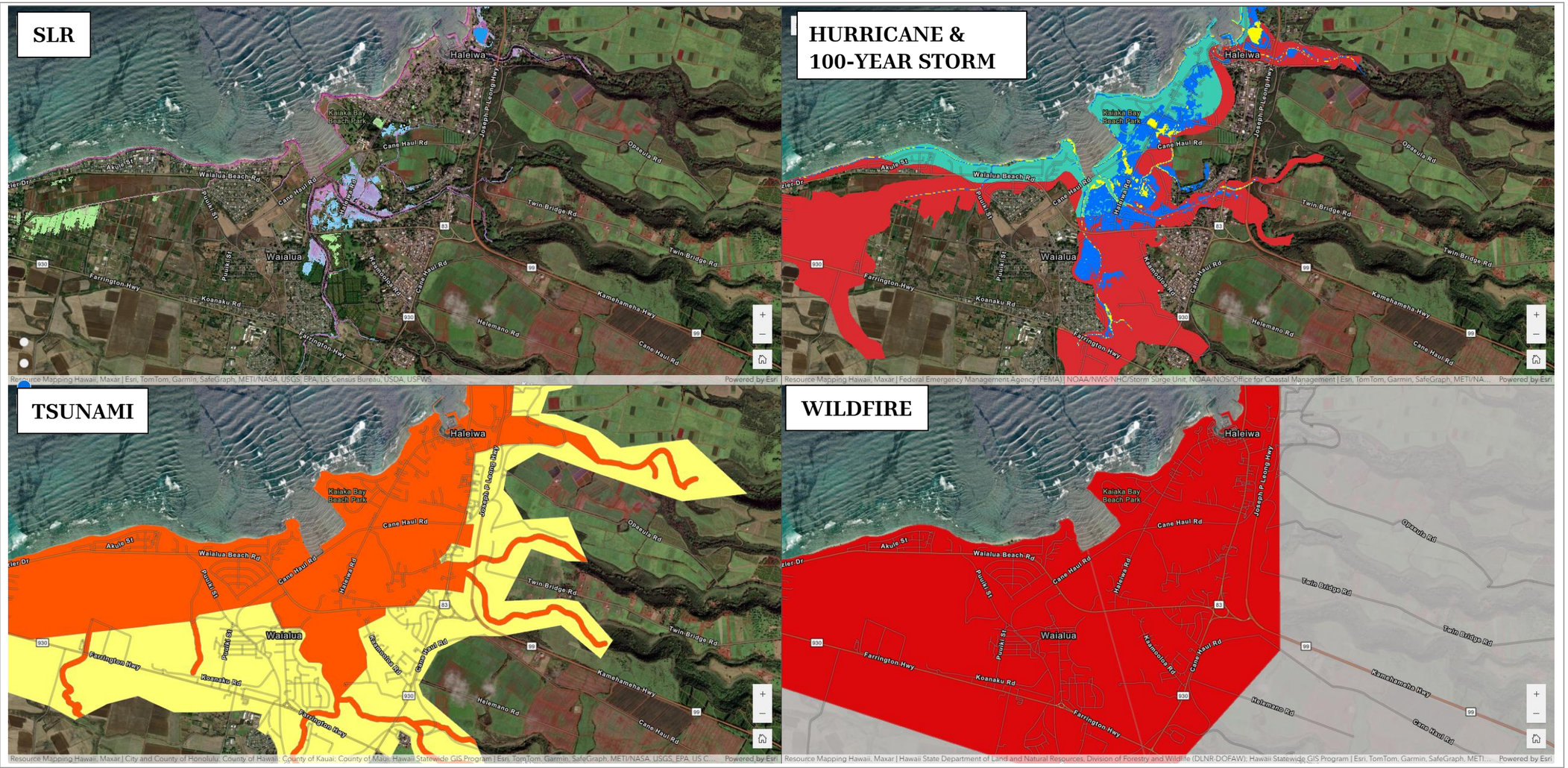

SLR
HURRICANE & 100-YEAR STORM
TSUNAMI
WILDFIRE
Haleiwa
Waialua
Kaiaka Bay Beach Park
Cane Haul Rd
Joseph P Leong Hwy
Opaeula Rd
Twin Bridge Rd
Akule St
Waialua Beach Rd
Puuiki St
Hiiaka Rd
Farrington Hwy
Koanaku Rd
Kamehameha Hwy
Helemano Rd
930
83
99
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, METI/NA...
Powered by Esri
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US C...
Powered by Esri
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI:...
Powered by Esri

Key Assets	
Wastewater	Paʻalaʻa Kai WWTP Influent PS, Paʻalaʻa Kai WWTP, Paʻalaʻa Kai WWTP Effluent, 6 in. force mains, 8 in./10 in./12 in. sewer gravity mains
Stormwater	Kiʻikiʻi Stream, Kaukonahua Stream, Poamoho Stream, 12 in./18 in./60 in. SW conduits
Water	High risk water mains
Major Streets	Farrington Hwy/Waialua Plt Rd Bridge, Farrington Hwy/Kaukonahua Stream Bridge, Waialua Plt Rd/Farrington Hwy Bridge, Kaukonahua Rd/North Poamoho Steam Bridge, Waialua Beach Rd/Kiʻikiʻi Stream Bridge, Waialua Beach Rd, Farrington Hwy
Community Assets	Kaiaka Bay Beach, protected Kaiaka Bay, Waialua Elementary, St. Michael Private School, Waialua High & Intermediate School
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 2 ft of SLR • 80% probability of passive flooding at 4 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Within dam evacuation zone (Wahiawa Dam and Kemoʻo 5 Reservoir) • Need for a drainage master plan for the Waialua watershed to address erosion and flood protection concerns. Conduct public outreach and education programs that explain the potential for flooding and efforts to minimize the effects of flooding. • Kiʻikiʻi and Kaukonahua streams noted as flood prone
Ongoing/Planned Projects	• No identified
Potential Gaps	• Need for flood protection measures (may be more immediate given complete inundation during current 100-year storm) • Need for strategies to address wildfire and heat risk, especially given concentration of vulnerable populations (e.g., schools)

1.2.6 BILL AND PEGGY PATY KAIAKA BAY BEACH PARK AND CAMPGROUND/HALE‘IWA

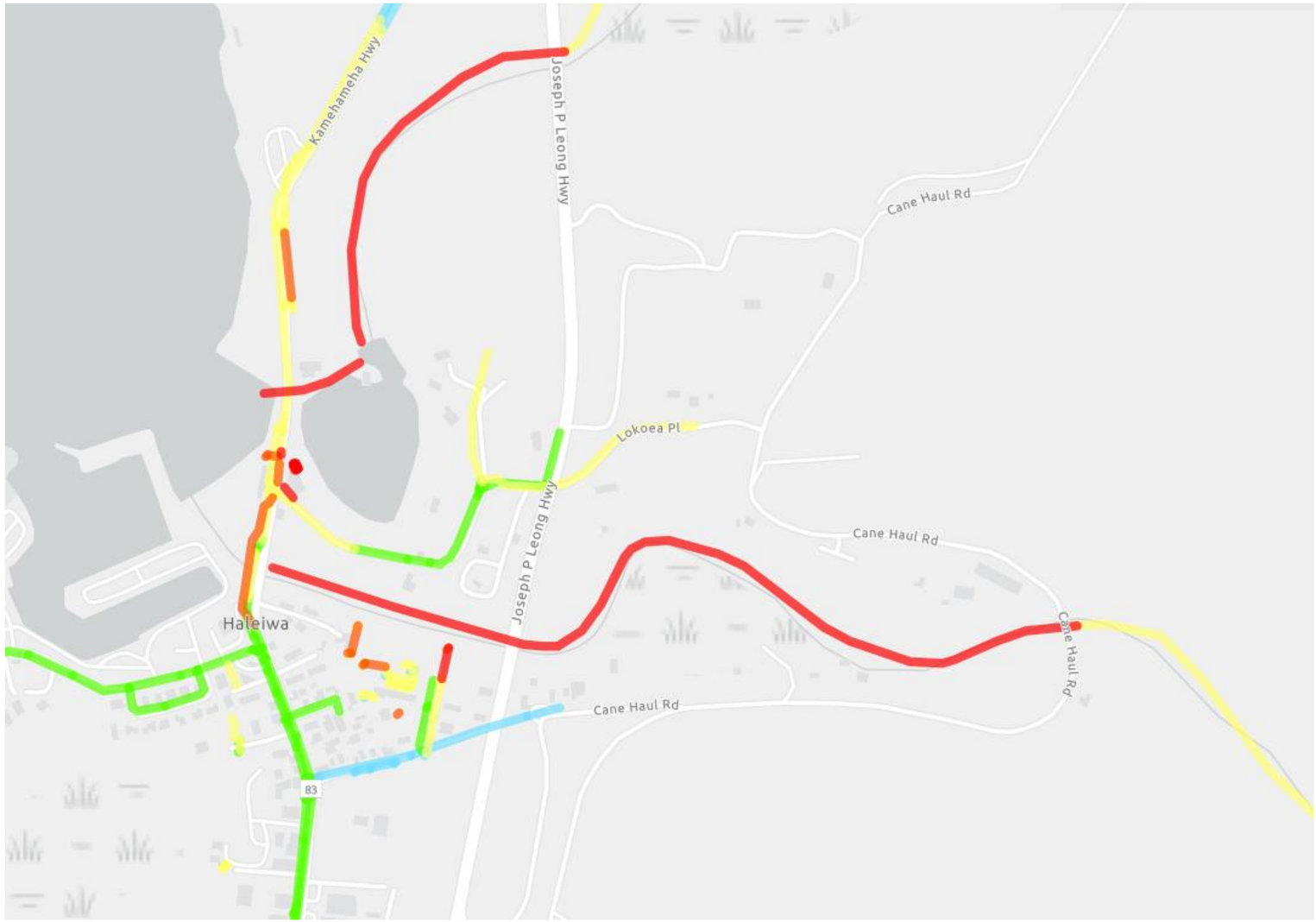
Location Information and Maps	
Location	Hale‘iwa
Risk Score Map	

Threat Maps

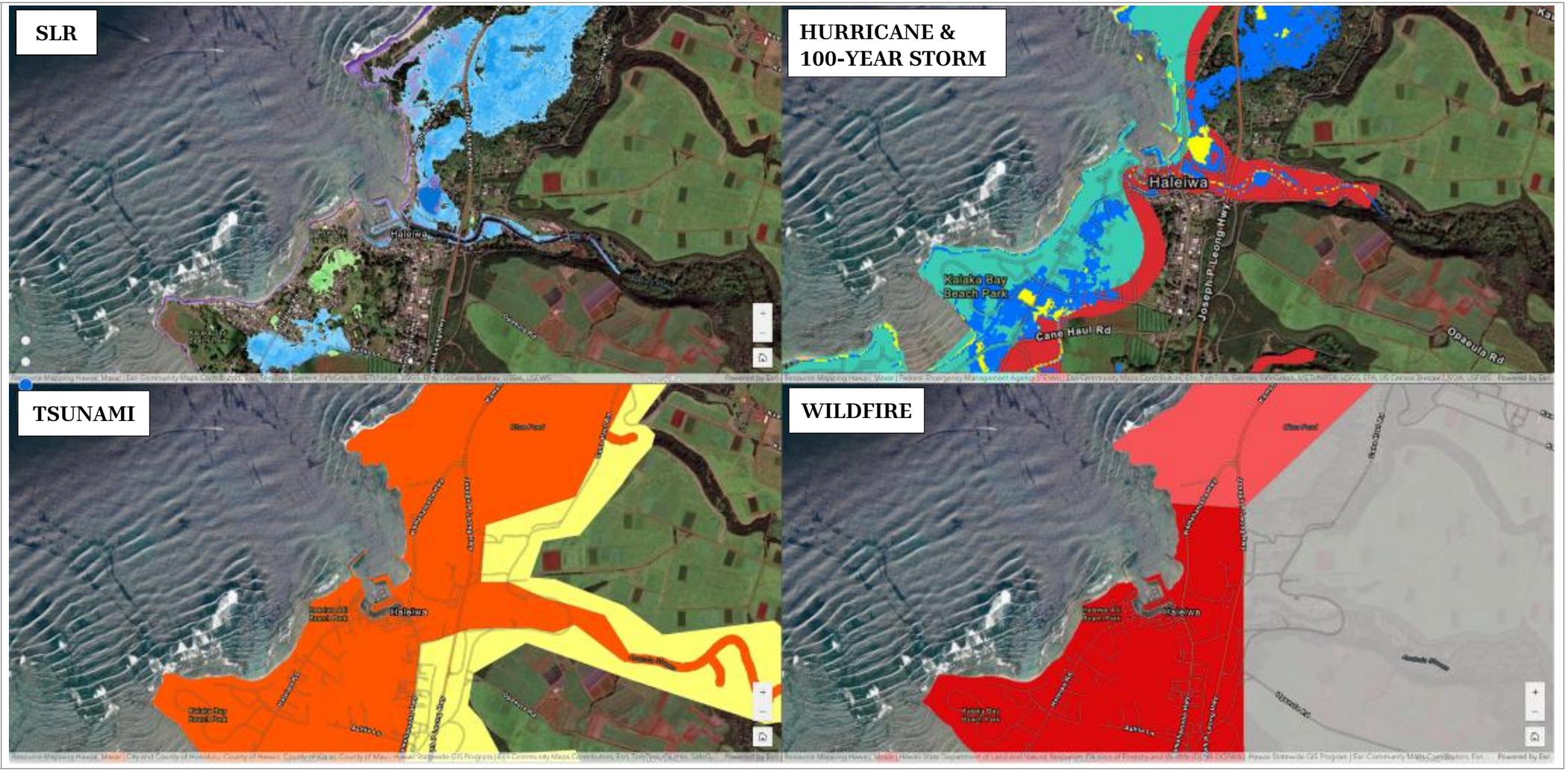

SLR
HURRICANE & 100-YEAR STORM
TSUNAMI
WILDFIRE
Haleiwa
Waialua
Kaiaka Bay Beach Park
Cane Haul Rd
Joseph P Leong Hwy
Opaeula Rd
Twin Bridge Rd
Akule St
Waialua Beach Rd
Puuiki St
Hihiwai Rd
Farrington Hwy
Koanaku Rd
Kamehameha Hwy
Helemano Rd
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, METI/NA...
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Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US C...
Powered by Esri
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI:...
Powered by Esri

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	Paukauila Stream, ʻŌpaeʻula Stream, Helemano Stream,18 in. SW conduits
Water	High risk water mains, nearby critical wells, nearby water treatment plant
Major Streets	Paukauila Stream/Haleʻiwa Rd Bridge, Paʻalaʻa Rd/Unknown Stream Bridge, Cane Haul Rd/Irrigation Ditch Bridge, ʻŌpaeʻula Waialua Twn B/Kamehameha Hwy Bridge, Waialua Twn A (Helemano)/Kamehameha Hwy Bridge, ʻŌpaeʻula Stream/Kamehameha Hwy Bridge, Helemano Stream/Kamehameha Hwy Bridge, Joseph P. Leong Hwy, Waialua Beach Rd, Haleʻiwa Rd
Community Assets	Bill and Peggy Paty Kaiaka Bay Beach Park and Campground, Haleʻiwa Elementary School, Waialua Fire Station #14
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 2 ft SLR • 80% probability of passive flooding at 4 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Within dam evacuation zone (Wahiawa Dam) • Paukauila Stream noted as flood prone • Kaiaka Bay noted as being flood prone
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for erosion and flooding protection measures for streams, roads, and many infrastructure assets in this area

1.2.7 HALE‘IWA TOWN/HALE‘IWA BEACH PARK

Location Information and Maps	
Location	Hale‘iwa
Risk Score Map	

Threat Maps

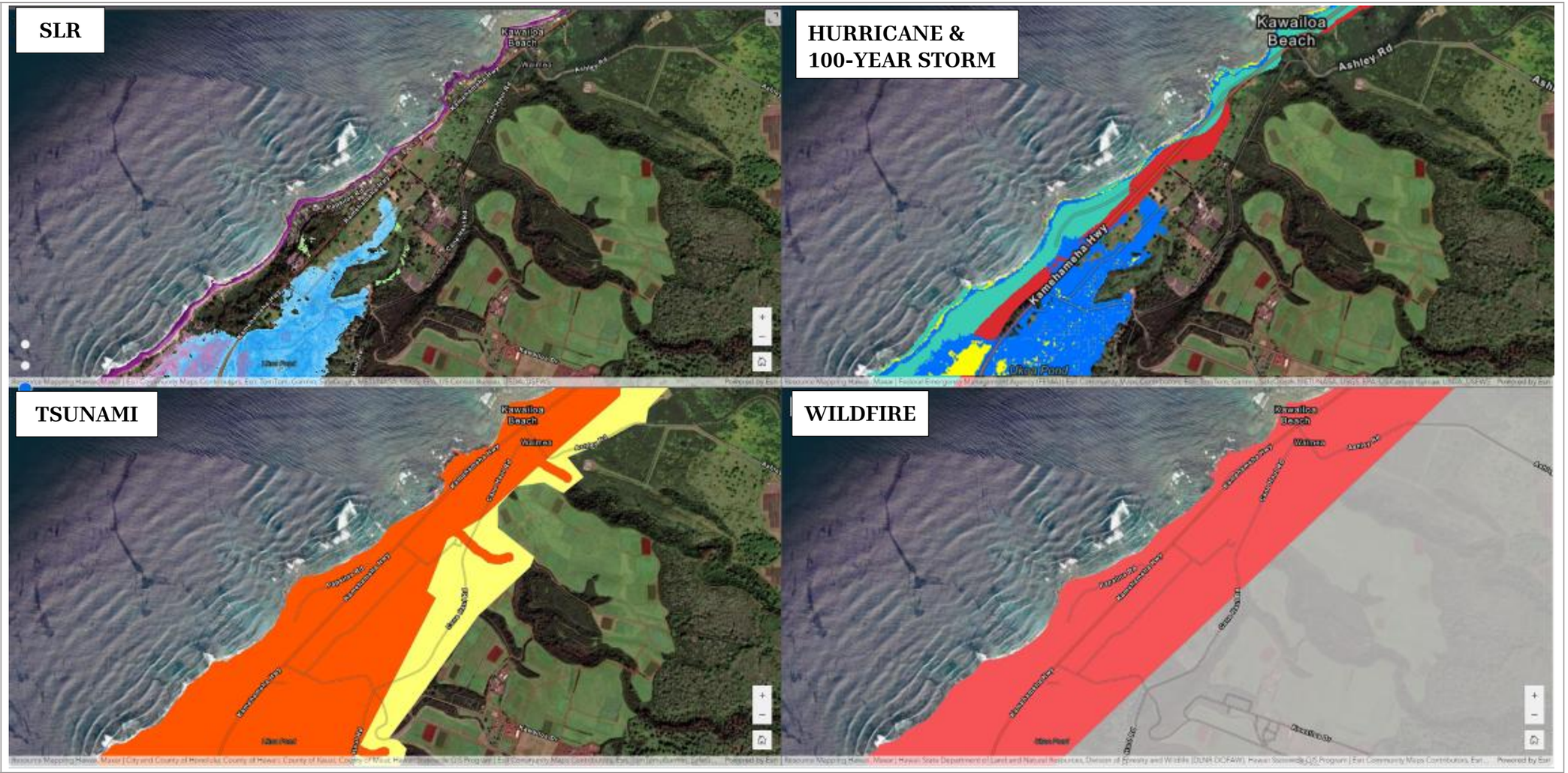

SLR
HURRICANE & 100-YEAR STORM
TSUNAMI
WILDFIRE
Haleiwa
Kaiaka Bay Beach Park
Cane Haul Rd
Joseph P. Leong Hwy
Opaeula Rd

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	Flood Barriers and Containment, Loko Ea Stream, 24 in. SW conduits
Water	High risk water mains
Major Streets	Haleʻiwa Rd, Kamehameha Hwy, Anahulu Stream/Kamehameha Hwy Bridge, Loko Ea Stream/Kamehameha Hwy Bridge, ʻUkoʻa Pond/Kamehameha Hwy Bridge, DFW Road Maintenance Base Yard, Joseph P. Leong Hwy
Community Assets	Haleʻiwa Boat Harbor, Haleʻiwa Aliʻi Beach Park, Haleʻiwa Beach Park, Loko Ea Fishpond, ʻUkoʻa Pond
Climate Threats	
SLR	• Coastal erosion at 1 ft SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 1 ft of SLR • 80% probability of passive flooding at 6 ft of SLR
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • Within dam evacuation zones (ʻŌpaeʻula 01 Reservoir and Kemoʻo 5 Reservoir) • Anahulu Stream noted as being flood prone
Ongoing/Planned Projects	• North Shore Resilience Working Group addressing severe erosion • Honolulu Complete Streets – North Shore (Multi-use path along Haleʻiwa Rd and Bike Path along Sharks Cove) (City) • North Shore Sustainable Communities Plan (DPP) • HFD Fire Station & Kawailoa Transfer Station
Potential Gaps	• Need for erosion and flood protection measures potentially near-term given complete inundation at current 100-year storm and coastal erosion already at 1 ft SLR

1.2.8 LANIĀKEA BEACH

Location Information and Maps	
Location	North Shore
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps

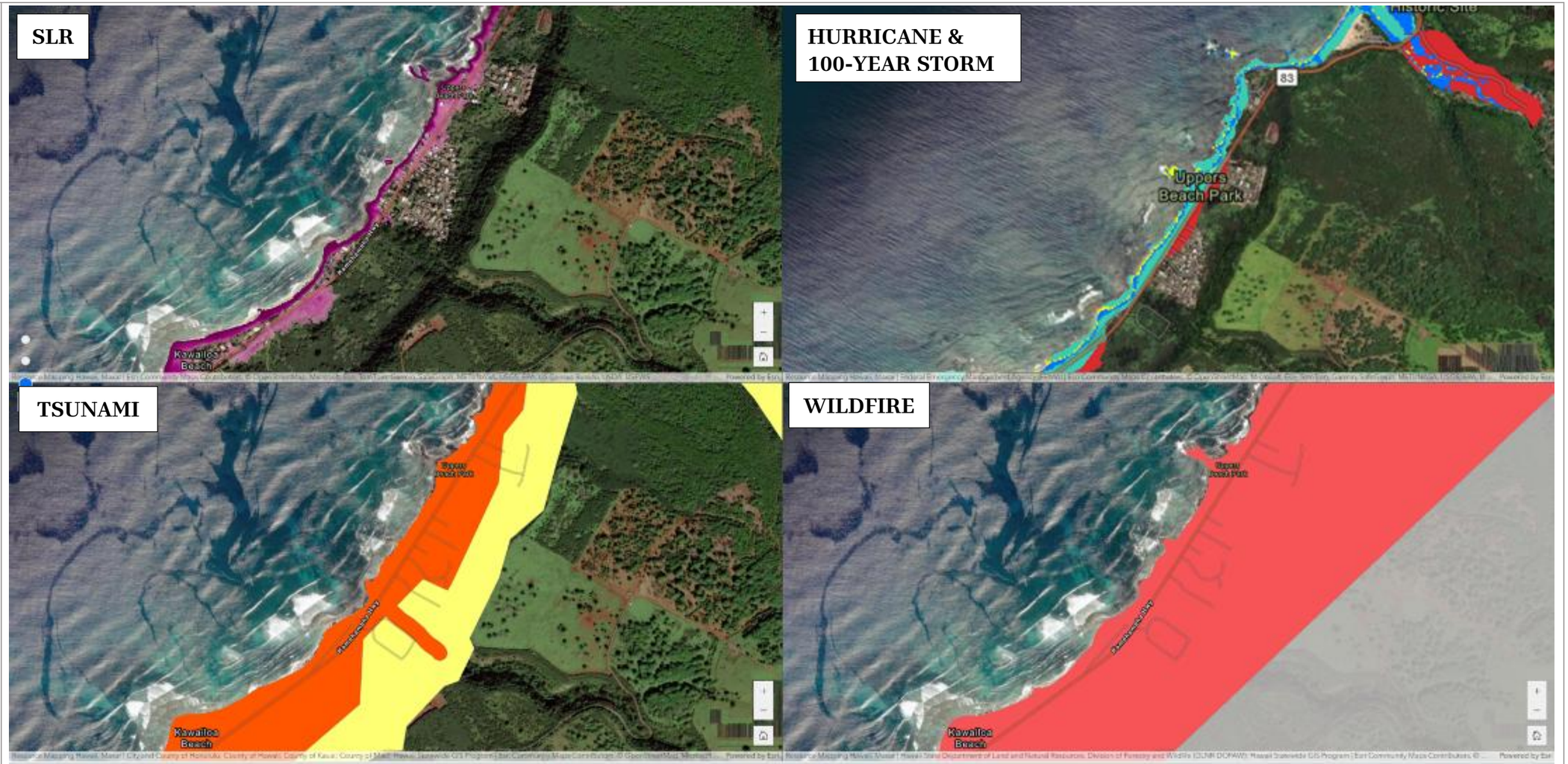

SLR
HURRICANE & 100-YEAR STORM
TSUNAMI
WILDFIRE
Kawailoa Beach
Waimea
Ashley Rd
Kamehameha Hwy
Ukoa Pond

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	12 in. SW conduit, Laniākea Stream, Kawailoa Stream
Water	High risk/Very High risk water mains
Major Streets	Lauhulu Stream/Kamehameha Hwy Bridge, Kamehameha Hwy
Community Assets	Laniākea Beach, Kawailoa Beach
Climate Threats	
SLR	• Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Annual high wave-driven flooding at 2 ft of SLR • 80% probability of passive flooding at 7 ft of SLR • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 4 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • Potential accessibility issue along Kamehameha Highway
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for erosion and flood protection measures potentially near-term given complete inundation at current 100-year storm and coastal erosion already at 1 ft SLR

I.2.9 KAWAILOA BEACH

Location Information and Maps	
Location	North Shore
Risk Score Map	

Threat Maps

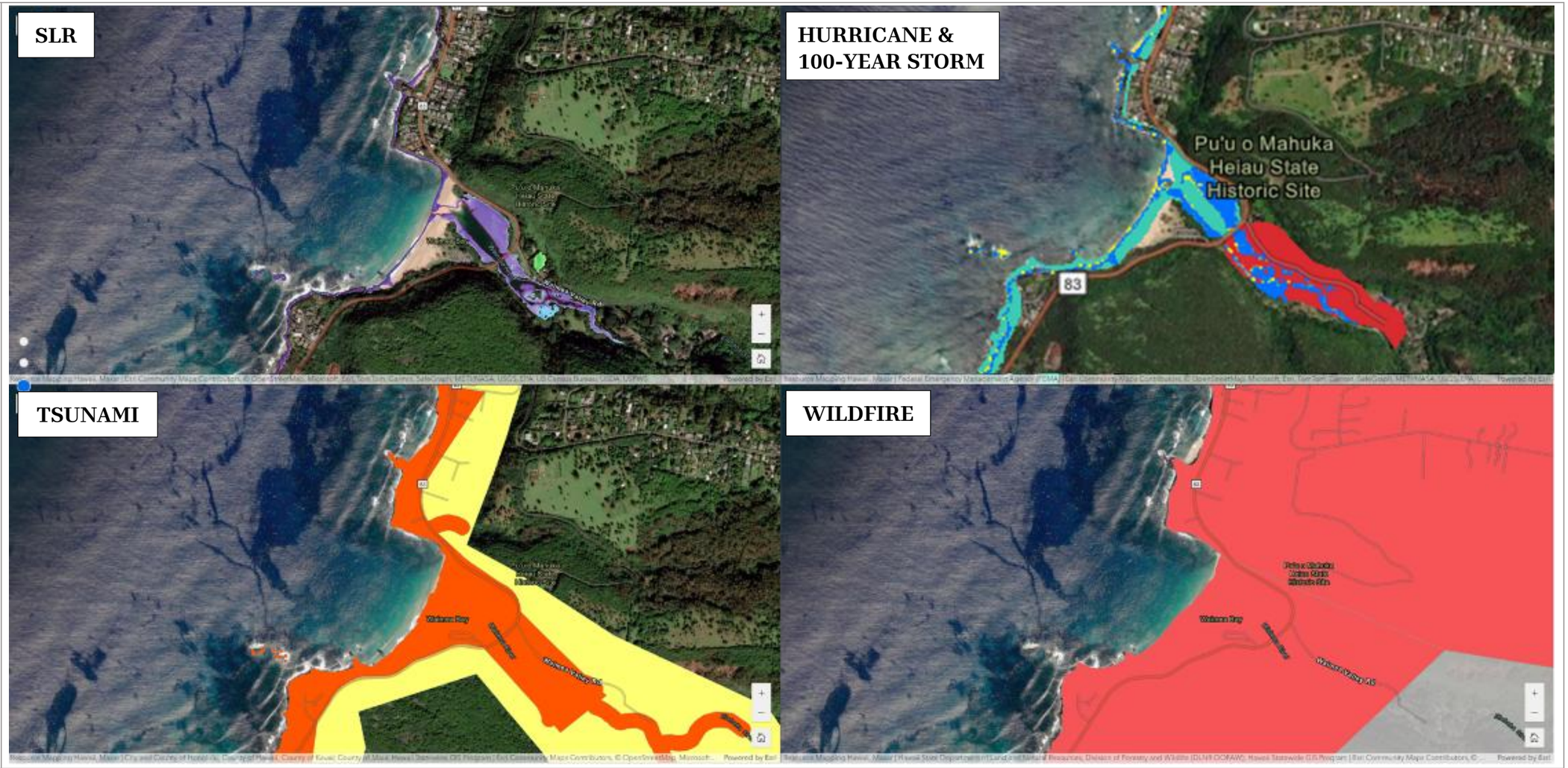

SLR
HURRICANE &
100-YEAR STORM
TSUNAMI
WILDFIRE
Kawailoa
Beach
Uppers
Beach Park
83
Kamehameha Hwy

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	Ka‘alaea gulch, Ka‘alaea stream, 18 in./24 in./30 in. SW conduits
Water	High risk water mains
Major Streets	Kawailoa stream/Kamehameha Hwy Bridge, Kamehameha Hwy
Community Assets	Uppers Beach, Kawailoa Beach
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft of SLR • 80% probability of passive flooding at 10 ft of SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 4 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for erosion and flood protection measures potentially near-term given coastal erosion already at 1 ft SLR, and potential impacts for community accessibility

I.2.10 WAIMEA BAY

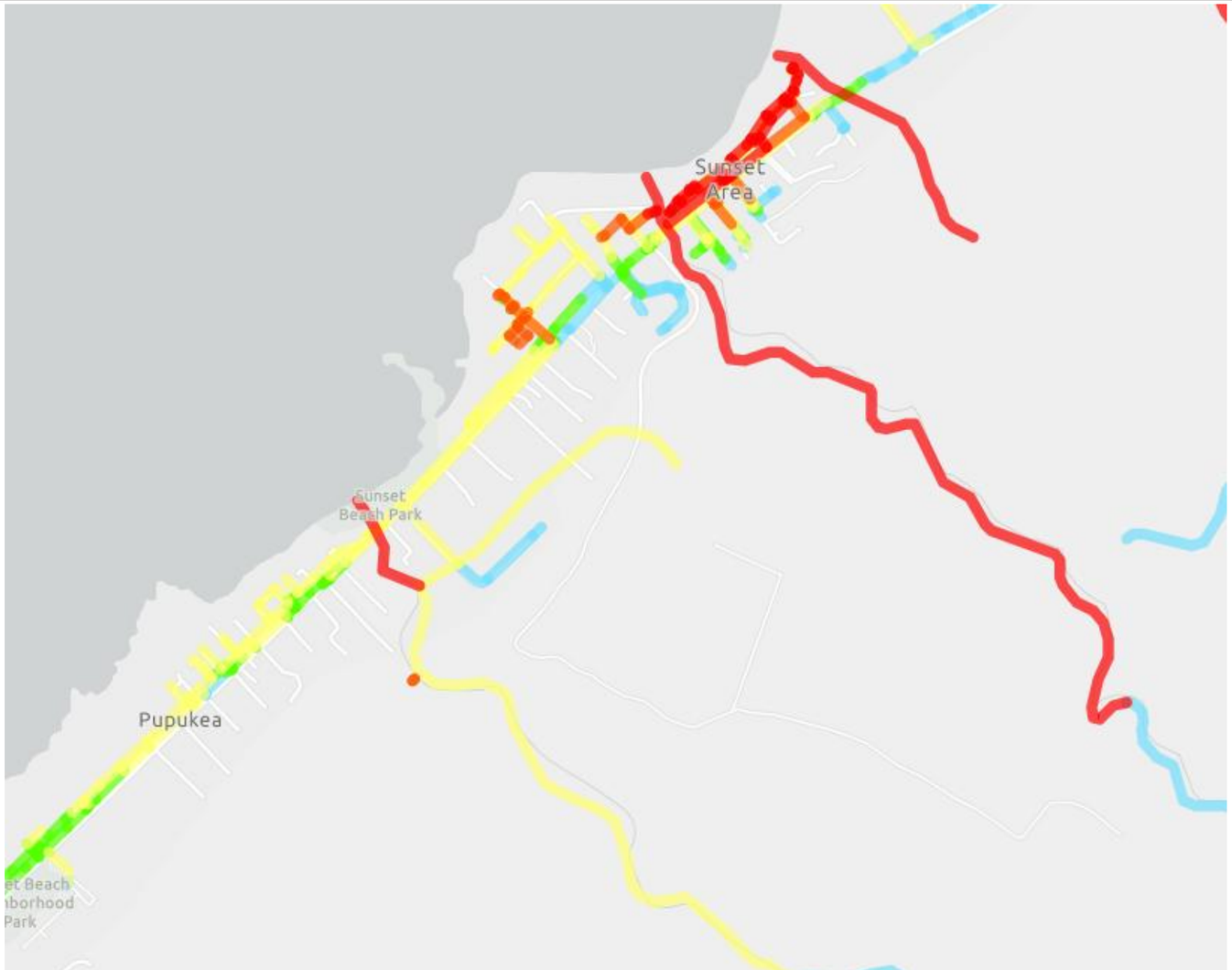
Location Information and Maps	
Location	North Shore
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

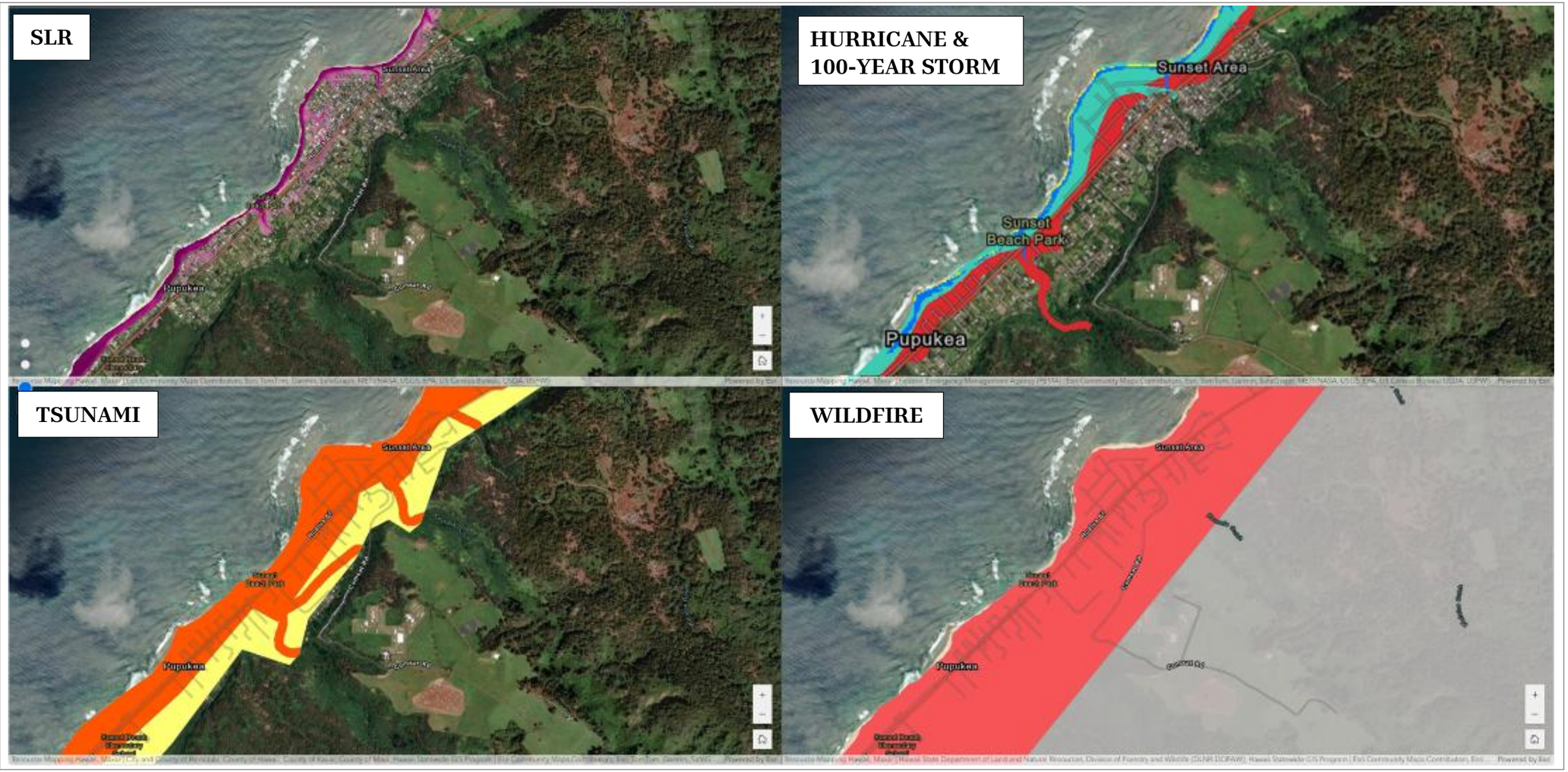
Threat Maps


SLR
HURRICANE &
100-YEAR STORM
Pu'u o Mahuka
Heiau State
Historic Site
83
TSUNAMI
WILDFIRE

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	Waimea River, ʻElehāhā Stream, Kalahopele Gulch, 18 in./24 in./30 in./36 in. SW conduits
Water	High risk water mains
Major Streets	Waimea River/Kamehameha Hwy Bridge, Kamehameha Hwy
Community Assets	Waimea Bay Beach Park, Waimea Bay, Puʻu o Mahuka Heiau State Historic Site, Sunset Fire Station #11, Waimea Falls
Climate Threats	
SLR	• Annual high wave-driven flooding impacts at 1 ft of SLR • 80% probability of passive flooding at 6 ft of SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 4 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Kaiwikoʻele Stream (Waimea River) poses significant concerns for natural resources and flooding impacts
Ongoing/Planned Projects	• North Shore Canoe Hālau (DDC) • Kamehameha Hwy Rehab (HDOT) from Waimea Bay Beach Park to ʻŌpaeʻula bridge • Kamehameha Highway Rockfall Protection, Waimea Bay • Punaluʻu Beach Project- erosion mitigation • Laniākea Highway Realignment
Potential Gaps	• Need for erosion and flood protection measures potentially near-term given coastal erosion and annual high wave flooding already at 1 ft SLR, and potential impacts for community accessibility

F.2.11 SUNSET BEACH

Location Information and Maps	
Location	North Shore
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	 SLR HURRICANE & 100-YEAR STORM Sunset Area Sunset Beach Park Pupukea TSUNAMI WILDFIRE

Key Assets	
Wastewater	Lack of sewer infrastructure
Stormwater	Paumalū Gulch, Paumalū Stream, Kaunala Gulch, SW unlined channel, 18 in./24 in./30 in./36 in./54 in. SW conduits
Water	High risk water mains
Major Streets	Paumalū Stream/Kamehameha Hwy Bridge, Kaunala Gulch/Kamehameha Hwy Bridge, Kamehameha Hwy, 12 BROWS between Pūpūkea Beach Park and Sunset Beach Park, 3 BROWS east of Sunset Beach Park
Community Assets	Sunset Beach Park, Pūpūkea Beach Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft of SLR • 80% probability of passive flooding at 9 ft of SLR • Drainage backflow data in this area not available • Groundwater inundation data in this area not available • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 4 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• Coastal Mitigation – Dune restoration at Sunset Beach (DPR/Sea Grant)
Potential Gaps	• Need for erosion and flood protection measures potentially near-term given coastal erosion already at 1 ft SLR, and potential impacts for community accessibility

SECTION F.2: KOʻOLAU LOA

F.2.1 CONSIDERATIONS FROM REGIONAL SUMMARY

Koʻolau Loa is designated as a rural region under the Oʻahu General Plan and Koʻolau Loa Sustainable Communities Plan. Low-lying areas face flooding risks and coastal erosion threatens Kamehameha Highway, the region's primary roadway. Protecting local water resources and preserving ecological and agricultural practices remain top priorities. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.2.

F.2.1.1 SPECIFIC LOCATIONS

Flooding and coastal erosion impact infrastructure and coastal areas across the region, causing recurring issues and harm to the community.

- Flooding from **Mālaekahana Stream** affects **Kamehameha Highway** and downstream areas. HDOT scheduled bridge improvements to alleviate flooding conditions on the highway.
- **Coastal areas (Hauʻula and Kaʻaʻawa)** are susceptible to coastal erosion, threatening infrastructure and habitats. They are also important for marine ecosystems and recreational opportunities.
- Runoff from mauka areas floods the campus of **Kahuku High and Intermediate School**, as well as portions of nearby **residential areas.**

F.2.1.2 GENERAL CONCERNS ACROSS THE REGION

The region faces broader challenges tied to sea level rise, water resource management, and infrastructure resilience.

- Sea level rise intensifies **coastal flooding** and areas of **Kamehameha Highway** are sometimes not passable due to inundation.
- There is concern over the **effects of coastal erosion** and a strong desire for **secondary/emergency access** to facilitate movement in and out of the region.
- **Agricultural and potable water supply are drought-prone** in areas of Koʻolau Loa.
- **Sediment and nutrient runoff** impact nearshore waters leading to coral reef degradation and **negative impacts on marine ecosystems.**
- There is **inadequate flood control infrastructure** to manage stormwater runoff, increasing the risk of flooding in vulnerable areas. The need for environmentally friendly solutions, such as low-impact development and natural buffers, is emphasized.

- **Groundwater Management** is necessary due to concerns about over-extraction and contamination of aquifers stemming from inadequate monitoring and regulation. Infrastructure is needed to assess and manage groundwater levels and recharge rates.
- Ensuring that rural communities in Koʻolau Loa have **equitable access to water resources and infrastructure improvements** is a significant concern.

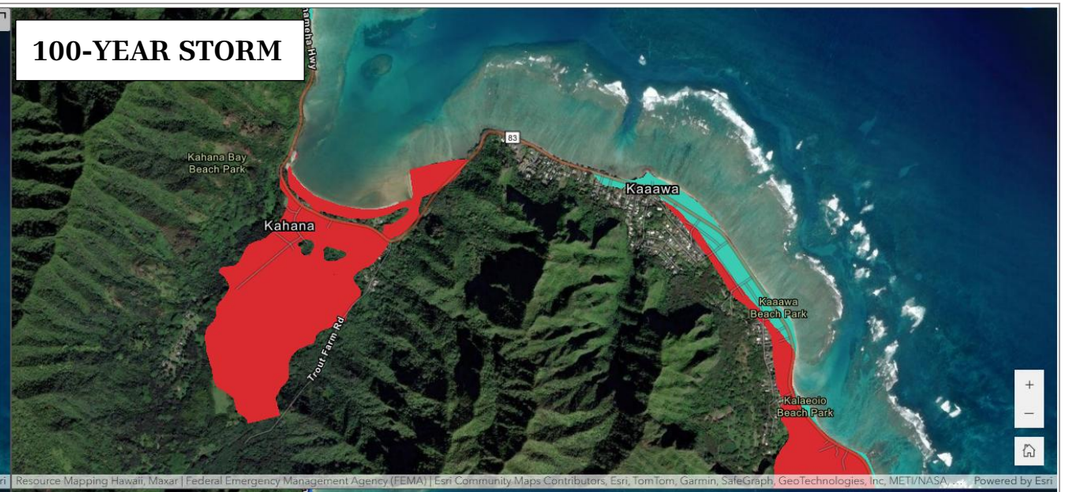
F.2.2 IDENTIFIED HOTSPOTS

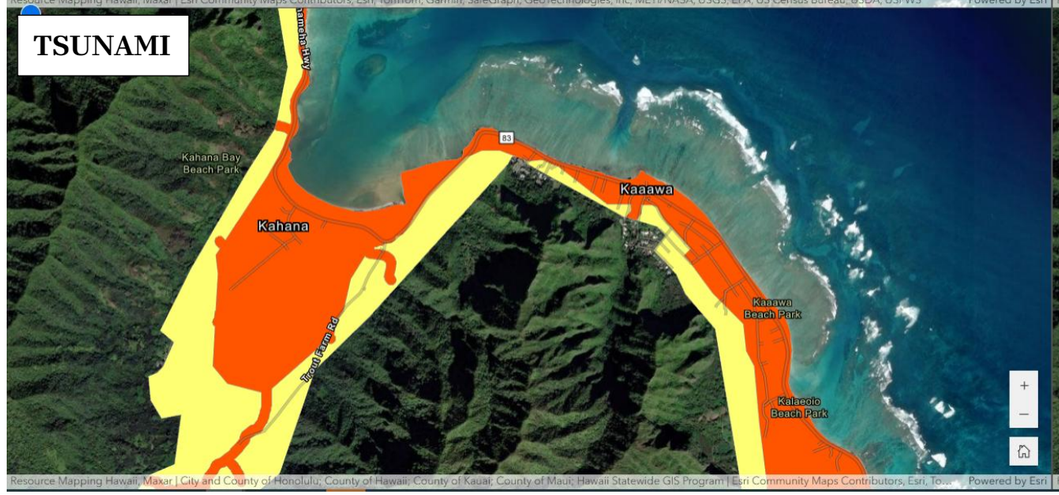
2.2.1 KA‘A‘AWA/KAHANA/KAMEHAMEHA HWY

Location Information and Maps	
Location	Ka‘a‘awa/Kahana
Risk Score Map	

Threat Maps


SLR
Kahana Bay Beach Park
Kahana
Kaaawa
Kaaawa Beach Park
Kalaeoio Beach Park
Trout Farm Rd
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
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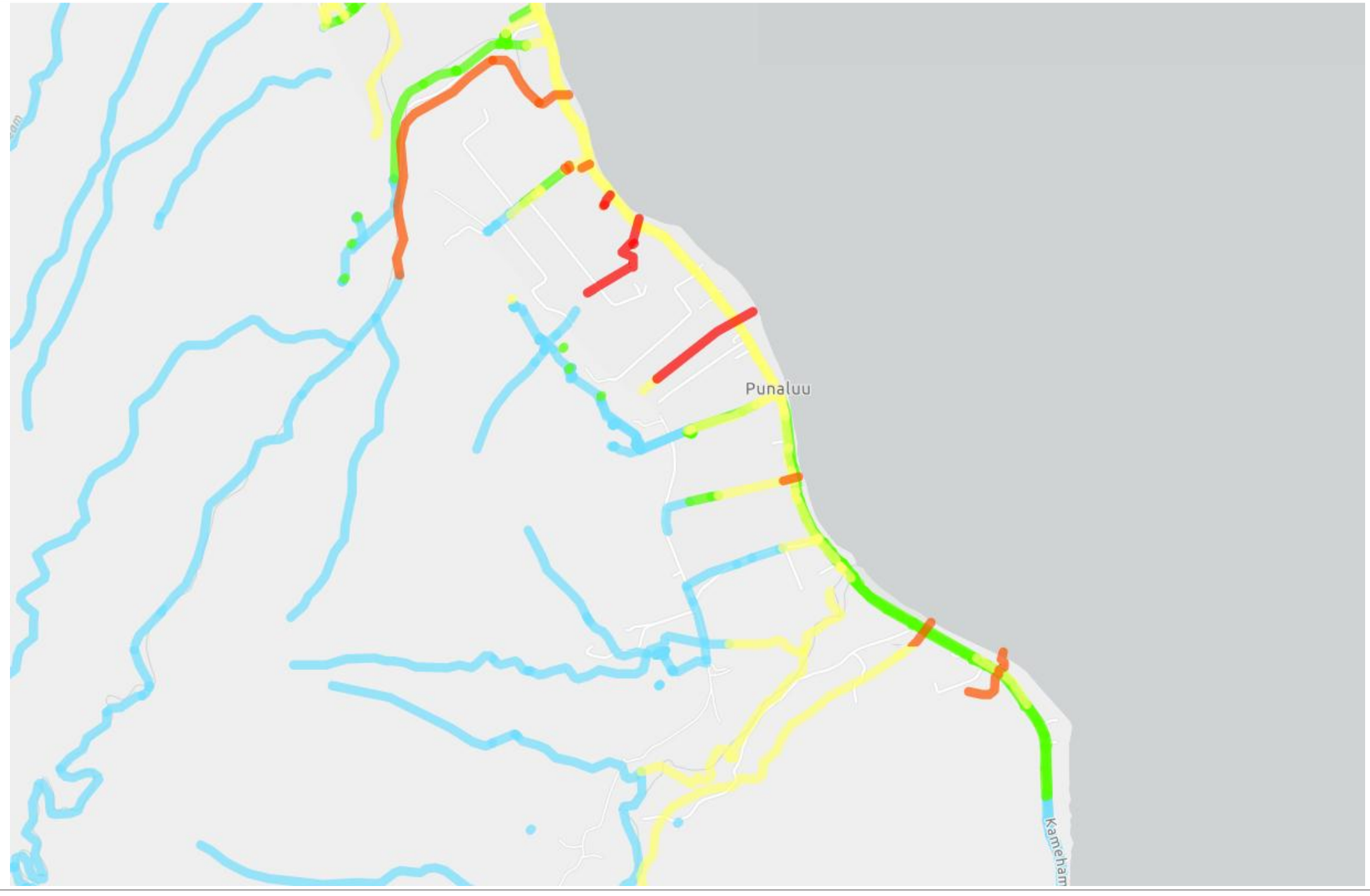

100-YEAR STORM
Kahana Bay Beach Park
Kahana
Kaaawa
Kaaawa Beach Park
Kalaeoio Beach Park
Trout Farm Rd
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TSUNAMI
Kahana Bay Beach Park
Kahana
Kaaawa
Kaaawa Beach Park
Kalaeoio Beach Park
Trout Farm Rd
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri Community Maps Contributors, Esri, To...
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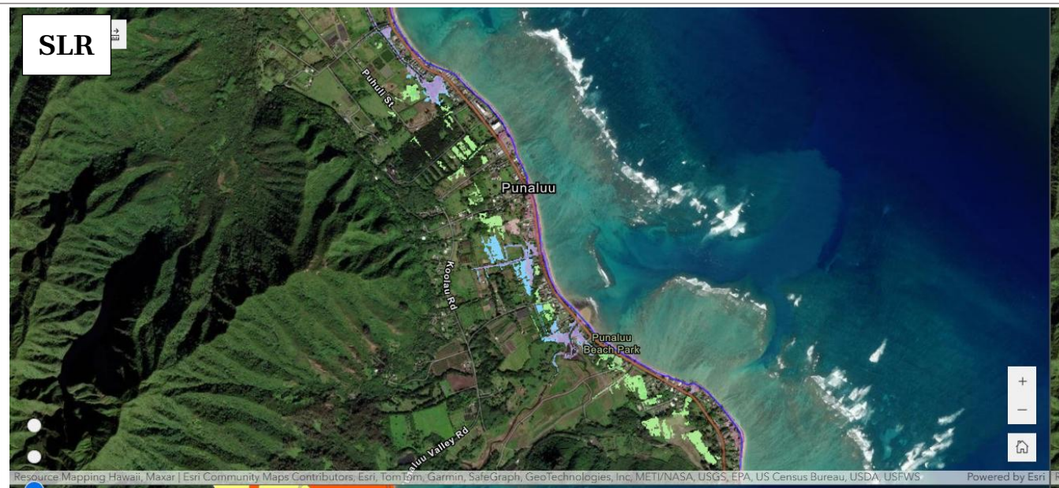

HURRICANE
Kahana Bay Beach Park
Kahana
Kaaawa
Kaaawa Beach Park
Kalaeoio Beach Park
Trout Farm Rd
Resource Mapping Hawaii, Maxar | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, Ge...
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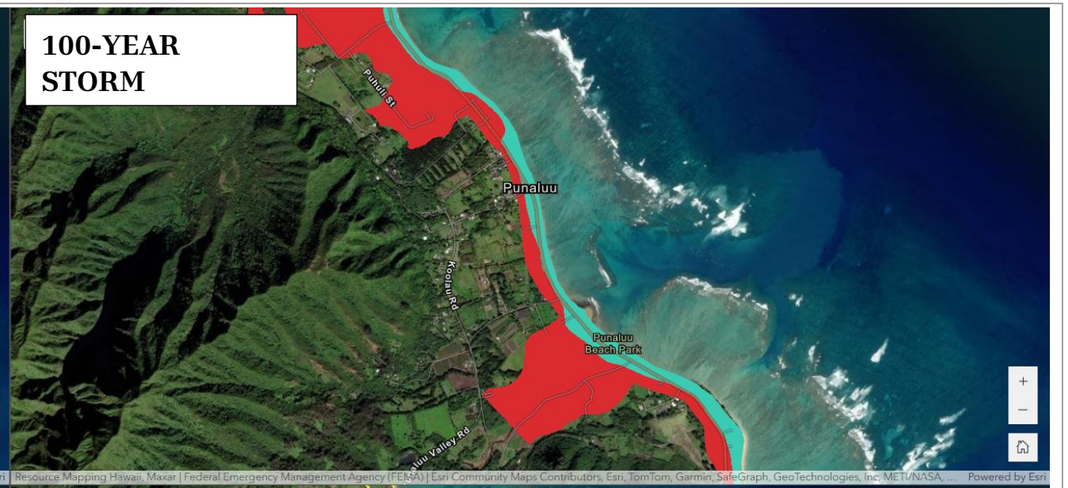
Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	12 in./18 in./24 in. SW conduit, Kaʻaʻawa Stream, Makaua Stream, Kahana Stream, Puʻupiei Stream, Keaniani Stream
Water	High risk water mains, wells/critical wells
Major Streets	Kamehameha Hwy, Lau Place, Kamehameha Hwy/Makaua Stream Bridge, Kamehameha Hwy/Kaʻaʻawa Stream Bridge, Kamehameha Hwy/Kahana Stream Bridge, Kamehameha Hwy/N Kahana Stream Bridge
Community Assets	Kalaeʻōʻio Beach Park, Kaʻaʻawa Public Elementary School, Kaʻaʻawa Fire Station 21, Swanzy Beach Park, Makaua Beach Park (no longer exists due to erosion), Kaʻaʻawa Beach Park, Ahupuaʻa O Kahana State Park and Campground (State Parks/DLNR), Kahana Bay Launch Ramp Facility (DOBOR/DLNAR)
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 2 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions. Some areas experiencing greater than 3 ft.
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools, High SoVI index • Kaʻaʻawa communities noted as susceptible to coastal erosion
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for flood protection measures potentially in near-term planning horizon (especially given complete inundation with current 100-year storm and groundwater inundation at 1 ft SLR) and erosion protection and consideration of alternative routes in case of accessibility impacted by flooding. Greater potential flooding risk from annual high waves and passive flooding potentially closer to mid-term planning horizon.

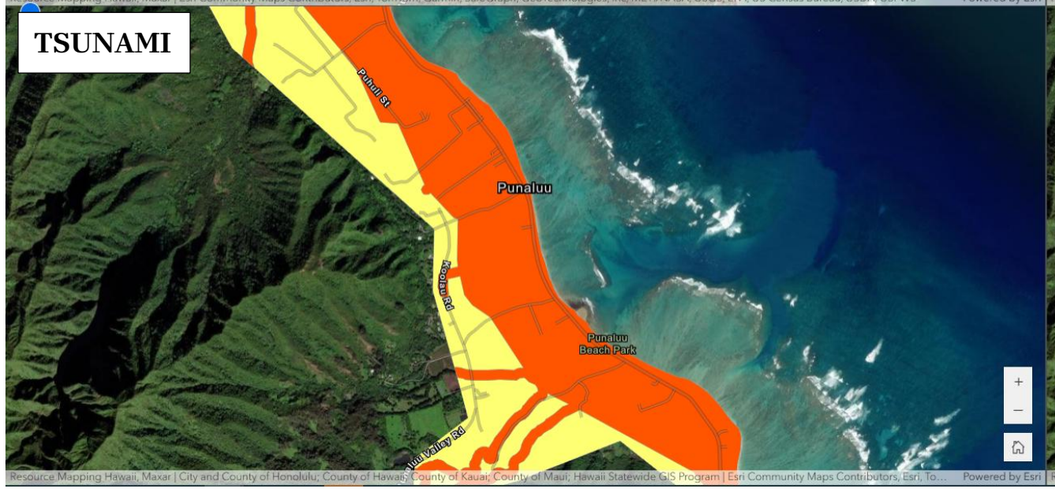
2.2.2 PUNALU‘U/KAMEHAMEHA HWY

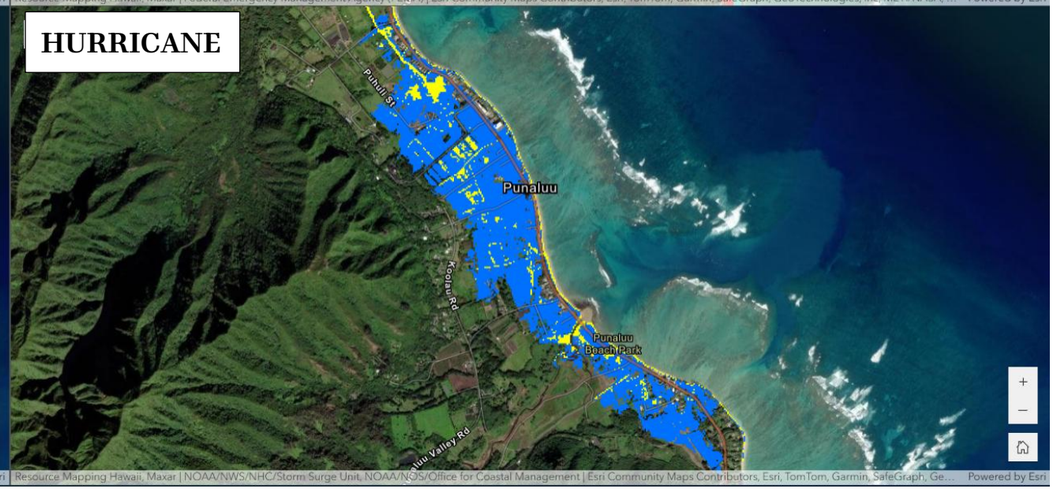
Location Information and Maps	
Location	Punalu‘u
Risk Score Map	

Threat Maps


SLR
Punaluu
Punaluu Beach Park
Koolau Rd
Puhuli St
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
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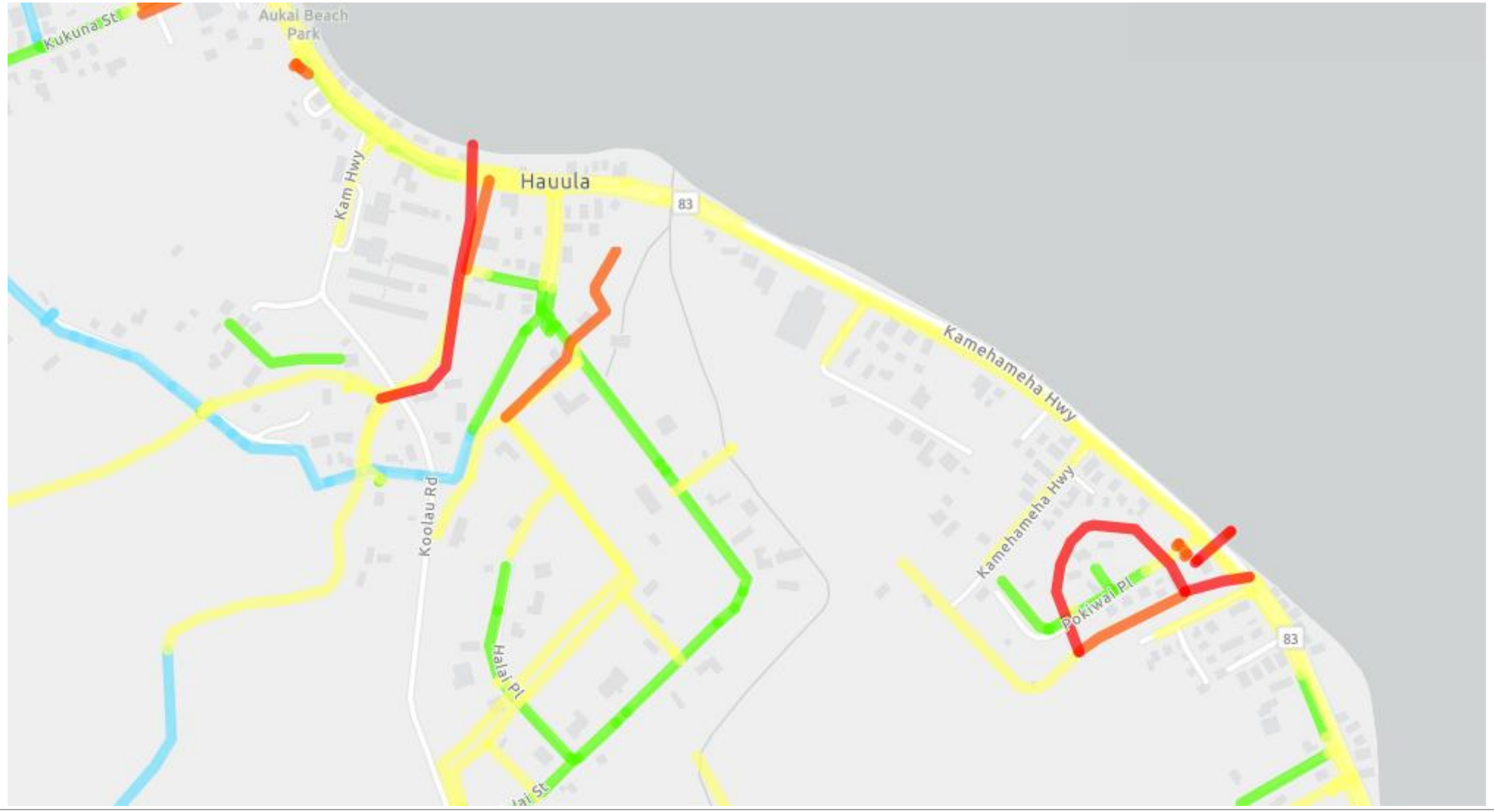

100-YEAR STORM
Punaluu
Punaluu Beach Park
Koolau Rd
Puhuli St
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, ...
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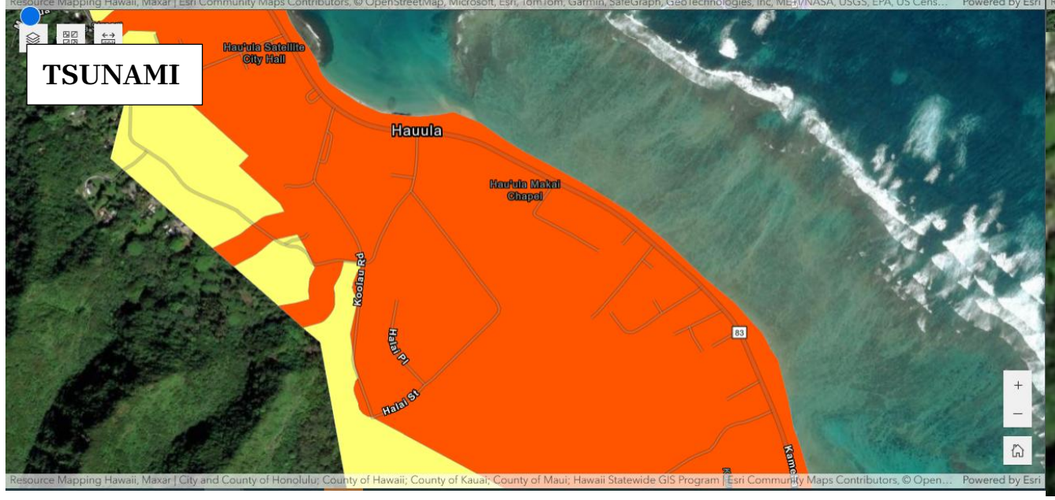

TSUNAMI
Punaluu
Punaluu Beach Park
Koolau Rd
Puhuli St
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri Community Maps Contributors, Esri, To...
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HURRICANE
Punaluu
Punaluu Beach Park
Koolau Rd
Puhuli St
Resource Mapping Hawaii, Maxar | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, Ge...
Powered by Esri

Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	18 in. SW conduits, Maipuna Stream, Punaluʻu Stream, Kapano Stream, Halehaʻa Stream, Papaʻakoko Stream, Kaluanui Stream
Water	High risk water mains, many critical wells
Major Streets	Kamehameha Hwy, Punaluʻu Valley Rd, Kamehameha Hwy/Punaluʻu Stream Bridge, Kamehameha Hwy/Kapano Stream Bridge, Hale Aha Rd, Puhuli St, Kamehameha Hwy/Kaluanui Stream Bridge
Community Assets	Punaluʻu Beach Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 1 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 3 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions. Some areas experiencing greater than 3 ft.
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for potential flood (high wave and groundwater) and erosion protection measures in near-term planning horizon

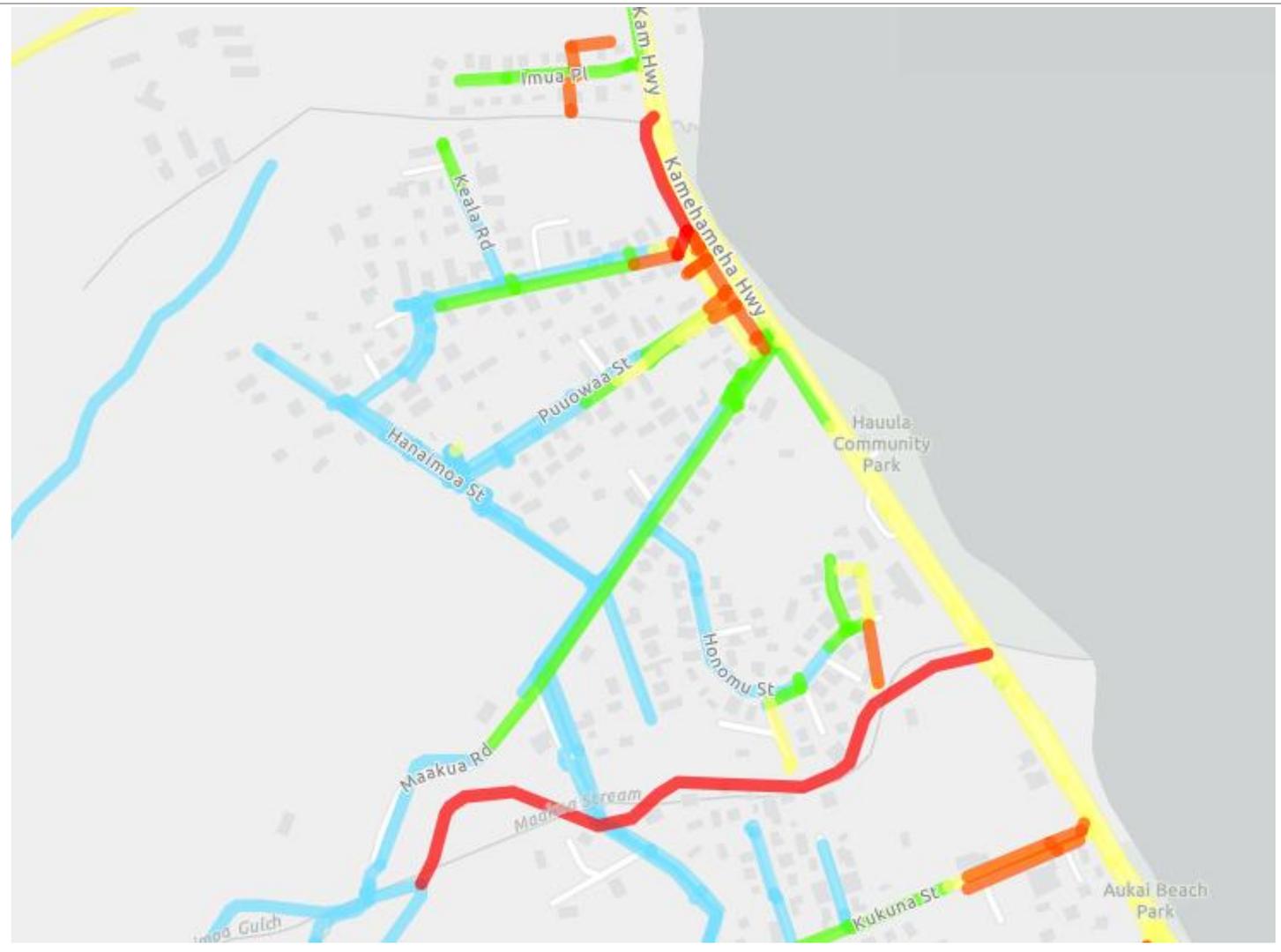
2.2.3 HAU‘ULA/KAPALAOA BEACH

Location Information and Maps	
Location	Hau‘ula
Risk Score Map	

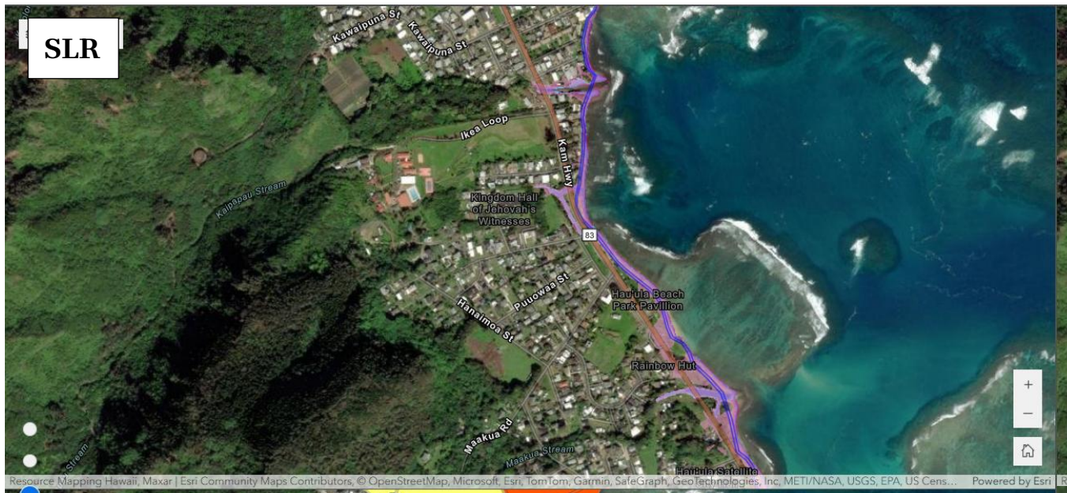
Threat Maps	   

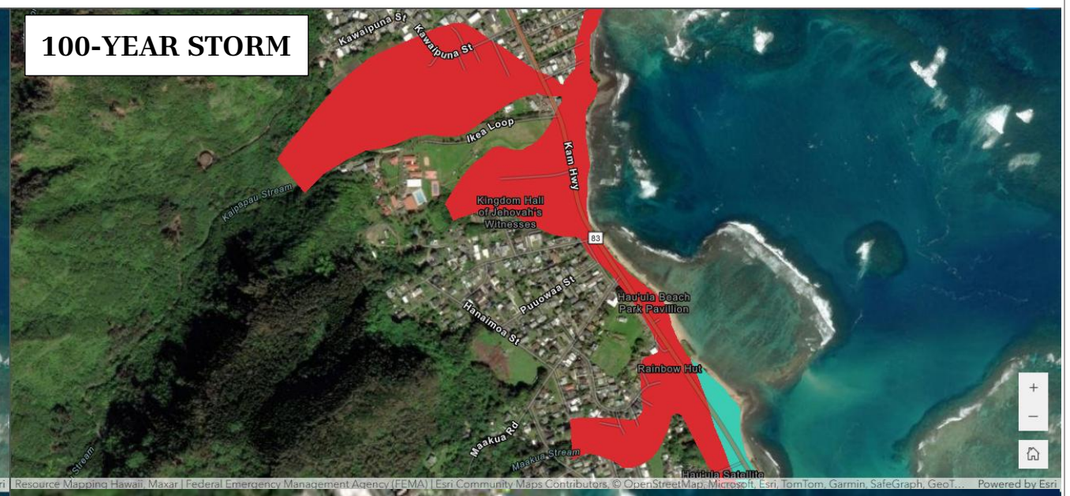
Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	18 in./48 in. SW conduits, Kapaka Stream, Makao Stream, Hauʻula Stream
Water	High risk water mains, several wells
Major Streets	Kamehameha Hwy, Hulahula Pl, Pokiwai Pl, Hauʻula Homestead Rd, Makao Rd, Kamehameha Hwy/Kapaka Stream Bridge, Kamehameha Hwy/Maheiwi Stream Bridge, Kamehameha Hwy/Kukuna Rd Bridge, Kamehameha Hwy/Hauʻula Stream Bridge
Community Assets	Hauʻula Public Elementary School, Hauʻula Fire Station 15, Hauʻula Satellite City Hall, Kapalaoa Beach, Hauʻula Beach Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 1 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 3 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions. Some areas experiencing greater than 3 ft.
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools, high SoVI index • Hauʻula communities noted as susceptible to coastal erosion
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for potential flood (high wave and groundwater) protection measures in near-term planning horizon. Erosion and additional flooding potential greater risk closer to mid-term planning horizon.

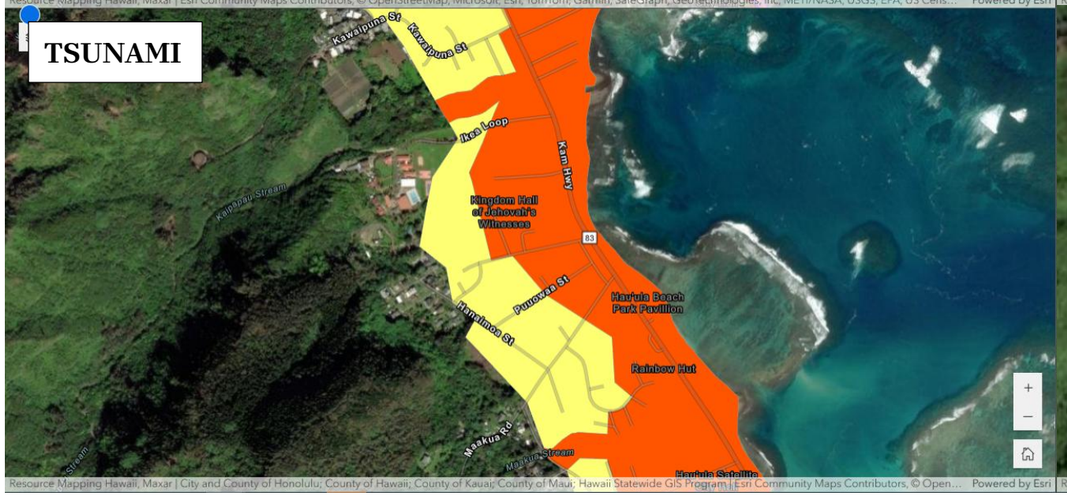
2.2.4 HAU‘ULA COMMUNITY PARK

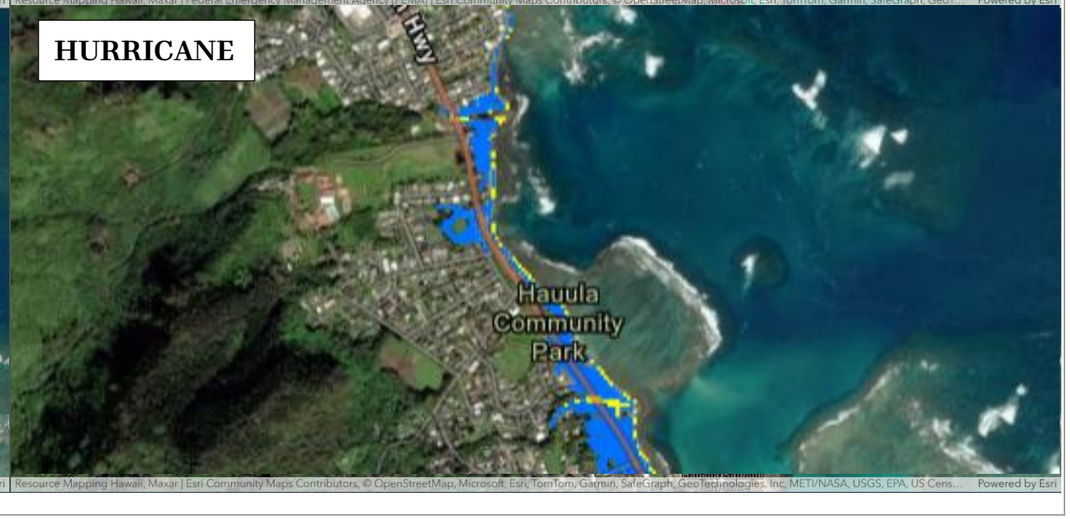
Location Information and Maps	
Location	Hau‘ula
Risk Score Map	

Threat Maps


SLR
Kawaipuna St
Ikea Loop
Kam Hwy
Kalipapau Stream
Kingdom Hall of Jehovah's Witnesses
83
Puuowaa St
Hanaimoa St
Hauʻula Beach Park Pavillion
Rainbow Hut
Maakua Rd
Maakua Stream
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100-YEAR STORM
Kawaipuna St
Ikea Loop
Kam Hwy
Kalipapau Stream
Kingdom Hall of Jehovah's Witnesses
83
Puuowaa St
Hanaimoa St
Hauʻula Beach Park Pavillion
Rainbow Hut
Maakua Rd
Maakua Stream
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TSUNAMI
Kawaipuna St
Ikea Loop
Kam Hwy
Kalipapau Stream
Kingdom Hall of Jehovah's Witnesses
83
Puuowaa St
Hanaimoa St
Hauʻula Beach Park Pavillion
Rainbow Hut
Maakua Rd
Maakua Stream
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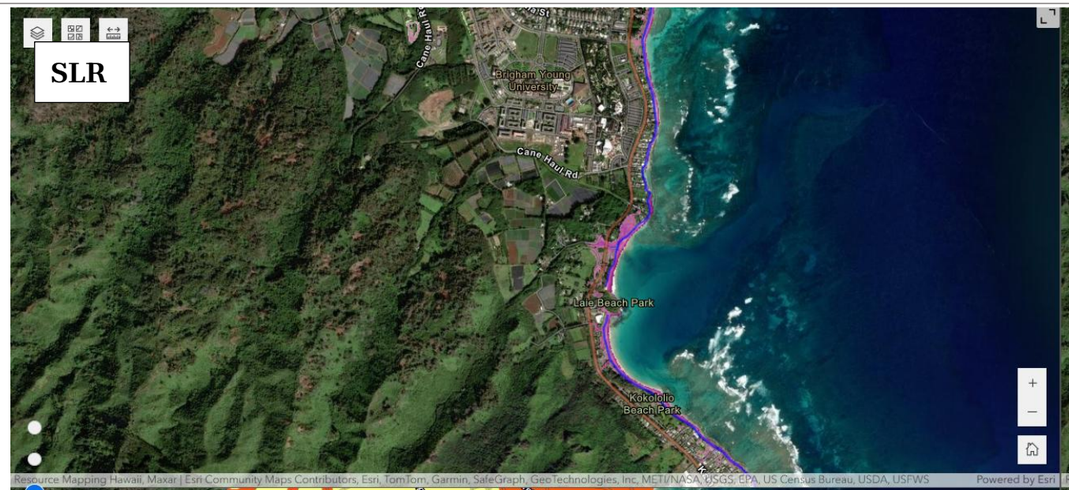

HURRICANE
Hwy
Hauula Community Park
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Cens...
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Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	18 in./24 in./30 in./48 in. SW conduits, Maʻakua Stream, Kaipapaʻu Stream, Kokololio Gl Stream, ʻAʻakakiʻi Gl Stream, Koloa Stream
Water	High risk water mains pipelines, several wells
Major Streets	Kamehameha Hwy, Kukuna St, Honomu St, Kawaipapa St, Waikulama St, Imua Pl, Kawaihemo Pl, Kamehameha Hwy/Maʻakua Stream Bridge, Kamehameha Hwy/Hauʻula Homestead Rd Bridge, Kamehameha Hwy/Waipilopilo Stream Bridge
Community Assets	Hauʻula Community Park, Hauʻula Beach Park, Private Asia Pacific International School
Climate Threats	
SLR	• Annual high wave-driven flooding at 1 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 3 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions. Some areas experiencing greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools, high SoVI index • Hauʻula communities noted as susceptible to coastal erosion
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for potential flood (high wave and groundwater) protection measures in near-term planning horizon. Erosion and additional flooding potential greater risk closer to mid-term planning horizon.

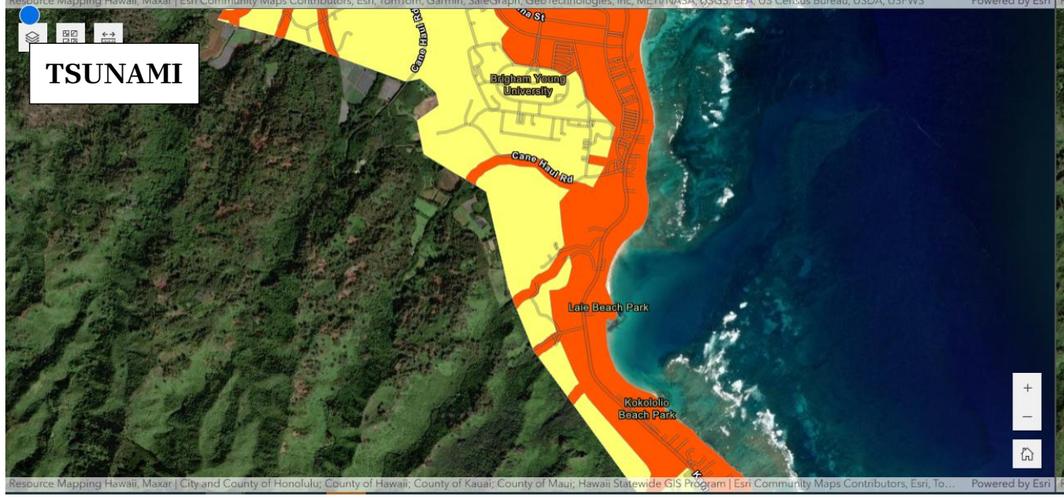
2.2.5 LĀʻIE/ LĀʻIELOHELOHE BEACH PARK

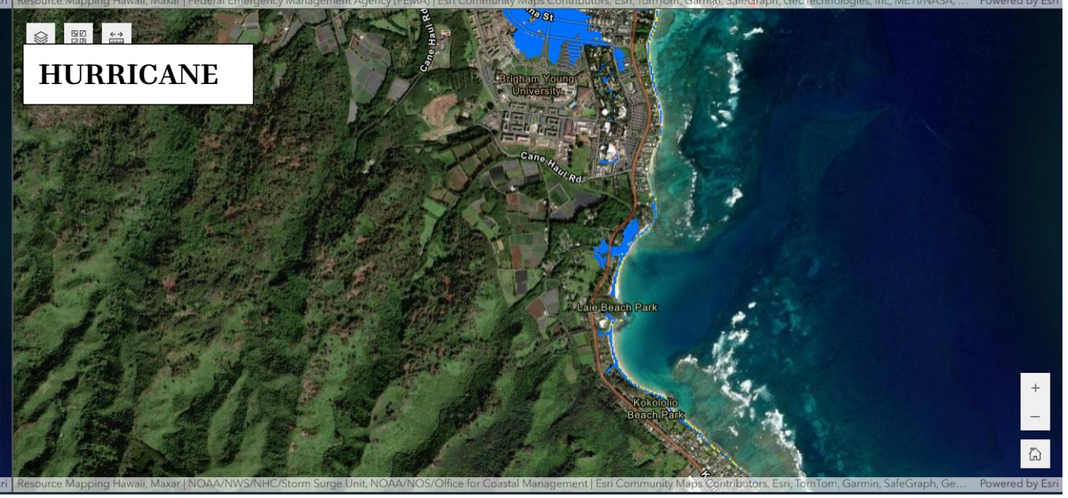
Location Information and Maps	
Location	Lāʻie
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Brigham Young University
Cane Haul Rd
Laie Beach Park
Kokololio Beach Park
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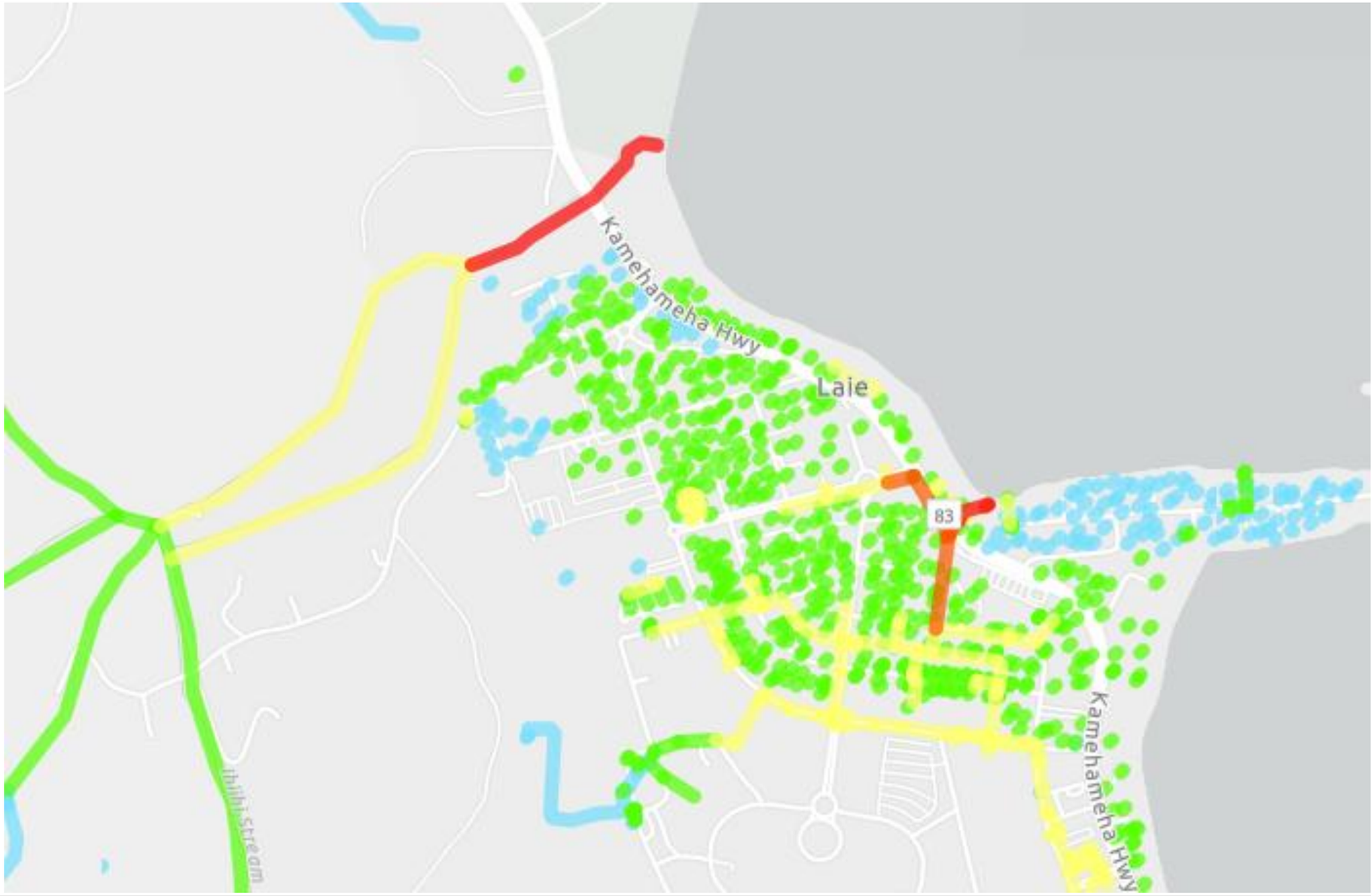

100-YEAR STORM
Brigham Young University
Cane Haul Rd
Laie Beach Park
Kokololio Beach Park
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, ...
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TSUNAMI
Brigham Young University
Cane Haul Rd
Laie Beach Park
Kokololio Beach Park
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri Community Maps Contributors, Esri, To...
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HURRICANE
Brigham Young University
Cane Haul Rd
Laie Beach Park
Kokololio Beach Park
Resource Mapping Hawaii, Maxar | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, Ge...
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Key Assets	
Wastewater	Lack of wastewater infrastructure, 2 in./3 in. sewer mains
Stormwater	48 in. SW conduits, Kokololio Gl Stream, ʻAʻakakiʻi Gl Stream, Koloa Stream, Wailele Stream, Laniloa Stream
Water	High risk water mains pipelines, several wells
Major Streets	Kamehameha Hwy, Cane Haul Rd, Kamehameha Hwy/Kokololio Stream Bridge, Kamehameha Hwy/Koloa Stream Bridge, Kamehameha Hwy/Koloa Stream Bridge
Community Assets	Kokololio Beach Park, Lāʻielohelohe Beach Park, Brigham Young University
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 3 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions. Some areas experiencing greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• Wailele Stream Flood Mitigation Project (DDC with USACE)
Potential Gaps	• Need for potential flood (high wave and groundwater) protection measures in near-term planning horizon. Erosion and additional flooding potential greater risk closer to mid-term planning horizon.

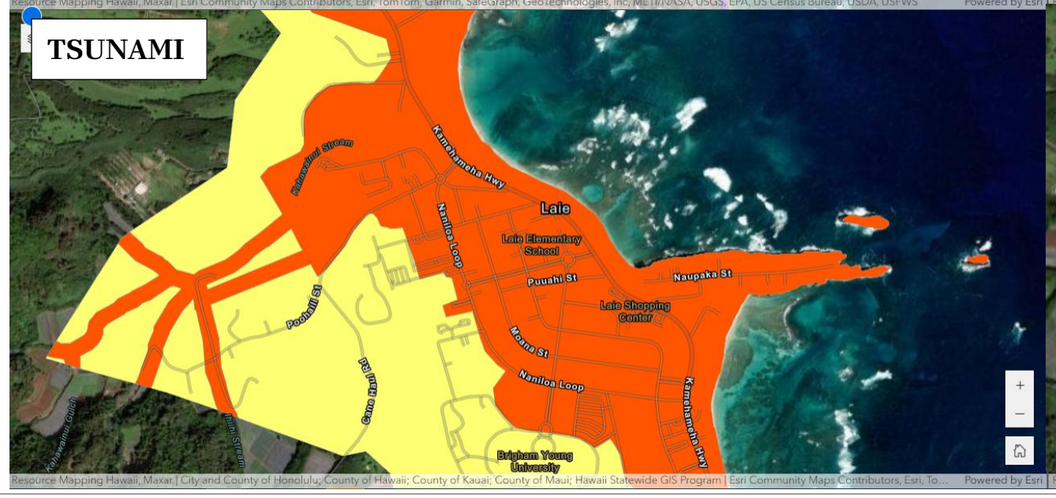
2.2.6 LĀʻIE/KAMEHAMEHA HWY

Location Information and Maps	
Location	Lāʻie
Risk Score Map	

Threat Maps


SLR
Laie
Kamehameha Hwy
Nanilos Loop
Laie Elementary School
Puuahi St
Naupaka St
Laie Shopping Center
Poohaili St
Cane Haul Rd
Moana St
Nanilos Loop
Brigham Young University
Resource Mapping Hawaii, Maxar, | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
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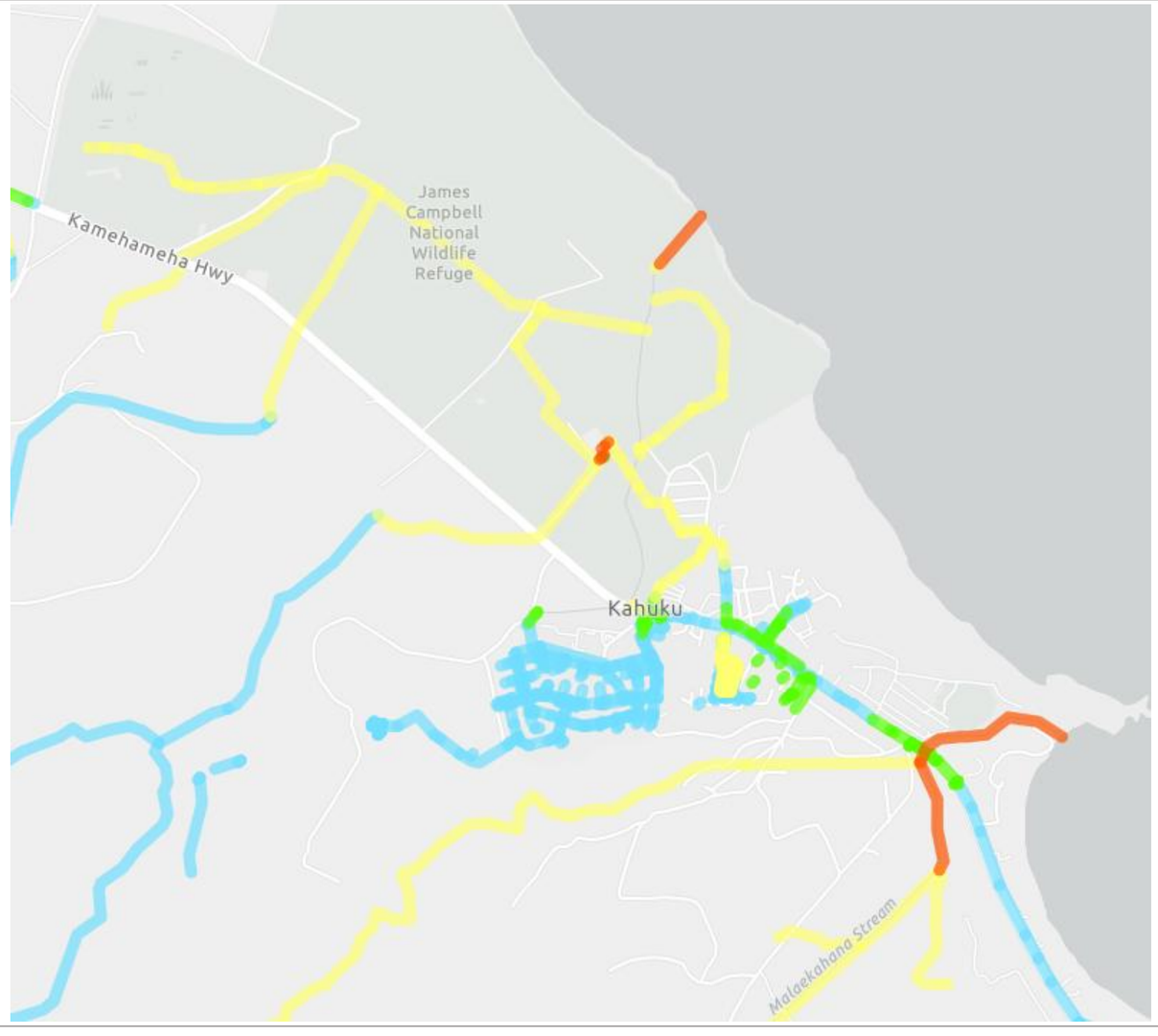

100-YEAR STORM
Laie
Kamehameha Hwy
Nanilos Loop
Laie Elementary School
Puuahi St
Naupaka St
Laie Shopping Center
Poohaili St
Cane Haul Rd
Moana St
Nanilos Loop
Brigham Young University
Resource Mapping Hawaii, Maxar, | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA
Powered by Esri


TSUNAMI
Laie
Kamehameha Hwy
Nanilos Loop
Laie Elementary School
Puuahi St
Naupaka St
Laie Shopping Center
Poohaili St
Cane Haul Rd
Moana St
Nanilos Loop
Brigham Young University
Resource Mapping Hawaii, Maxar, | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri Community Maps Contributors, Esri, To...
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HURRICANE
Laie
Naupaka St
Laie Shopping Center
Poohaili St
Cane Haul Rd
Moana St
Resource Mapping Hawaii, Maxar, | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri

Key Assets	
Wastewater	Lā‘ie WWTP, Lā‘ie WWPS, 18 in./24 in. sewer mains, sewer submersible pumps
Stormwater	18 in./24 in./30 in./36 in./48 in. SW conduits, DFM Road Maintenance Base Yard, Kahawainui Stream
Water	High risk pipelines, several wells
Major Streets	Kamehameha Hwy, Palekana St, Hale Laa Blvd, Naniloa Loop, Kamehameha Hwy/Laieloa Stream Bridge, Kamehameha Hwy/Kahawainui Stream Bridge
Community Assets	Brigham Young University, Lā‘ie Elementary School, Mālaekahana State Recreational Area
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions. Some areas experiencing greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evacuation zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• None identified
Potential Gaps	• Potential flood mitigation measures needed for mid to long-term planning horizon. However, should consider impacts to underground infrastructure from groundwater inundation in near to mid-term planning horizon.

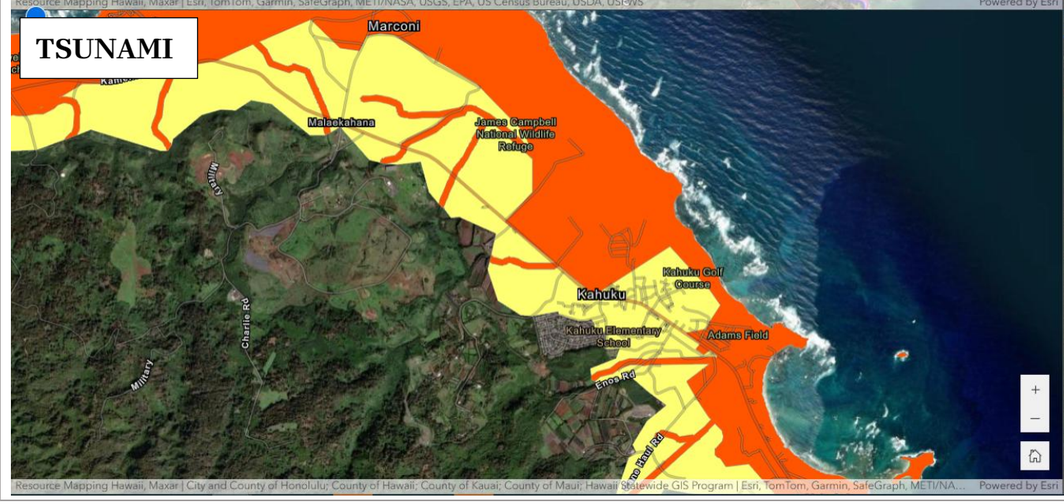
2.2.7 KAHUKU/KAMEHAMEHA HWY

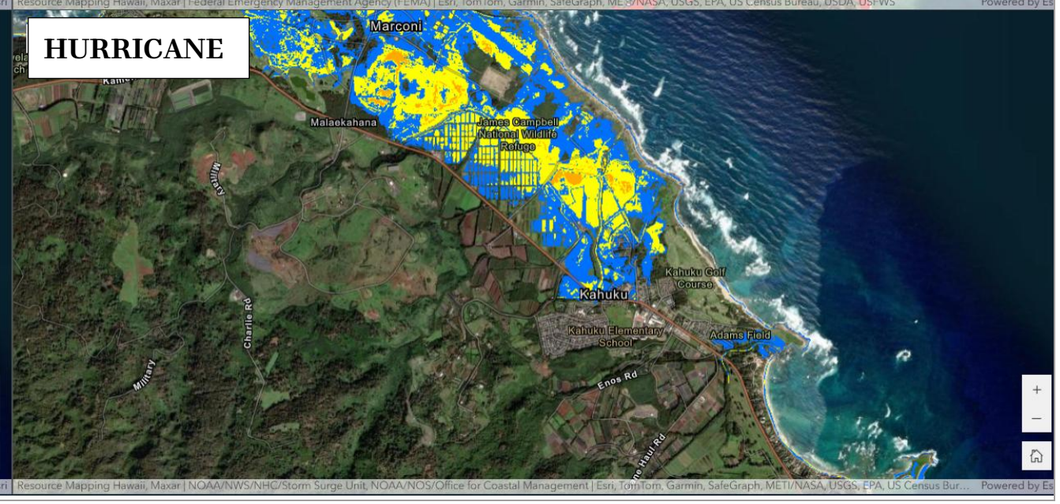
Location Information and Maps	
Location	Kahuku
Risk Score Map	

Threat Maps


SLR
Marconi
Malaekahana
James Campbell National Wildlife Refuge
Kahuku Golf Course
Kahuku
Kahuku Elementary School
Adams Field
Enos Rd
Charlie Rd
Military
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
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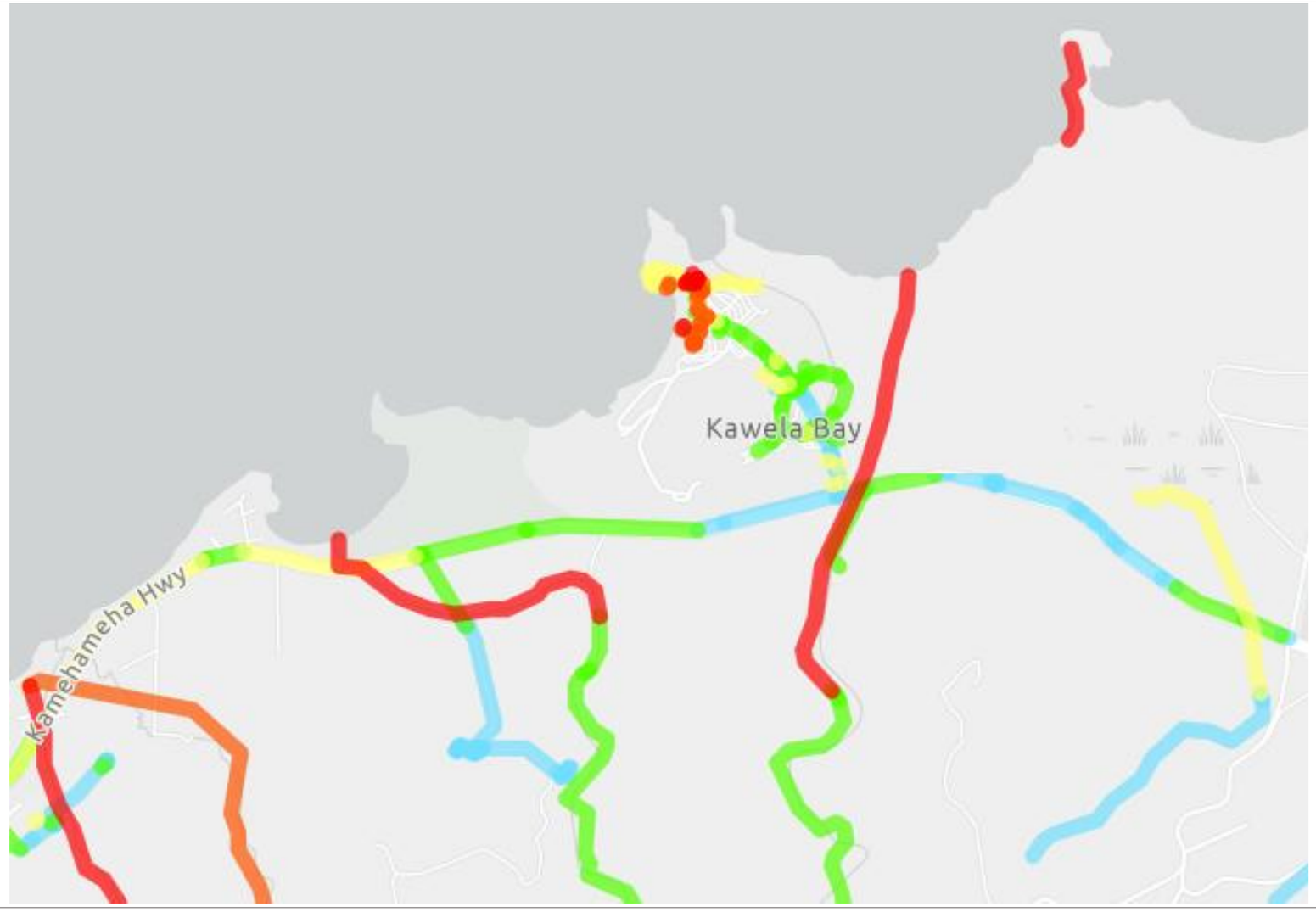

100-YEAR STORM
Marconi
Malaekahana
James Campbell National Wildlife Refuge
Kahuku Golf Course
Kahuku
Kahuku Elementary School
Adams Field
Enos Rd
Charlie Rd
Military
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri


TSUNAMI
Marconi
Malaekahana
James Campbell National Wildlife Refuge
Kahuku Golf Course
Kahuku
Kahuku Elementary School
Adams Field
Enos Rd
Charlie Rd
Military
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri, TomTom, Garmin, SafeGraph, METI/NA...
Powered by Esri


HURRICANE
Marconi
Malaekahana
James Campbell National Wildlife Refuge
Kahuku Golf Course
Kahuku
Kahuku Elementary School
Adams Field
Enos Rd
Charlie Rd
Military
Resource Mapping Hawaii, Maxar | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bur...
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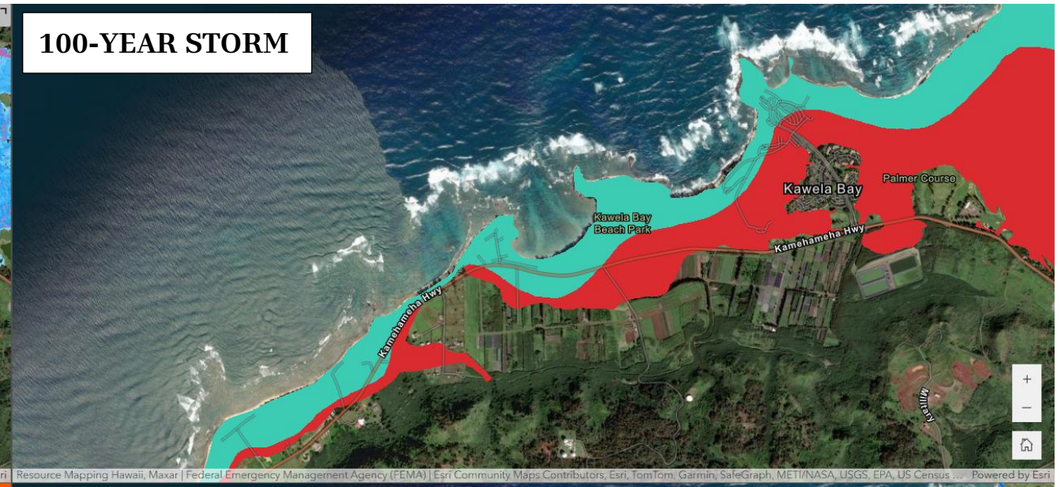
Key Assets	
Wastewater	Kahuku WWTP, Kahuku WWTP Influent WWPS, Kahuku WWTP Backup WWPS, Kahuku WWTP Effluent WWPS, sewer main/lateral system
Stormwater	12 in./18 in./24 in./30 in./36 in./42 in./48 in. SW conduits, Mālaekahana Stream, Kii Stream
Water	High risk/at risk/lower risk pipelines, well/critical wells
Major Streets	Kamehameha Hwy, Kamehameha Hwy/Mālaekahana Stream Bridge, Kamehameha Hwy/Kahuku Stream Bridge, Kamehameha Hwy/Kii Stream Bridge
Community Assets	Adams Field, Kahuku Golf Course, Honolulu Police Department Kahuku Substation, Kahuku Public Elementary School, Kahuku Public High and Intermediate School, Kaiser Kahuku Clinic, Kahuku Medical Center, James Campbell National Wildlife Refuge
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions. Some areas experiencing greater than 3 ft and greater than 6 ft.
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Flooding due to runoff during intense rainfall noted for Kahuku Public High and Intermediate School
Ongoing/Planned Projects	• Kahuku WWTP potential R-1 Reuse as an alternative to injection well (ENV)
Potential Gaps	• Need for potential flood (high wave and groundwater) protection measures in near-term planning horizon. Erosion and additional flooding potential greater risk closer to mid-term planning horizon.

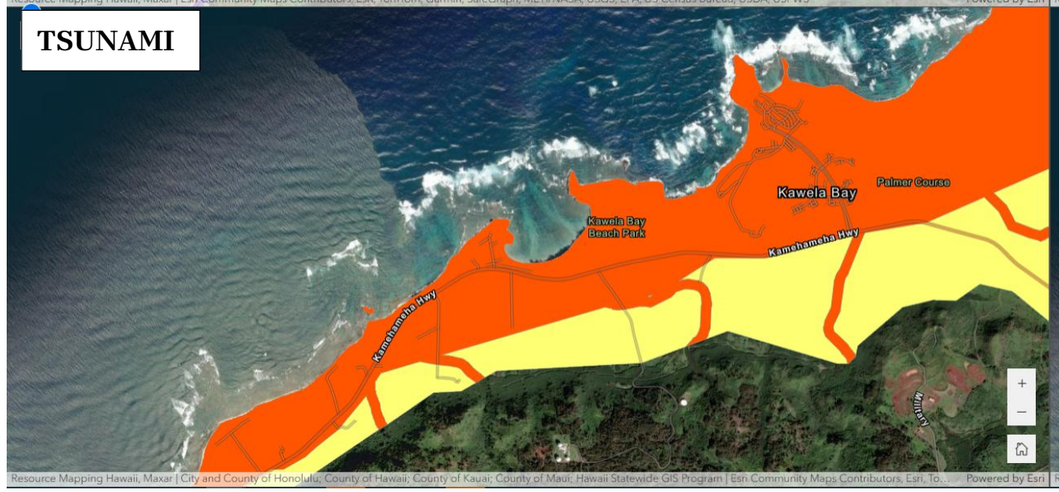
2.2.8 KAWELA BAY (TURTLE BAY)/KAMEHAMEHA HWY

Location Information and Maps	
Location	Kawela Bay
Risk Score Map	

Threat Maps


SLR
Kawela Bay
Palmer Course
Kawela Bay Beach Park
Kamehameha Hwy
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri


100-YEAR STORM
Kawela Bay
Palmer Course
Kawela Bay Beach Park
Kamehameha Hwy
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census ...
Powered by Esri


TSUNAMI
Kawela Bay
Palmer Course
Kawela Bay Beach Park
Kamehameha Hwy
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri Community Maps Contributors, Esri, To...
Powered by Esri


HURRICANE
Kawela Bay
Palmer Course
Kawela Bay Beach Park
Kamehameha Hwy
Resource Mapping Hawaii, Maxar | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, ME...
Powered by Esri

Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	12 in./18 in./24 in./36 in. SW conduits, Kahuku Stream, ʻŌʻio Gulch, Kawela Stream, Waialeʻe Stream
Water	Very high risk/high risk pipelines, well/critical well
Major Streets	Kamehameha Hwy, Kuilima Dr, Kamehameha Hwy/Kahuku (Hoʻolapa) Stream Bridge, Kamehameha Hwy/ʻŌʻio Stream Bridge, Kamehameha Hwy/Kawela Stream Bridge, Kamehameha Hwy/Waialeʻe Stream Bridge
Community Assets	Turtle Bay Golf Course, Kawela Bay Beach, Waialeʻe Beach Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 7 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 3 conditions. Some areas experiencing greater than 3 ft.
100-Year Storm	Partial inundation
Tsunami	Within tsunami evacuation zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index
Ongoing/Planned Projects	• None identified
Potential Gaps	• Need for potential erosion protection measures in near-term planning horizon. Additional flooding potential greater risk closer to mid-term to long-term planning horizons.

SECTION F.3: KOʻOLAU POKO

F.3.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The Koʻolau Poko region is a mix of developed residential, rural, commercial, and agricultural communities along with the Marine Corps Base Hawaiʻi in Kāneʻohe. The area is a popular destination for recreation. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.3.

F.3.1.1 SPECIFIC LOCATIONS

Several coastal and wetland areas across Koʻolau Poko face water quality and erosion challenges tied to urban runoff, agricultural activity, and changing rainfall patterns.

- Pollution from urban runoff and agricultural activities affects water quality, which is further impacted by increased storm intensity and over-extraction.
  - **Waimānalo Bay, Kailua Bay, Lanikai Beach, and Kāneʻohe Bay**
  - **Kualoa Regional Park** (This area experiences long-term erosion.)
- Saltwater intrusion and rainfall changes impact **Waikalua, Heʻeia, and Nuʻupia Fishponds.**
- **Heʻeia Wetland (Marsh)** needs continued management and restoration to improve flood management and water quality.
- **Koʻolau Mountains and Forest Reserves** are critical for groundwater recharge and at risk of wildfires.

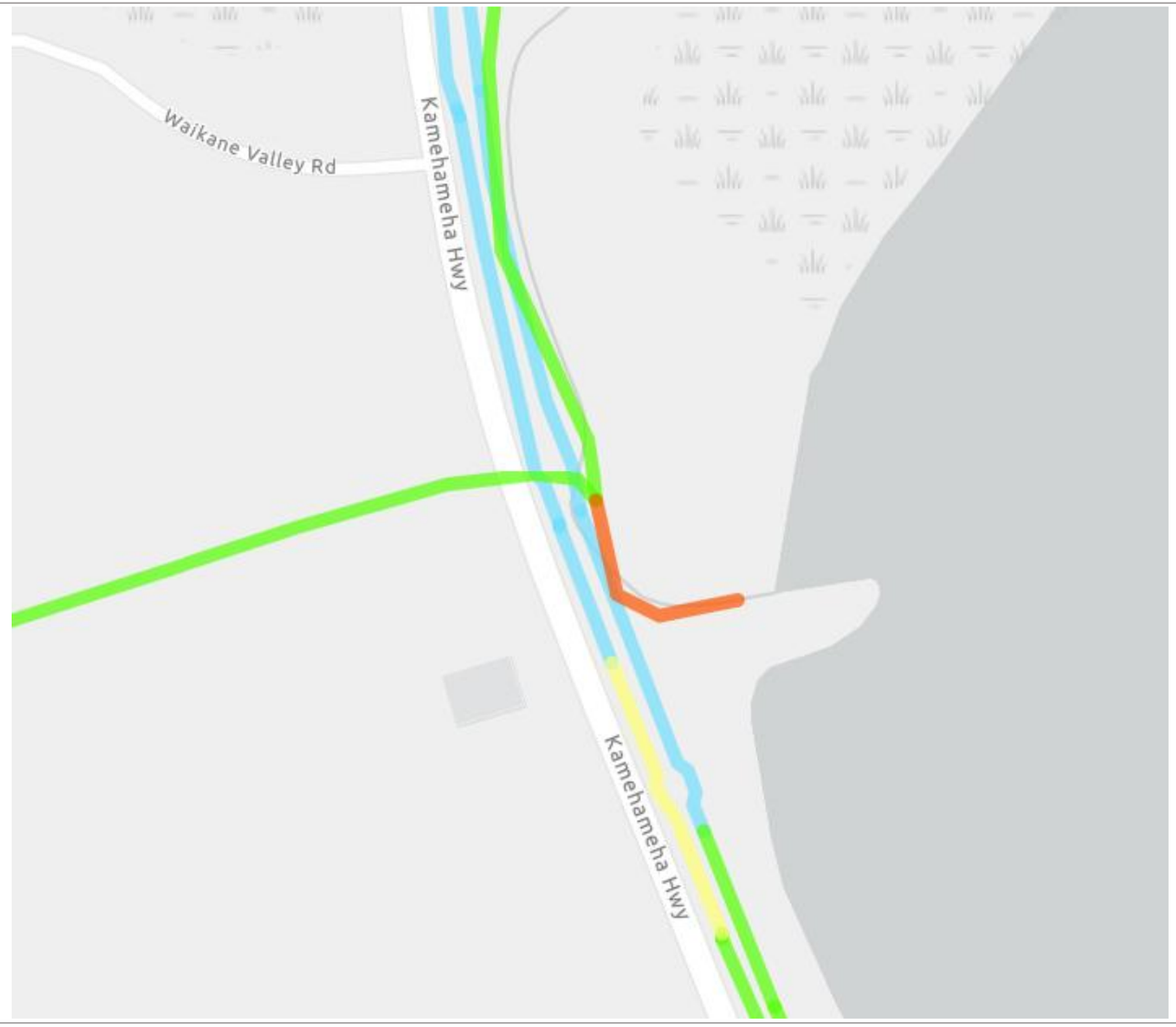
F.3.1.2 GENERAL CONCERNS ACROSS THE REGION

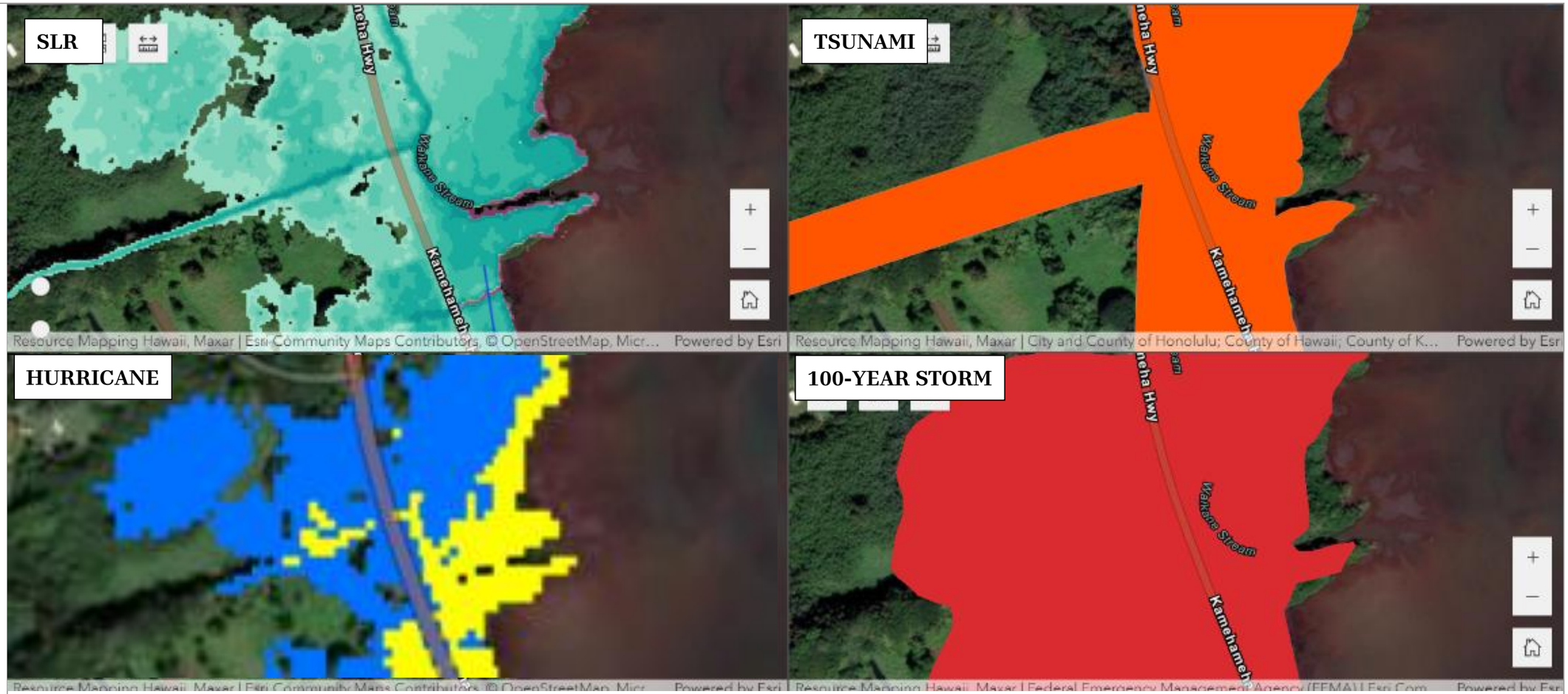
Koʻolau Poko faces broader challenges related to water supply, agricultural sustainability, and wastewater infrastructure.

- There are **limited drinking water sources** in Koʻolau Poko.
- **Agricultural water sources are threatened by changing precipitation patterns, and increased temperatures** can affect agricultural productivity, particularly for kalo.
- **Cesspools** outside of service areas should be updated and replaced with septic systems.

F.3.2 IDENTIFIED HOTSPOTS

F.3.2.1 WAIKĀNE/KAMEHAMEHA HWY

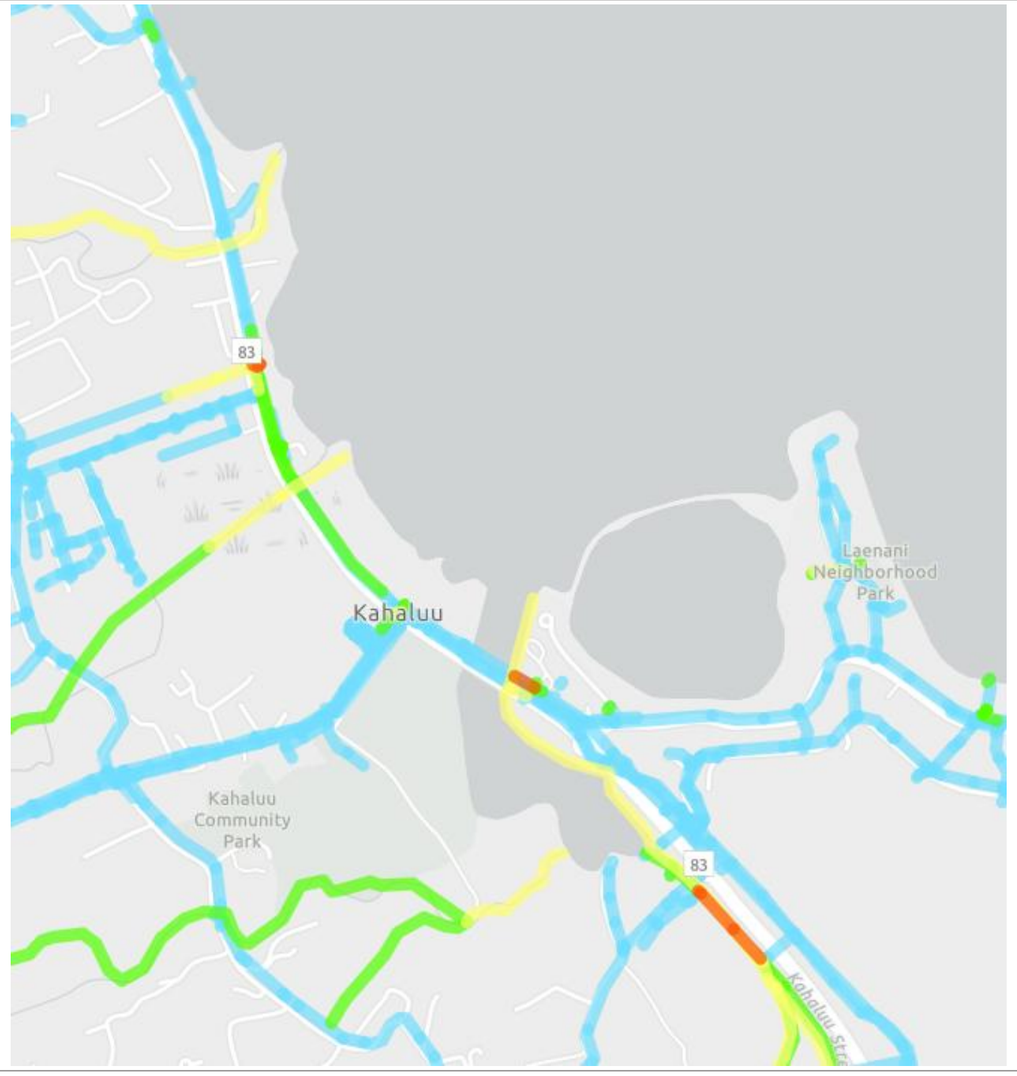
Location Information and Maps	
Location	Waikāne
Risk Score Map	

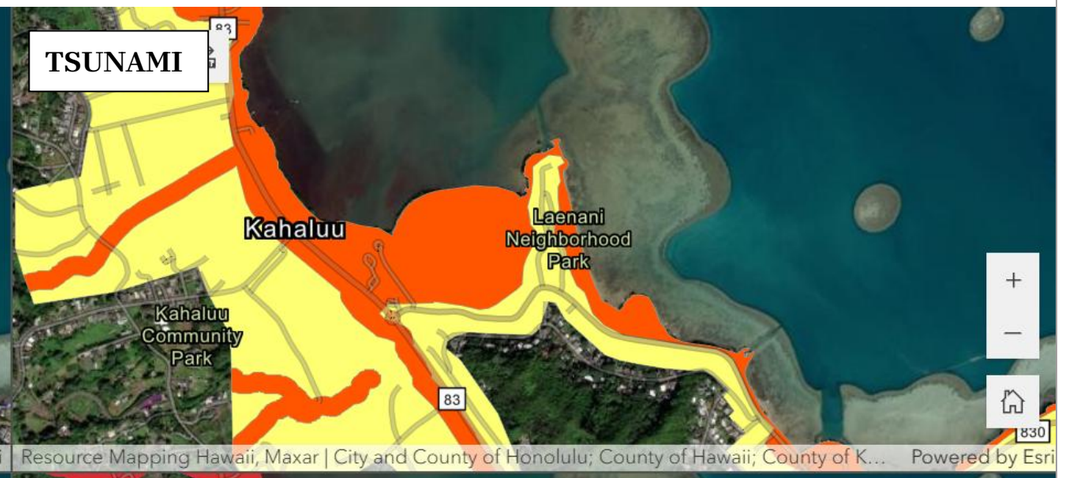
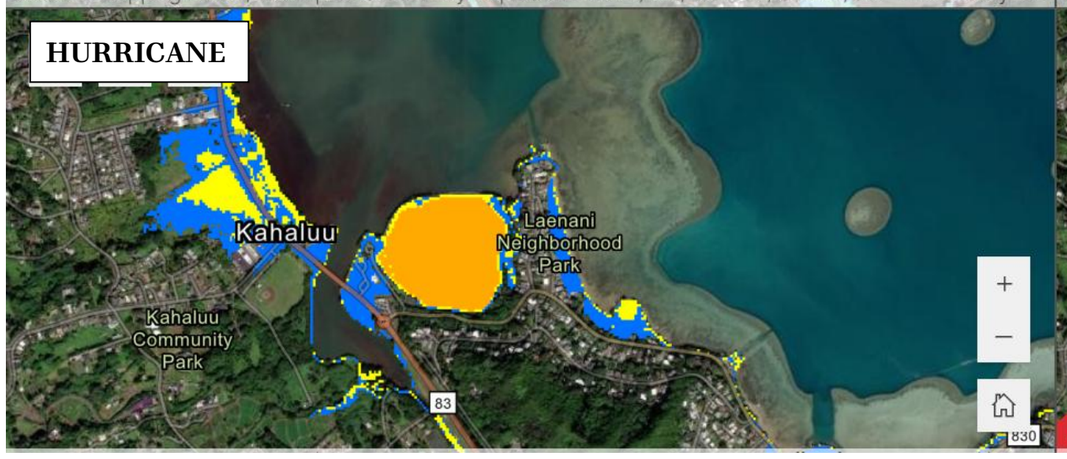
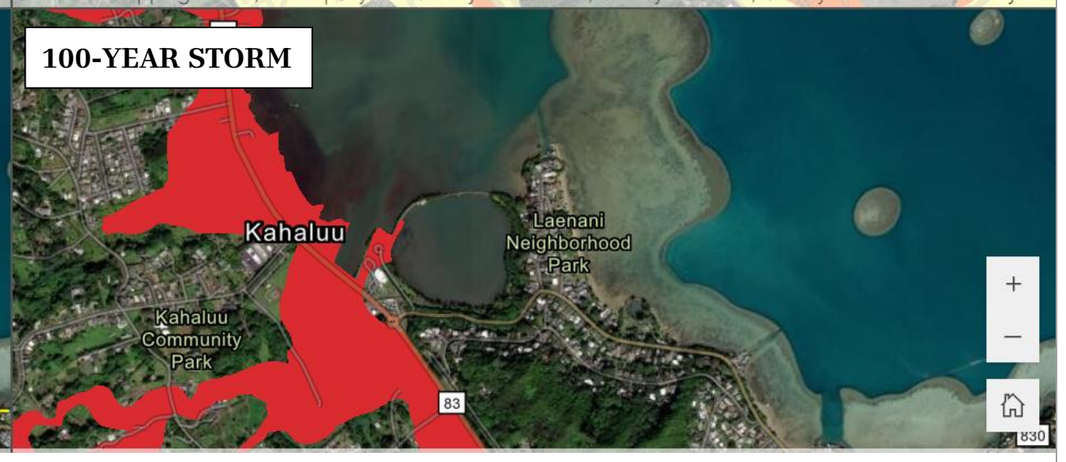
Threat Maps	 SLR TSUNAMI HURRICANE 100-YEAR STORM Kamehameha Hwy Waikiki Stream Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr… Powered by Esri Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K… Powered by Esri Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Com… Powered by Esri

Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	18 in./36 in. SW conduits, Hakipuʻu Stream, Waikāne Stream
Water	High risk pipelines
Major Streets	Kamehameha Hwy, Kamehameha Hwy/Waikāne Stream Bridge, Kamehameha Hwy/Hakipuʻu Stream Bridge
Community Assets	Kualoa Regional Park, Waikāne Valley Nature Park (3 TMKs mauka of Kamehameha Hwy and 1 TMK makai of Kamehameha Hwy), Waiāhole Elementary School, Development of an Emergency Medical Services Ambulance Unit (Honolulu Emergency Services Department recently acquired a parcel in Waikāne for this purpose)
Climate Threats	
SLR	• Annual high wave-driven flooding at 1 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 3 ft SLR • Coastal erosion at 7 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas experiencing greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evacuation zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Cesspool and septic seepage impacting water quality near shore • Medium to High SoVI, Waiāhole Hawaiian homelands • Potential community displacement • Potential accessibility issues if Kamehameha Hwy blocked/impaired
Ongoing/Planned Projects	• Repairs to several locations after climate events on state highways including the Pali Highway (HDOT) • Vulnerability assessment that identified roads at risk due to climate events in the future, and have identified strategies for future work (HDOT) • MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Water quality issues from cesspool and other onsite waste sites • Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat mitigation efforts

	• I&I and corrosion solutions for utility infrastructure affected by emergent groundwater

3.2.2 KAHALUʻU/KAMEHAMEHA HWY

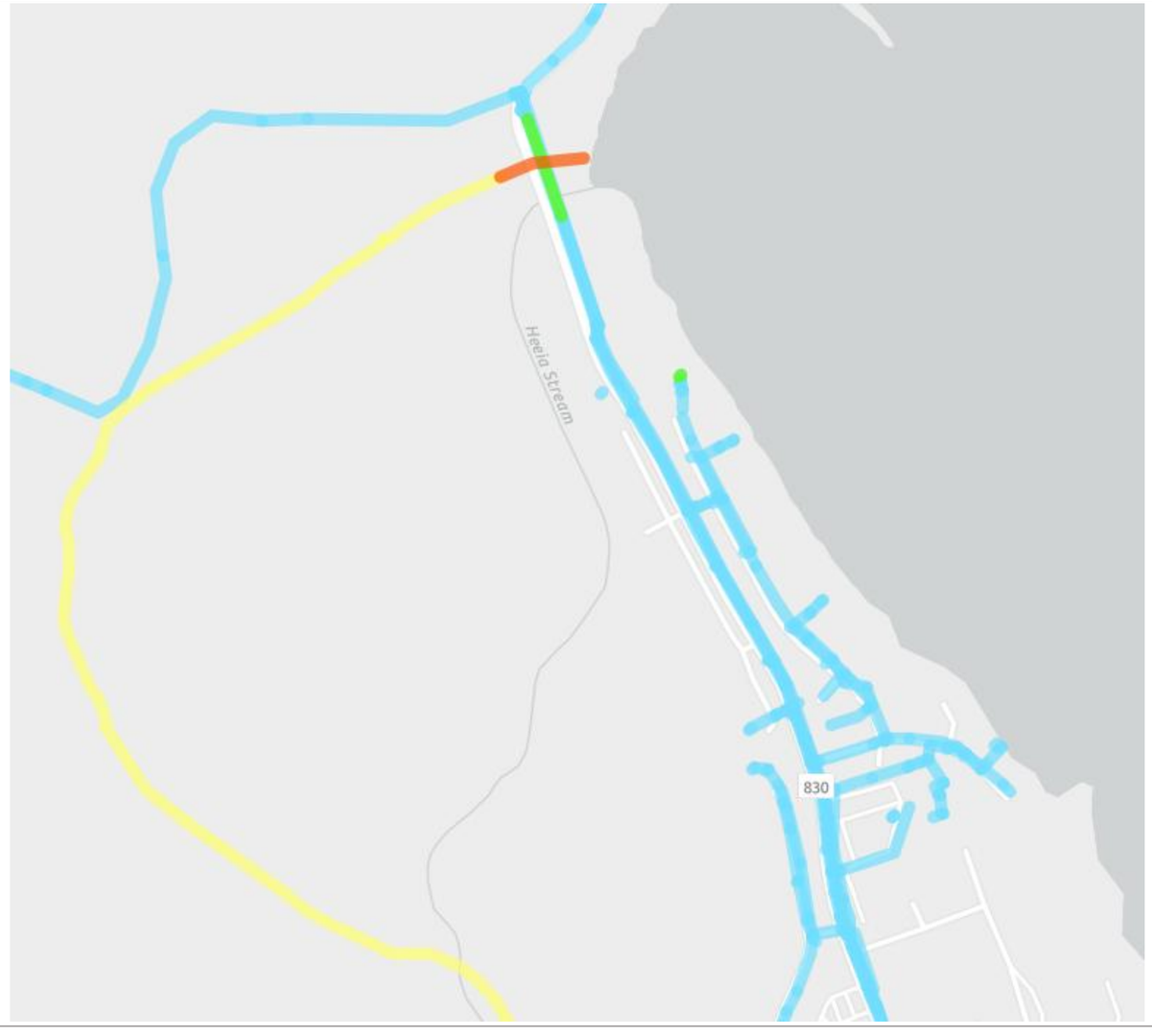
Location Information and Maps	
Kahaluʻu	
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Kahaluʻu WWPS, Laenani WWPS, Miomio WWPS, 6 in./8 in./10 in./12 in./15 in. sewer mains
Stormwater	18 in./24 in./30 in./36 in./48 in. major SW conduits, Kaʻalaea Stream, Haiamoa Stream, Kahaluʻu Flood Control Lagoon, Kahaluʻu Stream, Ahuimanu Stream, Waiheʻe Stream
Water	Waiheʻe Line Booster, high to med-high priority pipelines (Waiheʻe Rd and 42 in. Transmission Mains) that supply potable water to Kāneʻohe, Kailua, Waimānalo, and Kalama Valley, nearby wells and critical wells
Major Streets	Kamehameha Hwy, Ahaolelo Rd/Kahaluʻu Stream Bridge, Ahilama Rd/Waiheʻe Stream Bridge, Kamehameha Hwy/Kahaluʻu Stream Bridge, Kamehameha Hwy/Haiamoa Stream Bridge, Ahilama Rd/Waiheʻe Stream Bridge, Kamehameha Hwy/Kaʻalaea Stream Bridge, 2 BROWS between Wailehua Rd and Kaalaea Rd
Community Assets	Kahaluʻu Regional Park, Laenani Neighborhood Park, Kahaluʻu Public Elementary School, Kahaluʻu Fire Station 37, Kahaluʻu Pond, Heʻeia Kea Valley Nature Park/Waihee Valley Nature Park (36 DPR TMKs, US Army currently has a Right of Entry for 5 years to investigate the properties for chemical contamination, containerized regulated substances, and munitions or explosives of concern)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 5 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions. Some areas experiencing greater than 3 ft and greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 89 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Algal blooms/coral reef impacts in Kāneʻohe Bay • Cesspool and septic seepage impacting water quality near shore • Medium SoVI • Potential community displacement
Ongoing/Planned Projects	• Kahaluʻu Lagoon dredging (DFM) • MCBH Military Installation Resilience Review (CCSR) • Kamehameha Hwy Rehab (HDOT, specific locations)

Potential Gaps	• Water quality issues from cesspool and other onsite waste sites • Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat mitigation efforts • Inflow and infiltration (I&I) and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

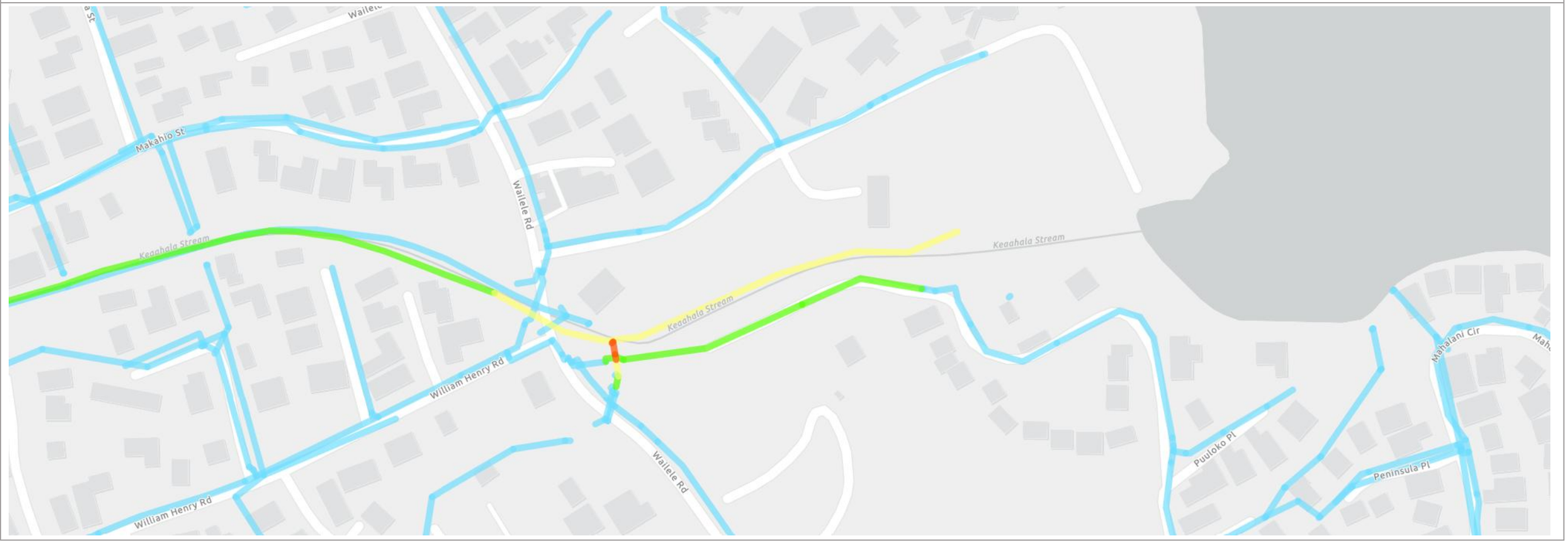
3.2.3 HE‘EIA/KAMEHAMEHA HWY

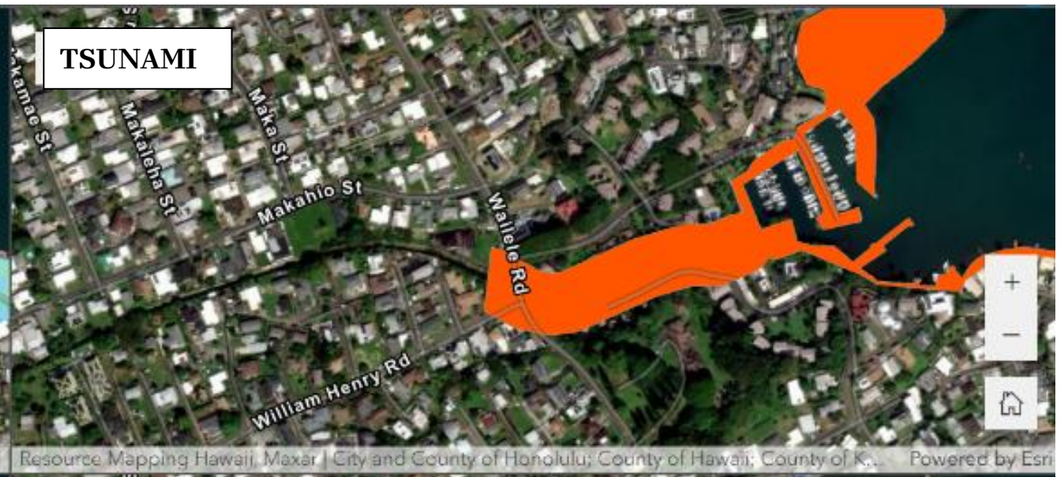
Location Information and Maps	
Location	He‘eia
Risk Score Map	

Threat Maps	 SLR Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S... Powered by Esri TSUNAMI Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of K... Powered b HURRICANE 100-YEAR STORM

Key Assets	
Wastewater	Ali‘i Bluffs WWPS, nearby Punawai WWPS, nearby He‘eia WWPS, nearby Kahanahou WWPS, 6 in./8 in. Force mains, 8 in. sewer mains
Stormwater	12 in./18 in./24 in./30 in./54 in. SW conduits, He‘eia Stream, DFM road maintenance base yard
Water	Very high risk and high risk pipelines
Major Streets	Kamehameha Hwy, Kamehameha Hwy/He‘eia Stream Bridge, nearby Alaloa St/He‘eia Stream Bridge, BROW at Ipuka St
Community Assets	King Intermediate Public School; He‘eia State Park; He‘eia Fishponds
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 6 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 88 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Potential community displacement • Community accessibility issues with near and mid-term flooding
Ongoing/Planned Projects	• MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

3.2.4 KĀNEʻOHE/KEAAHALA STREAM

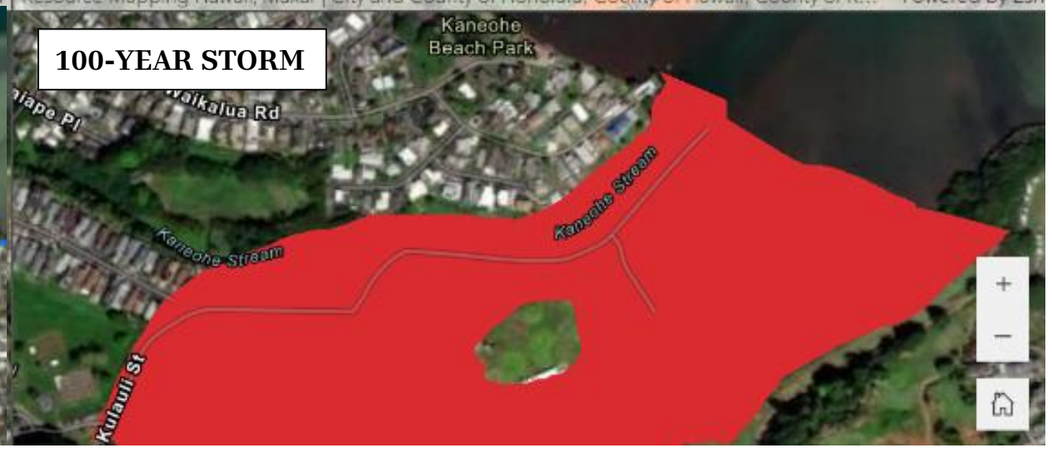
Location Information and Maps	
Location	Kāneʻohe Bay/Keaʻahala Stream
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Waikapoki WWPS, 8 in./12 in. sewer mains, 10 in./12 in. force main
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in./60 in./72 in. SW conduits, Keaʻahala Stream
Water	High risk pipelines
Major Streets	Wailele Road/Keaʻahala Stream Bridge, nearby Kamehameha Hwy/Keaʻahala Stream Bridge
Community Assets	Nearby Kāneʻohe Fire Station 17, nearby Kāneʻohe District Police Station, nearby Parker Public Elementary School, Kāneʻohe Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 7 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Within dam evacuation zone • Cesspool and septic seepage impacting water quality near shore • Algal blooms/coral reef impacts in Kāneʻohe Bay • Potential community displacement
Ongoing/Planned Projects	• MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Water quality issues from cesspool and other onsite waste sites • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

3.2.5 KĀNE‘OHE/KĀNE‘OHE STREAM

Location Information and Maps	
Location	Kāne‘ohe Bay/Kāne‘ohe Stream
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Waikalua WWPS, Kāneʻohe Influent WWPS, Kāneʻohe Effluent WWPS, Kāneʻohe Bay WWPS #1, Kāneʻohe Tunnel Influent Facility, 10 in./16 in./42 in. Force mains, 30 in./36 in./42 in./48 in./120 in. sewer mains
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in./60 in./72 in. SW conduits, Kāneʻohe Stream, Kawa Stream
Water	High risk pipelines, nearby wells/critical wells
Major Streets	Waikalua Rd, Holowai St/Pl , Kāneʻohe Bay Dr, Kulauli St
Community Assets	Pūʻōhala Public Elementary School, Ke Kula O Kamakau Lab Public School, Huakailani Private School for Girls, Bayview Golf Course, Nāoneala'a a Kāneʻohe Beach Park, Kahua O Waikalua Neighborhood Park, Kāneʻohe Bay, Waikalua Fishpond
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Within dam evacuation zone • Cesspool and septic seepage impacting water quality near shore • Algal blooms/coral reef impacts in Kāneʻohe Bay • Potential community displacement
Ongoing/Planned Projects	• MCBH Military Installation Resilience Review (CCSR) • Kawa Stream Trash Reduction Structures at Mokulele Drive, Nāmoku Street and Kāneʻohe Senior Community Center) (DFM)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Water quality issues from cesspool and other onsite waste sites • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater

	• Limited wind mitigation for above-ground utilities, such as powerlines

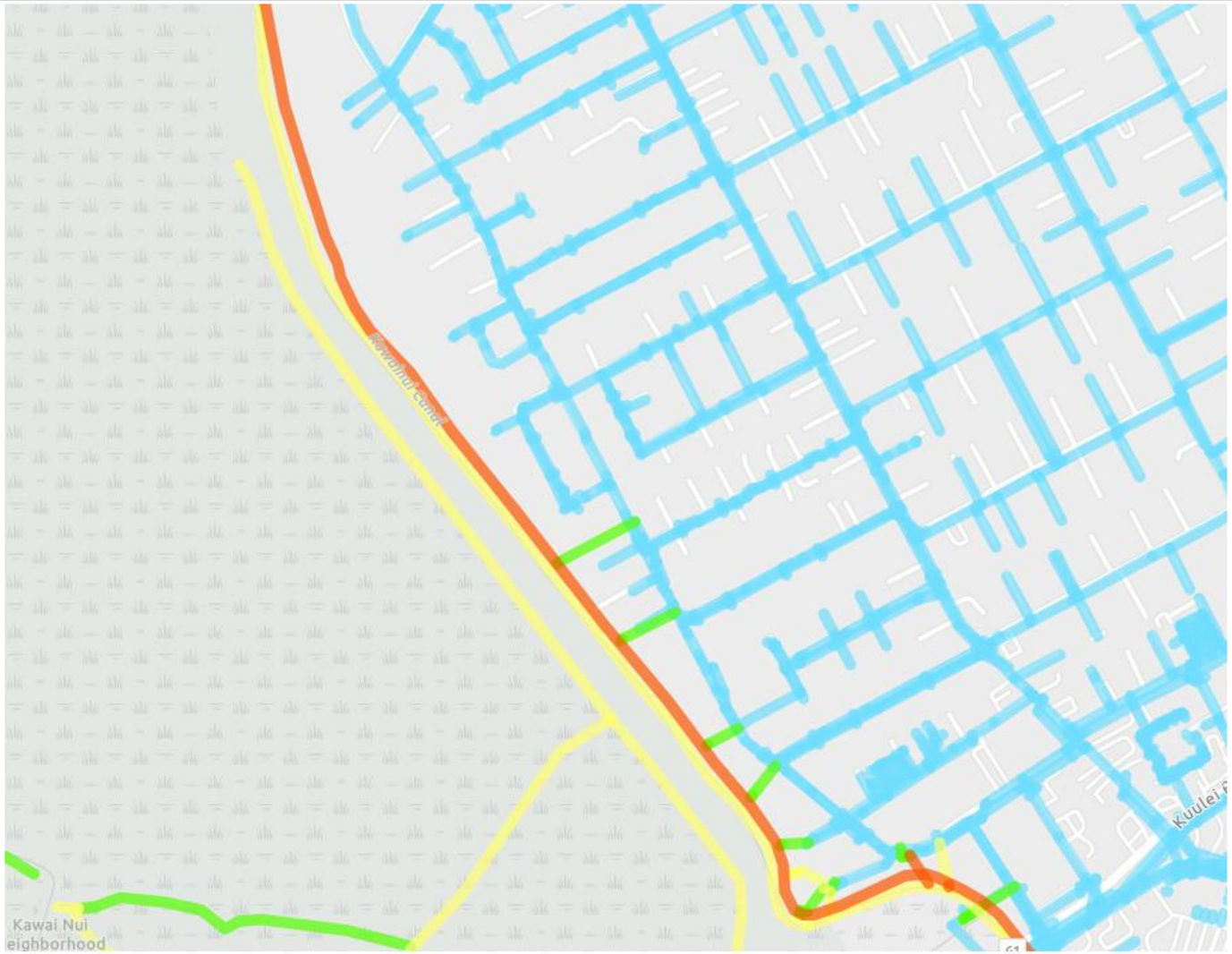
3.2.6 'AIKAHI/KALAHEO

Location Information and Maps	
Location	Kailua
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	 SLR TSUNAMI HURRICANE & 100-YEAR STORM WILDFIRE Mokapu Blvd N Kalaheo Ave 65 Resource Mapping Hawaii, Maxar | DLNR Commission on Water Resource Management, Natura... Powered by Esri Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of K... Powered by Esri

Key Assets	
Wastewater	Kailua WWTP, Kailua Effluent WWPS & TIPS, Kailua WWTP Effluent WWPS, 54 in. Sewer outfall, 32 in. Force main, 120 in./66 in. sewer main
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in. SW conduits, Kawainui Stream, Kawainui Marsh
Water	High risk/at-risk pipelines
Major Streets	Kāneʻohe Bay Dr, Mokapu Rd, Kailuana Pl, N Kalaheo Ave/Kawainui Canal Bridge, Oneawa St/Kawainui Canal Bridge, BROW along Kaneohe Bay Drive (North of Aina Moi Place)
Community Assets	ʻAikahi Fire Station 19, ʻAikahi Public Elementary School, ʻAikahi Park Shopping Center, Kalaheo Public Highschool, Kainalu Public Elementary School, Kāneʻohe Bay, Kailua Bay, Kawai Nui Neighborhood Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 5 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Within dam evacuation zone • Cesspool and septic seepage impacting water quality near shore
Ongoing/Planned Projects	• Coastal Mitigation – Dune restoration at Kailua Beach Park (DPR/Sea Grant) • MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Flood protection (short-term) for critical areas covered by partial inundation, and potential relocation for residential areas (long-term) • Water quality issues from cesspool and other onsite waste sites • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

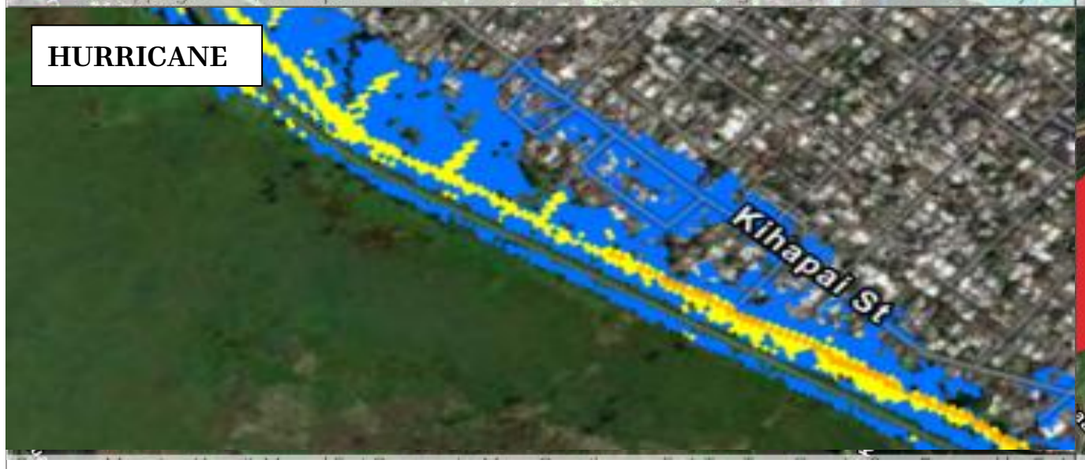
3.2.7 KAWAINUI

Location Information and Maps	
Location	Kailua
Risk Score Map	

Threat Maps


SLR
Kapaa Quarry Rd
Punaa St
Hooulu St
Oneawa St
Uluipaina St
Keaniani St
Auwai St
Halela St
Kawainui St
Ulunui St
Kihapai St
Kailua Rd
N Kainalu Dr
Kailua Elem
Resource Mapping Hawaii, Maxar | DLNR Commission on Water Resource Management; Natura...
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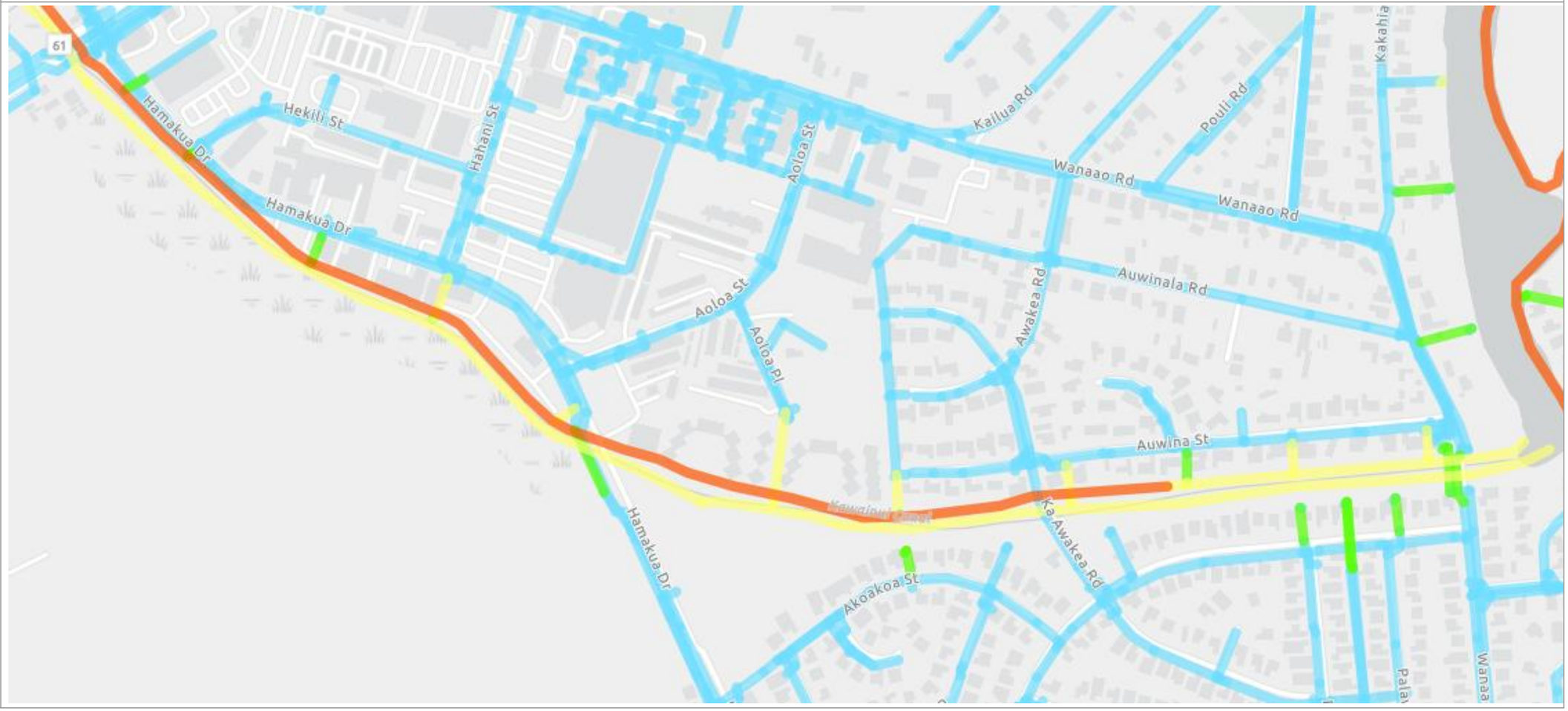

TSUNAMI
Kapaa Quarry Rd
Punaa St
Hooulu St
Oneawa St
Uluipaina St
Keaniani St
Auwai St
Halela St
Kawainui St
Ulunui St
Kihapai St
Kailua Rd
N Kainalu Dr
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K...
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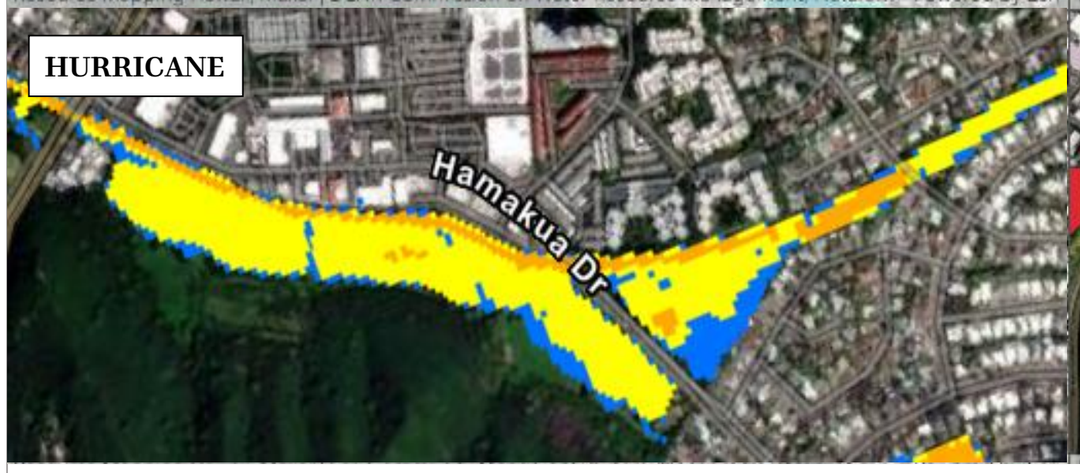

HURRICANE
Kihapai St


100-YEAR STORM
Kapaa Quarry Rd
Punaa St
Hooulu St
Oneawa St
Uluipaina St
Keaniani St
Auwai St
Halela St
Kawainui St
Ulunui St
Kihapai St
Kailua Rd
N Kainalu Dr

Key Assets	
Wastewater	Coconut Grove WWPS, Kailua Road WWPS, 8 in./18 in. mains, 8 in./20 in. force mains
Stormwater	18 in./24 in./30 in./36 in./48 in./54 in./66 in./72 in./84 in. SW conduits, Kawainui Stream
Water	Very high risk/high risk pipelines
Major Streets	Kailua Rd, Kuulei Rd, Kailua Rd/Kawainui Stream Bridge
Community Assets	Hawaiian Mission Academy Private School, St. Anthony Private School, Kalama Beach Park, Kawai Nui Neighborhood Park, Kailua Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation at 2 ft SLR • Drainage backflow due to 2 ft of SLR • 80% probability of passive flooding at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Within dam evacuation zone
Ongoing/Planned Projects	• Coastal Mitigation – Dune restoration at Kailua Beach Park (DPR/Sea Grant) • MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Water quality issues from cesspool and other onsite waste sites • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

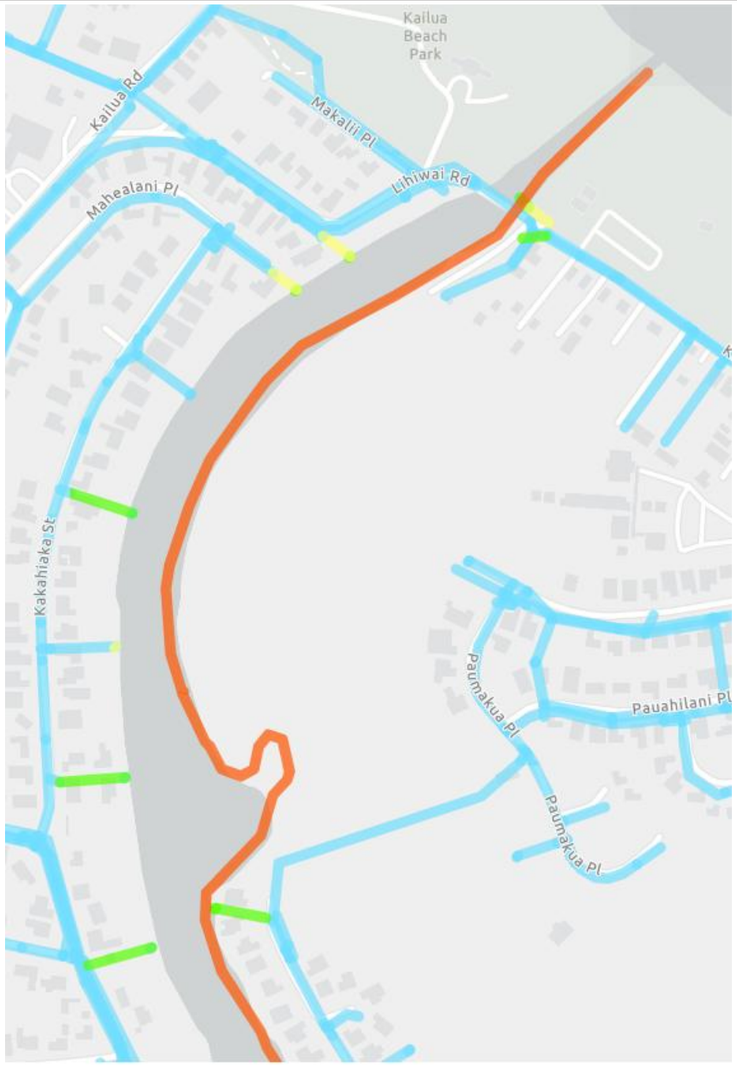
3.2.8 KAILUA TOWN

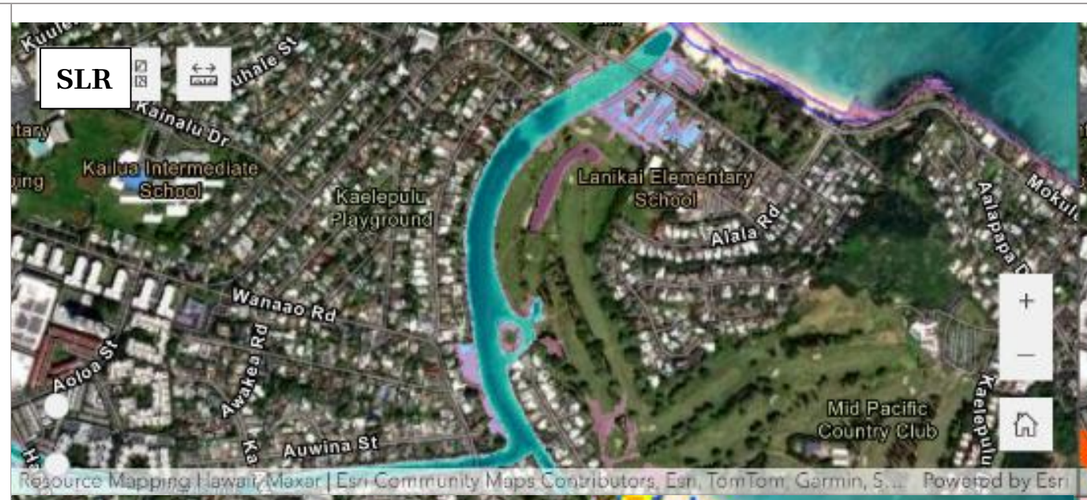
Location Information and Maps	
Location	Kailua
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Kailua Heights WWPS, 10 in./30 in./36 in. Sewer mains, 14 in./24 in. force mains
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in./54 in./66 in./72 in./84 in. SW conduits, Kawainui Stream
Water	Very high risk/high risk pipelines
Major Streets	Kailua Rd/Kawainui Stream Bridge, Hamakua Dr/Kawainui Stream Bridge, Ka Awakea Rd/Kawainui Stream Bridge, Wanaʻao Rd/Kaʻelepulu Stream Bridge
Community Assets	Kaiser Kailua Clinic, nearby Kailua Field, nearby Kailua Public Elementary School, nearby Kailua Public Intermediate School, nearby Kailua Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 1 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft and some greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Within dam evacuation zone
Ongoing/Planned Projects	• Coastal Mitigation – Dune restoration at Kailua Beach Park (DPR/Sea Grant) • MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Water quality issues from cesspool and other onsite waste sites • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

3.2.9 KAILUA BEACH PARK

Location Information and Maps	
Location	Kailua
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Kailua Heights WWPS, 8 in./10 in./21 in. sewer mains
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in./54 in./66 in./72 in./84 in. SW conduits, Kaʻelepulu Stream
Water	Very high risk/high risk pipelines
Major Streets	Lihiwai Rd, Iana St, Kawailoa Rd/Kaʻelepulu Stream Bridge
Community Assets	Lanikai Public Elementary School, Kailua Beach Park, Kailua Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 1 ft of SLR • 80% probability of passive flooding at 3 ft SLR • Coastal erosion due to 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft and some greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evacuation zones
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Area noted as location where marshlands need protection
Ongoing/Planned Projects	• Coastal Mitigation – Dune restoration at Kailua Beach Park (DPR/Sea Grant)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Water quality issues from cesspool and other onsite waste sites • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

3.2.10 ENCHANTED LAKE/KA‘ELEPULU

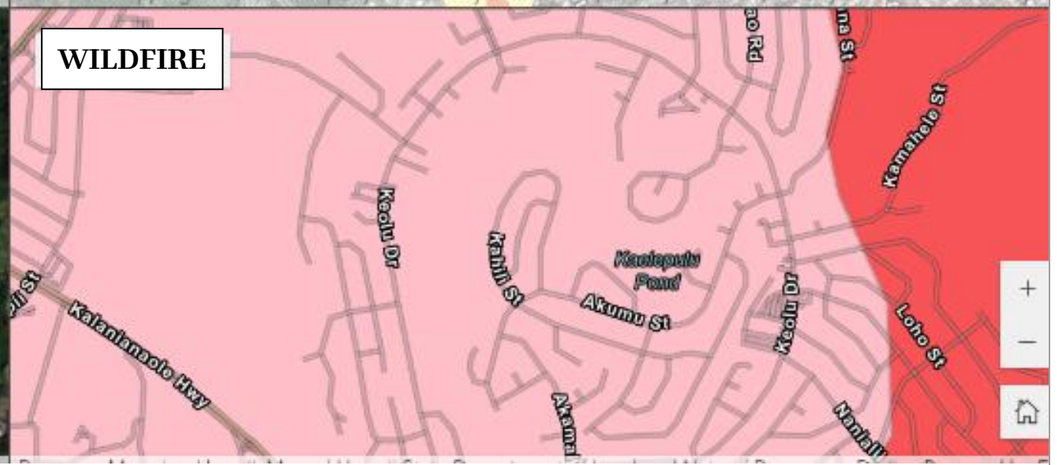
Location Information and Maps	
Location	Kailua
Risk Score Map	

Threat Maps


SLR
Kaelepulu Pond
Akumu St
Kahili St
Keolu Dr
Kalanianaole Hwy
Kamahele St
Loho St
Nanialii
Aka
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, Sp... Powered by Esri

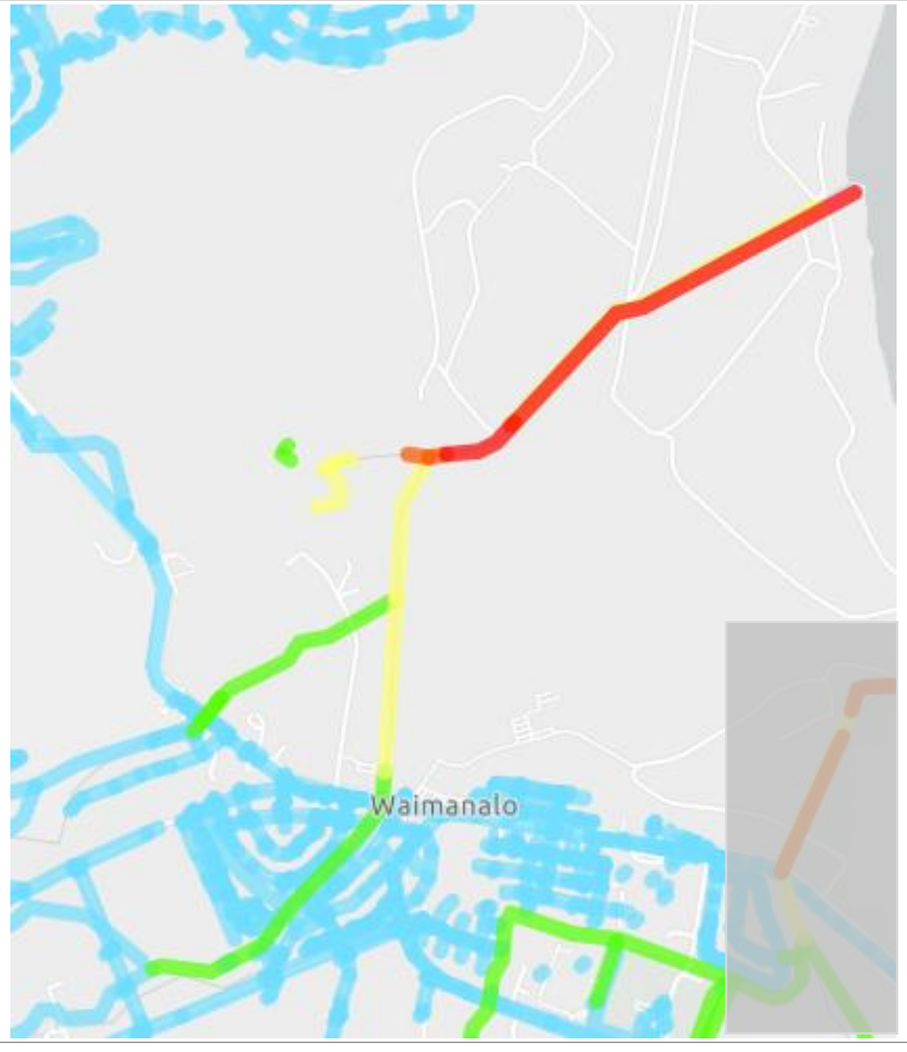

TSUNAMI
Kaelepulu Pond
Akumu St
Kahili St
Keolu Dr
Kalanianaole Hwy
Kamahele St
Loho St
Nanialii
Aka
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kau... Powered by E


HURRICANE &
100-YEAR STORM
Kaelepulu Pond
Akumu St
Kahili St
Keolu Dr
Kalanianaole Hwy
Kamahele St
Loho St
Nanialii
Aka


WILDFIRE
Kaelepulu Pond
Akumu St
Kahili St
Keolu Dr
Kalanianaole Hwy
Kamahele St
Loho St
Nanialii
Aka

Key Assets	
Wastewater	Enchanted Lake WWPS, 10 in. force main, 8 in./10 in. sewer main, 6 in./8 in./20 in. Siphon
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in. SW conduits, Kaʻelepulu Stream
Water	Very high risk/high risk pipelines
Major Streets	Keolu Dr/Kaʻelepulu Stream Bridge, Akumu St/Vienney Ditch Bridge, Keolu Dr/Helu Drain Channel Bridge
Community Assets	Mid Pacific Country Club, Kaʻelepulu Pond, Kaʻelepulu Public Elementary School, Enchanted Lake Public Elementary School, St. John Vianney Private School
Climate Threats	
SLR	• Annual high wave-driven flooding at 7 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 1 ft of SLR • 80% probability of passive flooding at 6 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft and some greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Area noted as location where marshlands need protection
Ongoing/Planned Projects	• None identified
Potential Gaps	• Flood protections needed in near to mid-term due to drainage backflow and groundwater inundation at 1 ft SLR

3.2.11 WAIMĀNALO NEAR OLOMANA GOLF COURSE

Location Information and Maps	
Location	Waimānalo
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Kahawai WWPS, 12 in. force main, 10 in./12 in. mains
Stormwater	Waimānalo Stream and channel, 30 in./18 in. SW conduits
Water	High priority pipelines, nearby wells
Major Streets	Kalaniana‘ole Hwy, Kal Hwy/Waimānalo Stream Bridge, Bellows Road Bridge, Kal Hwy Waimānalo Bridge
Community Assets	Olomana Golf Links, Bellows AFB, Bellows Field Beach Park and Campground (owned by the Navy and is under an expired license with the City, but the City continues a hold-over status) Waimānalo District Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 8 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft and greater than 6 ft.
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High social vulnerability • Waimānalo & Kakaina-Kumuhua Hawaiian Homesteads • Waimānalo bay water quality issues, including cesspool and septic seepage impacting water quality near shore • Within dam evacuation zone • Agriculture water sources are threatened by changing precipitation patterns, and increased temperatures can affect agricultural productivity, particularly for kalo
Ongoing/Planned Projects	• Waimānalo WWTP potential R-1 reuse as an alternative to injection well (ENV) • MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Water quality issues from cesspool and other onsite waste sites • Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater

	• Limited wind mitigation for above-ground utilities, such as powerlines

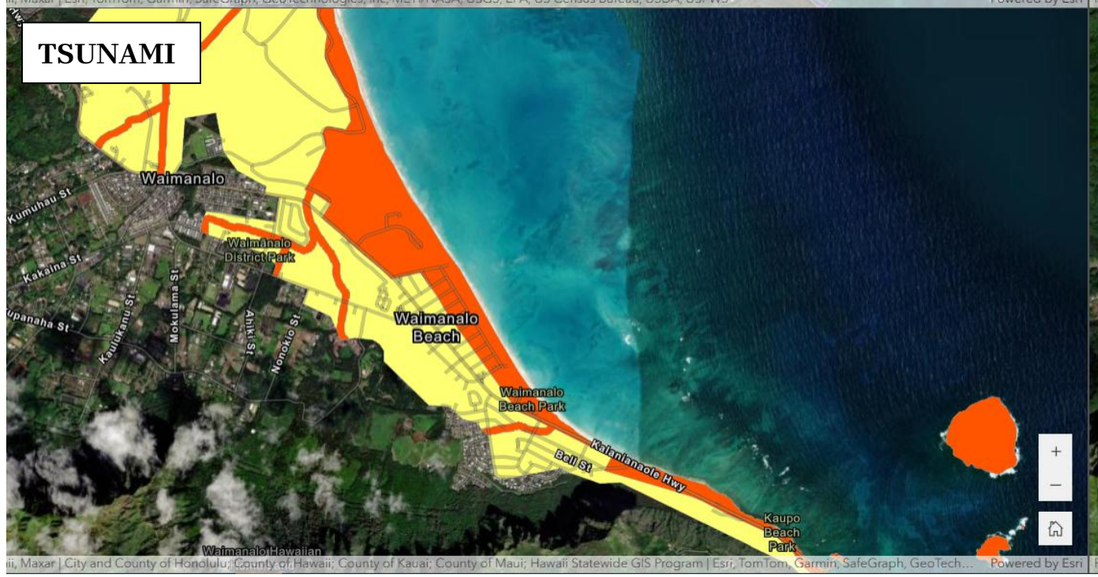
3.2.12 WAIMĀNALO BEACH

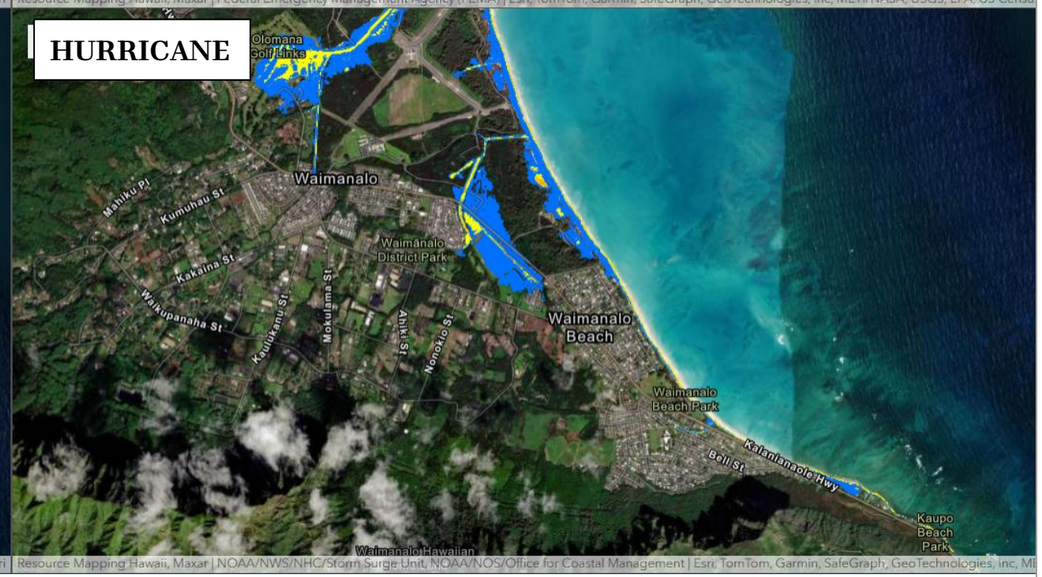
Location Information and Maps	
Location	Waimānalo
Risk Score Map	

Threat Maps


SLR
Waimanalo
Kumuhau St
Kakaina St
Waimānalo District Park
Waimanalo Beach
Waimanalo Beach Park
Kalanianaole Hwy
Bell St
Kaupo Beach Park
Waimanalo Hawaiian
Powered by Esri


100-YEAR STORM
Waimanalo
Kumuhau St
Kakaina St
Waimānalo District Park
Waimanalo Beach
Waimanalo Beach Park
Kalanianaole Hwy
Bell St
Kaupo Beach Park
Waimanalo Hawaiian
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census

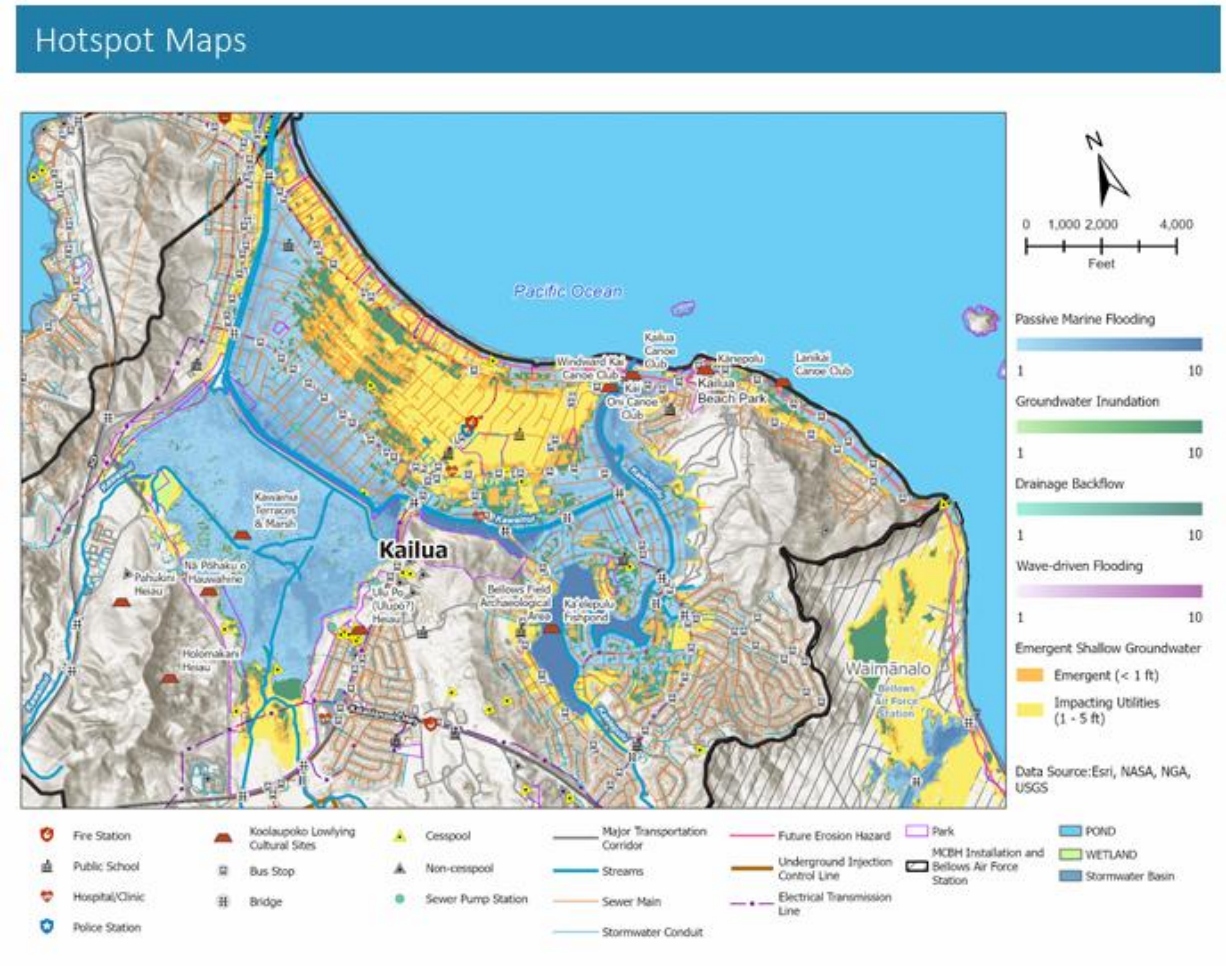

TSUNAMI
Waimanalo
Kumuhau St
Kakaina St
Waimānalo District Park
Waimanalo Beach
Waimanalo Beach Park
Kalanianaole Hwy
Bell St
Kaupo Beach Park
Waimanalo Hawaiian
Powered by Esri


HURRICANE
Olomana Golf Links
Waimanalo
Kumuhau St
Kakaina St
Waimānalo District Park
Waimanalo Beach
Waimanalo Beach Park
Kalanianaole Hwy
Bell St
Kaupo Beach Park
Waimanalo Hawaiian
Resource Mapping Hawaii, Maxar | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, inc, MI

Key Assets	
Wastewater	Waimānalo WWTP and WWTP Influent PS, Injection Wells, 12 in. force main, 24 in., 21 in., and 15 in. mains
Stormwater	Kahawai Stream, Unnamed stream, 54 in./36 in./30 in./18 in. SW conduits
Water	High priority pipelines, nearby critical well, nearby Waimānalo 60 MG reservoir
Major Streets	Kalanianaʻole Hwy, Hīhīmanu St, 8 BROWS (City owned) along Laumilo St between Hūnānaniho (Sherwoods) Beach Park and Waimānalo Beach Park
Community Assets	Waimānalo Fire Station 27, Waimānalo Health Clinic, Waimānalo Elementary and Intermediate Public School, Blanche Pope Elementary School, Malama Honua Public Charter School, Hūnānaniho (Sherwoods) Beach Park and Campground, Waimānalo Beach Park and Campground, Waimānalo District Park, Kaiona Beach Park, Kaupō Beach Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 2 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 8 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft and greater than 6 ft. Complete inundation under Cat 4 conditions.
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evacuation zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High social vulnerability • Waimānalo & Kakaʻina-Kumuhau Hawaiian Homesteads • Waimānalo bay water quality issues, including cesspool and septic seepage impacting water quality near shore • Within dam evacuation zone • Agriculture water sources are threatened by changing precipitation patterns, and increased temperatures can affect agricultural productivity, particularly for kalo

Ongoing/Planned Projects	• Waimānalo WWTP potential R-1 Reuse as an alternative to injection well (ENV) • MCBH Military Installation Resilience Review (CCSR)
Potential Gaps	• Water quality issues from cesspool and other onsite waste sites • Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat mitigation efforts • I&I and corrosion solutions for utility infrastructure affected by emergent groundwater • Limited wind mitigation for above-ground utilities, such as powerlines

Coastal Kailua is a further potential consideration from the **Ko‘olau Poko Readiness Review** in parallel efforts (other hotspots have been included). The following has been flagged here for reviewers in case we want to elevate this as an additional hotspot.



Key Assets	
Wastewater	Nearby ʻAʻala Drive WWPS, 8 in./10 in. sewer main
Stormwater	12 in./18 in./24 in. /30 in./36 in. SW conduits, Mokulua Stream
Water	High risk/at-risk pipelines
Major Streets	Lanipo Dr, Mokulua Dr
Community Assets	Lanikai Beach, Nearby Mid Pacific Country Club, Kailua Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 7 ft SLR • Drainage backflow due to 7 ft of SLR • 80% probability of passive flooding at 8 ft SLR • Coastal erosion at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 3 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evacuation zones
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Pollution from urban runoff and agricultural activities affecting water quality and impacted by increased storm intensity and over-extraction near Lanikai Beach • Wildfire risks threaten properties and ecosystems noted in past planning efforts
Ongoing/Planned Projects	• Nearby – Coastal Mitigation – Dune restoration at Kailua Beach Park (DPR/Sea Grant)
Potential Gaps	• Potential need for flood and erosion protection measures in the mid- to long-term planning horizon

SECTION F.4: EAST HONOLULU

F.4.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The East Honolulu region consists primarily of residential communities, supporting businesses, and Maunalua Bay. The area experiences a generally dry climate year-round, but development has increased flooding impacts along local streams. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.4.

F.4.1.1 SPECIFIC LOCATIONS

Several areas across the region face specific challenges including valley and stream flooding, erosion, and contamination concerns.

- There is a need for enhanced drainage, debris management, and flood control systems.
  - **Niu Valley**
  - **Kuliʻouʻou Valley**
  - **Hahaʻione Valley**
  - **Kamehame Ridge to Hawaiʻi Kai Golf Course**
  - **Wailupe Stream**
- There are water contamination concerns in the area due to salinity levels in recycled water from the **East Honolulu WWTP** effluent.
- There is a need to support restoration efforts in the upper watershed of Niu and Wailupe Valleys to decrease **soil erosion entering Maunalua Bay**.

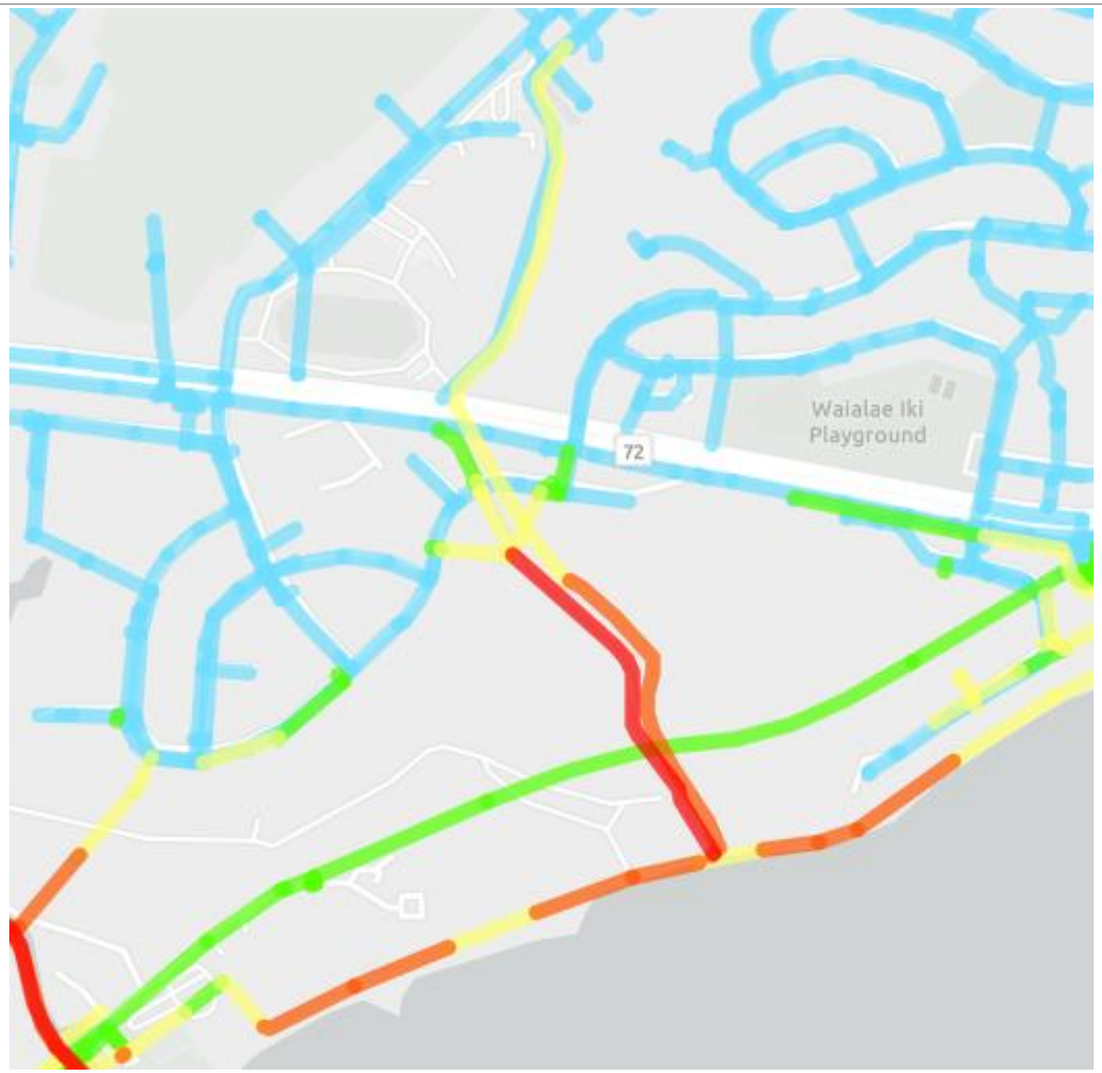
F.4.1.2 GENERAL CONCERNS ACROSS THE REGION

East Honolulu faces challenges regarding wildfire, vegetation, and water resource management that affect communities and resources across the region.

- There are concerns regarding **wildfire, vegetation management, and water resource management integration** into climate adaptation strategies.
- Numerous **cesspools pose contamination risks** to groundwater and nearshore waters.

F.4.2 IDENTIFIED HOTSPOTS

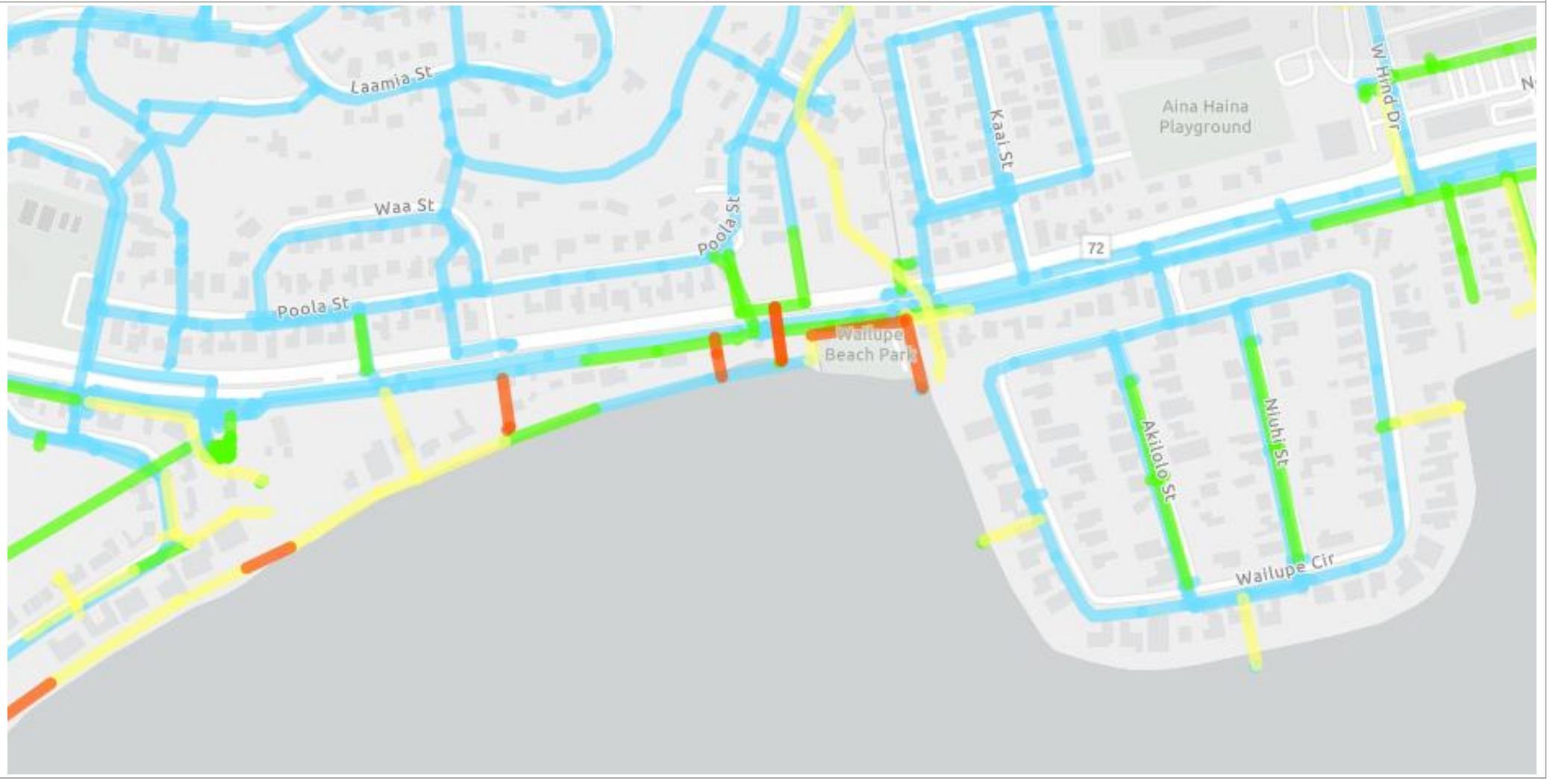
F.4.2.1 WAIALAE/KĀHALA

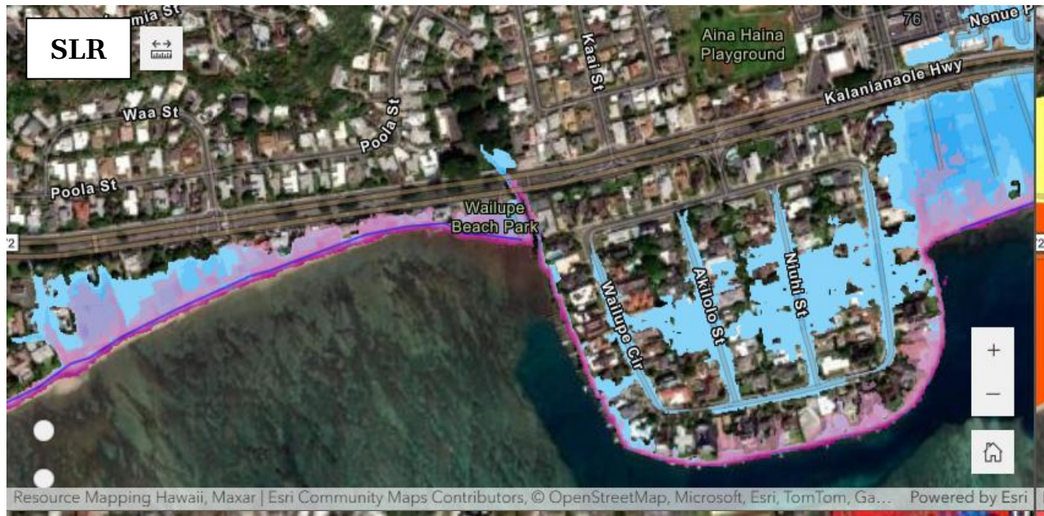
Location Information and Maps	
Location	Kāhala
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	 SLR Waialae Country Club Waiholo St Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr... Powered by Esri TSUNAMI Waialae Country Club Waiholo St Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K... Powered by Esri HURRICANE Waialae Country Club 100-YEAR STORM Waialae Country Club Waiholo St Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Com... Powered by Esri

Key Assets	
Wastewater	Kāhala WWPS, 18 in./24 in. force main, 8 in./15 in./24 in./36 in. sewer main
Stormwater	18 in./24 in. SW conduits, Waialae Iki Stream, Waialae Nui Stream
Water	High risk pipelines
Major Streets	Kāhala Ave, Waiholo St, Waialae Nui Stream/Kāhala Ave Bridge
Community Assets	Waialae Iki Playground, Waialae Country Club, Waialae Beach Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 5 ft SLR • 80% probability of passive flooding at 2 ft of SLR • Coastal erosion due to 2 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impacts to housing, potential relocation (long-term)
Ongoing/Planned Projects	• DFM Waialae Nui Channel Flood Control Improvement
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Community impacts during a storm/tsunami event (accessibility)

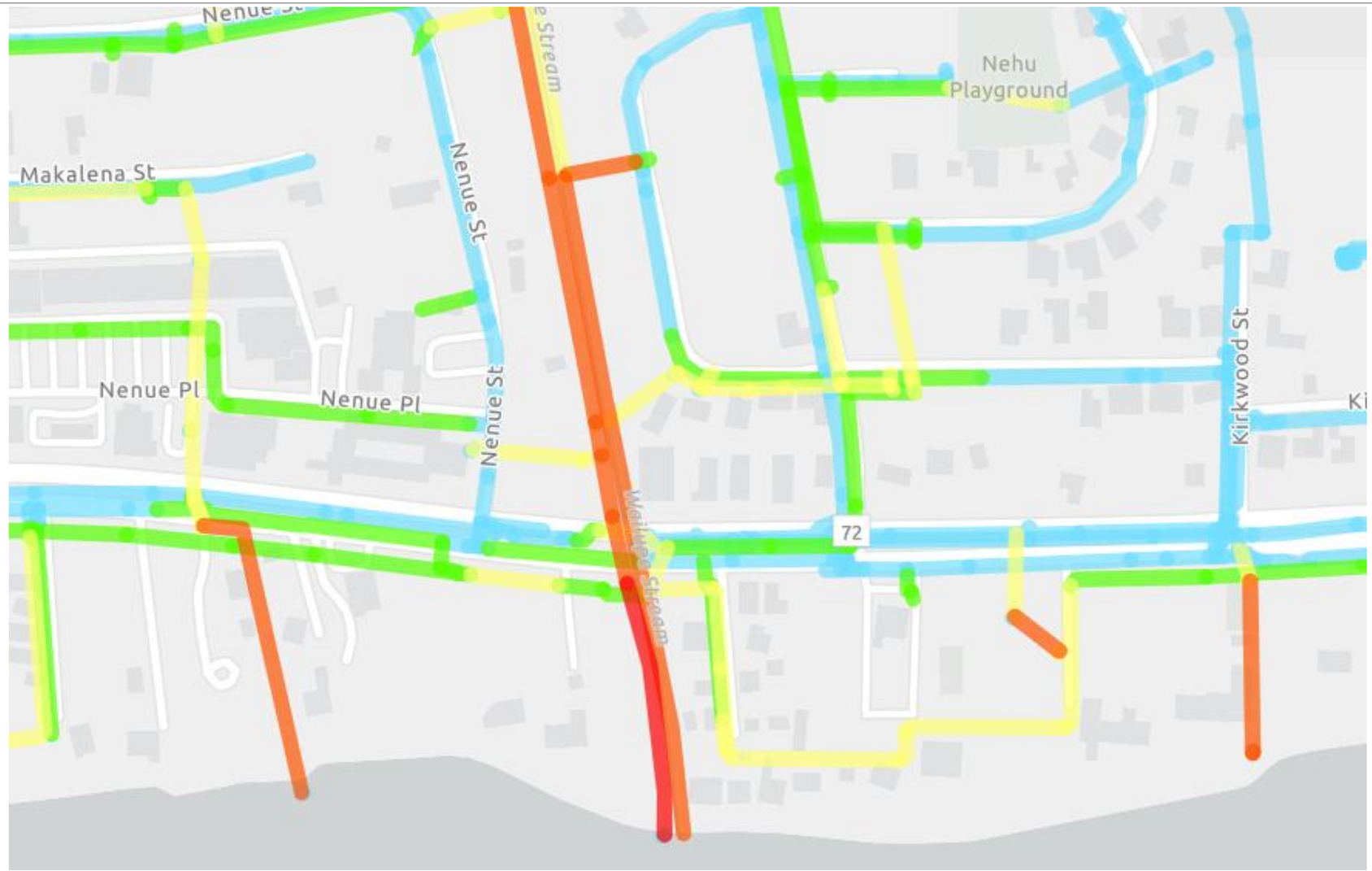
F.4.2.2 KALANIANA'OLE HWY/WAILUPE BEACH PARK

Location Information and Maps	
Location	Wailupe
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	   

Key Assets	
Wastewater	6 in./8 in./10 in./15 in./30 in. sewer main
Stormwater	6 in./18 in./24 in./30 in./36 in. SW conduits, Wailupe Stream
Water	High risk pipelines
Major Streets	Kalaniana‘ole Hwy
Community Assets	Wailupe Fire Station 23, Wailupe Beach Park (City beach park), ‘Āina Haina Community Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 6 ft SLR • 80% probability of passive flooding at 7 ft of SLR • Coastal erosion due to 1 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impacts to housing, potential relocation (long-term)
Ongoing/Planned Projects	• • USACE Wailupe Stream Flood Risk Management Study • ENV Kalanianaole Highway Sewer System Improvements • Proposed project to dredge Wailupe Stream from Kalaniana‘ole Hwy to West Hind Bridge (DFM)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Community impacts during a storm/tsunami event (accessibility)

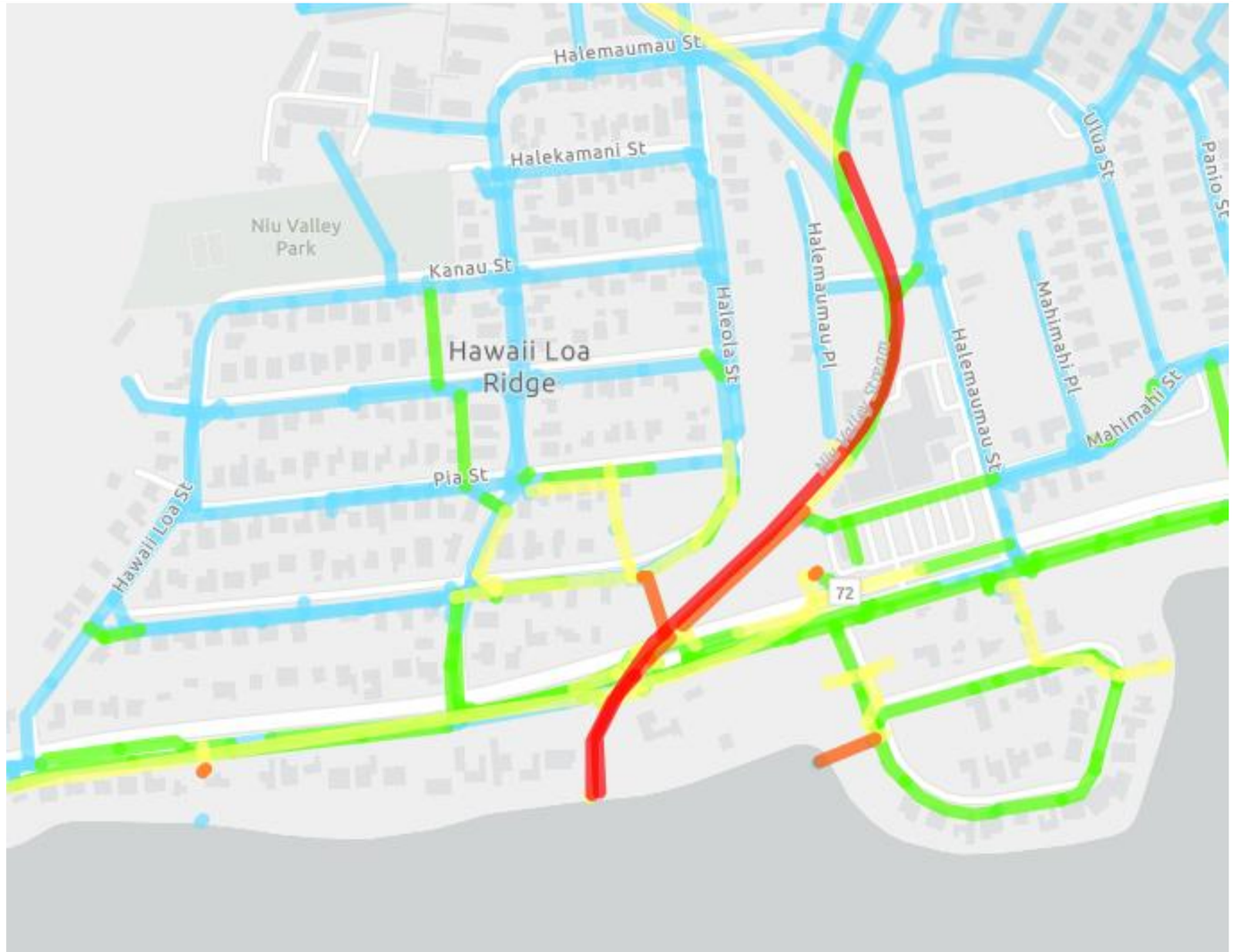
F.4.2.3 KALANIANA'OLE HWY/WAILUPE STREAM

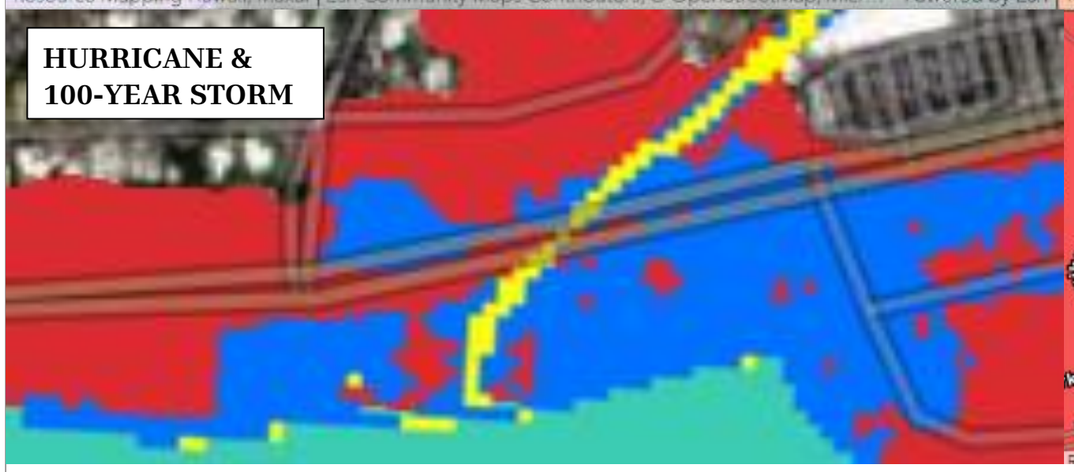
Location Information and Maps	
Location	Wailupe Stream
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	   

Key Assets	
Wastewater	8 in./10 in./12 in./18 in./24 in./30 in. sewer main, 8 in./10 in./16 in. sewer siphons
Stormwater	18 in./24 in./30 in./36 in. SW conduits, Wailupe Stream
Water	Very high risk/high risk pipelines
Major Streets	Kalanianaʻole Hwy, Kirkwood St, Punahele Pl, Kal Hwy/Wailupe Stream Bridge (OB), Kal Hwy/Wailupe Stream Bridge (IB)
Community Assets	Holy Nativity Private School, Aina Haina Shopping Center, Aina Haina Elementary School, Kawaikuʻi Beach Park (City beach park), Maunalua Bay, Nehu Neighborhood Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 1 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 5 ft SLR • 80% probability of passive flooding at 6 ft of SLR • Coastal erosion due to 2 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impacts to housing, potential relocation (long-term)
Ongoing/Planned Projects	• USACE Wailupe Stream Flood Risk Management Study and Rehabilitation • Proposed project to dredge Wailupe Stream from Kalanianaʻole Hwy to West Hind Bridge (DFM)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Community impacts during a storm/tsunami event (accessibility)

F.4.2.4 KALANIANA‘OLE HWY/HAWAI‘I LOA RIDGE

Location Information and Maps	
Location	Hawai‘i Loa Ridge
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	   

Key Assets	
Wastewater	Niu Valley WWPS, 16 in./20 in. force main, 8 in./10 in./12 in./15 in./18 in./21 in. sewer main
Stormwater	18 in./24 in./26 in./30 in./36 in./42 in. SW conduits, Niu Valley Stream
Water	High risk pipelines
Major Streets	Kalaniana‘ole Hwy, Kal Hwy/Niu Stream Bridge, Halemaumau Pl/Niu Valley Stream, Halemaumau Pl, BROW between Pu‘uikena Dr And Niuiki Circle
Community Assets	Honolulu Private Waldorf School, Niu Valley Middle School, Niu Valley Neighborhood Park, Maunalua Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 5 ft SLR • 80% probability of passive flooding at 6 ft of SLR • Coastal erosion due to 4 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impacts to housing, potential relocation (long-term) • Niu Valley has history of severe flooding, especially during intense rainstorms
Ongoing/Planned Projects	• Niu Valley Stream identified as stream of interest • Maunalua Bay is the focus of many community restoration efforts coordinated by Mālama Maunalua and include invasive species removal
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Community impacts during a storm/tsunami event (accessibility)

F.4.2.5 KALANIANA‘OLE HWY/PAIKŌ DR

Location Information and Maps	
Location	Kuli‘ou‘ou Valley
Risk Score Map	

Threat Maps


SLR
Kalanianaole
Holy Trinity School
Paiko Dr
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr...
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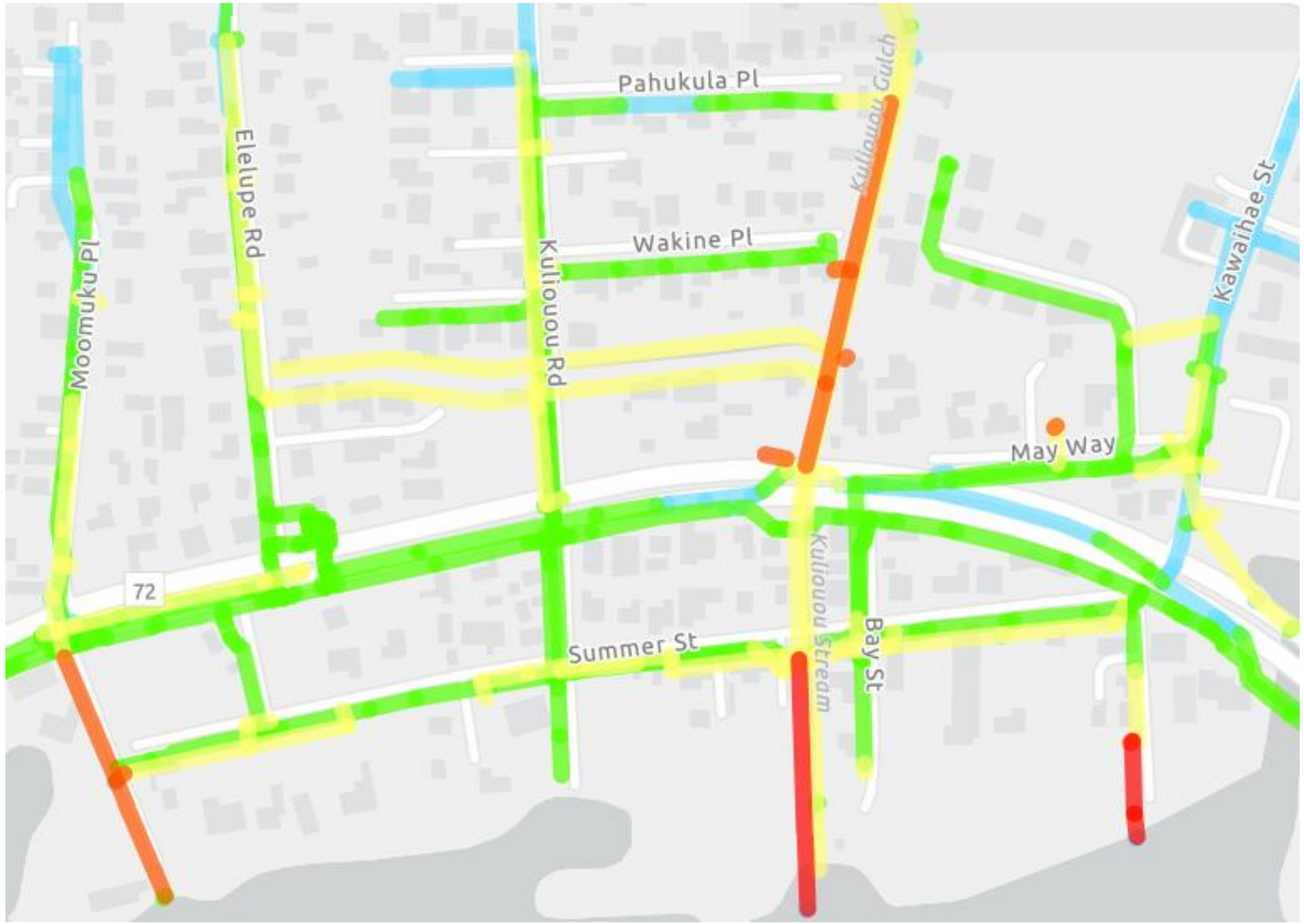

TSUNAMI
Kalanianaole
Holy Trinity School
Paiko Dr
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K...
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HURRICANE & 100-YEAR STORM
Holy Trinity School
Paiko Dr

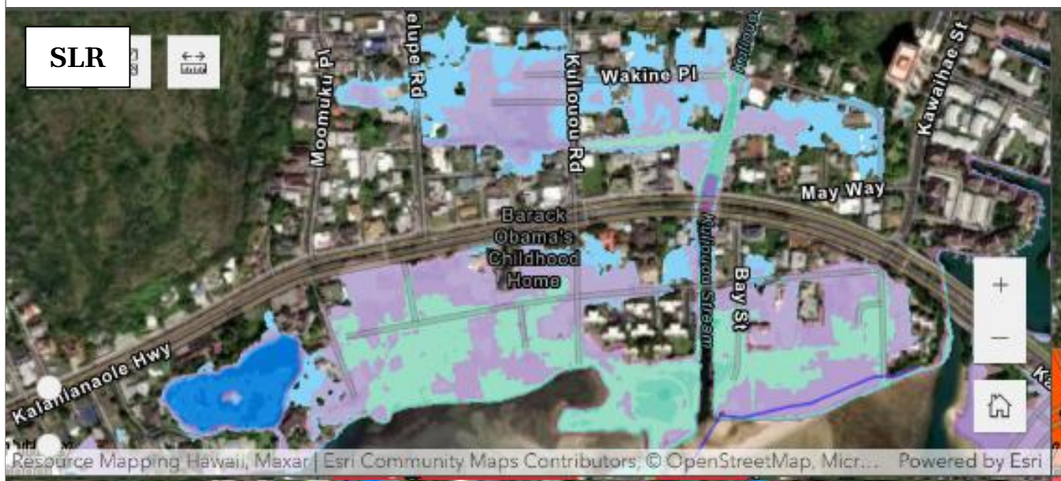

WILDFIRE
Kalanianaole
Holy Trinity School
Paiko Dr

Key Assets	
Wastewater	Paikō Drive WWPS, 6 in. force main, 8 in./10 in. sewer main
Stormwater	12 in./18 in./24 in. SW conduits
Water	High risk pipelines
Major Streets	Kalaniana‘ole Hwy, Paikō Dr, BROW along Paikō Dr
Community Assets	Paikō Lagoon Wildlife Sanctuary (under State DOFAW/DLNR), Paikō Beach, Maunalua Bay
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 3 ft SLR • 80% probability of passive flooding at 4 ft of SLR • Coastal erosion due to 1 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impacts to housing, potential relocation (long-term)
Ongoing/Planned Projects	• None identified
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Community impacts during a storm/tsunami event (accessibility)

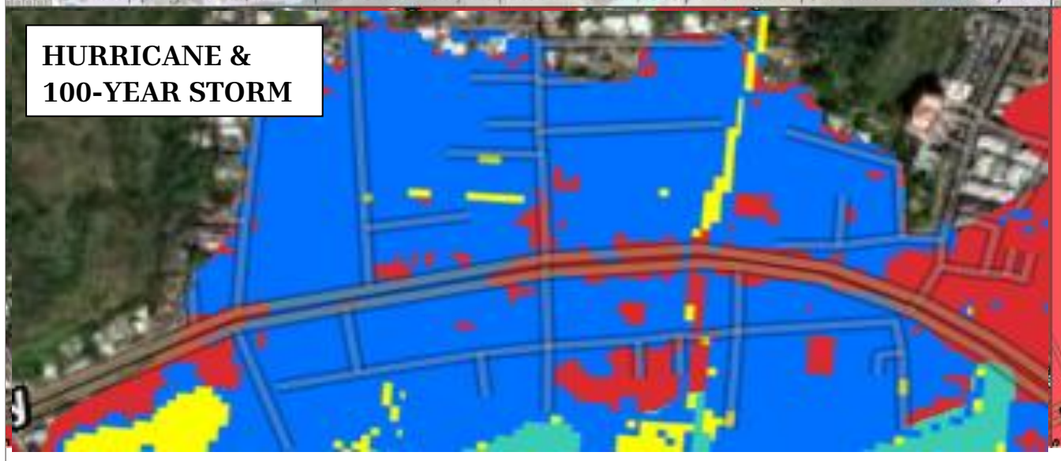
4.2.6 KALANIANA‘OLE HWY/KULI‘OU‘OU

Location Information and Maps	
Location	Kuli‘ou‘ou
Risk Score Map	

Threat Maps


SLR
Wakine Pl
Kuliouou Rd
Moomuku Pl
elupe Rd
Kawaihae St
May Way
Barack Obama's Childhood Home
Kuliouou Stream
Bay St
Kalanianaole Hwy
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr... Powered by Esri


TSUNAMI
Wakine Pl
Kuliouou Rd
Moomuku Pl
elupe Rd
Kawaihae St
May Way
Barack Obama's Childhood Home
Kuliouou Stream
Bay St
Kalanianaole Hwy
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K... Powered by Esri


HURRICANE & 100-YEAR STORM


WILDFIRE
Wakine Pl
Kuliouou Rd
Moomuku Pl
elupe Rd
Kawaihae St
May Way
Barack Obama's Childhood Home
Kuliouou Stream
Bay St
Kalanianaole Hwy

Key Assets	
Wastewater	Kuliʻouʻou WWPS, 12 in. force main, 6 in./8 in./12 in./15 in./18 in. sewer main
Stormwater	Kuliʻouʻou Gulch, Drainage Ditch, 18 in./36 in./24 in./30 in./36 in./42 in. SW conduits
Water	High risk pipelines
Major Streets	Kalanianaʻole Hwy, Kal Hwy Kuliʻouʻou Stream Bridge, Summer St Kuliʻouʻou Stream Bridge, Kal Hwy Kuapā PD/Maunalua Bridge
Community Assets	Kuliʻouʻou Beach Park (City beach park), Maunalua Bay, Kānewai Spring, Paikō Lagoon Wildlife Sanctuary (under State DOFAW/DLNR)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 3 ft SLR • 80% probability of passive flooding at 4 ft of SLR • Coastal erosion due to 2 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Maunalua Bay water quality issues • Impacts to housing, potential relocation (long-term) • Need for enhanced drainage, debris management, and flood control systems – Kuliʻouʻou Valley – Hahaʻione Valley (neighboring valley)
Ongoing/Planned Projects	• Kuliʻouʻou Stream sand dredging/transfer • Emergency improvements at various Hawaiʻi Kai bridges
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited preparation of above-ground infrastructure (powerlines) for high wind events • Community impacts during a storm/tsunami event (accessibility)

4.2.7 KAMILOIKI

Location Information and Maps	
Location	Kamiloiki
Risk Score Map	

Very Low Risk

Low Risk

At Risk

High Risk

Very High Risk

Threat Maps


SLR
Wainiha St
Kalapaki St
Niumalu Loop
Waioli St
Kukii St
Kamilo St
Kuekue St
Hawaii Kai Dr
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S... Powered by Esri
TSUNAMI
Wainiha St
Kalapaki St
Niumalu Loop
Waioli St
Kukii St
Kamilo St
Kuekue St
Hawaii Kai Dr
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K... Powered by Esri
HURRICANE & 100-YEAR STORM
Waioli St
Hawaii Kai Dr
WILDFIRE
Wainiha St
Kalapaki St
Niumalu Loop
Waioli St
Kukii St
Kamilo St
Kuekue St
Hawaii Kai Dr
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Div... Powered by Esri

Key Assets	
Wastewater	Private wastewater system
Stormwater	18 in./24 in./30 in./36 in./42 in./54 in./60 in. SW conduits, Kamilo Iki Stream
Water	High risk pipelines
Major Streets	Maniniholo St, Awāwamalu St, Hawai‘i Kai Dr/Kamiloiki Stream Bridge, Maniniholo St/Kamiloiki Stream Bridge, Wainiha St/Kamiloiki Stream Bridge
Community Assets	Kamiloiki Community Park, Kamiloiki Public Elementary School
Climate Threats	
SLR	• Annual high wave-driven flooding at 8 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 3 ft SLR • 80% probability of passive flooding at 9 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• Add capacity for East Honolulu via upgrades to the Sand Island Wastewater Treatment Plant (ENV)
Potential Gaps	• Community impacts during a storm/tsunami event (accessibility) • Limited heat and wildfire mitigation efforts • Limited preparation of above-ground infrastructure (powerlines) for high wind events

SECTION F.5: PRIMARY URBAN CENTER

F.5.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The Primary Urban Center (PUC) is Oʻahu's most densely developed region, home to roughly 44% of the island's population and a major hub of employment. Much of its coastline was historically shaped by land reclamation — including Waikīkī, built on drained wetlands, and Māpunapuna, built on filled fishponds — and current development continues to trend toward infill, densification, and transit-oriented growth. The region faces significant climate-driven hazards, including sea level rise, coastal erosion, and flooding in low-lying areas such as Pearl Harbor and the Ala Wai Canal, alongside aging water infrastructure in need of repair or replacement. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.5.

F.5.1.1 SPECIFIC LOCATIONS

Pollutants from urban runoff affect recreational opportunities and public health, presenting opportunities for restoration.

- **ʻAiea Stream f**lows through ʻAiea town into ʻAiea Bay, with urban development raising concerns about water quality and ecosystem health.
- **Ala Wai Canal** requires attention for stormwater management and pollution control to improve water quality and protect community health.
- **Waikīkī Beaches** are affected by erosion, as well as pollution from the Ala Wai Canal, raising concerns about water quality and public health.
- **Kupehau Park** is a potential bioremediation site. (This park is an underdeveloped area in Kalihi Valley maintained by DPR. The central portion is unmaintained due to its steep terrain.)
- **Hālawa Stream** traverses Hālawa Valley into Pearl Harbor, where channelization has impacted flooding and habitats. Improvements are needed to address flood risks and support ecological resilience.

Some of the densely urbanized areas are at high risk for flooding and coastal inundation.

- **Māpunapuna Industrial Area** is threatened by high-tide flooding and challenges from sea level rise.
- The **Middle Street Station Area** is noted for flooding potential during heavy rainfall, requiring improved drainage systems for enhanced water management.
- **Waiwai Loop Area** is vulnerable to flooding, requiring improved drainage systems for risk mitigation.

- **Kapālama Canal** is a focus area for beautification, recreation, and flood control, with efforts to improve ecological quality while addressing flood management.
- **Kalihi Station Area** is prone to flooding, highlighting the need for effective stormwater management to protect infrastructure and the community.
- **Waikīkī** is already subject to shallow and emergent groundwater, requiring constant pumping and decreasing gravity-fed drainage capacity.

Open spaces and waterbodies provide recreation and opportunities for improved water quality:

- **Pearl Harbor Shoreline**
- **Areas Makai of Kalaniana‘ole Highway**
- **Ke‘ehi Lagoon**
- **Nu‘uanu Stream**
- **Honolulu Harbor**
- **Irwin Park**
- **Waikīkī Beaches**
- **Sand Island (Mauliola)**
- **Ala Wai Golf Course**
- **Ala Wai Canal**
- **Kapi‘olani Regional Park**

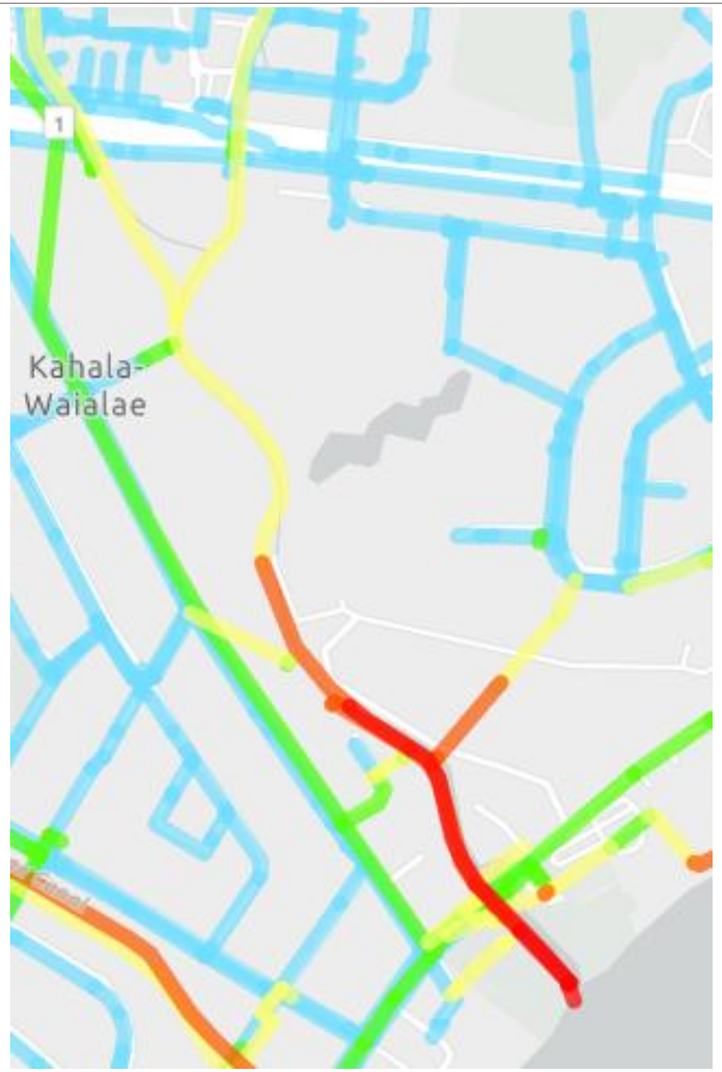
F.5.1.2 GENERAL CONCERNS ACROSS THE REGION

Outdated water and wastewater infrastructure, combined with stream flooding and sea level rise, pose ongoing challenges to water resources across PUC.

- Heavy rains and flooding events threaten critical infrastructure, businesses, and residences along streams (including the ‘Aiea and Hālawa Streams).
- Outdated infrastructure adversely impacts water, wastewater, and stormwater services, contributing to pollution.
- Sea level rise impacts certain infrastructure (including Sand Island Wastewater Treatment Plant).
- Water sources for drinking water need long-term protection (Honolulu and Pearl Harbor Aquifers).

F.5.2 IDENTIFIED HOTSPOTS

5.2.1 KĀHALA

Location Information and Maps	
Location	Kāhala
Risk Score Map	

Very Low Risk

Low Risk

At Risk

High Risk

Very High Risk

Threat Maps	   

Key Assets	
Wastewater	Kāhala WWPS, 18 in./24 in. sewer force main, 8 in./24 in. sewer main
Stormwater	Kapakahi Stream, Waialae Nui Drainage Canal, 18 in./24 in./36 in. SW conduits
Water	High priority water lines
Major Streets	Kāhala Ave, Kealaolu Ave, Kapakahi Stream Bridge
Community Assets	Waialae Beach Park, Waialae Country Club
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 4 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation greater than 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low wildfire risk
Drought	Low drought risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Accessibility issues if Kāhala Ave inundated/impassible (although does not appear to limit access to residential areas but could impact access to local businesses, Kāhala Beach, Waialae Beach Park, and Waialae Country Club) • In very low vulnerability area per SoVI
Ongoing/Planned Projects	• Adapt Waikīkī 2025 • Ala Wai Flood Risk Management Study (USACE) – unlikely to happen • Complete Streets Waikīkī • Kūhiō Beach Showers Improvements (DFM) • Sand replenishment at Ala Moana Beach
Potential Gaps	• None identified

5.2.2 KĀHALA/PUEO ST

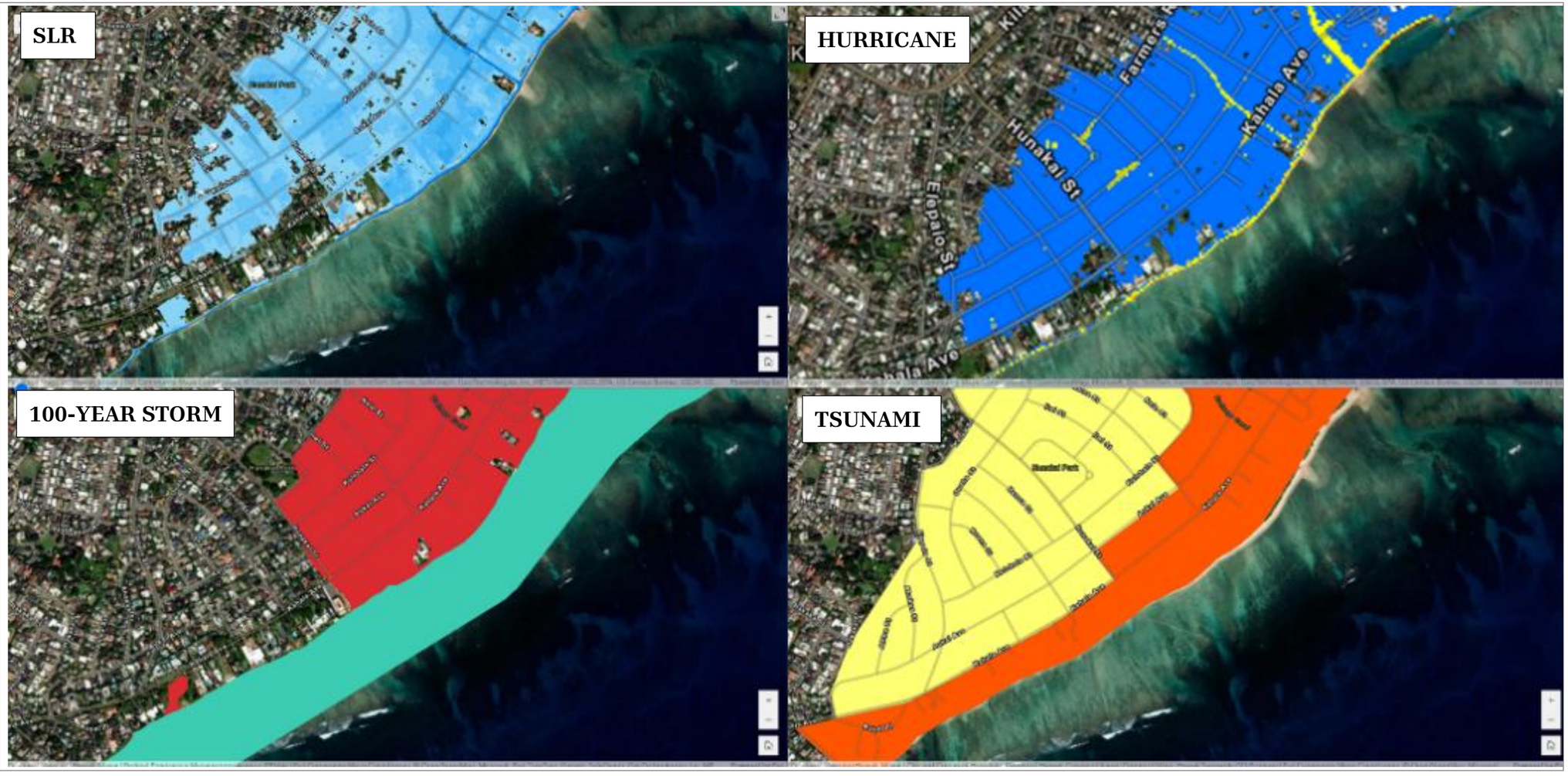
Location Information and Maps	
Location	Kāhala
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	10 in./24 in. sewer mains
Stormwater	Muliwai Drainage Canal, 18 in./24 in. SW conduits
Water	High priority waterlines
Major Streets	Kāhala Ave, Pueo St, Kīlauea Ave, Hunakai St, Muliwai-Kāhala Bridge
Community Assets	Kāhala Elementary School, Hunakai Beach, Kāhala Mall
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 4 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation greater than 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low wildfire risk
Drought	Low drought risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

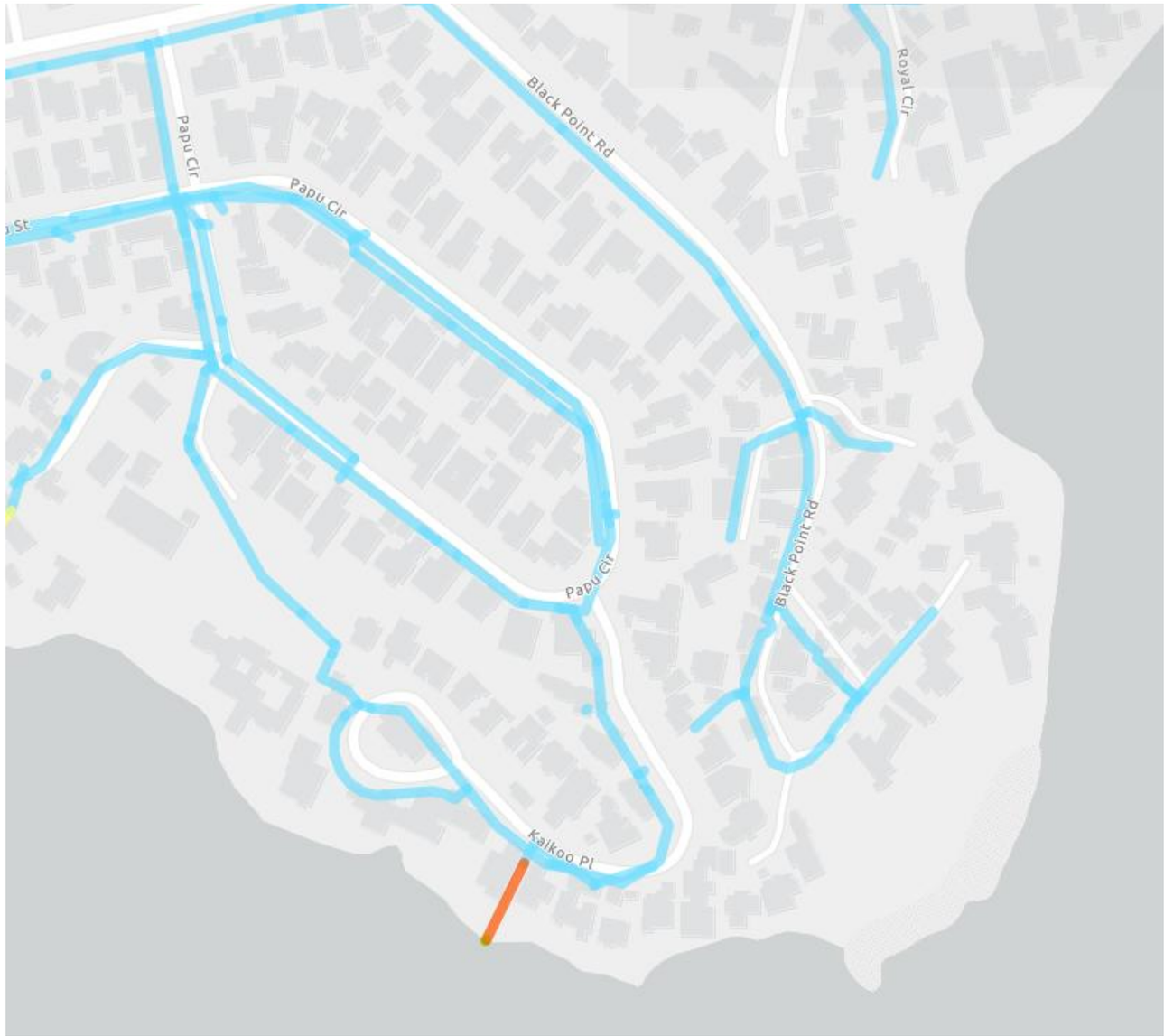
5.2.3 KĀHALA/HUNAKAI BEACH

Location Information and Maps	
Location	Kāhala
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	 SLR HURRICANE Hunakai St Kahala Ave Elepaio St 100-YEAR STORM TSUNAMI

Key Assets	
Wastewater	8 in./12 in./18 in./21 in./24 in. sewer mains
Stormwater	Stormwater outfalls, 18 in./24 in./30 in./36 in./42 in./48 in./54 in. SW conduits
Water	High risk pipelines
Major Streets	Kāhala Ave, Hunakai St
Community Assets	Hunakai Beach, Hunakai Park (Managed by the Hunakai Park Association)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 7 ft of SLR • 80% probability of passive flooding at 8 ft SLR • Coastal erosion at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low wildfire risk
Drought	Low drought risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• At-risk cesspools
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.4 BLACK POINT/KAIKOʻO PL

Location Information and Maps	
Location	Kāhala
Risk Score Map	

Threat Maps	

Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	18 in. SW conduits
Water	High risk pipelines
Major Streets	Kaikoʻo Pl
Community Assets	Kaʻalāwai Beach
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 7 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 4 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• At-risk cesspools
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

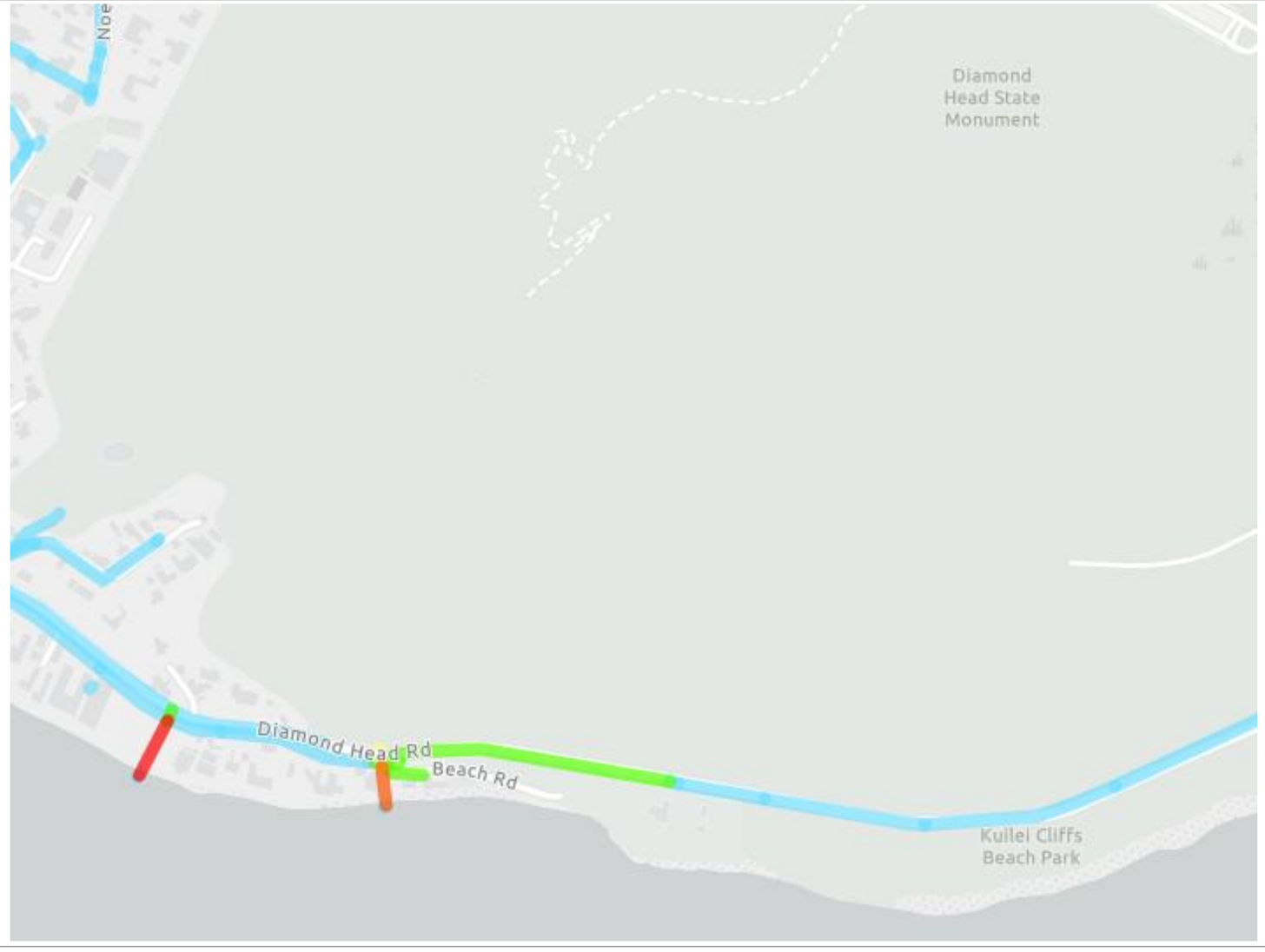
5.2.5 KULAMANU PL/KA‘ALĀWAI PL

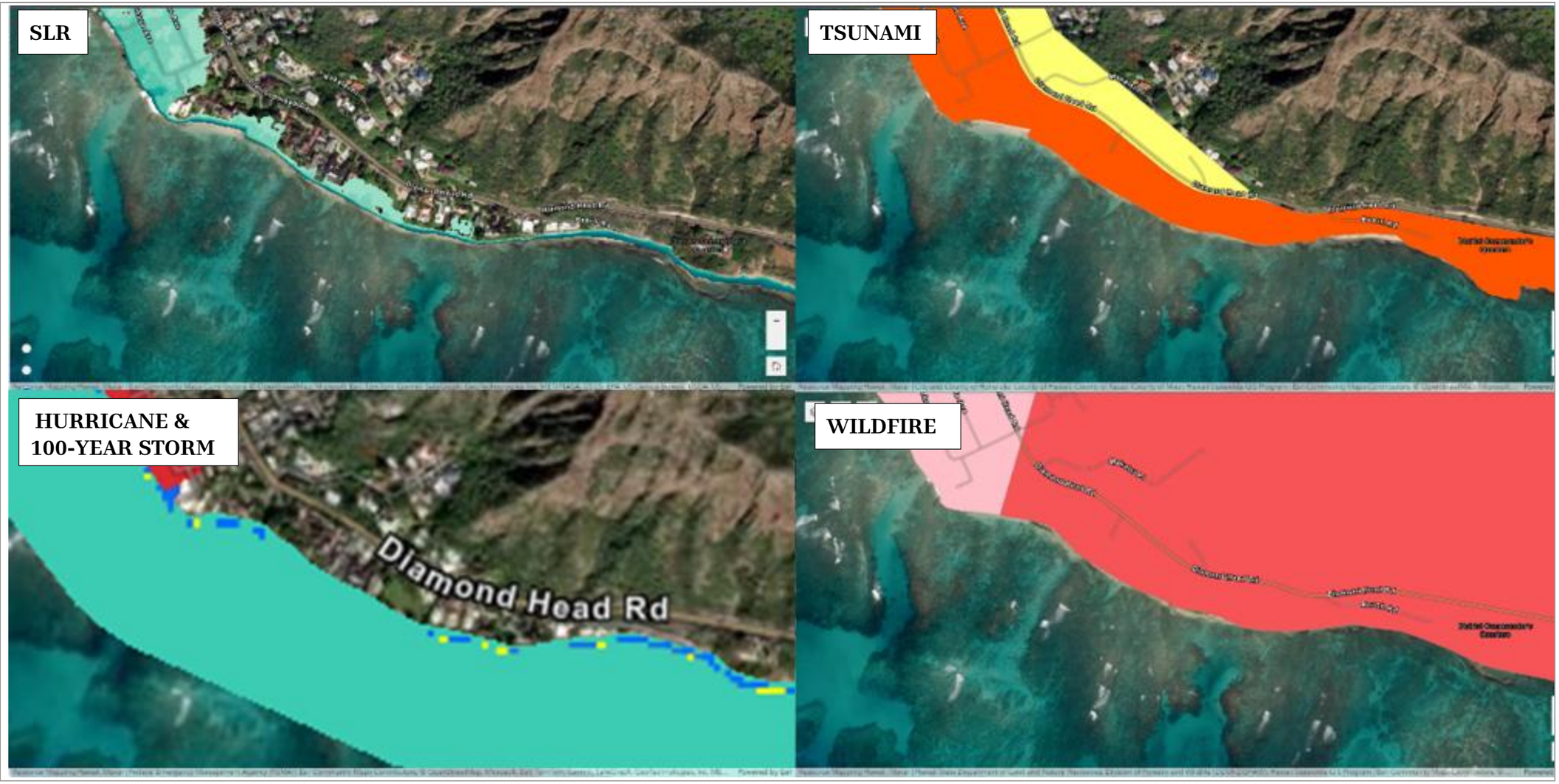
Location Information and Maps	
Location	Diamond Head
Risk Score Map	

Threat Maps	

Key Assets	
Wastewater	2 in./8 in. sewer main
Stormwater	18 in./24 in./36 in./30 in./42 in. SW conduits
Water	High risk pipelines
Major Streets	Kulamanu Pl, Kuine Pl, Kaʻalāwai Pl, Diamond Head Rd
Community Assets	Kuilei Cliffs Beach Park, Kaʻalāwai Beach, Operation Red Wing Medal of Honor Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation data in this area not available • Drainage backflow due to 9 ft of SLR • 80% probability of passive flooding at 9 ft SLR • Coastal erosion at 3 ft SLR
Hurricane	Complete inundation up to 3 ft above ground under Cat 4 conditions, some areas greater than 3 ft and some greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• At-risk cesspools
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.6 DIAMOND HEAD

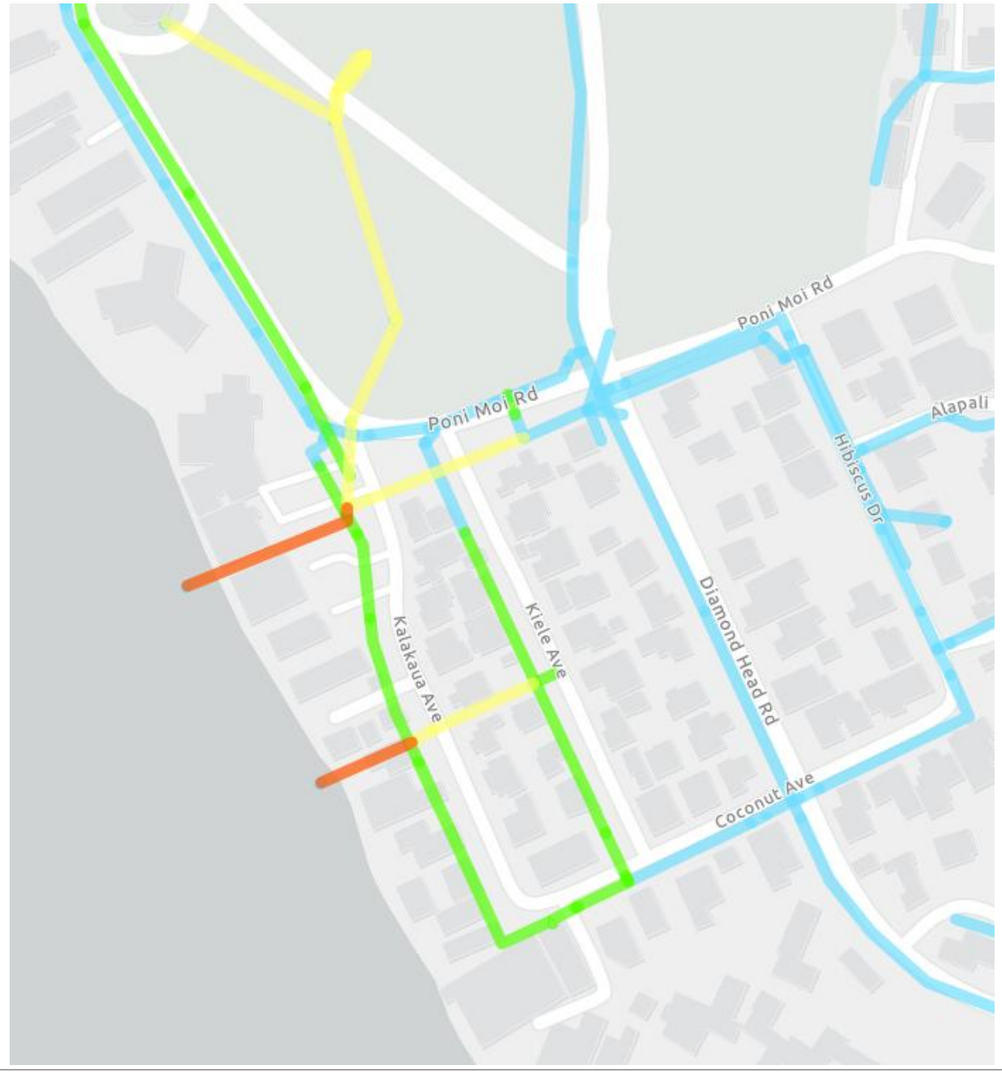
Location Information and Maps	
Location	Diamond Head Rd
Risk Score Map	

Threat Maps	 SLR TSUNAMI HURRICANE & 100-YEAR STORM Diamond Head Rd WILDFIRE

Key Assets	
Wastewater	8 in. sewer main
Stormwater	18 in./30 in. SW conduits
Water	High risk pipelines
Major Streets	Beach Rd, Diamond Head Rd
Community Assets	Kuilei Cliffs Beach Park, Lē‘ahi Beach Park, Diamond Head State Monument
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation at 8 ft SLR • Drainage backflow due to 9 ft of SLR • 80% probability of passive flooding at 9 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Medium risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.7 KALĀKAUA AVE/KAPIOLANI REGIONAL PARK

Location Information and Maps	
Location	Kalākaua Ave
Risk Score Map	Very Low Risk Low Risk At Risk High Risk Very High Risk



Threat Maps



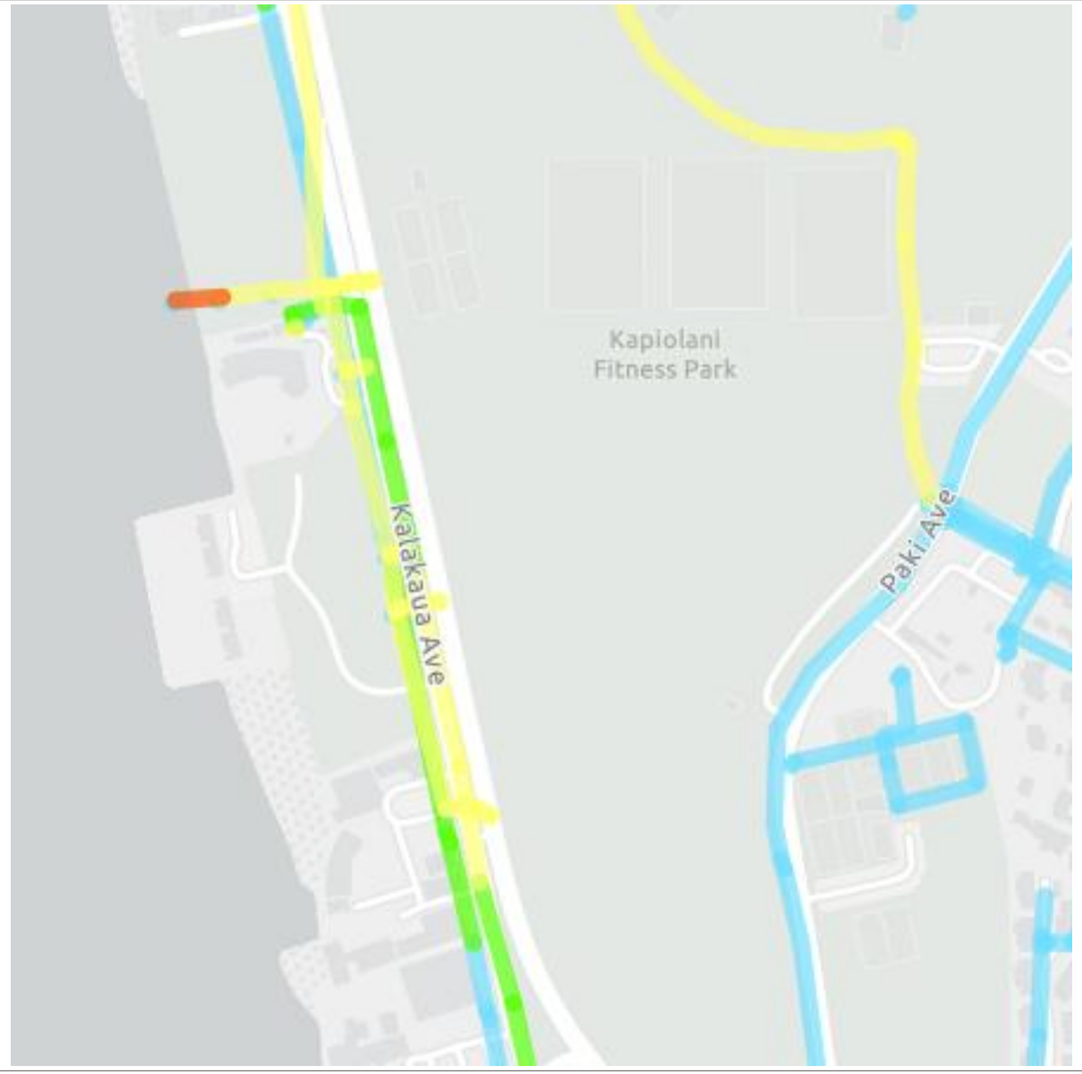


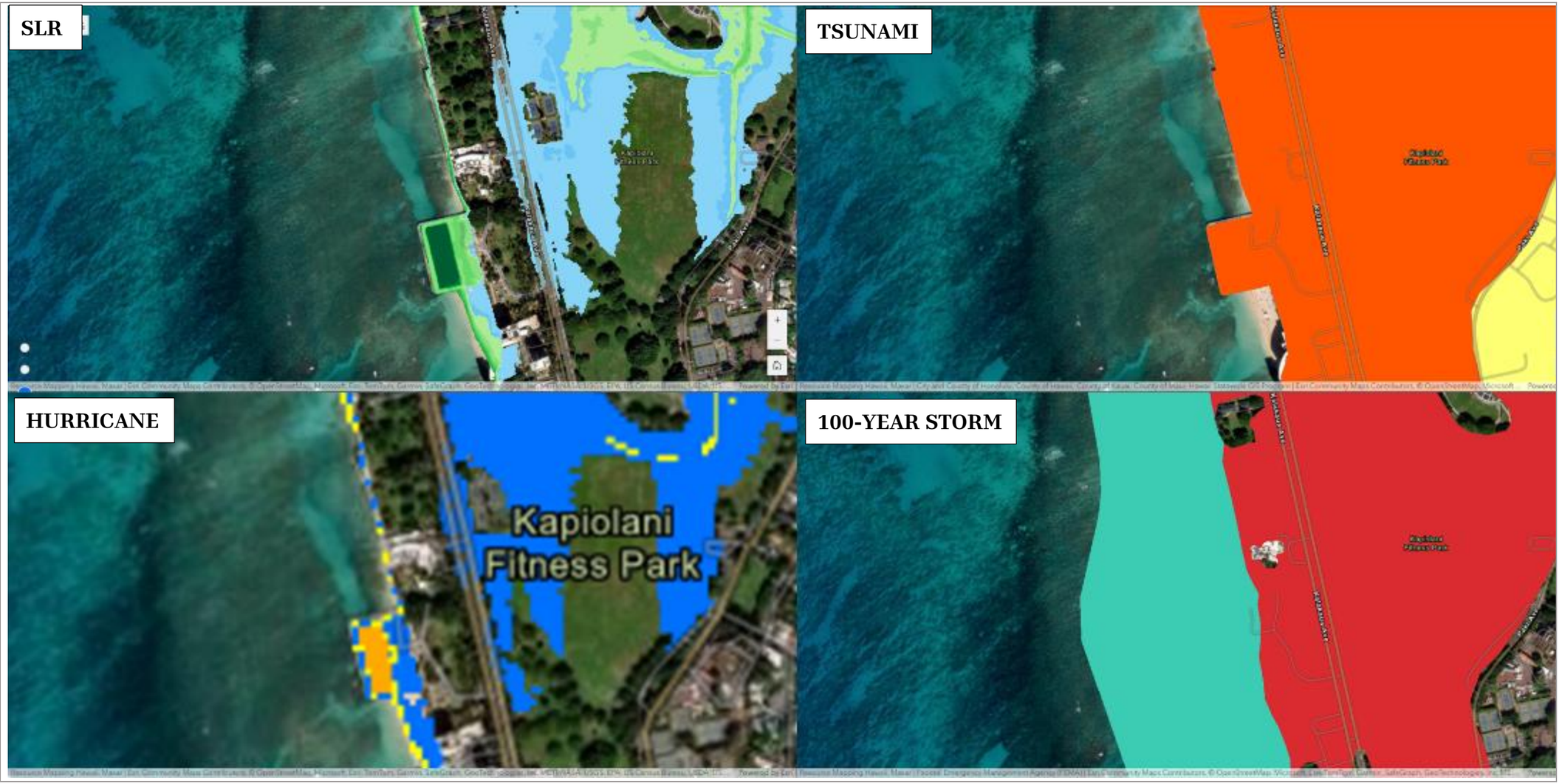




Key Assets	
Wastewater	6 in./8 in./10 in. sewer main
Stormwater	18 in./24 in. SW conduits
Water	High risk pipelines
Major Streets	Kalākaua Ave, Kiele Ave
Community Assets	Kapiolani Regional Park (Queens Beach and Kaimana/Sans Souci Beach), La Pietra Private School, Kaluahole Beach, Diamond Head
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 6 ft SLR • Drainage backflow due to 7 ft of SLR • 80% probability of passive flooding at 7 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 4 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

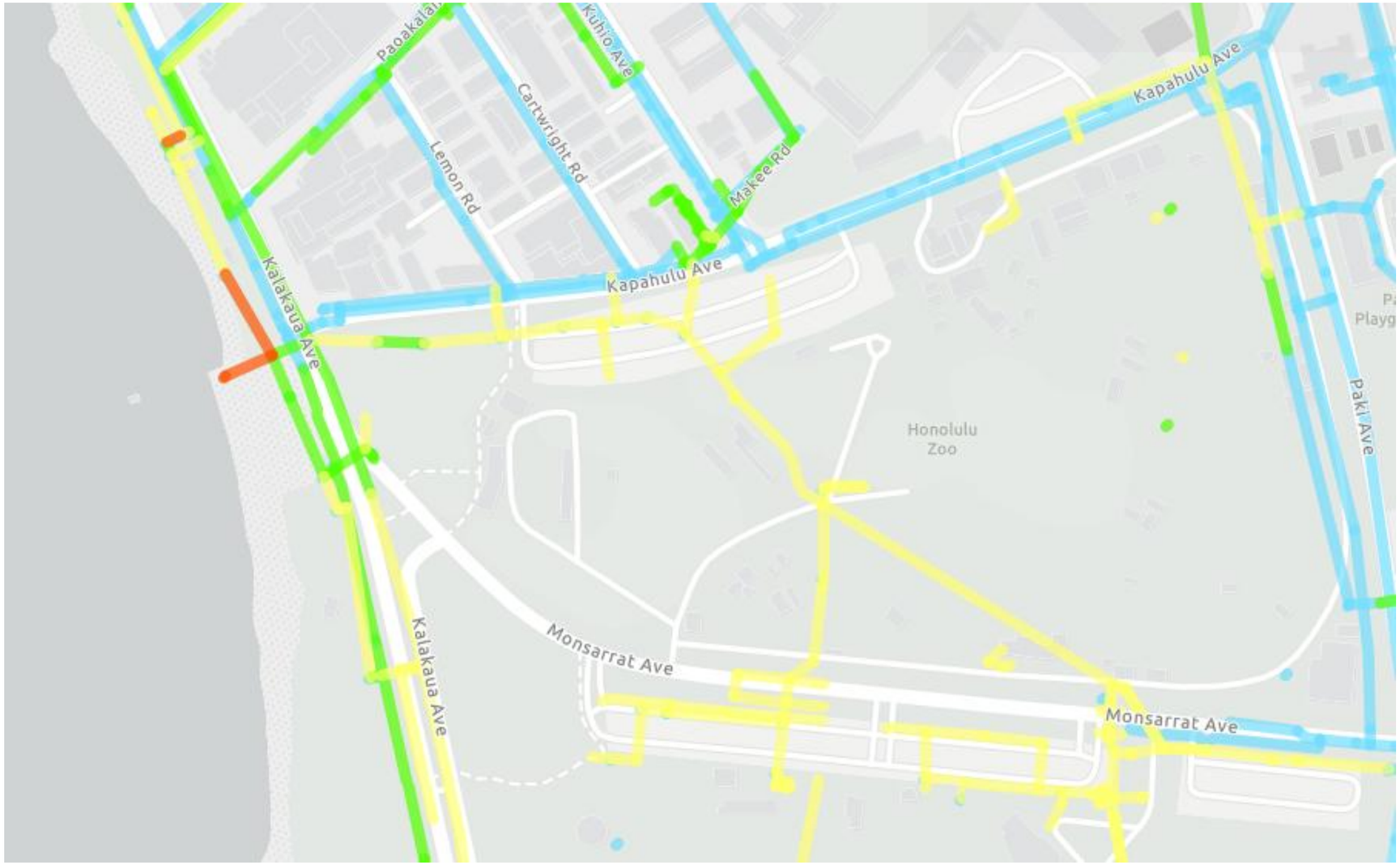
5.2.8 KAPIOLANI REGIONAL PARK/KALĀKAUA AVE

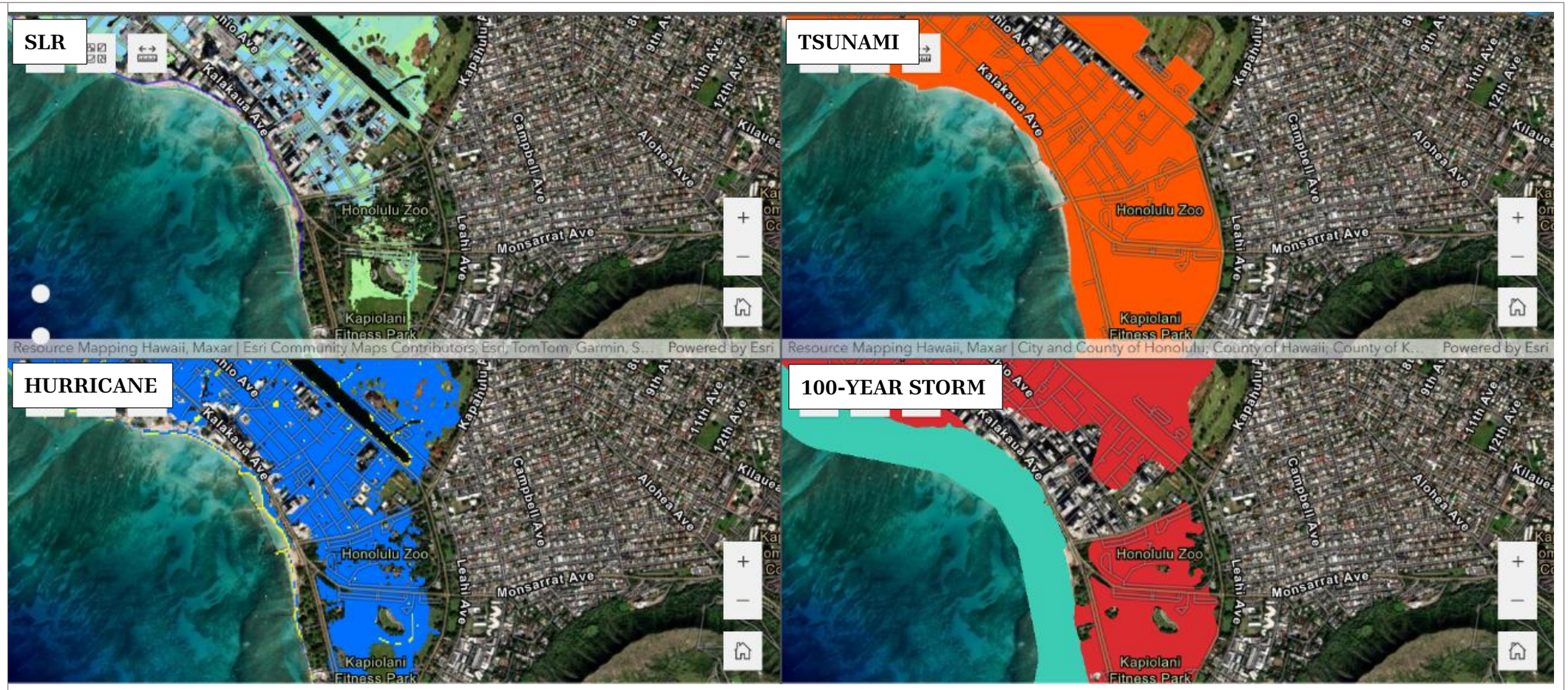
Location Information and Maps	
Location	Kalākaua Ave
Risk Score Map	

Threat Maps	 SLR TSUNAMI HURRICANE Kapiolani Fitness Park 100-YEAR STORM

Key Assets	
Wastewater	Public Baths WWPS, 12 in./16 in. sewer force main, 12 in./18 in. sewer main
Stormwater	12 in./18 in./24 in./24 in. SW conduits
Water	High risk pipelines
Major Streets	Kalākaua Ave, Monsarrat Ave
Community Assets	Kapiolani Regional Park (Queens Beach and Kaimana/Sans Souci Beach), Waikīkī Aquarium, Kaimana Beach, War Memorial Natatorium (under renovation, managed by DPR), Kapiolani Beach
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 4 ft SLR • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.9 WAIKĪKĪ/KALĀKAUA-KAPAHULU

Location Information and Maps	
Location	Waikīkī
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	 SLR TSUNAMI HURRICANE 100-YEAR STORM Honolulu Zoo Kapiolani Fitness Park Kalakaua Ave Monsarrat Ave Campbell Ave Alohea Ave Leahi Ave Kapahulu 11th Ave 12th Ave Kilauea Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S... Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of K... Powered by Esri

Key Assets	
Wastewater	12 in./16 in. sewer force main, 12 in./15 in./18 in./24 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in./42 in. SW conduits, nearby Ala Wai Canal
Water	Very high risk/high risk pipelines
Major Streets	Kalākaua Ave, Kapahulu Ave, Monsarrat Ave, ʻŌhua Ave, Paoakalani Ave, nearby Ala Wai GC Culvert Bridge
Community Assets	Kūhiō Beach Park, Jefferson Public Elementary School, Hawaiʻi Center for Deaf and Blind School, Honolulu Zoo, Queens Beach, Waikīkī Shell, Kapiolani Regional Park (Queens Beach and Kaimana/Sans Souci Beach), nearby Waikīkī Elementary, Jefferson Orthopedic Unit
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 4 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 5 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impact on beaches
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.10 WEST WAIKĪKĪ NEAR FORT DERUSSY

Location Information and Maps	
Location	Waikīkī
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Paoa Pl
Fort Derussy
Kalakaua Ave
Lewers St
Saratoga Rd
Beach Walk
Kalia Rd
Ala Wai Blvd
Aloha Dr
Manukai St
Royal Hawaiian Ave
Seaside Ave
Nohonani St
Nahua St
Duke's Ln
Kuhio Ave
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Cens... Powered by Esri

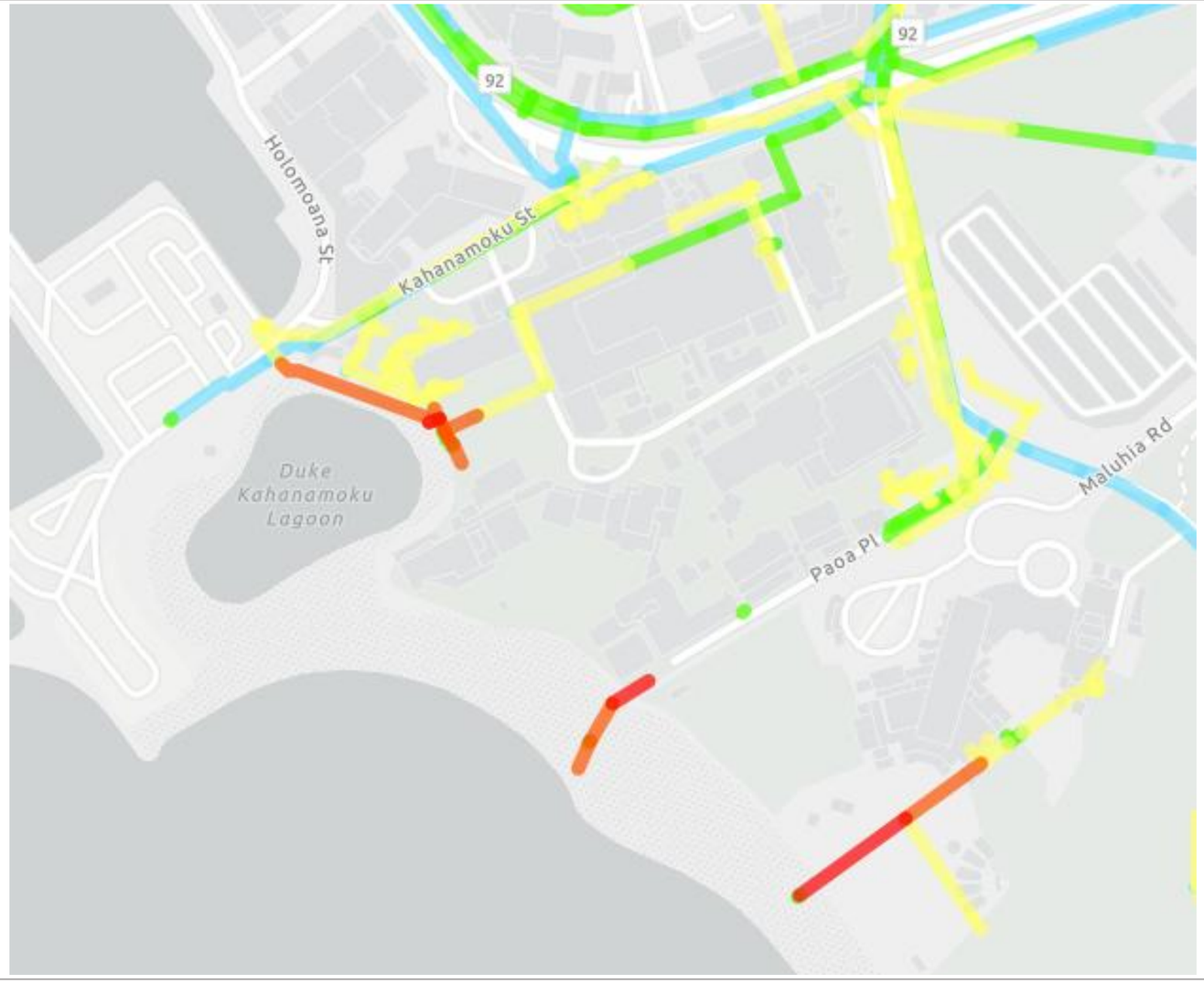

TSUNAMI
Paoa Pl
Fort Derussy
Kalakaua Ave
Lewers St
Saratoga Rd
Beach Walk
Kalia Rd
Ala Wai Blvd
Aloha Dr
Manukai St
Royal Hawaiian Ave
Seaside Ave
Nohonani St
Nahua St
Duke's Ln
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri Community Maps Contributors, © Open... Powered by Esri


HURRICANE
Fort Derussy
Lewers St
Ala Wai Blvd
Kuhio Ave
Kalakaua Ave
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Cens... Powered by Esri


100-YEAR STORM
Fort Derussy
Kalakaua Ave
Lewers St
Saratoga Rd
Beach Walk
Kalia Rd
Ala Wai Blvd
Aloha Dr
Manukai St
Royal Hawaiian Ave
Seaside Ave
Nohonani St
Nahua St
Duke's Ln
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoT... Powered by Esri

Key Assets	
Wastewater	Beachwalk WWPS, 36 in./42 in. force main, 12 in./15 in./16 in./18 in./21 in./24 in./30 in./48 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in./42 in./48 in. SW conduits, stormwater outfall
Water	Very high risk/high risk pipelines
Major Streets	Kālia Rd, Beach Walk, Saratoga Rd, Lewers St, Helumoa Rd
Community Assets	Straub Waikīkī Hospital Clinic, Fort DeRussy, Fort DeRussy Beach
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 5 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impact on beaches
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.11 WEST WAIKĪKĪ NEAR HILTON HAWAIIAN VILLAGE

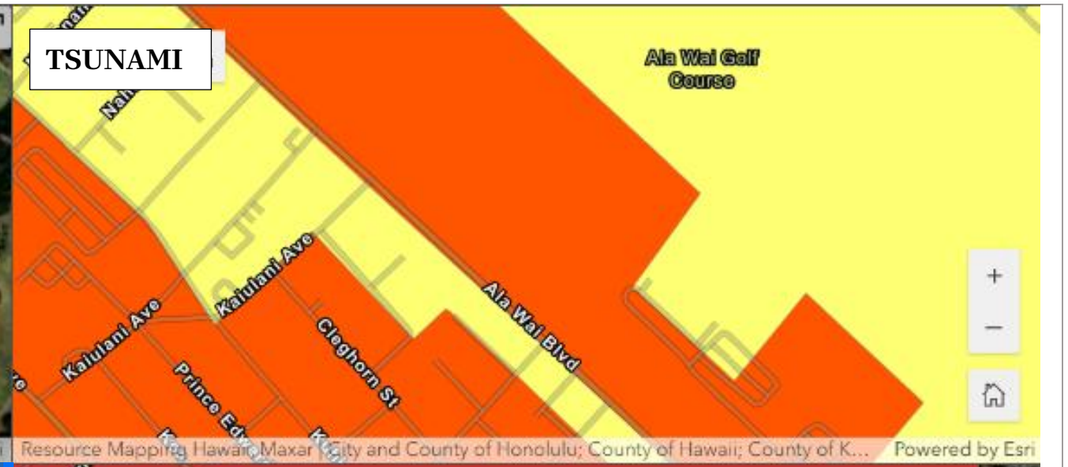
Location Information and Maps	
Location	Waikīkī
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	12 in./15 in./16 in./20 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in. SW conduits
Water	Very high risk/high risk pipelines
Major Streets	Kahanamoku St, Kālia Rd, BROW at Paoa Place, BROW at Kalia Road (currently closed due to erosion)
Community Assets	Kahanamoku Beach, Duke Paoa Kahanamoku Beach Park, Fort DeRussy, Duke Kahanamoku man-made Lagoon, Ala Wai Boat Harbor, Straub Waikīkī Hospital Clinic
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Impact on beaches
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.12 ALA WAI GOLF COURSE

Location Information and Maps	
Location	Waikīkī
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	   

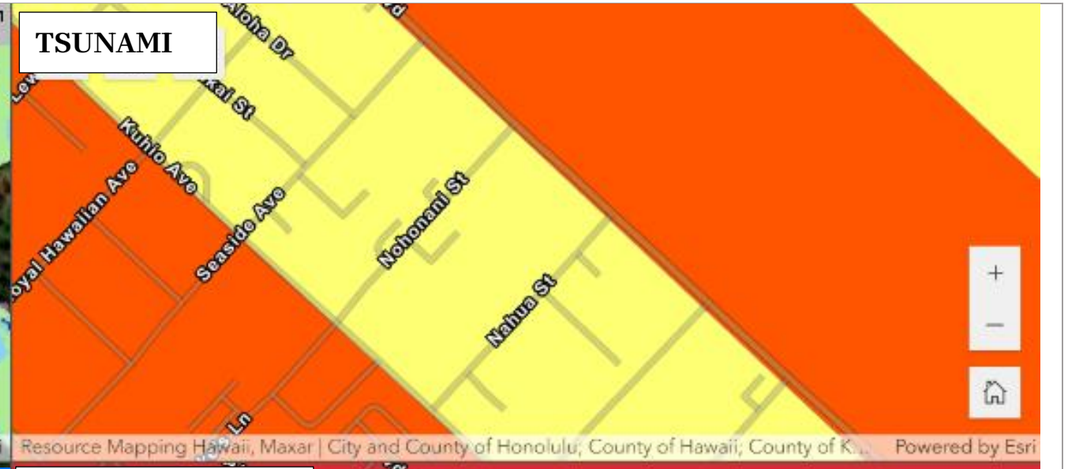
Key Assets	
Wastewater	8 in. sewer main
Stormwater	Ala Wai Canal, 12 in./18 in./30 in./48 in. SW conduits
Water	Very high risk/high risk pipelines
Major Streets	Ala Wai Blvd, Ala Wai GC Culvert/Ala Wai GC Drain Bridge
Community Assets	Ala Wai Golf Course (DES), Ala Wai Canal (and impacts to beaches)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.13 ALA WAI BLVD/ALA WAI CANAL

Location Information and Maps	
Location	Ala Wai Blvd
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Aloha Dr
Kuhio Ave
Royal Hawaiian Ave
Seaside Ave
Nohonani St
Nahua St
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr...
Powered by Esri


TSUNAMI
Aloha Dr
Kuhio Ave
Royal Hawaiian Ave
Seaside Ave
Nohonani St
Nahua St
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of K...
Powered by Esri


Ala Wai Blvd
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr...
Powered by Esri


100-YEAR STORM
Kuhio Ave
Royal Hawaiian Ave
Seaside Ave
Nohonani St
Nahua St
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Com...
Powered by Esri

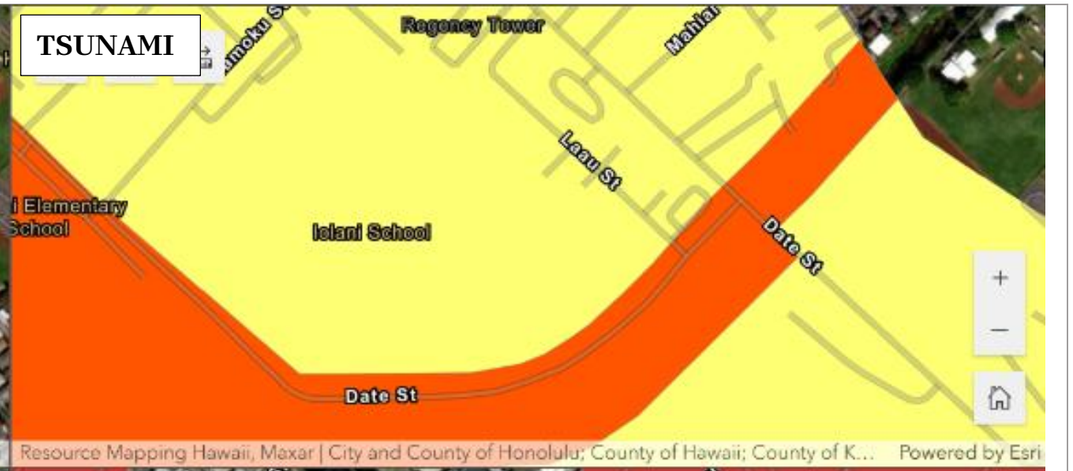
Key Assets	
Wastewater	10 in./20 in./27 in. sewer main
Stormwater	Ala Wai Canal, 18 in./24 in./48 in./60 in./66 in. SW conduits
Water	Very high risk/high risk pipelines
Major Streets	Ala Wai Blvd, Seaside Ave, Kānekapōlei St
Community Assets	Ala Wai Golf Course (DES), Ala Wai Canal (and impacts to beaches)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.14 DATE ST/MĀNOA-PALOLO DRAINAGE CANAL

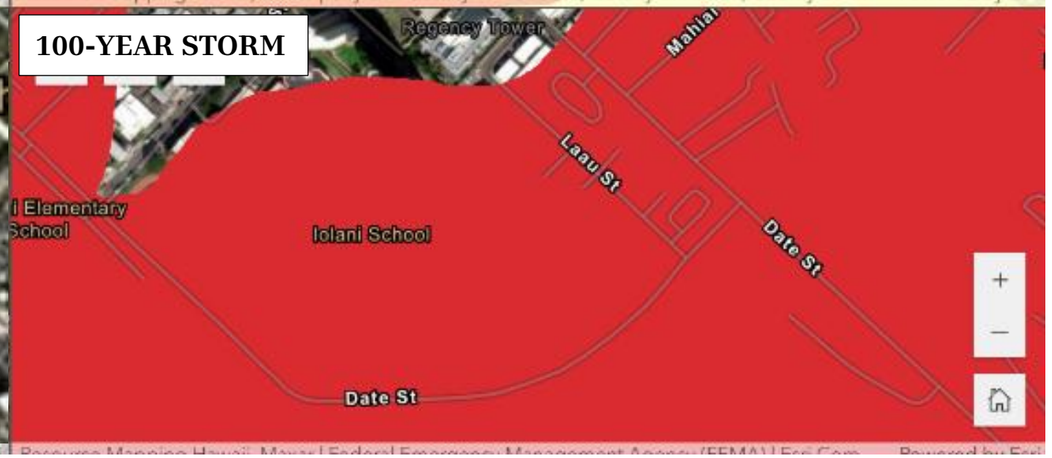
Location Information and Maps	
Location	Date St
Risk Score Map	

Threat Maps


SLR
Regency Tower
Mahiai
Laau St
Iolani School
Date St
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr...
Powered by Esri


TSUNAMI
Regency Tower
Mahiai
Laau St
Iolani School
Date St
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K...
Powered by Esri


Kaimuki High School
Date St


100-YEAR STORM
Regency Tower
Mahiai
Laau St
Iolani School
Date St

Key Assets	
Wastewater	21 in./24 in./27 in./30 in./48 in. sewer mains, 36 in./72 in. sewer force mains
Stormwater	Ala Wai Canal, Mānoa-Palolo Drainage Canal, 18 in./24 in./36 in. SW conduits
Water	Very high risk pipelines
Major Streets	Date St, Mānoa Palolo Stream/Date St Bridge
Community Assets	ʻIolani School, Ala Wai Elementary, McCully Fire Station 29, Ala Wai Canal (and impacts to beaches)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.15 ALA WAI NEIGHBORHOOD PARK

Location Information and Maps	
Location	Mōʻiliʻili/Ala Wai Neighborhood Park
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Kapiolani Blvd
Moiliili
McCully St
Ala Wai Blvd
Ala Wai Park
Ena Rd
Kamoku St
Waikiki
Iolani School
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Micr... Powered by Esri

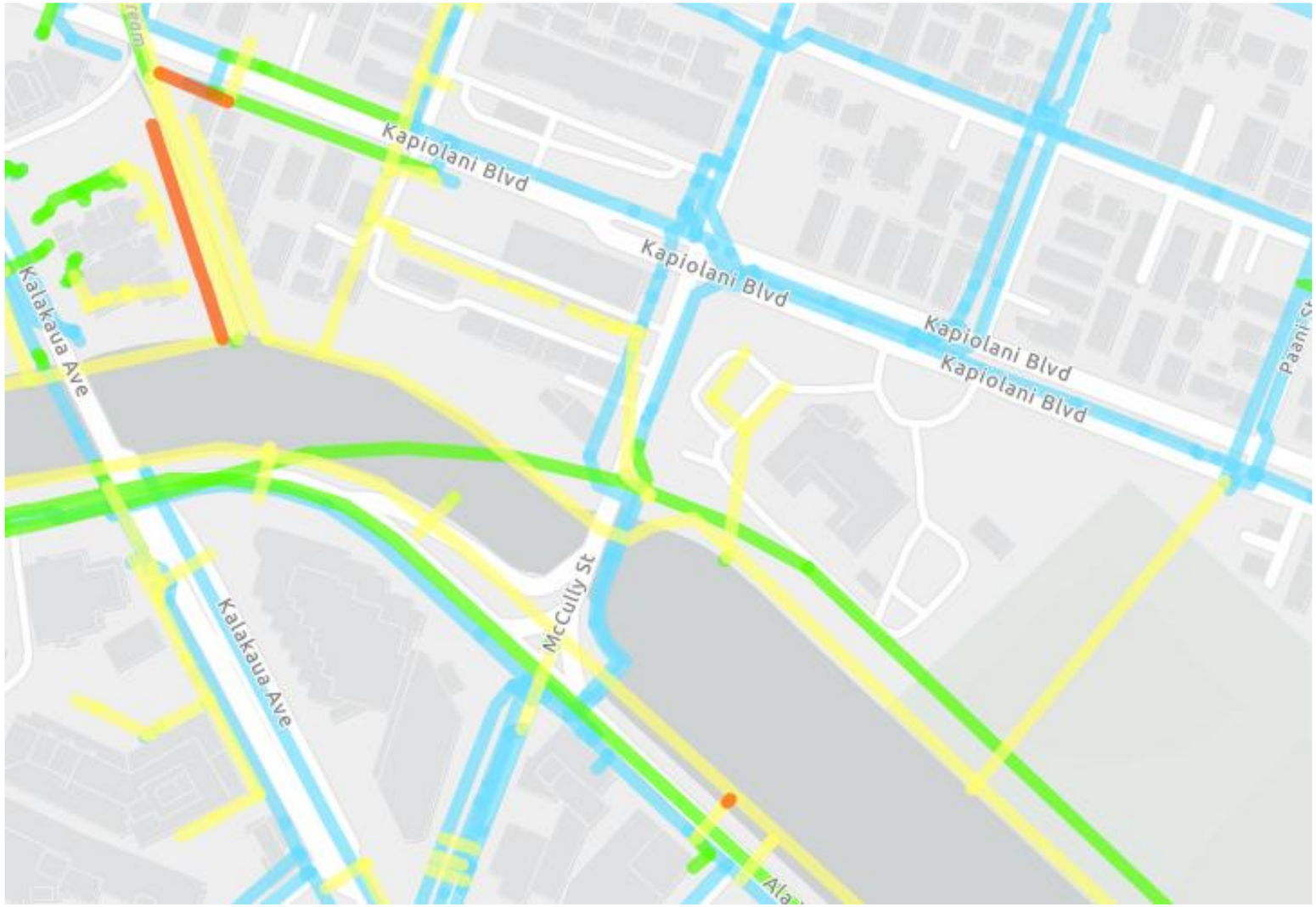

TSUNAMI
Kapiolani Blvd
Moiliili
McCully St
Ala Wai Blvd
Ala Wai Park
Ena Rd
Kamoku St
Waikiki
Iolani School
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K... Powered by Esri

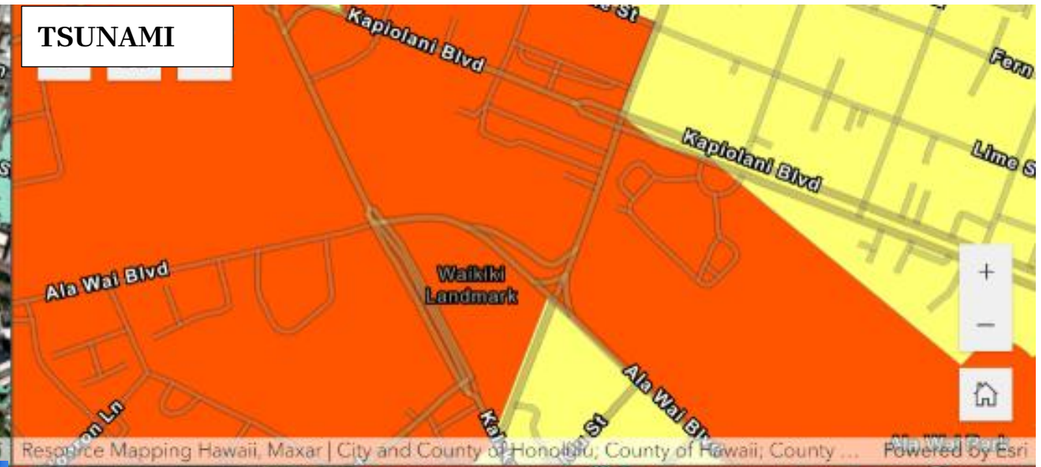

Kapiolani Blvd
Moiliili
Waikiki


100-YEAR STORM
Kapiolani Blvd
Moiliili
McCully St
Ala Wai Blvd
Ala Wai Park
Ena Rd
Kamoku St
Waikiki
Iolani School

Key Assets	
Wastewater	36 in./42 in./72 in. force main, 8 in./18 in. sewer main
Stormwater	Ala Wai Canal, Ala Wai stream, 18 in./24 in./36 in. SW conduits
Water	Very high risk/high risk pipelines
Major Streets	Ala Wai Blvd, Niu St, Pau St, Namahana St, ʻOlohana St, Kapiolani Blvd, Isenberg St
Community Assets	Ala Wai Neighborhood Park, Ala Wai Canal (and impacts to beaches), Ala Wai Public Elementary School, McCully Fire Station 29
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 2 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

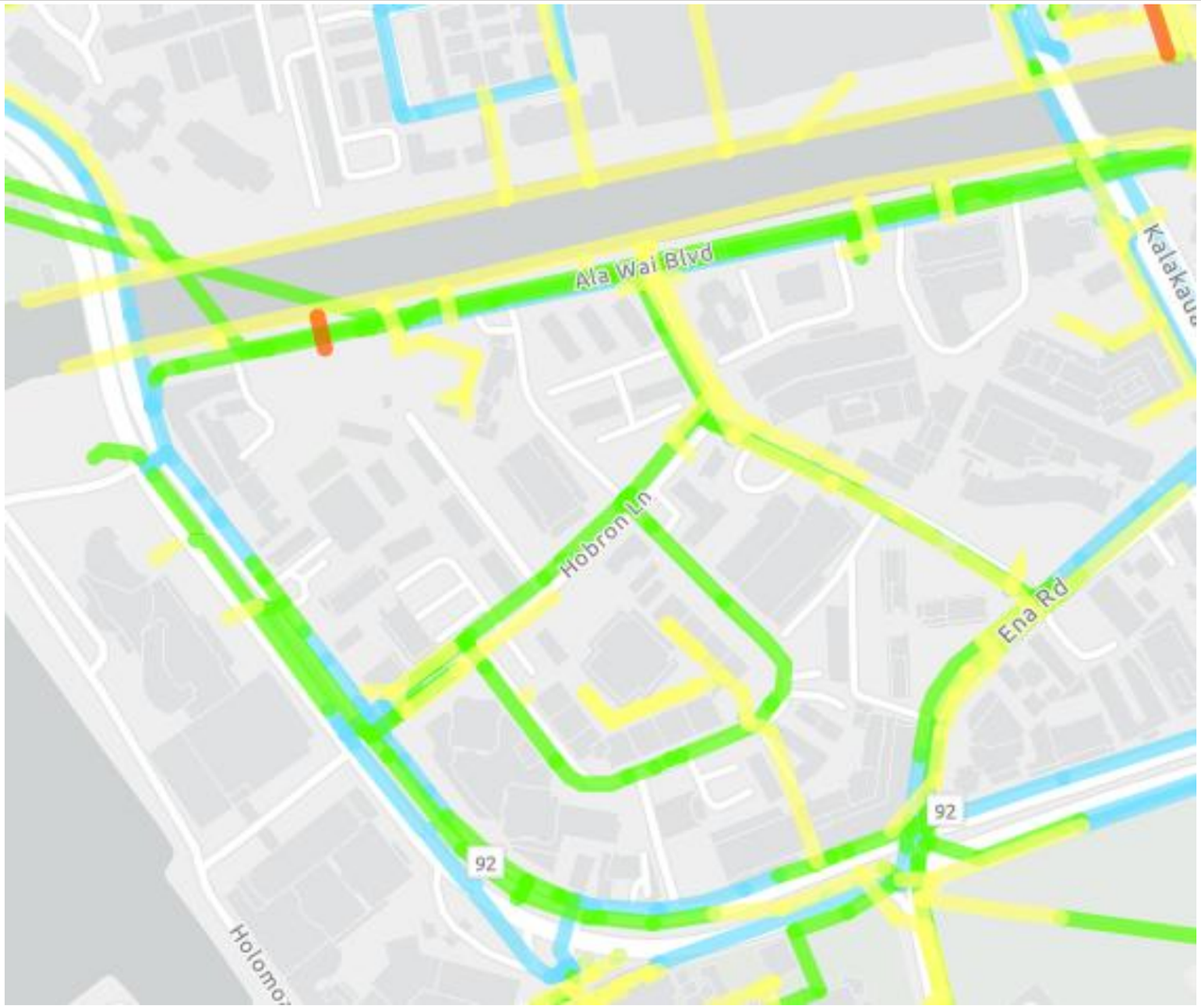
5.2.16 MCCULLY/ALA WAI

Location Information and Maps	
Location	Waikīkī
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

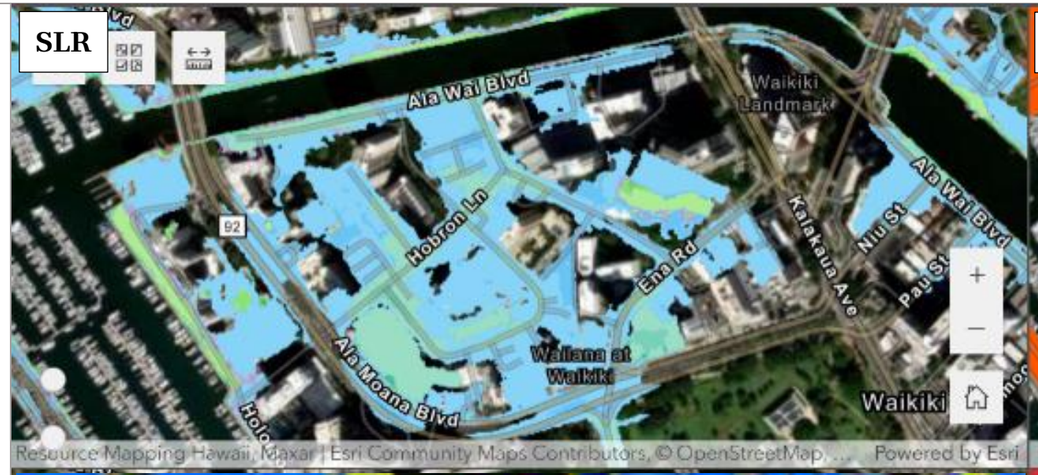
Threat Maps	   

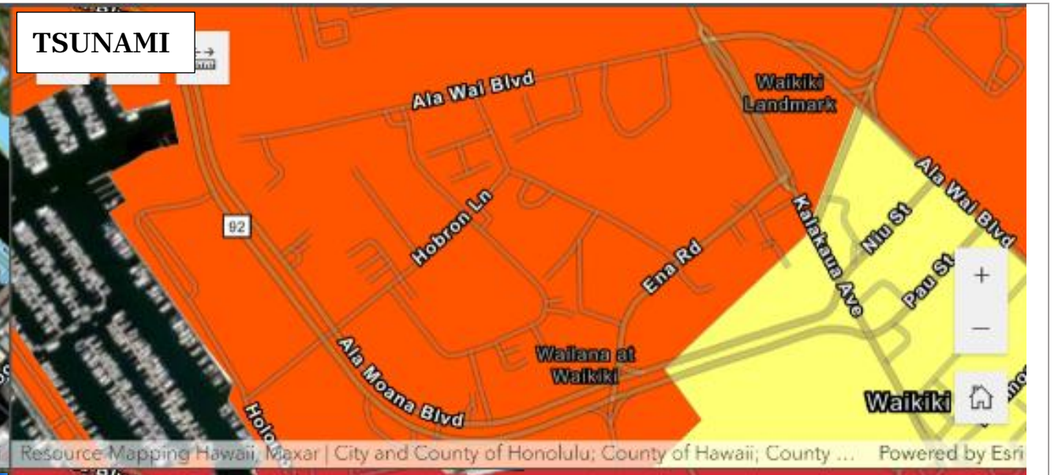
Key Assets	
Wastewater	10 in./12 in./18 in. sewer main, 10 in./12 in./24 in./42 in./72 in. sewer force main
Stormwater	Ala Wai Canal, Makiki Stream, 18 in./24 in./30 in. SW conduits
Water	Very high risk/high risk pipelines
Major Streets	Kapiolani Blvd, McCully St, & Ala Wai Blvd, Kalākaua Ave, Kalākaua Ave/Ala Wai Canal Bridge, McCully St/Ala Wai Canal Bridge, Kapiolani Blvd/Hauʻoli St Bridge
Community Assets	Hawaiʻi Convention Center, Ala Wai Community Park, Ala Wai Canal (and impacts to beaches)
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

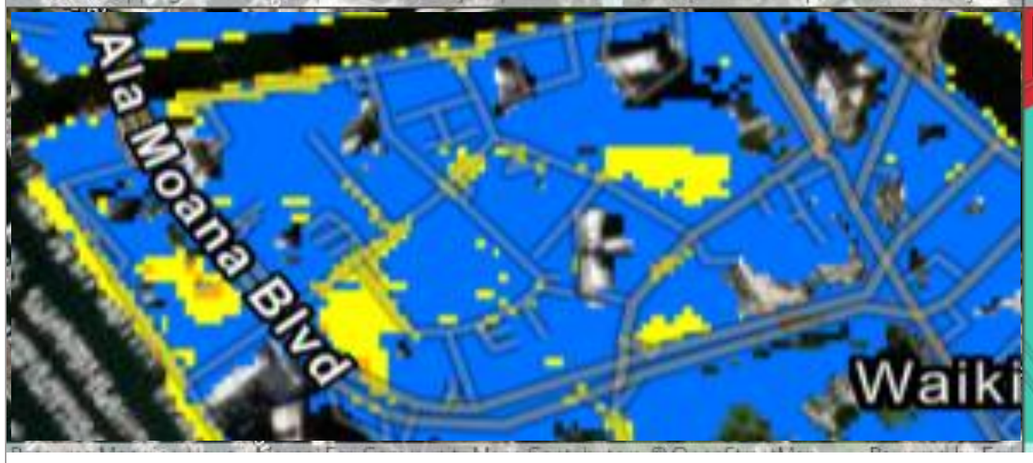
5.2.17 HOBRON LN

Location Information and Maps	
Location	Waikīkī
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Ala Wai Blvd
Waikiki Landmark
Hobron Ln
92
Kalakaua Ave
Niu St
Ena Rd
Pau St
Ala Moana Blvd
Wailana at Waikiki
Waikiki
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap ...
Powered by Esri


TSUNAMI
Ala Wai Blvd
Waikiki Landmark
Hobron Ln
92
Kalakaua Ave
Niu St
Ena Rd
Pau St
Ala Moana Blvd
Wailana at Waikiki
Waikiki
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County ...
Powered by Esri

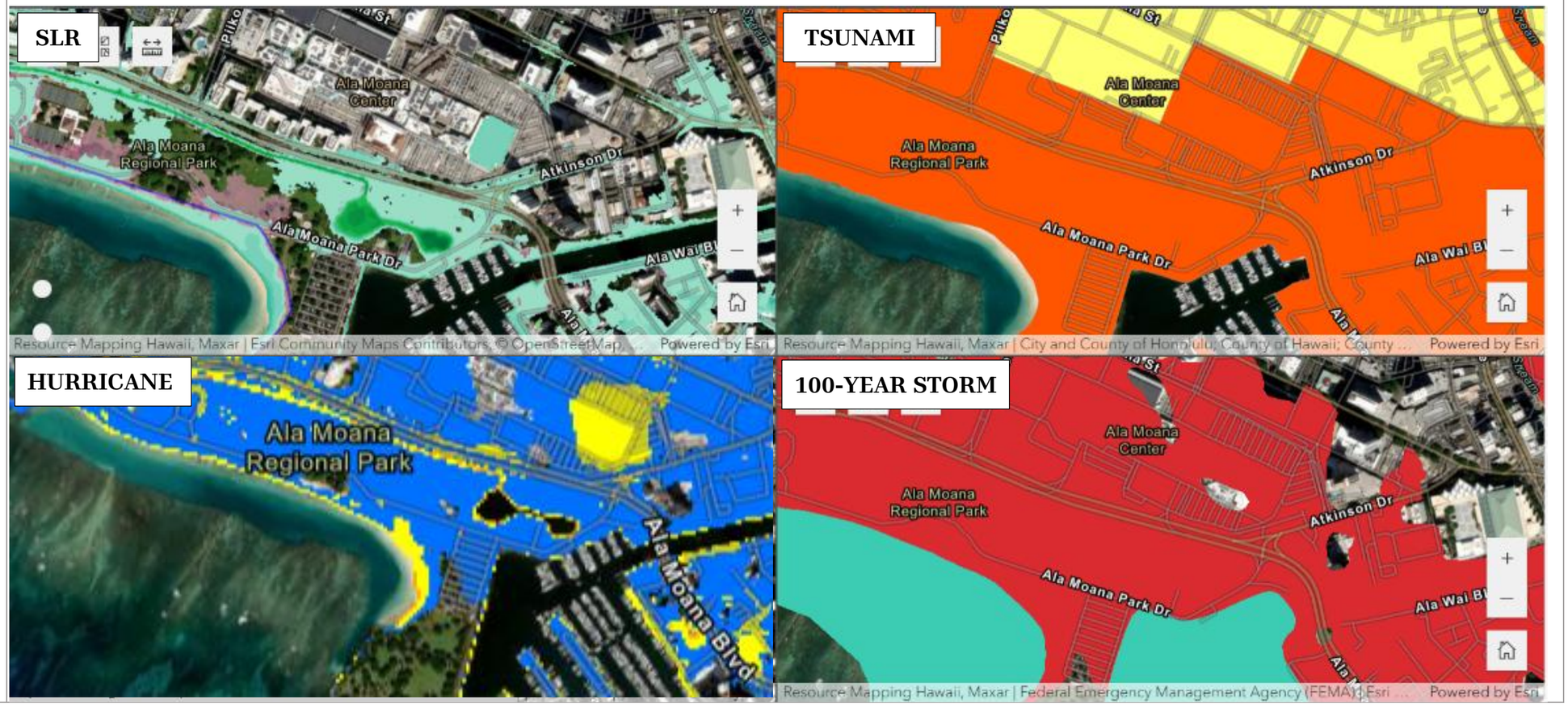

Moana Blvd
Waiki


100-YEAR STORM
Ala Wai Blvd
Waikiki Landmark
Hobron Ln
92
Kalakaua Ave
Niu St
Ena Rd
Pau St
Ala Moana Blvd
Wailana at Waikiki
Waikiki

Key Assets	
Wastewater	12 in./15 in./18 in. sewer main, 42 in./72 in. force main
Stormwater	Ala Wai Canal, 18 in./24 in./42 in./48 in. SW conduits
Water	High risk pipelines
Major Streets	Ala Wai Blvd, Ala Moana Blvd, Ala Moana Blvd/Ala Wai Canal Bridge, Hobron Ln
Community Assets	Ala Wai Canal (and impacts to beaches), Ala Wai Boat Harbor
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 2 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft and some greater than 6 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.18 ALA MOANA REGIONAL PARK/ALA WAI BOAT HARBOR

Location Information and Maps	
Location	Ala Moana
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	 SLR Ala Moana Center Ala Moana Regional Park Atkinson Dr Ala Moana Park Dr Ala Wai Blvd Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, ... Powered by Esri TSUNAMI Ala Moana Center Ala Moana Regional Park Atkinson Dr Ala Moana Park Dr Ala Wai Blvd Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County ... Powered by Esri HURRICANE Ala Moana Regional Park Ala Moana Blvd 100-YEAR STORM Ala Moana Center Ala Moana Regional Park Atkinson Dr Ala Moana Park Dr Ala Wai Blvd Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri ... Powered by Esri

Key Assets	
Wastewater	Moana Park WWPS, 42 in./72in force main, 12 in./16 in./15 in./24 in./69 in. sewer main
Stormwater	12 in./18 in./24 in./36 in./42 in. SW conduits, Ala Wai Canal
Water	High risk pipelines
Major Streets	Ala Moana Blvd, Ala Moana Park Dr, Atkinson Dr
Community Assets	Ala Wai Canal (and impacts to beaches), Ala Moana Regional Park, Ala Wai Boat Harbor, Ala Moana Center
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft, and some greater than 6 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

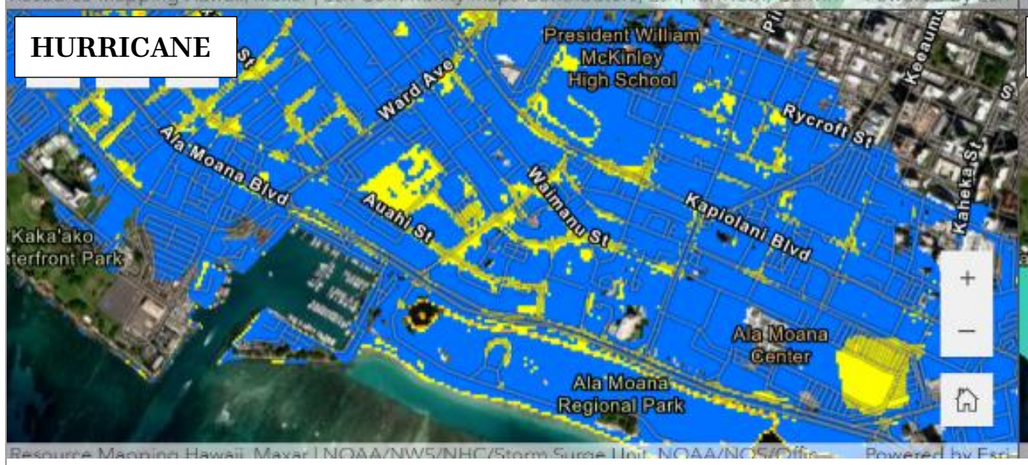
5.2.19 ALA MOANA REGIONAL PARK/ALA MOANA PARK DR

Location Information and Maps	
Location	Ala Moana Park Dr
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
President William McKinley High School
Ward Ave
Ala Moana Blvd
Auahi St
Waimanu St
Kapiolani Blvd
Rycroft St
Kaheka St
Kaka'ako Waterfront Park
Ala Moana Center
Ala Moana Regional Park
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garm...
Powered by Esri


TSUNAMI
President William McKinley High School
Ward Ave
Ala Moana Blvd
Auahi St
Waimanu St
Kapiolani Blvd
Rycroft St
Kaheka St
Kaka'ako Waterfront Park
Ala Moana Center
Ala Moana Regional Park
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County ...
Powered by Esri

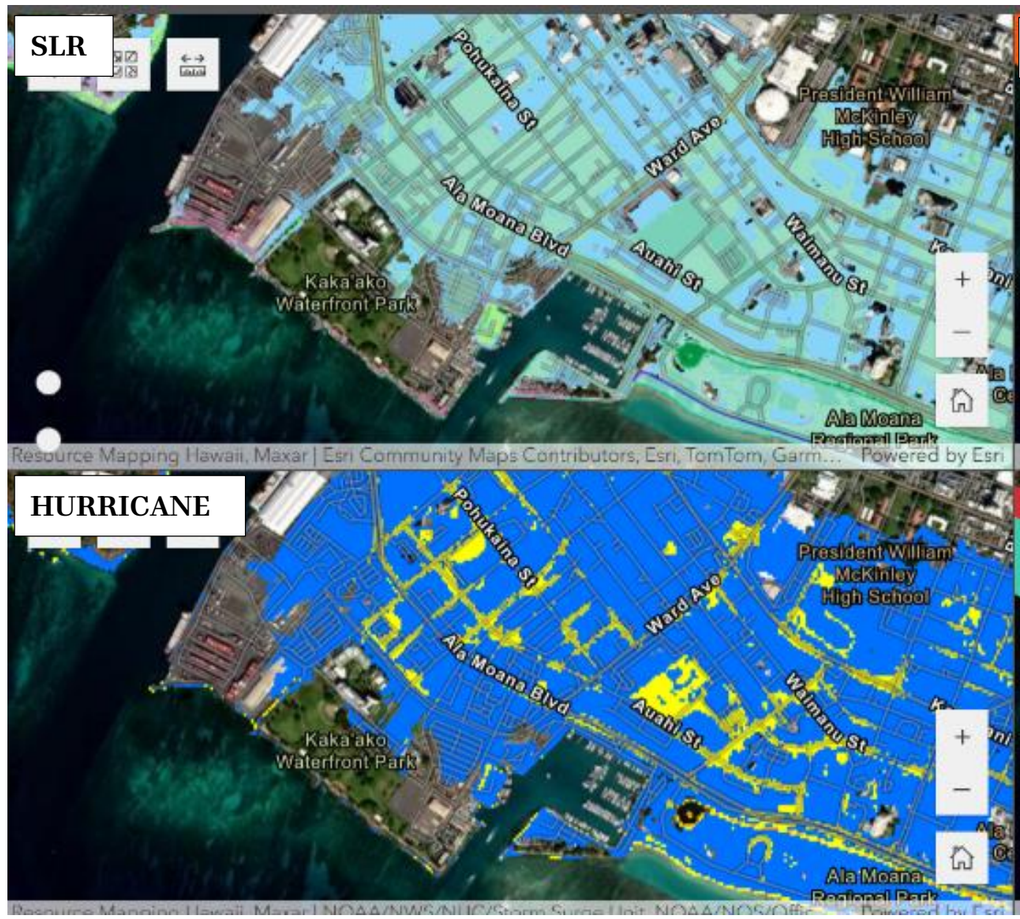

HURRICANE
President William McKinley High School
Ward Ave
Ala Moana Blvd
Auahi St
Waimanu St
Kapiolani Blvd
Rycroft St
Kaheka St
Kaka'ako Waterfront Park
Ala Moana Center
Ala Moana Regional Park


100-YEAR STORM
President William McKinley High School
Ward Ave
Ala Moana Blvd
Auahi St
Waimanu St
Kapiolani Blvd
Rycroft St
Kaheka St
Kaka'ako Waterfront Park
Ala Moana Center
Ala Moana Regional Park

Key Assets	
Wastewater	10 in./12 in./15 in./36 in./30 in./69 in. sewer main
Stormwater	12 in./18 in./24 in. SW conduits
Water	High risk pipelines
Major Streets	Ala Moana Blvd, Ala Moana Park Dr, Ala Moana Blvd/Pensacola Relief Drain Bridge
Community Assets	Ala Moana Regional Park, Kewalo Basin Harbor
Climate Threats	
SLR	• Annual high wave-driven flooding at 3 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 4 ft of SLR • 80% probability of passive flooding at 5 ft SLR • Coastal erosion at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

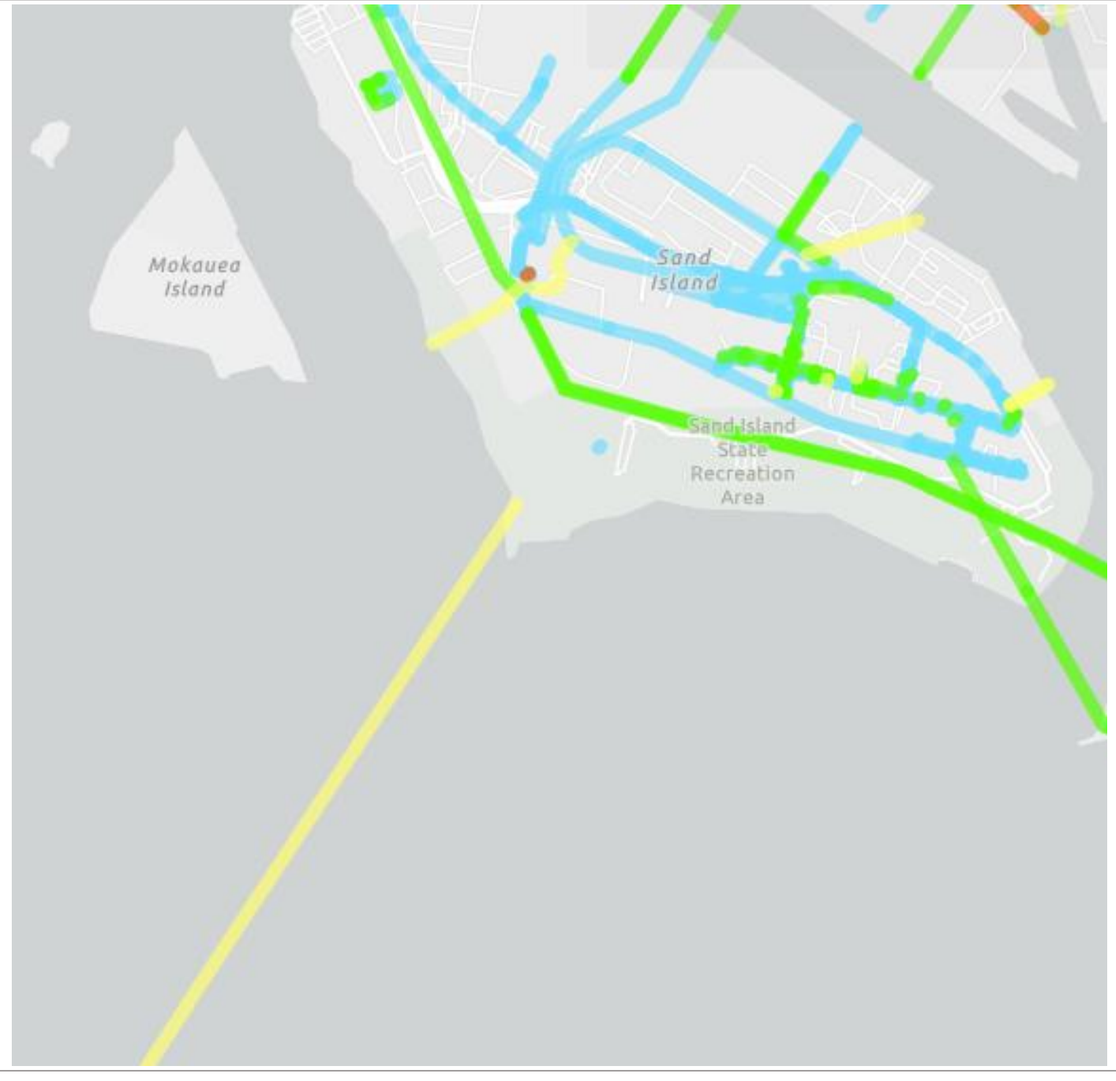
5.2.20 KEWALO HARBOR

Location Information and Maps	
Location	Kewalo Harbor
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

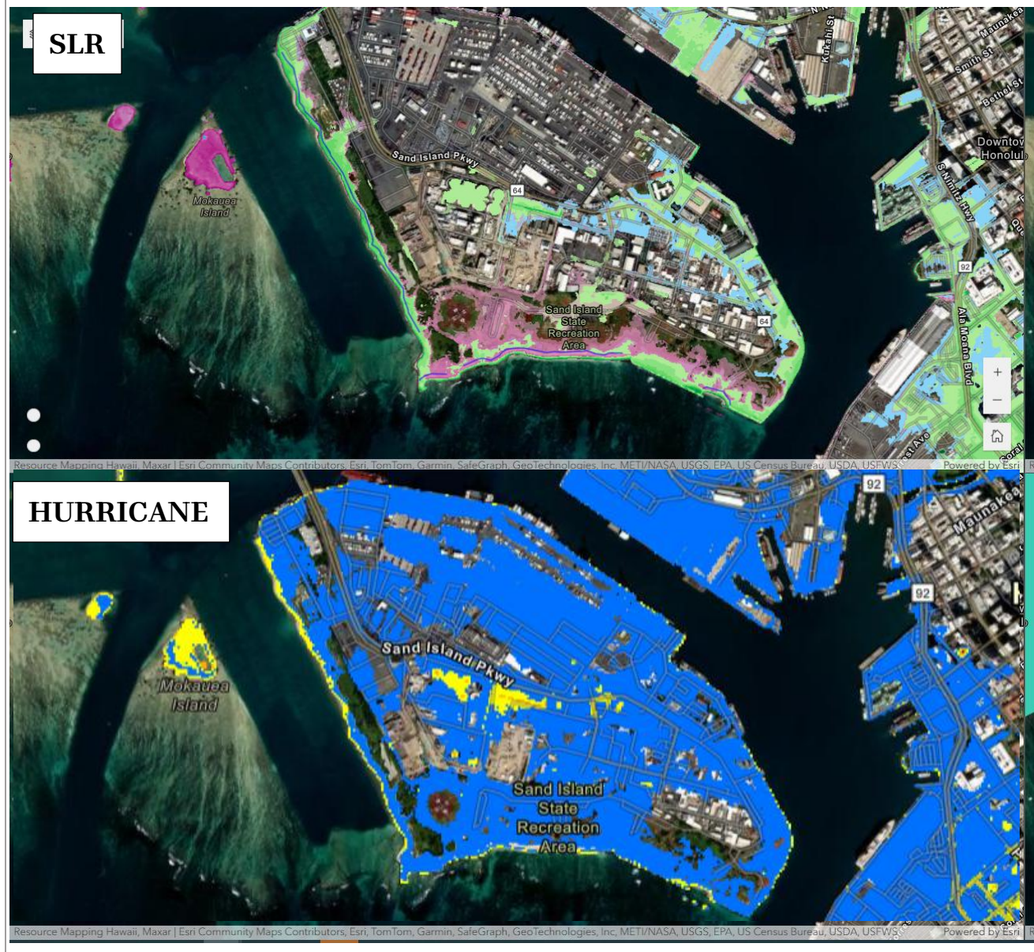
Threat Maps	 SLR Pohukaina St President William McKinley High School Ward Ave Ala Moana Blvd Auahi St Waimanu St Kaka'ako Waterfront Park Ala Moana Regional Park Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garm... Powered by Esri TSUNAMI Pohukaina St President William McKinley High School Ward Ave Ala Moana Blvd Auahi St Waimanu St Kaka'ako Waterfront Park Ala Moana Regional Park Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County ... Powered by Esri HURRICANE Pohukaina St President William McKinley High School Ward Ave Ala Moana Blvd Auahi St Waimanu St Kaka'ako Waterfront Park Ala Moana Regional Park Resource Mapping Hawaii, Maxar | NOAA/NWS/NUIC/Storm Surge Unit, NOAA/NOS/Offic... Powered by Esri 100-YEAR STORM Pohukaina St President William McKinley High School Ward Ave Ala Moana Blvd Auahi St Waimanu St Kaka'ako Waterfront Park Ala Moana Regional Park Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri ... Powered by Esri

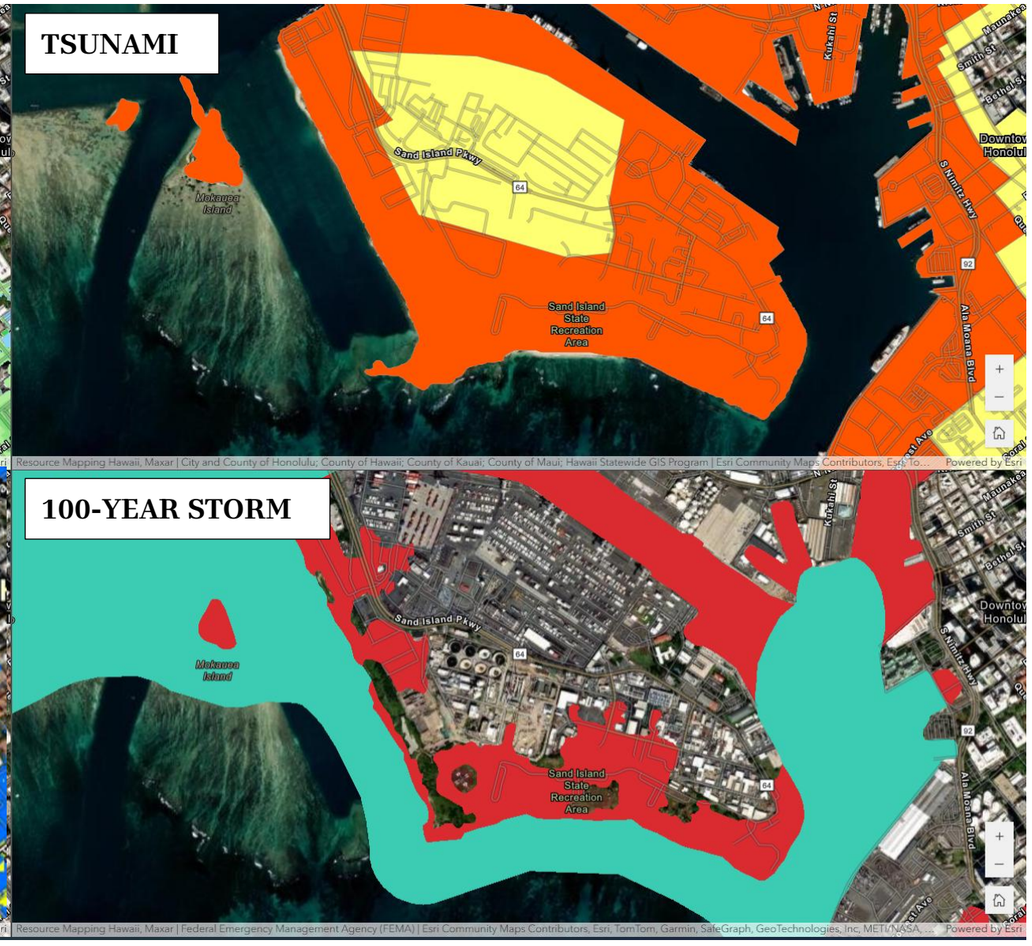
Key Assets	
Wastewater	12 in./15 in./36 in./69 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./42 in./48 in./72 in. SW conduit
Water	High risk pipelines
Major Streets	Ala Moana Blvd, Ala Moana Blvd Bridge Ahui St, Ward Ave, Ala Moana Park Dr
Community Assets	Ala Moana Regional Park, Kewalo Basin, Kakaʻako Waterfront Park
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation at 4 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.21 SAND ISLAND

Location Information and Maps	
Location	Sand Island
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Sand Island Pkwy
Mokauea Island
Sand Island State Recreation Area
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS | Powered by Esri

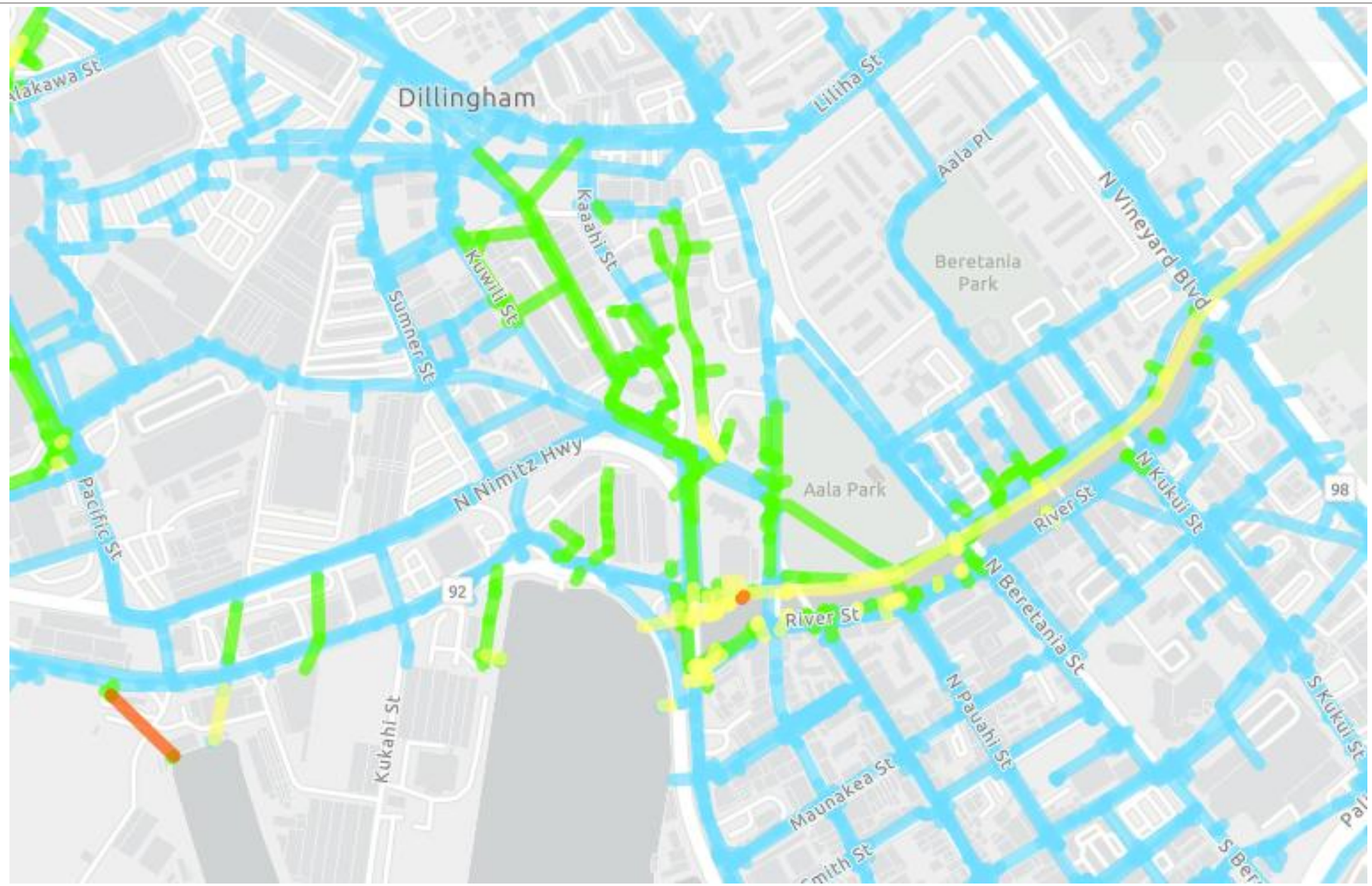

TSUNAMI
Sand Island Pkwy
Mokauea Island
Sand Island State Recreation Area
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri Community Maps Contributors, Esri, To... | Powered by Esri

HURRICANE
Sand Island Pkwy
Mokauea Island
Sand Island State Recreation Area
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS | Powered by Esri

100-YEAR STORM
Sand Island Pkwy
Mokauea Island
Sand Island State Recreation Area
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, ... | Powered by Esri

Key Assets	
Wastewater	Sand Island WWTP, Sand Island Parkway WWPS, 14 in./24 in./48 in./78 in. force main, 8 in./10 in./12 in./18 in. sewer main, 84 in. treatment main
Stormwater	Sand Island Stream, 24 in./36 in./54 in./72 in. SW conduits
Water	Nearby high risk pipelines
Major Streets	Sand Island Pkwy
Community Assets	Sand Island State Recreation Area
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 5 ft SLR • Drainage backflow due to 7 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.22 IWILEI/CHINATOWN

Location Information and Maps	
Location	Chinatown/Dillingham
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	


SLR
Palama
Dillingham
Shops of Dole Cannery
N Nimitz Hwy
N Vineyard Blvd
Nuuanu Ave
Maunakea St
92
Honolu
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S...
Powered by Esri


TSUNAMI
Palama
Dillingham
Shops of Dole Cannery
N Nimitz Hwy
N Vineyard Blvd
Nuuanu Ave
Maunakea St
92
Honolu
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii; County of K...
Powered by Esri


HURRICANE
Palama
Dillingham
Shops of Dole Cannery
N Nimitz Hwy
N Vineyard Blvd
Nuuanu Ave
Maunakea St
92
Honolu


100-YEAR STORM
Palama
Dillingham
Shops of Dole Cannery
N Nimitz Hwy
N Vineyard Blvd
Nuuanu Ave
Maunakea St
92
Honolu

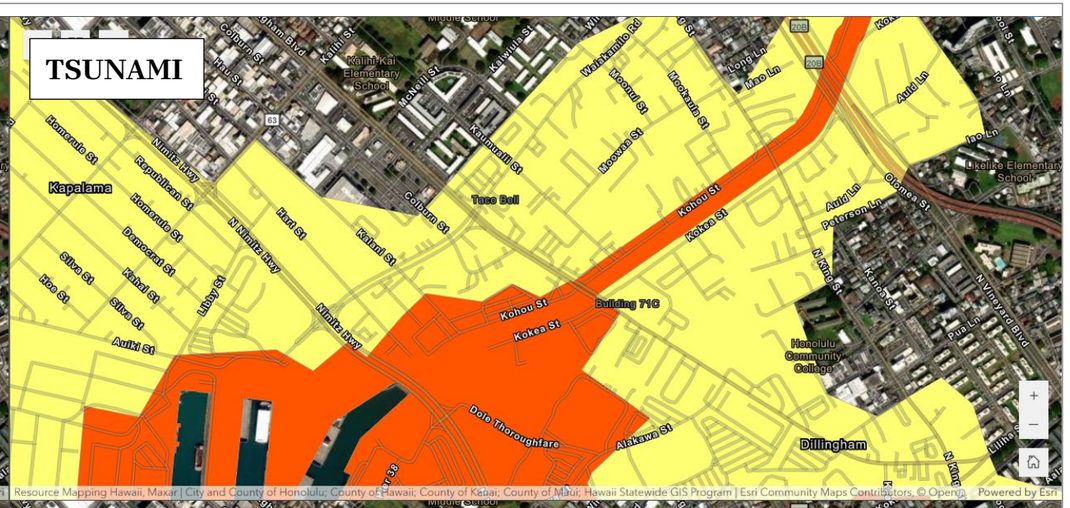
Key Assets	
Wastewater	Awa Street WWPS, 20 in. force main, 6 in./8 in./10 in./18 in./24 in./27 in./30 in./54 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in. SW conduits, Nu‘uanu Stream
Water	High risk pipelines
Major Streets	Ala Moana Blvd, Nimitz Hwy, Nimitz Hwy/Slip Cover Hon Harbor Bridge, Nimitz Hwy/Slip Cover Hon Harbor Bridge #1, Nimitz Hwy/Nu‘uanu Stream Bridge (E.B./W.B.), N King St/Nu‘uanu Stream Bridge, N Hotel St/Nu‘uanu Stream Bridge, N King St/Kahili Stream Bridge
Community Assets	Honolulu Harbor, Aloha Tower, ‘A‘ala Park, Nearby Waterfront fire station 45, nearby Chinatown Substation Police Station
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 4 ft SLR • Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 5 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI • Dam evacuation zone (Nu‘uanu Reservoir #1)
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.23 KAPĀLAMA STREAM/OLOMEA ST

Location Information and Maps	
Location	Kapālama/Dillingham
Risk Score Map	

Threat Maps	


SLR
Kapalama
Kohou St
Kokea St
Building 71C
Dillingham
Dole Thoroughfare
Alakawa St
Honolulu Community College
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS | EPA, US Cens


TSUNAMI
Kapalama
Kohou St
Kokea St
Building 71C
Dillingham
Dole Thoroughfare
Alakawa St
Honolulu Community College
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri Community Maps Contributors, © Opens


HURRICANE
N Nimitz Hwy
Dillingham Blvd
N King St
Dillingham
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS | EPA, US Census


100-YEAR STORM
Kapalama
Kohou St
Kokea St
Building 71C
Dillingham
Dole Thoroughfare
Alakawa St
Honolulu Community College
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTe

Key Assets	
Wastewater	10 in./14 in./21 in./24 in./36 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in. SW conduits, Kapālama Stream
Water	Very high risk/high risk pipelines
Major Streets	Kokea St, Nimitz Hwy/Kapālama Canal Bridge (E.B./W.B.), Dillingham Blvd/Kapālama Canal Bridge, N King St/Kapālama Canal Bridge, Halona St/Kapālama Canal Bridge, Olomea St/Kapālama Canal Bridge
Community Assets	Kalihi Kai fire station 31, Hālau Lokahi NCPCS Public School, Damien Private School
Climate Threats	
SLR	• Annual high wave-driven flooding at 5 ft SLR • Groundwater inundation at 5 ft SLR • Drainage backflow due to 6 ft of SLR • 80% probability of passive flooding at 7 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI • Honolulu Makai Hawaiian homelands
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.24 NIMITZ HWY/SAND ISLAND ACCESS RD

Location Information and Maps	
Location	Sand Island Access Rd
Risk Score Map	

Very Low Risk

Low Risk

At Risk

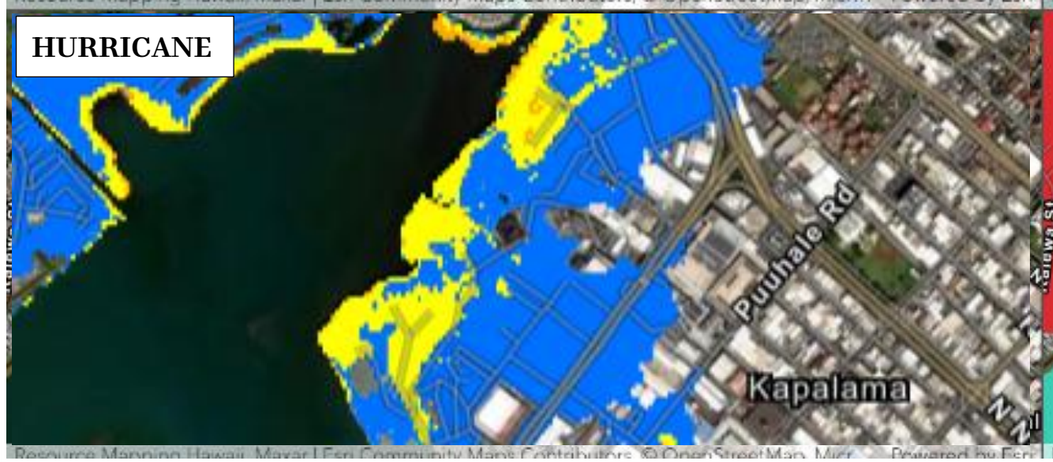
High Risk

Very High Risk

Threat Maps


SLR
Alahao Pl
Hoonee Pl
Puuhale Rd
64
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Powered by Esri


TSUNAMI
Alahao Pl
Hoonee Pl
Puuhale Rd
64
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K...
Powered by Esri


HURRICANE
Puuhale Rd
Kapalama

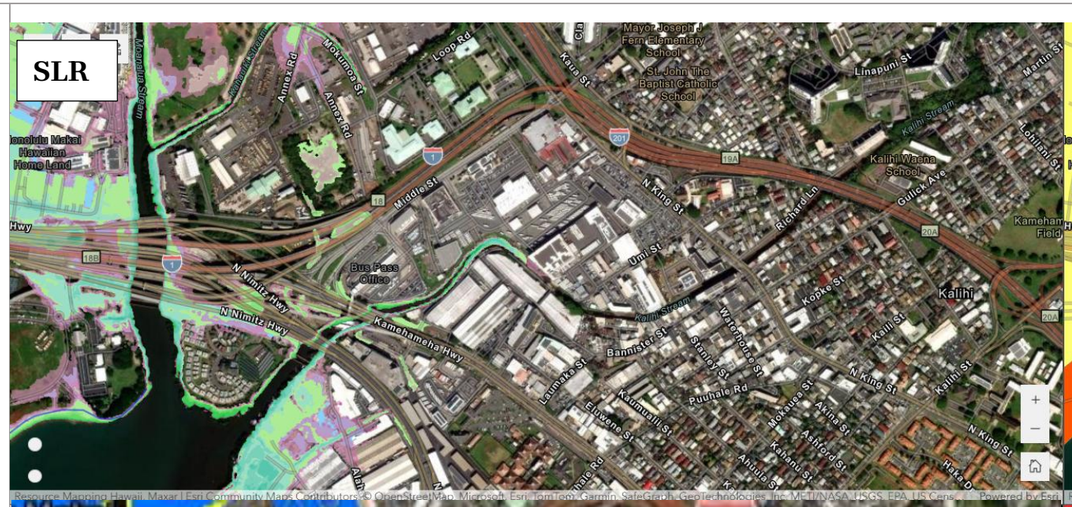

100-YEAR STORM
Alahao Pl
Hoonee Pl
Puuhale Rd
64

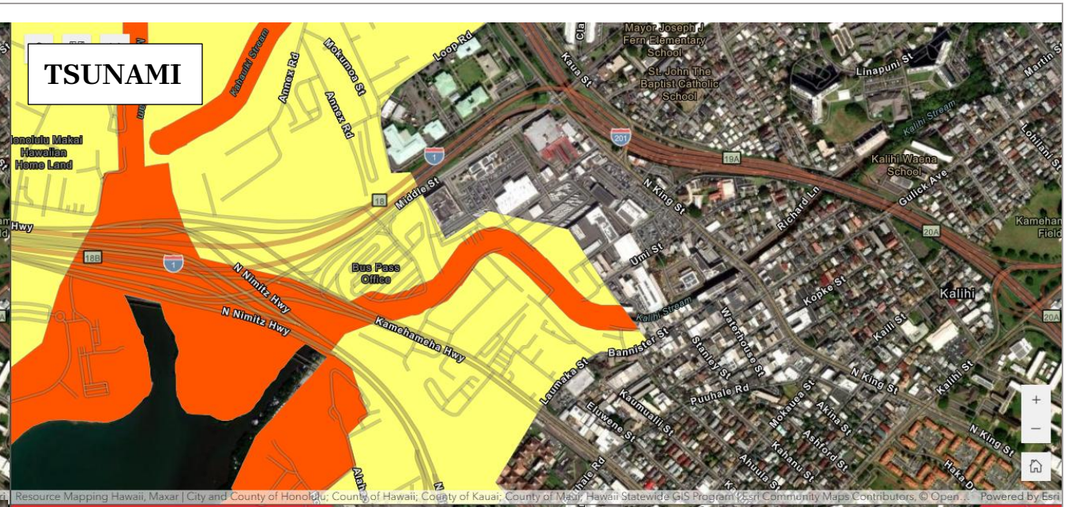
Key Assets	
Wastewater	8 in./10 in./12 in./16 in./18 in./54 in. sewer main, 24 in. force main
Stormwater	18 in./24 in./36 in./42 in. SW conduits
Water	High risk pipelines
Major Streets	Nimitz Hwy, Sand Island Access Rd, Hoʻoneʻe Pl
Community Assets	Keʻehi Lagoon, Keʻehi Boat Harbor, Puʻuhale Elementary
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 2 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• None identified
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.25 KALIHI STREAM

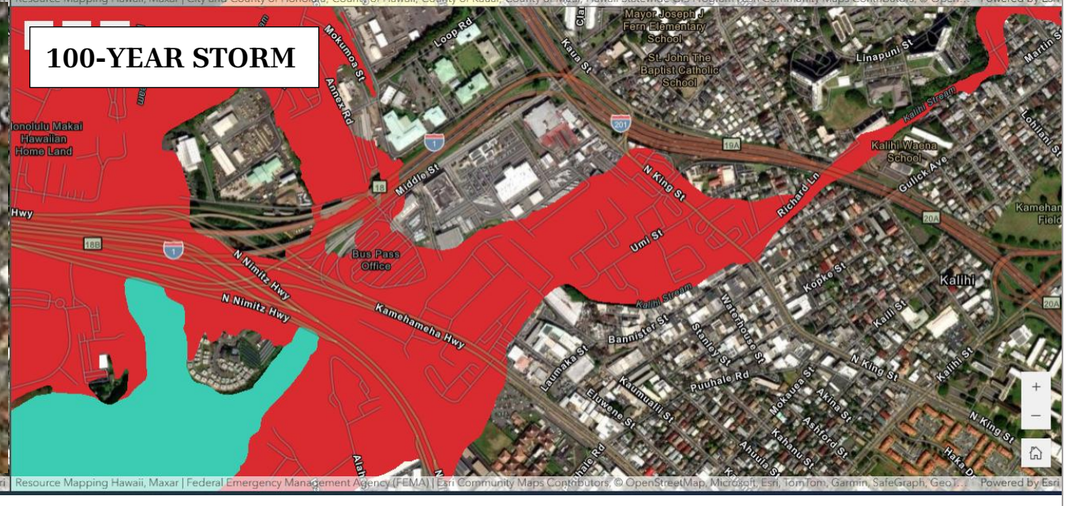
Location Information and Maps	
Location	Kalihi
Risk Score Map	

Threat Maps


SLR
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Cens... Powered by Esri

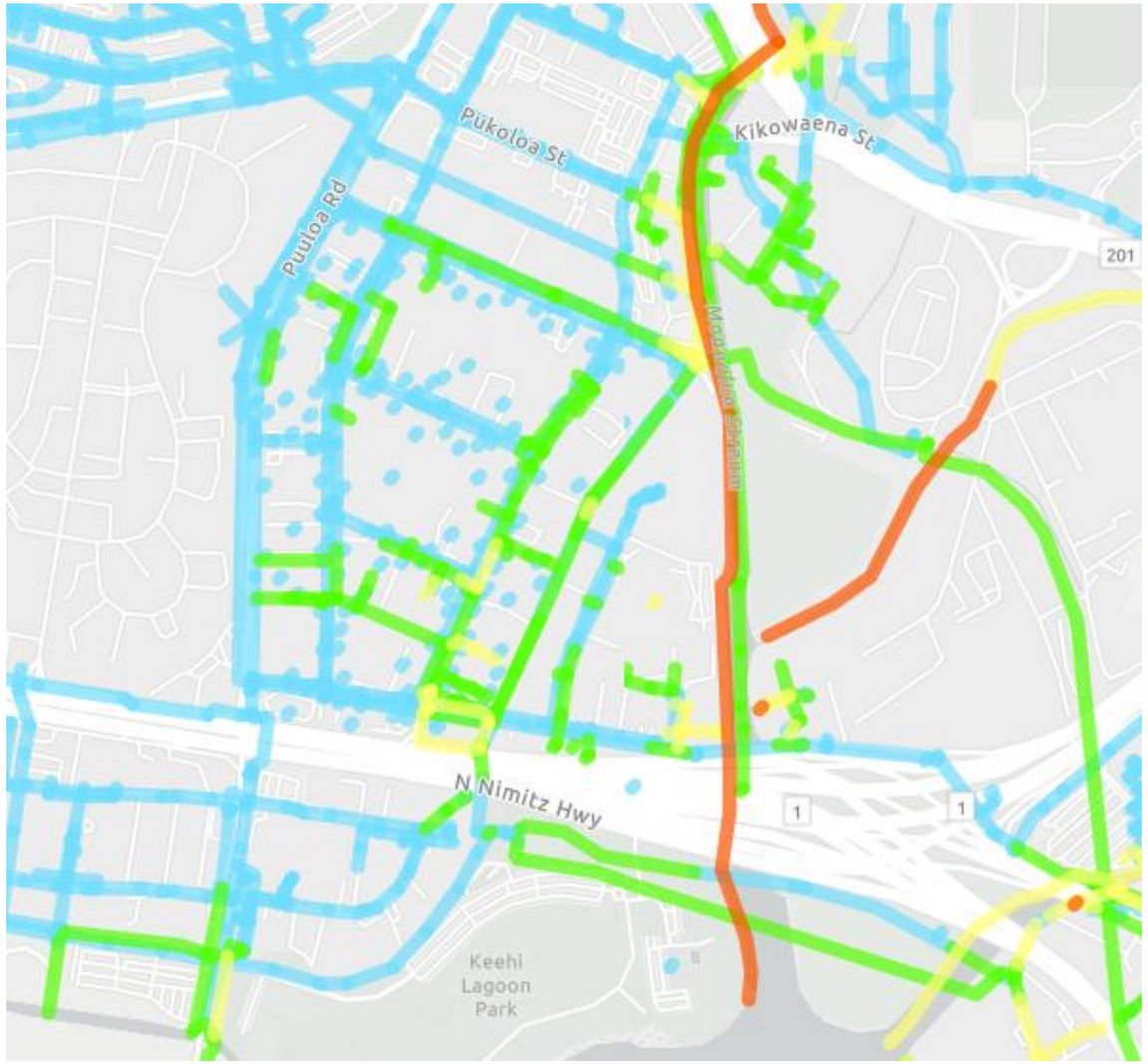

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HURRICANE
Middle St
N Nimitz Hwy
N King St
90
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Cens... Powered by Esri

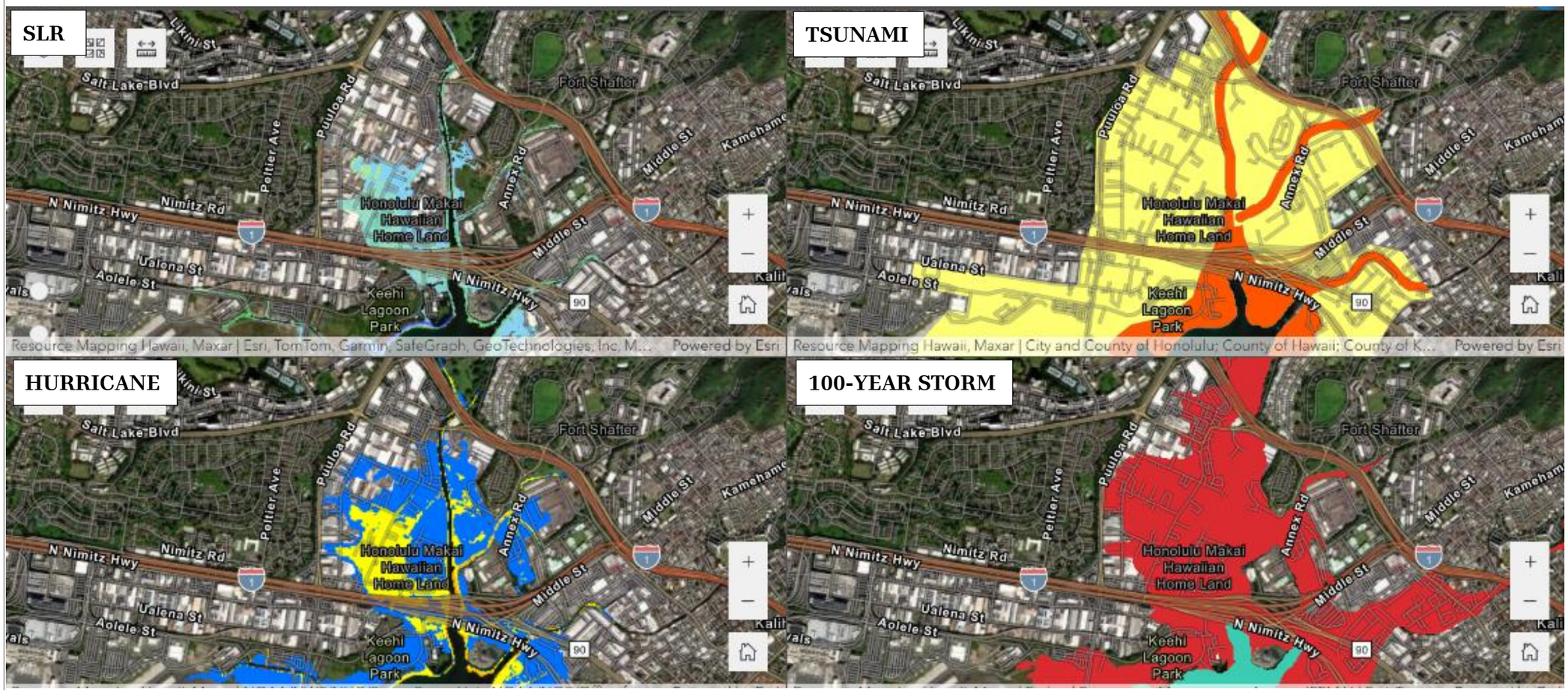

100-YEAR STORM
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoT... Powered by Esri

Key Assets	
Wastewater	24 in. force main, 10 in./18 in./21 in./24 in./27 in. sewer main
Stormwater	24 in./54 in. SW conduits, Kalihi Stream
Water	High risk pipelines
Major Streets	Kamehameha Hwy, Kamehameha Hwy/Kalihi Stream Bridge
Community Assets	Kalihi Canal
Climate Threats	
SLR	• Annual high wave-driven flooding at 4 ft SLR • Groundwater inundation at 3 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some area greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	Low wildfire risk zone
Drought	Low drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Very high SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.26 MĀPUNAPUNA

Location Information and Maps	
Location	Māpunapuna
Risk Score Map	

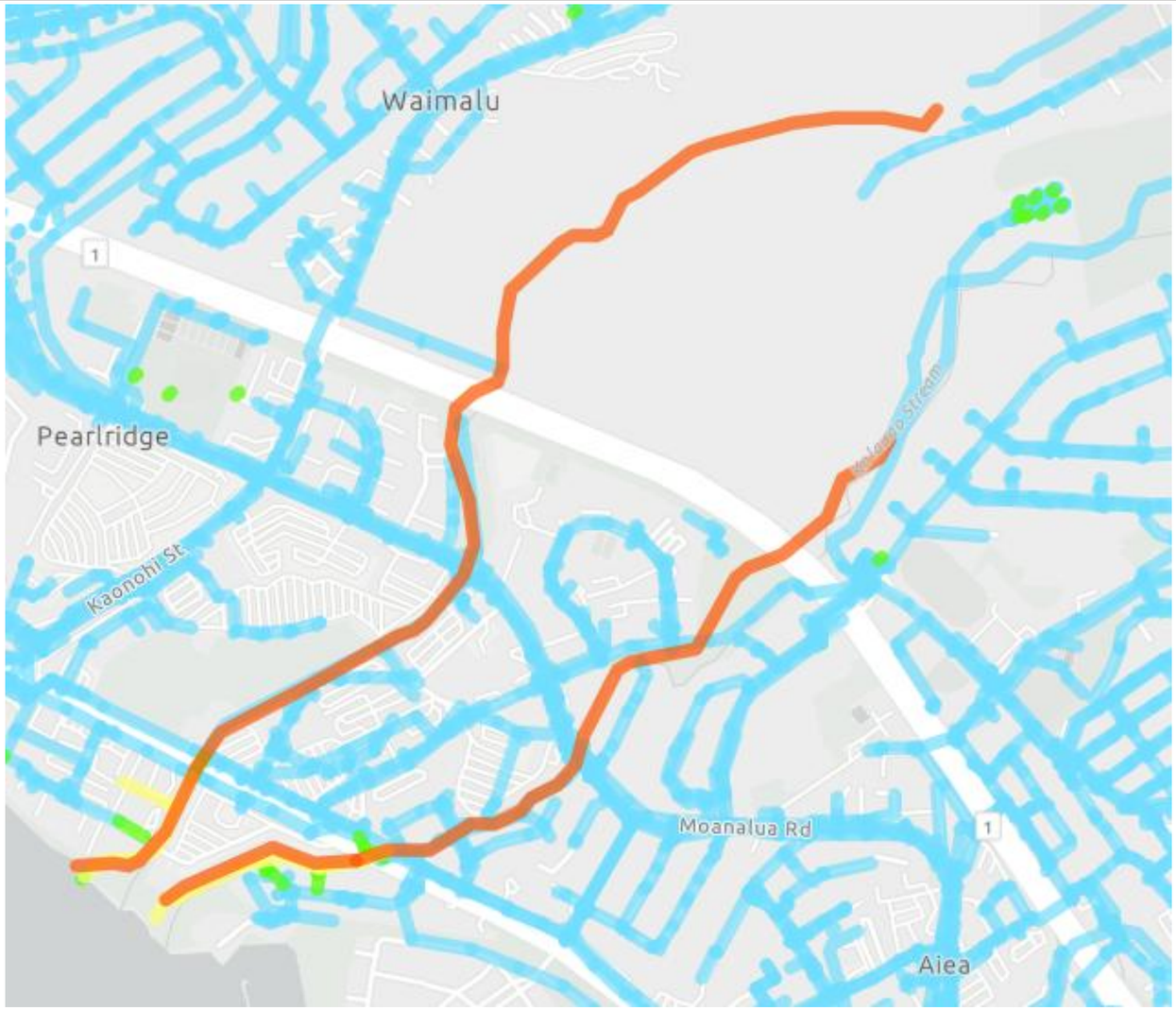
Threat Maps


SLR
TSUNAMI
HURRICANE
100-YEAR STORM
Likini St
Salt Lake Blvd
Puuloa Rd
Fort Shafter
Middle St
Kamehame
Peltier Ave
Annex Rd
N Nimitz Hwy
Nimitz Rd
Ualena St
Aolele St
Honolulu Makai Hawaiian Home Land
Keehi Lagoon Park
90
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Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K...
Powered by Esri

Key Assets	
Wastewater	Kamehameha Highway WWPS, Fort Shafter WWPS, 24 in./30 in./42 in. force main, 10 in./12 in./20 in./24 in./30 in./36 in./48 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in./42 in./48 in./54 in. SW conduits, Moanalua Stream
Water	Very high risk/high risk pipelines
Major Streets	Moanalua Rd, N Nimitz Hwy, Makai Frontage Rd/Moanalua Stream Bridge, Nimitz Hwy/Moanalua Stream Bridges (E.B/W.B.), Puʻuloa Ramp/Moanalua Stream Bridge, Funston Rd/Kahauiki Stream Bridge, Walker Dr/Kahauiki Stream Bridge, Funston Loop/Kahauiki Stream Bridge
Community Assets	Keʻehi Lagoon, DOT Base Yards, Keʻehi Lagoon Beach Park, Keʻehi Lagoon Memorial State Park (State Parks/DLNR), Moanalua Gardens, Moanalua Public Middle and Elementary Schools
Climate Threats	
SLR	• Annual high wave-driven flooding at 2 ft SLR • Groundwater inundation at 1 ft SLR • Drainage backflow due to 3 ft of SLR • 80% probability of passive flooding at 4 ft SLR • Coastal erosion due to 2 ft of SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft, and some greater than 6 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	Low risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI
Ongoing/Planned Projects	• Fort DeRussy Beach Sector – Sand backpassing (DLNR) • Royal Hawaiian Beach Sector – Ongoing maintenance using offshore sands (DLNR) • Kūhiō Beach Sector: Diamond Head (east) Basin – Beach maintenance (DLNR) • Kūhiō Beach Sector: ʻEwa (west) Basin – Beach nourishment with a segmented breakwater (DLNR) • Halekūlani Beach Sector – Beach nourishment with stabilizing groins (cleared environmental review and awaits funding) (DLNR) • Ala Wai Boulevard Complete Streets • Integrated Planning Feasibility Study (ENV, DFM) – Ala Wai Blvd

	• Green Fee Advisory Council, Phased Risk Reduction • Proposed Community Investment Vehicle (CIVic) for Ala Wai watershed – to establish a special improvement district • Waikīkī (Sea Level Rise) Resilience and Adaptation Project (WRAP) - Phase 2 • TOD Lagoon Drive Station Area (DHHL) • OWH Māpunapuna Flooding Mitigation Working Group Summary (CDM Smith, 2022) – Floodwall cost > benefit, follow-up needed about retreat • FEMA Māpunapuna Area Drainage Study and Action Plan (ADSAP, May 2024) • Recommend alternative 5: Elevate Roadways, Storm Drain Improvements, Acquiring Property for Detention Area, Storm and Groundwater Pumping
Potential Gaps	• None identified

5.2.27 PEARLRIDGE/KALAUAO STREAM

Location Information and Maps	
Location	Pearlridge
Risk Score Map	

Threat Maps


SLR
Pearlridge
Kamehameha Hwy
Pearlridge Center
Aiea
Kaamilo St
Iliee St
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S... Powered by Esri

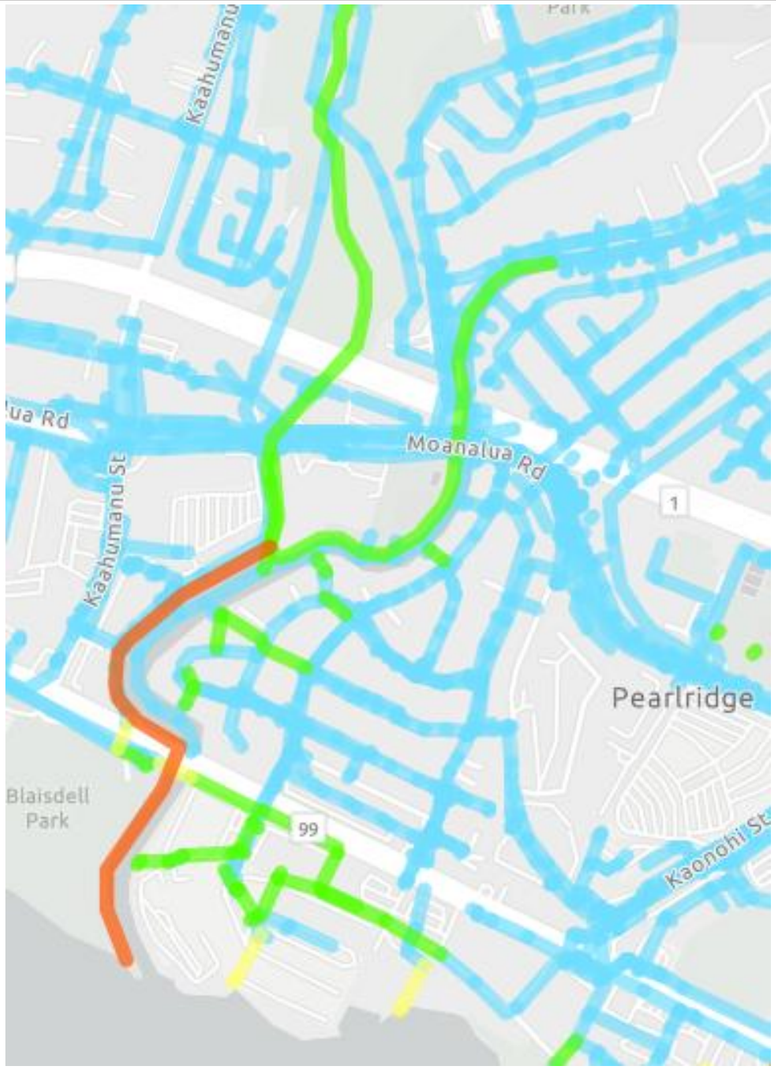

TSUNAMI
Pearlridge
Kamehameha Hwy
Pearlridge Center
Aiea
Kaamilo St
Iliee St
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawai'i, County of K... Powered by Esri


HURRICANE & 100-YEAR STORM
Pearlridge
Kamehameha Hwy
Pearlridge Center
Aiea
Kaamilo St
Iliee St


WILDFIRE
Pearlridge
Kamehameha Hwy
Pearlridge Center
Aiea
Kaamilo St
Iliee St

Key Assets	
Wastewater	12 in./15 in./18 in./36 in./42 in./48 in. sewer main
Stormwater	12 in./18 in./24 in./35 in./36 in./42 in./48 in. SW conduits, Kalauao Stream
Water	Very high risk/high risk pipelines, nearby critical wells
Major Streets	Kamehameha Hwy/Kalauao Spring Bridge (E.B./W.B.), Kihal St/Kalauao Stream Bridge, Moanalua Rd/Kalauao Stream Bridge, Kaʻamilo St/H1 Bridge, H1/Kalauao Stream Bridge, Kaonohi St/H1 Bridge
Community Assets	Aiea Public High School, Alvah A Scott Public Elementary School, Aiea Fire Station 10, Our Savior Private Lutheran School, Kapiolani Medical Center at Pali Momi, Straub Pearl Ridge Hospital Clinic, Pearl Country Club, Pearlridge Center
Climate Threats	
SLR	• Drainage backflow due to 3 ft of SLR • Groundwater inundation data in this area not available • 80% probability of passive flooding at 3 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	High risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.28 PEARLRIDGE

Location Information and Maps	
Location	Pearlridge/Waimalu
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps


SLR
Moanalua Rd
Pono St
Waimalu
Moanalua Rd
Kaonohi St
Hekaha St
Pearlridge
Kamehameha Hwy
Pearlridge Center
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S...
Powered by Esri

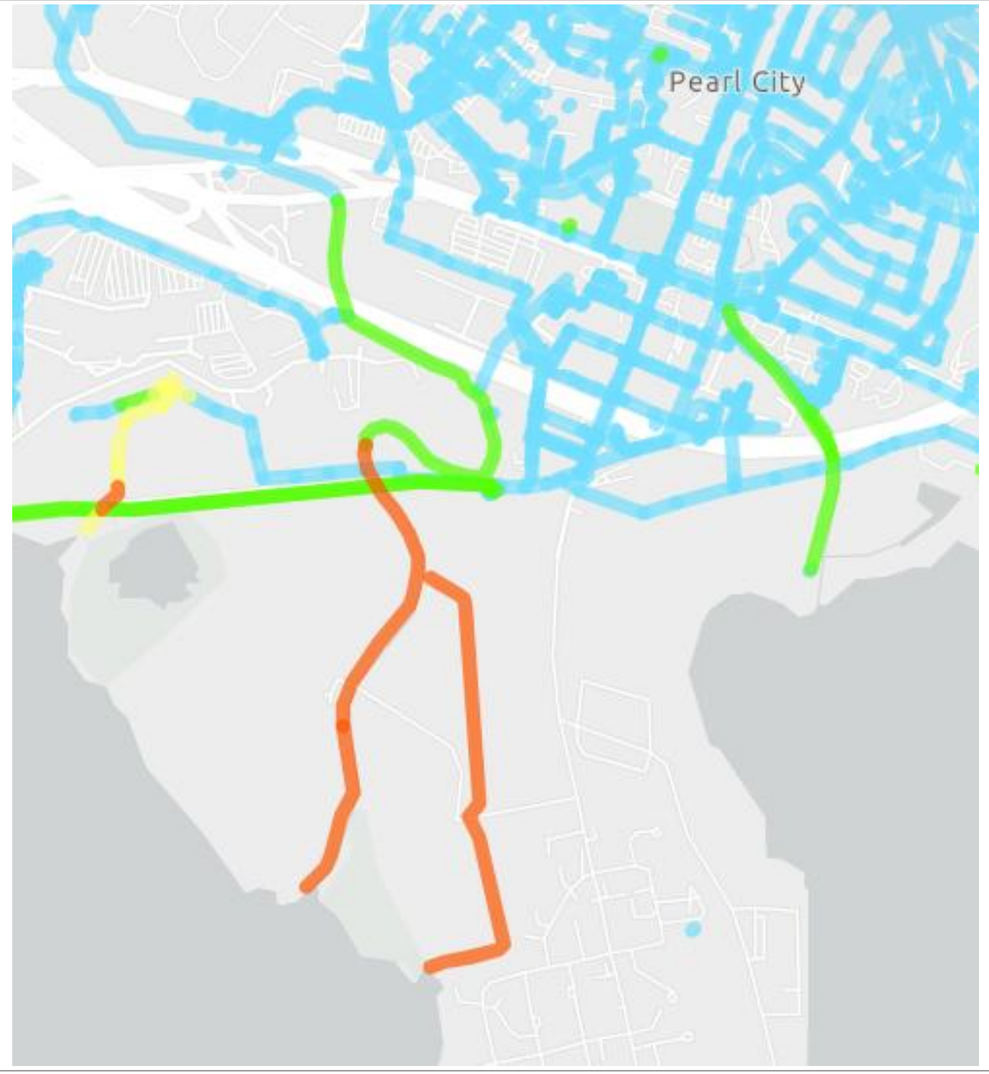

TSUNAMI
Moanalua Rd
Pono St
Waimalu
Moanalua Rd
Kaonohi St
Hekaha St
Pearlridge
Kamehameha Hwy
Pearlridge Center
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of K...
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HURRICANE &
100-YEAR STORM
Moanalua Rd
Pono St
Waimalu
Moanalua Rd
Kaonohi St
Hekaha St
Pearlridge
Kamehameha Hwy
Pearlridge Center


WILDFIRE
Moanalua Rd
Pono St
Waimalu
Moanalua Rd
Kaonohi St
Hekaha St
Pearlridge
Kamehameha Hwy
Pearlridge Center

Key Assets	
Wastewater	Waimalu WWPS, 30 in. force main, 6 in./8 in./10 in./12 in./18 in./27 in./42 in./48 in. sewer main
Stormwater	18 in./24 in./30 in./36 in./42 in. conduits, Waimalu Stream
Water	Very high risk/high risk pipelines, nearby critical wells
Major Streets	Kamehameha Hwy, Kamehameha Hwy/Waimalu Stream Bridge (E.B./W.B.), Kaʻahumanu St, Moanalua Rd/Punanani Channel Bridge, Hwy 1/Waimalu Stream Bridge
Community Assets	Neal S. Blaisdell Park, Waimalu Public Elementary School, Pearl Ridge Elementary School
Climate Threats	
SLR	• Drainage backflow due to 4 ft of SLR • Groundwater inundation data in this area not available • 80% probability of passive flooding at 5 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

5.2.29 WAIAWA ROAD

Location Information and Maps	
Location	Waiawa/Pearl City
Risk Score Map	

Threat Maps


SLR
Pearl Harbor
Naval Station
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, S...
Powered by Esri


TSUNAMI
Pearl Harbor
Naval Station
Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of K...
Powered by Esri


HURRICANE &
100-YEAR STORM
Pearl Harbor
Naval Station


WILDFIRE
Pearl Harbor
Naval Station

Key Assets	
Wastewater	Pearl City WWPS, 36 in. force main, 18 in./24 in./36 in./42 in./48 in. sewer main
Stormwater	18 in. SW conduits, Waiawa Stream/Spring
Water	High risk pipelines
Major Streets	Waiawa Rd
Community Assets	DOT Base Yard, Pearl City Fire Station 20, Lehua Public Elementary School
Climate Threats	
SLR	• Drainage backflow due to 4 ft of SLR • Groundwater inundation data in this area not available • 80% probability of passive flooding at 2 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Complete inundation
Tsunami	Within extreme tsunami evac zone
Wildfire	High risk
Drought	Low risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI
Ongoing/Planned Projects	• None identified
Potential Gaps	• None identified

SECTION F.6: CENTRAL O‘AHU

F.6.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The Central O‘ahu region includes established residential communities, military installations, agricultural lands, and critical groundwater resources that support water supplies across the island. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.6.

F.6.1.1 SPECIFIC LOCATIONS

Several areas across the region face site specific hazards, ranging from stream and shoreline flooding to sea level rise affecting critical access routes.

- Climate-driven hazards such as flooding along streams and coastal and shoreline erosion threaten Waipahū homes and businesses and may require infrastructure improvements.
  - **Waikele Stream**
  - **Kapakahi Wailani Channel**
  - **Waiawa Stream**
- The transportation network is affected by flooding (**Farrington Highway**).
- Roads to access the planned solid waste facility on **Waipi‘o Peninsula** are highly vulnerable to sea level rise.

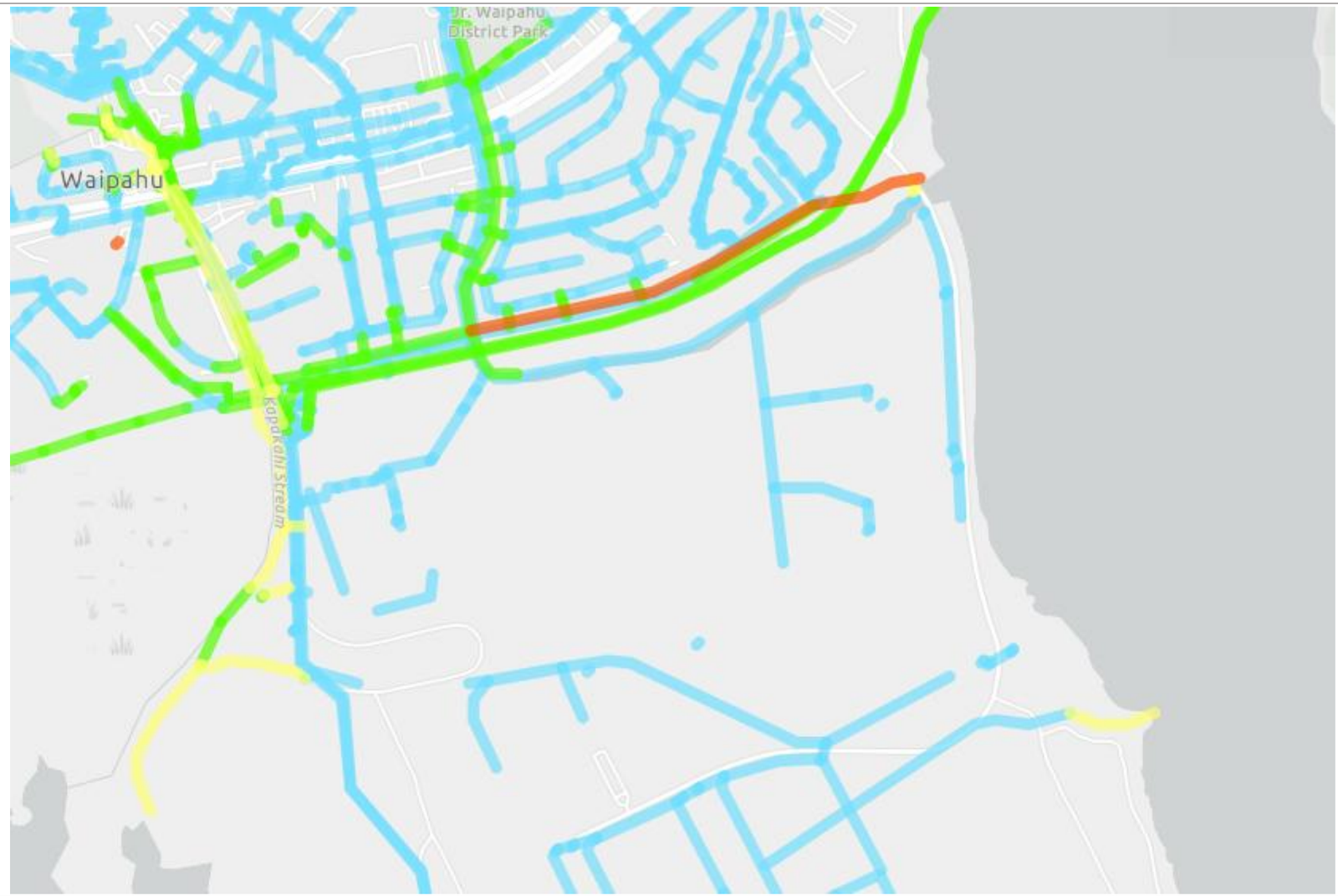
F.6.1.2 GENERAL CONCERNS ACROSS THE REGION

The region contains broader challenges related to water quality, supply, and contamination that affect communities and resources islandwide.

- **Sedimentation and chemical and nutrient contamination** from polluted streams and nonpoint sources can negatively affect potable water, the Pearl Harbor Aquifer, and agriculture.
- **New water sources are needed** to support growing demand in the Primary Urban Center.
- **Effluent can enter local streams**, causing environmental and agricultural concerns.

F.6.2 IDENTIFIED HOTSPOTS

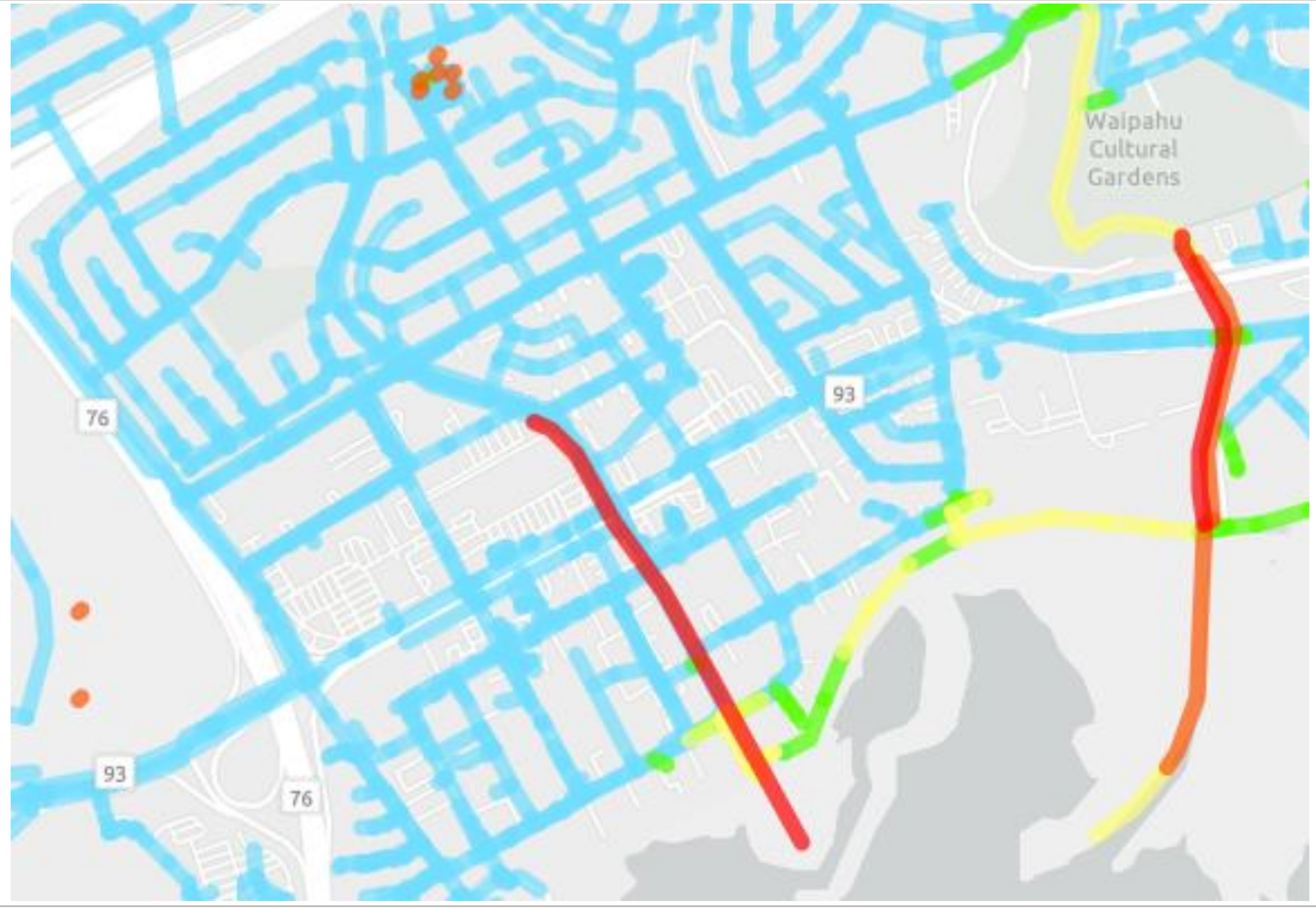
F.6.2.1 WAIPAHŪ/FARRINGTON HWY

Location Information and Maps	
Location	Farrington Hwy
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

Threat Maps	   

Key Assets	
Wastewater	Waipahū WWPS, 42 in. force main, 4 in./8 in./10 in./24 in./27 in./30 in./36 in./42 in. sewer main
Stormwater	12 in./18 in./24 in./30 in./36 in./42 in. SW conduits, Ted Makalena GC Stream, Kapakahi Stream
Water	Very high risk/high risk pipelines, nearby critical wells
Major Streets	Farrington Hwy, Farrington Hwy/Kapakahi Stream Bridge, Farrington Hwy/Waipahū Canal Bridge, Paiwa St/Waipahū Canal Bridge, Farrington Hwy/Bill Balfour Jr. Waipahū District Park Canal Bridge, Waipi‘o Pt. Acc Rd/Waipahū Canal
Community Assets	Waipahū Public High School, Waipahū Clinic, Bill Balfour Jr. Waipahū District Park, Ted Makalena Golf Course (irrigation water comes from Waikele Stream – the pump house is above Farrington Hwy) , nearby Skyline Rail Operations Center
Climate Threats	
SLR	• Drainage backflow due to 5 ft of SLR • 80% probability of passive flooding at 6 ft SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft, some areas greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Flooding along Farrington Highway
Ongoing/Planned Projects	• Planned solid waste facility on Waipi‘o Peninsula
Potential Gaps	• Need for potential wildfire prevention and protection measures. Potential need for flood prevention measures for Farrington Highway due to 100-year storm flooding in specific areas

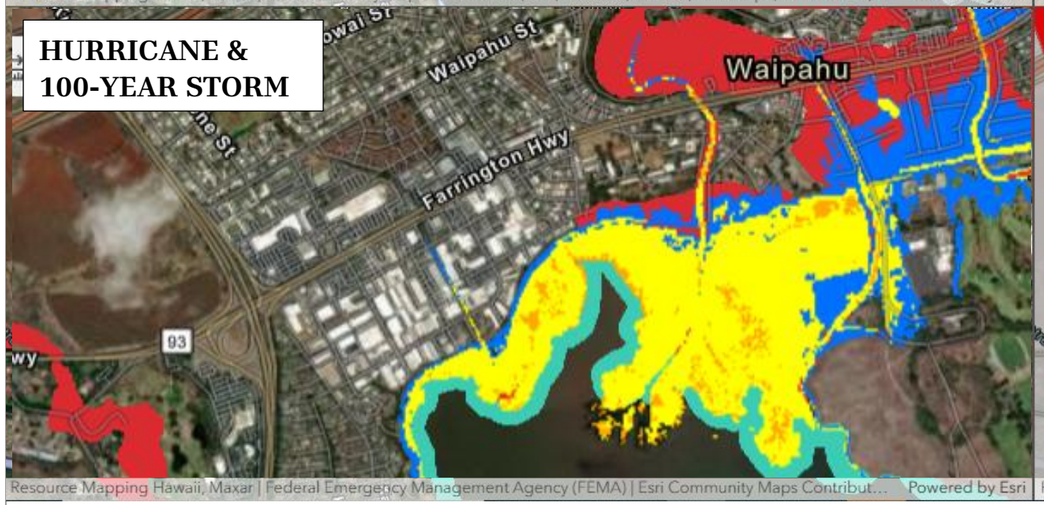
F.6.2.2 WAIPAHŪ/POUHALA MARSH WILDLIFE SANCTUARY

Location Information and Maps	
Location	Waipahū
Risk Score Map	

Threat Maps


SLR
Waipahu
Waipahu Intermediate School
Waipahu Town Center
Farrington Hwy
Fort Weaver Rd
Leoku St
Leonui St
Loolo St
Pupuole St
Kaihuopalaai St
Pupukahi St
Pupupuhi St
Kapakahi Stream
Drainage Channel
Haaa St
Awalau St
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, METI/NASA, ... Powered by Esri


TSUNAMI
Waipahu
Waipahu Intermediate School
Waipahu Town Center
Farrington Hwy
Fort Weaver Rd
Leoku St
Leonui St
Loolo St
Pupuole St
Kaihuopalaai St
Pupukahi St
Pupupuhi St
Kapakahi Stream
Drainage Channel
Haaa St
Awalau St
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; H... Powered by Esri


HURRICANE & 100-YEAR STORM
Waipahu
Waipahu St
Farrington Hwy
93
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contribut... Powered by Esri


WILDFIRE
Waipahu
Waipahu Intermediate School
Waipahu Town Center
Farrington Hwy
Fort Weaver Rd
Leoku St
Leonui St
Loolo St
Pupuole St
Kaihuopalaai St
Pupukahi St
Pupupuhi St
Kapakahi Stream
Drainage Channel
Haaa St
Awalau St
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wi... Powered by Esri

Key Assets	
Wastewater	Kunia WWPS, Waipahū WWPS, 10 in./18 in. force main, 6 in./8 in./10 in./12 in./14 in./15 in./24 in./21 in./30 in. sewer main
Stormwater	18 in./24 in./30 in./36 in./42 in./48 in. SW conduits, Waikele Stream, Hōʻaeʻae Stream
Water	Very high risk/high risk pipelines, nearby critical wells
Major Streets	Farrington Hwy, Farrington Hwy/Hwy OP Bridge, Farr Hwy/Waikele Canal Bridge, Farr Hwy/Hōʻaeʻae Stream Bridge, Leonui St/Waipahū Stream Bridge, Leokane St/Waipahū Stream Bridge
Community Assets	Pouhala Marsh Wildlife Sanctuary, Pouhala Marsh (in 2024 City Council approved the transfer of 6 parcels to the State DLNR), Waipahū Fire Station 12, New Hope Private Christian School, Kaiser Punawai Clinic, Waipahū Public Intermediate School, Waipahū Cultural Garden Park, Honowai Elementary School, Waipiʻo Peninsula Soccer Complex (Irrigation water comes from Waikele Stream – the pump house is above Farrington Hwy and it is currently under a license with the US Navy, set to expire in 2048)
Climate Threats	
SLR	• 80% probability of passive flooding at 3 ft SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft, some areas greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	High afternoon extreme heat index (above 90°F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Very High SoVI index • Climate hazards: flooding along streams and coastal/shoreline erosion require infrastructure improvements (esp. Waikele Stream, Kapakahi Wailani Channel) • Low-lying areas of Pearl Harbor and parts of Waipahū are subject to coastal erosion • Contamination and sediment (from nonpoint sources and esp. Schoefield Barracks) impact potable water, Pearl Harbor Aquifer, and ag • New water sources are needed to support growing demand in PUC; sources may be developed in Waipahū and Waiawa

	• Roads to access planned solid waste facility on Waipiʻo Peninsula highly vulnerable to sea level rise
Ongoing/Planned Projects	• Planned solid waste facility on Waipiʻo Peninsula, planned TOD, Mililani WWTP/Patsy T. Mink Central Oʻahu Regional Park R-1 Stormwater Capture and Reuse Project (DFM with ENV, BWS, DDC, DPR & CWRM) • Wahiawā Wastewater Treatment Plant upgrades (ENV) • Central Oʻahu Watershed Management Plan, under development (BWS) • Solid waste facility on Waipiʻo peninsula • 2017 Waipahū Town Action Plan (DPP) • 2021 Central Oʻahu Sustainable Communities Plan (DPP) • Pouhala Marsh Wetland Restoration and Enhancement Project – DLNR • Waipahū Wastewater Pump Station (WWPS) Force Main (new) • Mitigating flood risk under Farrington Hwy
Potential Gaps	• Need for potential wildfire prevention and protection measures. Potential for passive flooding protection measures for the mid-term planning horizon

SECTION F.7: ʻEWA

F.7.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The diverse ecosystem in ʻEwa ranges from coastal zones to high-elevation forests that face significant threats due to urbanization, climate change, and rising sea levels. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.7.

F.7.1.1 SPECIFIC LOCATIONS

Rapid urbanization causes flooding and nonpoint pollution, particularly where infrastructure needs upgrading. Climate hazards threaten the following areas due to sea level rise.

- **ʻEwa Plain** is a low-lying region susceptible to flooding, with ongoing efforts for improved stormwater systems.
- **Renton, Tenney, and Varona Villages** are identified for inadequate drainage and flood risks, requiring targeted infrastructure upgrades.
- **Kaloʻi Ditch** needs enhanced stormwater management to reduce runoff and flooding impacts.
- The **ʻEwa Beach coastline** faces challenges due to erosion and rising sea levels.

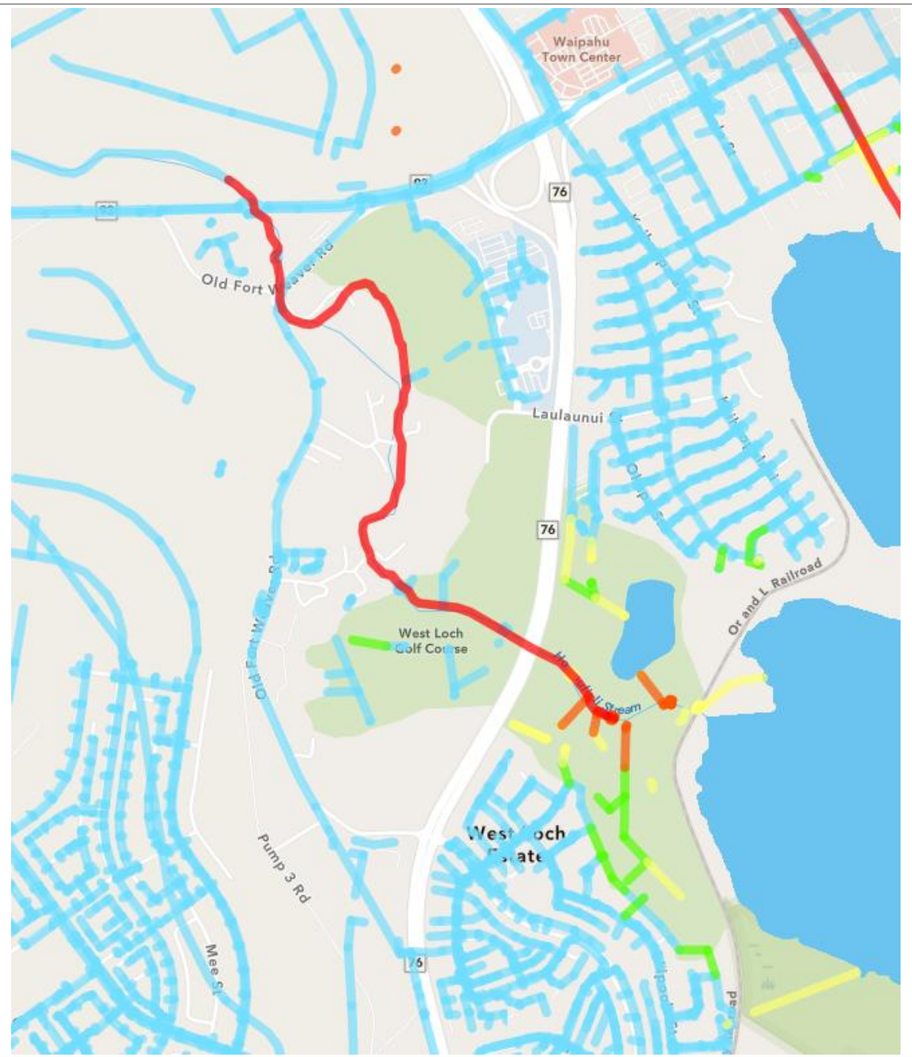
F.7.1.2 GENERAL CONCERNS ACROSS THE REGION

Significant impacts on water resources raise challenges around aquifers, stormwater, and flooding. Rising sea levels and extreme weather highlight the need for climate adaptation.

- **Additional water sources should be developed** in this area, as it imports more than half of its water needs.
- **Regional water conservation and education programs are needed** to reduce water demands.
- There is a need to balance **wildfire risks during drought** with **flood risks during storms.**
- **Erosion and sea level rise** threaten coastal areas.

F.7.2 IDENTIFIED HOTSPOTS

7.2.1 WAIPIʻO RESERVOIR

Location Information and Maps	
Location	West Loch
Risk Score Map	

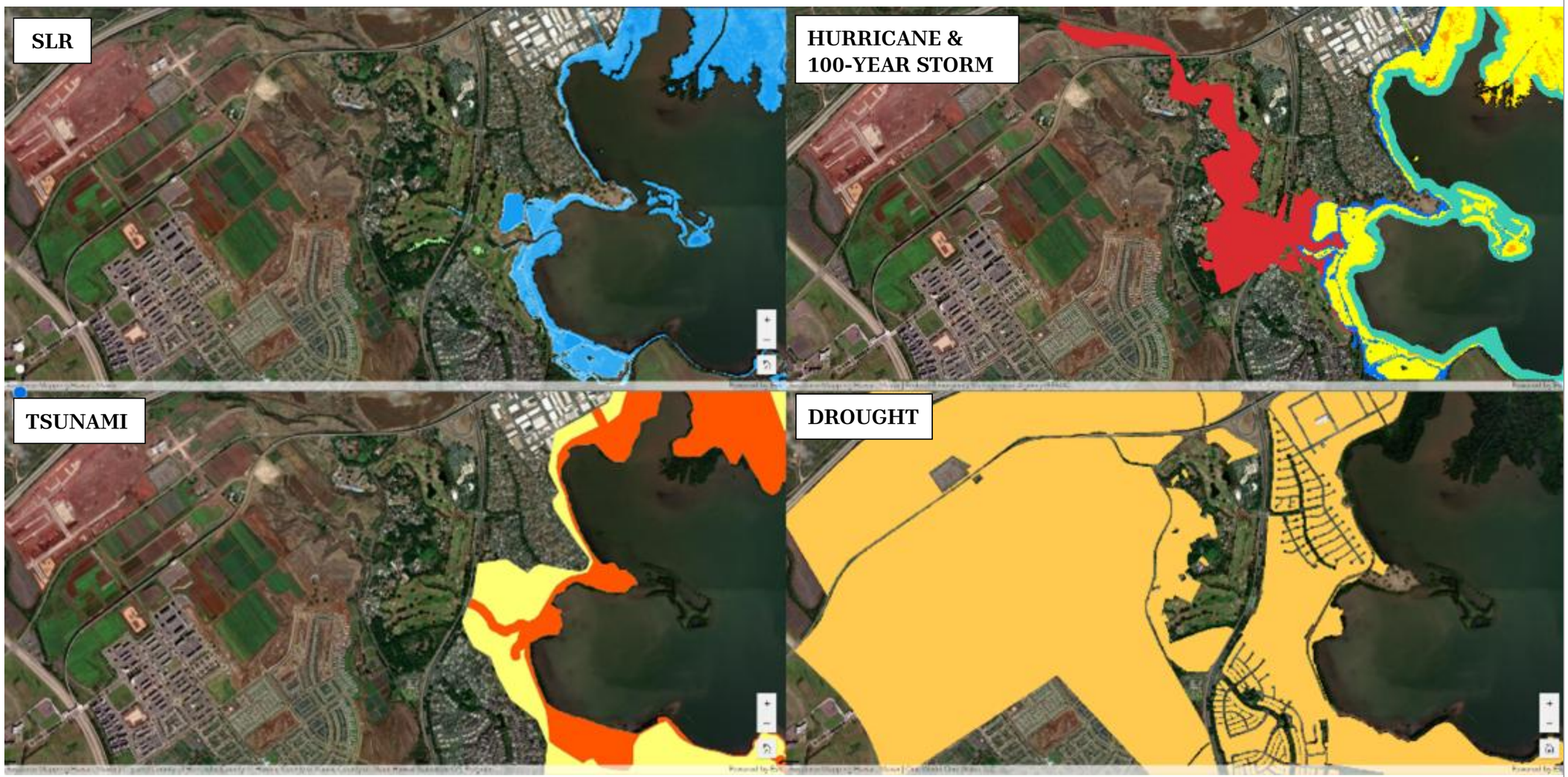
Very Low Risk

Low Risk

At Risk

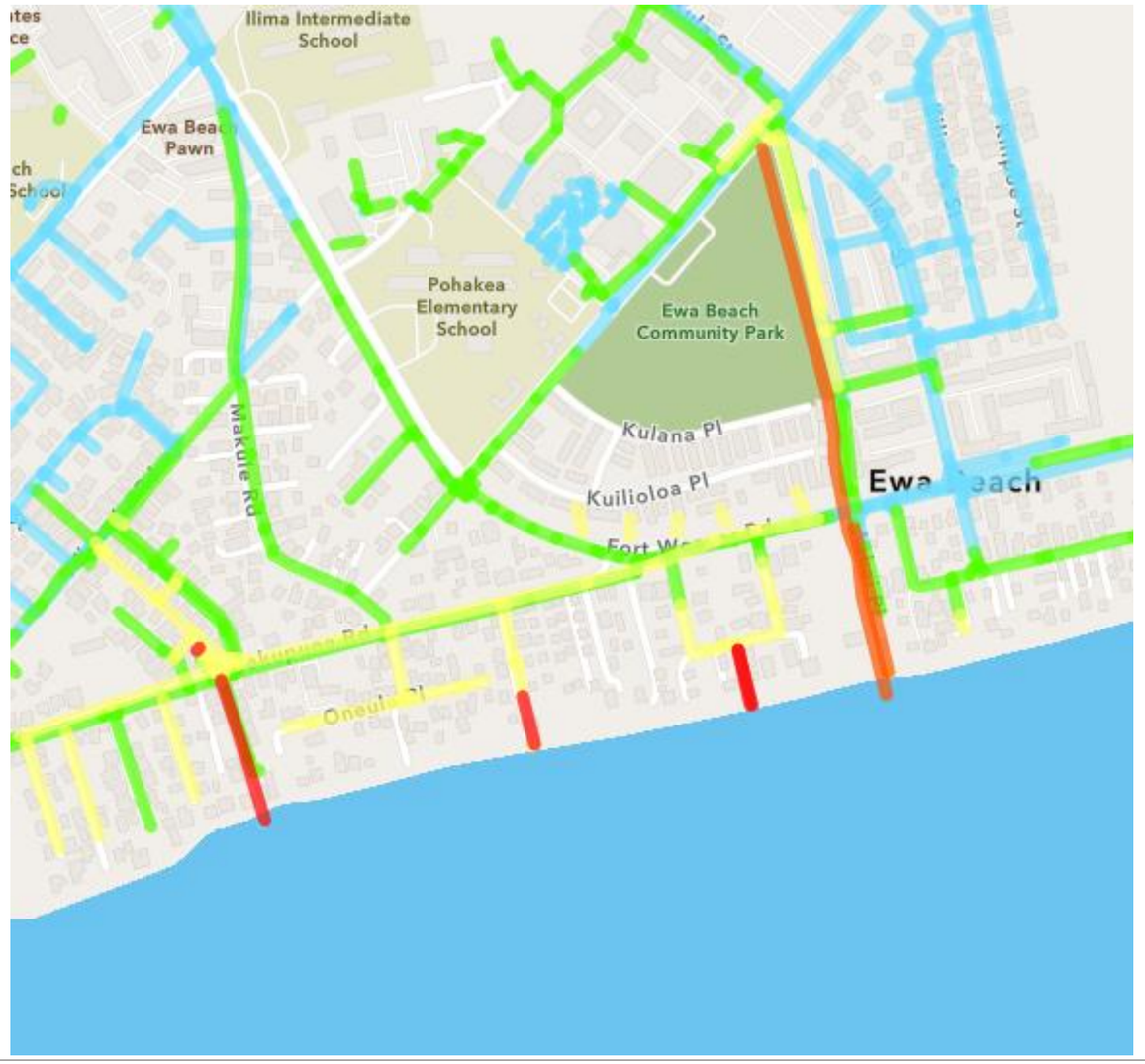
High Risk

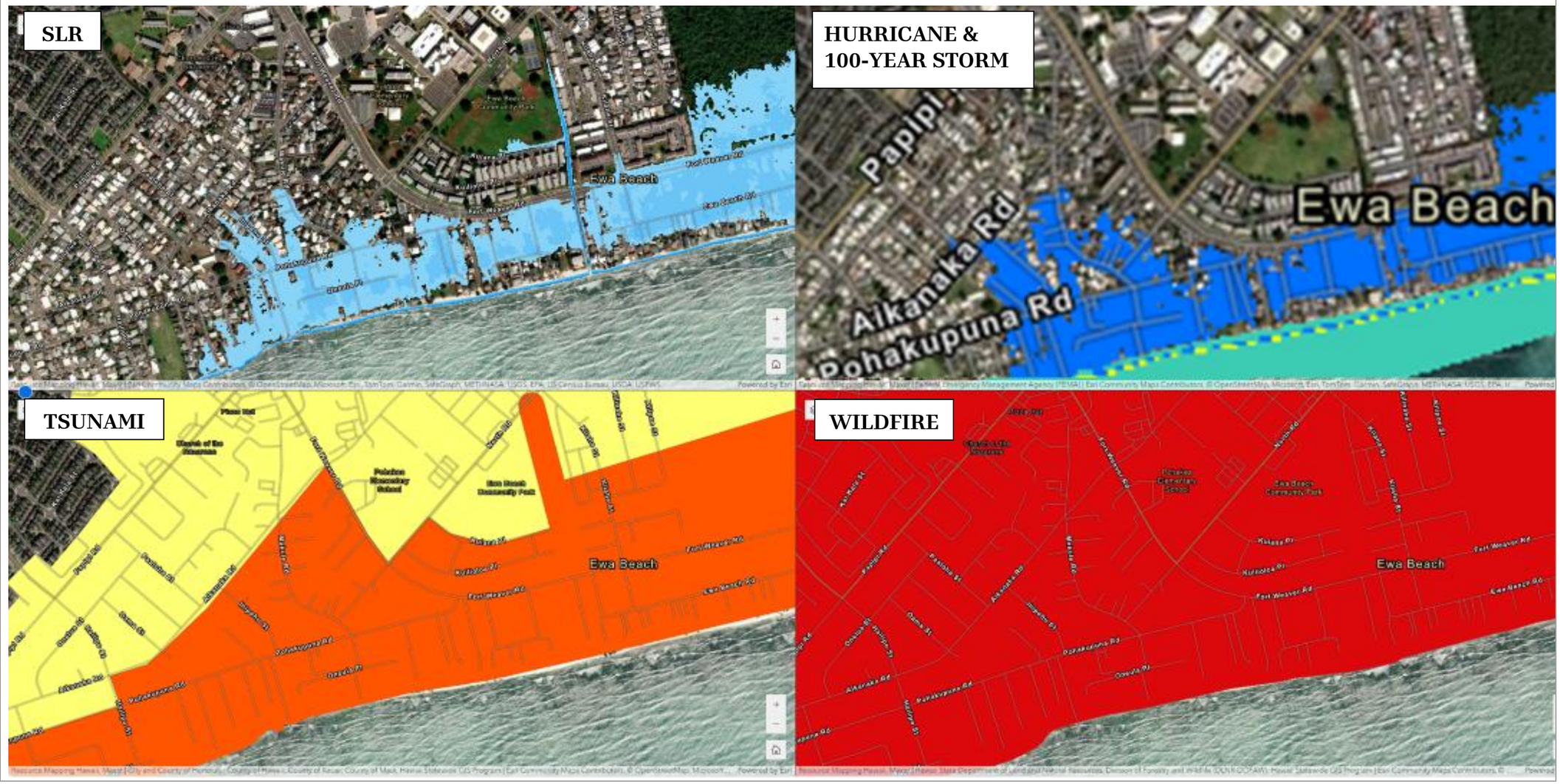
Very High Risk

Threat Maps	

Key Assets	
Wastewater	West Loch Fairways WWPS, West Loch Estates WWPS, 10 in./42 in./48 in. sewer force main, 8 in./10 in./12 in./15 in./42 in. sewer main
Stormwater	Honouliuli stream, National Wildlife reach, 18 in./24 in./30 in./36 in./42 in./48 in./60 in./66 in. SW conduits, Oʻahu Reservoir 155
Water	High risk pipelines, nearby critical wells, Kunia Wells III Treatment Plant
Major Streets	Fort Weaver Rd, Old Fort Weaver Rd, Farrington Hwy, Iroquois Rd & Waipahū Depot St, Or and L Railroad, Honouliuli Stream Bridge, Farrington Hwy/Honouliuli Stream Bridge, Fort Weaver Rd/ Honouliuli Stream Bridge, Farrington Hwy/Fort Weaver Rd Bridge
Community Assets	Naval Base, West Loch Golf Course, The Queen's Medical Center West Oʻahu, Kahi Mohala Hospital Clinic
Climate Threats	
SLR	• 80% probability of passive flooding at 5 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Partial inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Complete inundation, high risk zone
Tsunami	Within tsunami evac zone
Wildfire	No data, neighboring high fire risk area
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat risk (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Partially within dam evacuation zone (Oʻahu Reservoir 155) • Very High/High SoVI index • Nearby Hawaiʻi Homelands • Additional water sources should be developed in this area, as it imports more than half of its water needs. – Kunia and Waikele Gulch Wells (in the ʻEwa-Waipahū System)
Ongoing/Planned Projects	• None identified
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat (and potentially wildfire, but no risk data available) mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.2 'EWA BEACH/FORT WEAVER RD

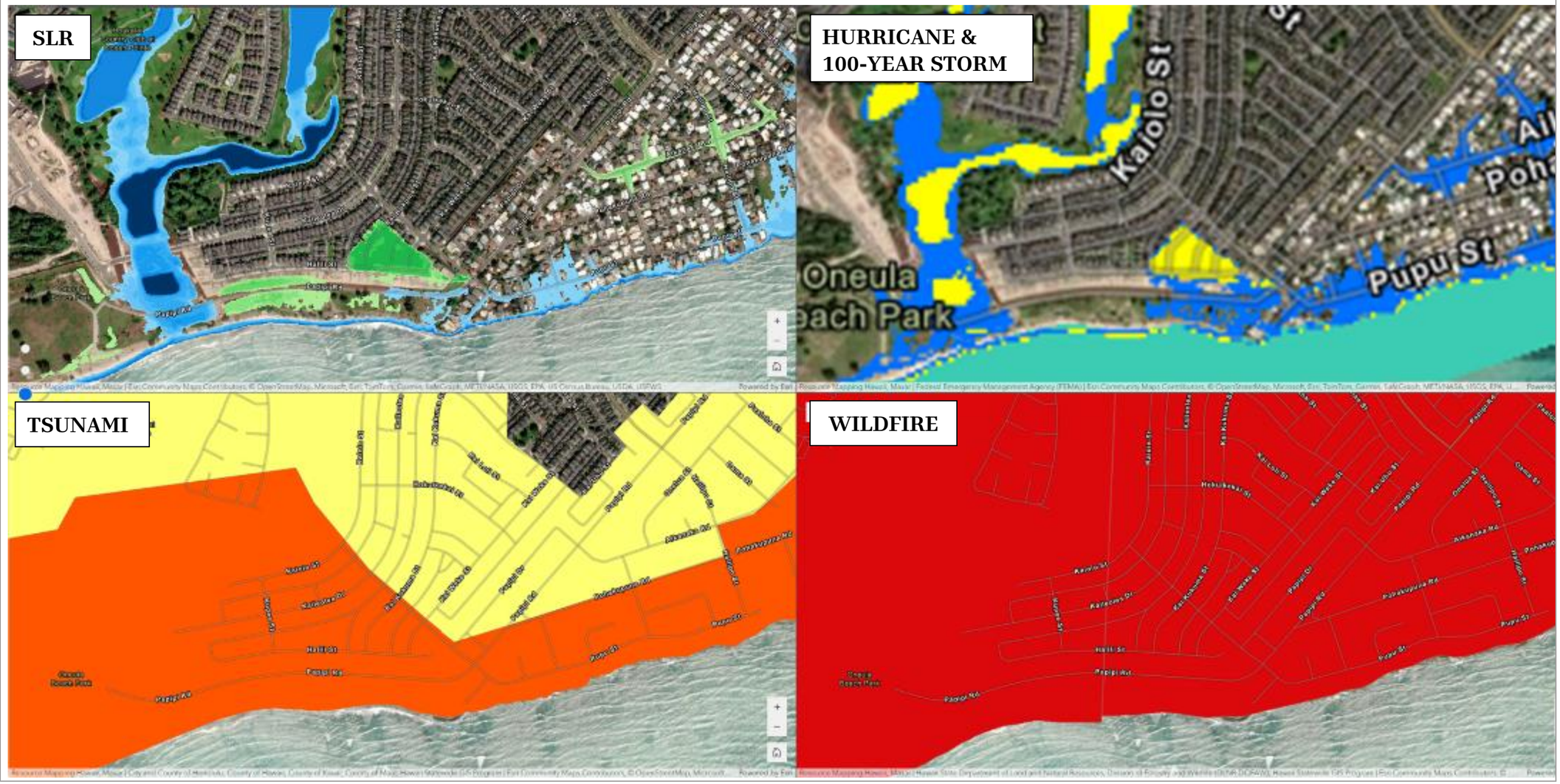
Location Information and Maps	
Location	'Ewa Beach
Risk Score Map	

Threat Maps	 SLR HURRICANE & 100-YEAR STORM TSUNAMI WILDFIRE Ewa Beach Papipi Aikanaka Rd Pohakupuna Rd

Key Assets	
Wastewater	ʻEwa Beach WWPS, 8 in./10 in./18 in./36 in. sewer main, 30 in. sewer force main
Stormwater	18 in./24 in./42 in. SW conduits
Water	High risk pipelines
Major Streets	Fort Weaver Rd
Community Assets	Pōhākea Elementary School, Kaʻimiloa Elementary School, ʻEwa Beach Elementary School, Ilima Intermediate School, Campbell High School, ʻEwa Beach Community Park, Puʻuloa Beach Park, NOAA – Pacific Tsunami Warning Center
Climate Threats	
SLR	• 80% probability of passive flooding at 6 ft of SLR • Coastal erosion at 1 ft SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Complete inundation up to 3 ft under Cat 1 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat risk (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Due to urbanization, flooding and nonpoint pollution occur, particularly where infrastructure needs upgrading – ʻEwa Plain: Low-lying region susceptible to flooding, with ongoing efforts for improved stormwater systems – Renton, Tenney, and Varona Villages: Identified for inadequate drainage and flood risks, requiring targeted infrastructure upgrades – Kaloʻi Ditch: Needs enhanced stormwater management to reduce runoff and flooding impacts
Ongoing/Planned Projects	• Honouliuli – East Kapolei R1 Reservoir and Pipeline (BWS) • Expansion of Honouliuli Water Recycled Water System (BWS with ENV & DPR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.3 PŪPŪ ST/PŪPŪ PL

Location Information and Maps	
Location	ʻEwa Beach
Risk Score Map	

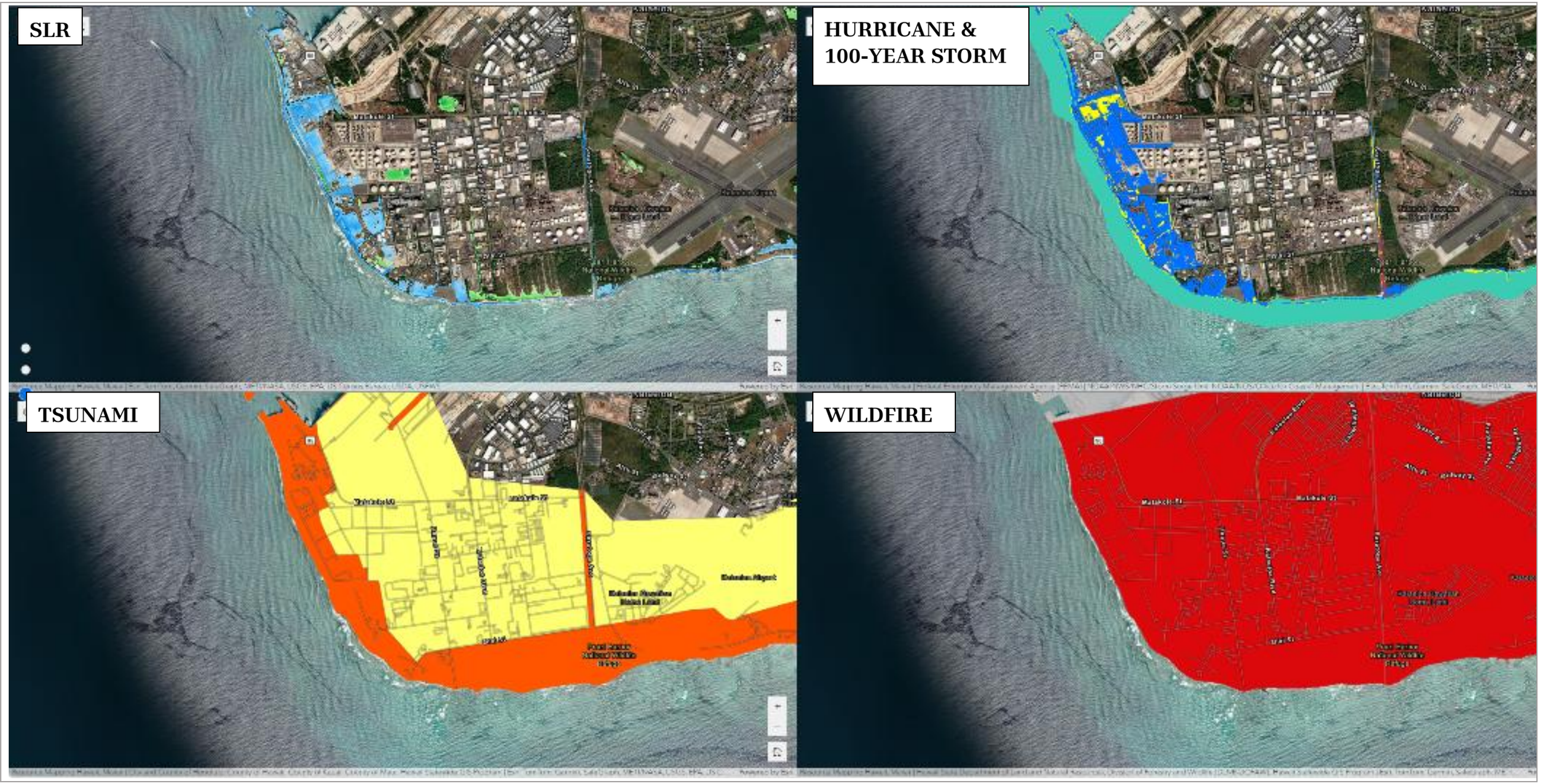
Threat Maps	 SLR HURRICANE & 100-YEAR STORM Kaiolo St Pupu St Oneula TSUNAMI WILDFIRE

Key Assets	
Wastewater	8 in./24 in. sewer mains
Stormwater	12 in./18 in./24 in./30 in./42 in./48 in. SW conduit
Water	High risk pipelines
Major Streets	Pūpū St, Pūpū Pl, Pohakupuna Rd, BROW at Paokakupuna Pl/Pūpū St, BROW at Pūpū Pl
Community Assets	One‘ula Beach Park
Climate Threats	
SLR	• 80% probability of passive flooding at 7 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • ENV – ‘Ewa Beach stormwater drainage issues • Due to urbanization, flooding and nonpoint pollution occur, particularly where infrastructure needs upgrading. – Although a distance away from Pupu St, Renton, Tenney, and Varona Villages identified for inadequate drainage and flood risks, requiring targeted infrastructure upgrades. • Erosion and sea level rise threaten coastal areas – Pūpū Place in ‘Ewa Beach
Ongoing/Planned Projects	• Conduct an analysis of adaptation or retreat options for Pūpū Pl (DPP)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term)—though some coastal adaptation planning work is underway • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.4 KALAELOA/CAMPBELL INDUSTRIAL PARK

Location Information and Maps	
Location	Campbell Industrial Park
Risk Score Map	

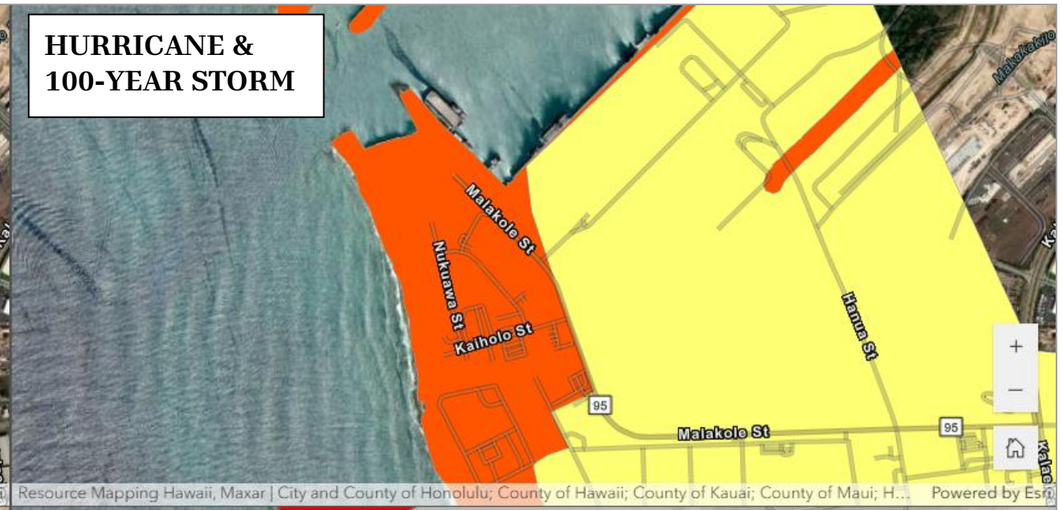
Threat Maps



Key Assets	
Wastewater	Kapolei Business Park WWPS, 8 in./10 in./12 in./14 in./15 in./30 in. sewer main, 18 in./30 in. sewer force main, no sewer lines south of Malakole St—potential federal wastewater system
Stormwater	SW channel parallel to Saratoga Ave, SW channel from Ōlaʻi St to beachfront, SW channel in Barbers Point Beach Park to beachfront, 18 in./24 in./30 in./36 in. SW conduit
Water	High risk pipelines
Major Streets	Saratoga Ave, Kalaeloa Blvd
Community Assets	Pearl Harbor National Wildlife Refuge, Barbers Point Beach Park, Kalaeloa Airport/Military Base
Climate Threats	
SLR	• Coastal erosion due to 1 ft SLR • 80% probability of passive flooding at 7 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI index • Nearby Hawaiian homelands • Due to urbanization, flooding and nonpoint pollution occur, particularly where infrastructure needs upgrading – ʻEwa Plain: Low-lying region susceptible to flooding, with ongoing efforts for improved stormwater systems
Ongoing/Planned Projects	• Kalaeloa Desal Project (BWS) • NPDES MS4 Structural BMPs for Trash Reduction – Campbell Industrial Park (DFM) • Expansion of Honouliuli Water Recycled Water System (BWS with ENV & DPR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.5 BARBERS POINT HARBOR

Location Information and Maps	
Location	Barbers Point
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	No sewer lines south of Malakole St—potential federal wastewater system
Stormwater	SW channel parallel to Nukuawa St, SW channel from Malakole St to harbor, 18 in./24 in./30 in./36 in. SW conduit
Water	Low risk pipelines
Major Streets	Malakole St
Community Assets	Barbers Point Harbor
Climate Threats	
SLR	• Coastal erosion due to 1 ft SLR • 80% probability of passive flooding at 7 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Medium SoVI index • Nearby Hawaiian homelands • Due to urbanization, flooding and nonpoint pollution occur, particularly where infrastructure needs upgrading – ʻEwa Plain: Low-lying region susceptible to flooding, with ongoing efforts for improved stormwater systems
Ongoing/Planned Projects	• Kalaeloa Desal Project (BWS) • NPDES MS4 Structural BMPs for Trash Reduction - Campbell Industrial Park (DFM) • Expansion of Honouliuli Water Recycled Water System (BWS with ENV & DPR)
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.6 KO ‘OLINA/MALAKOLE HARBOR

Location Information and Maps	
Location	Ko ‘Olina
Risk Score Map	

Threat Maps


SLR
Hale Kona
Hale Na'ia
Kai Pl
Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri


HURRICANE & 100-YEAR STORM
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, METI/...
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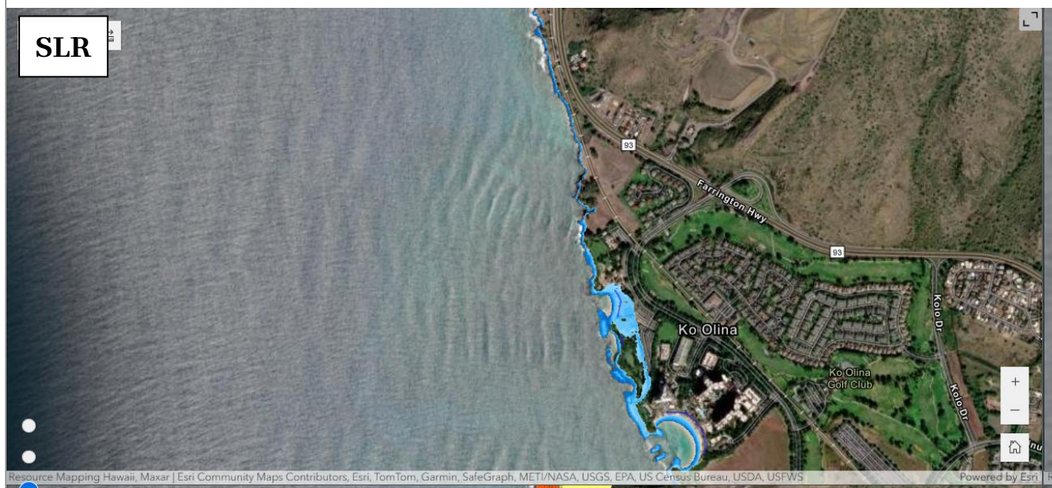
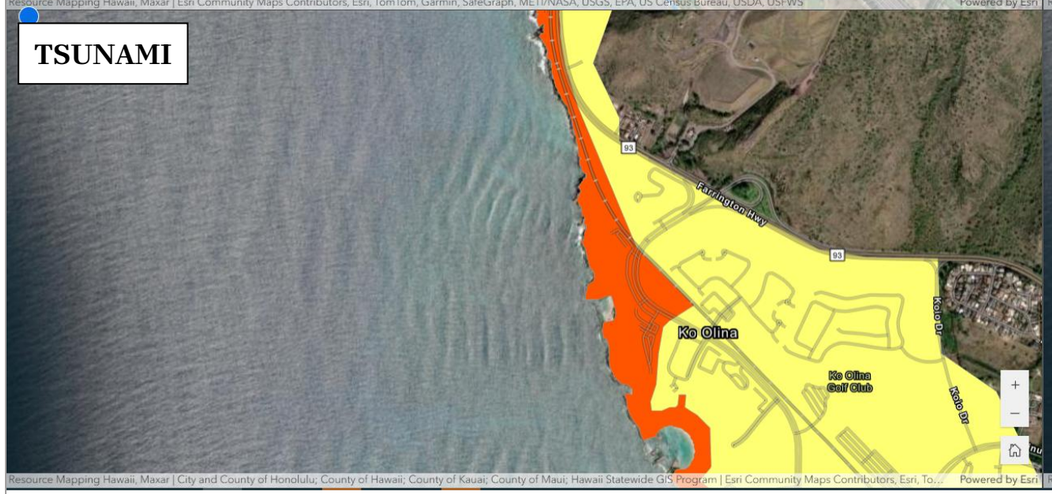

TSUNAMI
Hale Kona
Hale Na'ia
Kai Pl
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri Community Maps Contributors, © Open...
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WILDFIRE
Hale Kona
Hale Na'ia
Kai Pl
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri Community M...
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Key Assets	
Wastewater	West Beach Resort #2 WWPS, 16 in. sewer force main, 15 in./12 in./10 in. sewer mains
Stormwater	36 in./48 in./54 in./66 in./96 in. SW conduit, Ko ʻOlina Stream
Water	High risk pipelines
Major Streets	Aliʻinui Dr, Kekai Pl, Waipahē Pl
Community Assets	Malakole Harbor, Ulua Lagoon, Ko ʻOlina Beach
Climate Threats	
SLR	• Coastal erosion at 1 ft SLR • 80% probability of passive flooding at 8 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone, no data in surrounding area
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Erosion and sea level rise threaten coastal areas – Ko ʻOlina: Coastal resort area facing challenges from erosion and rising sea levels, critical for tourism resilience
Ongoing/Planned Projects	• None identified
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.7 KO ‘OLINA/FARRINGTON HWY

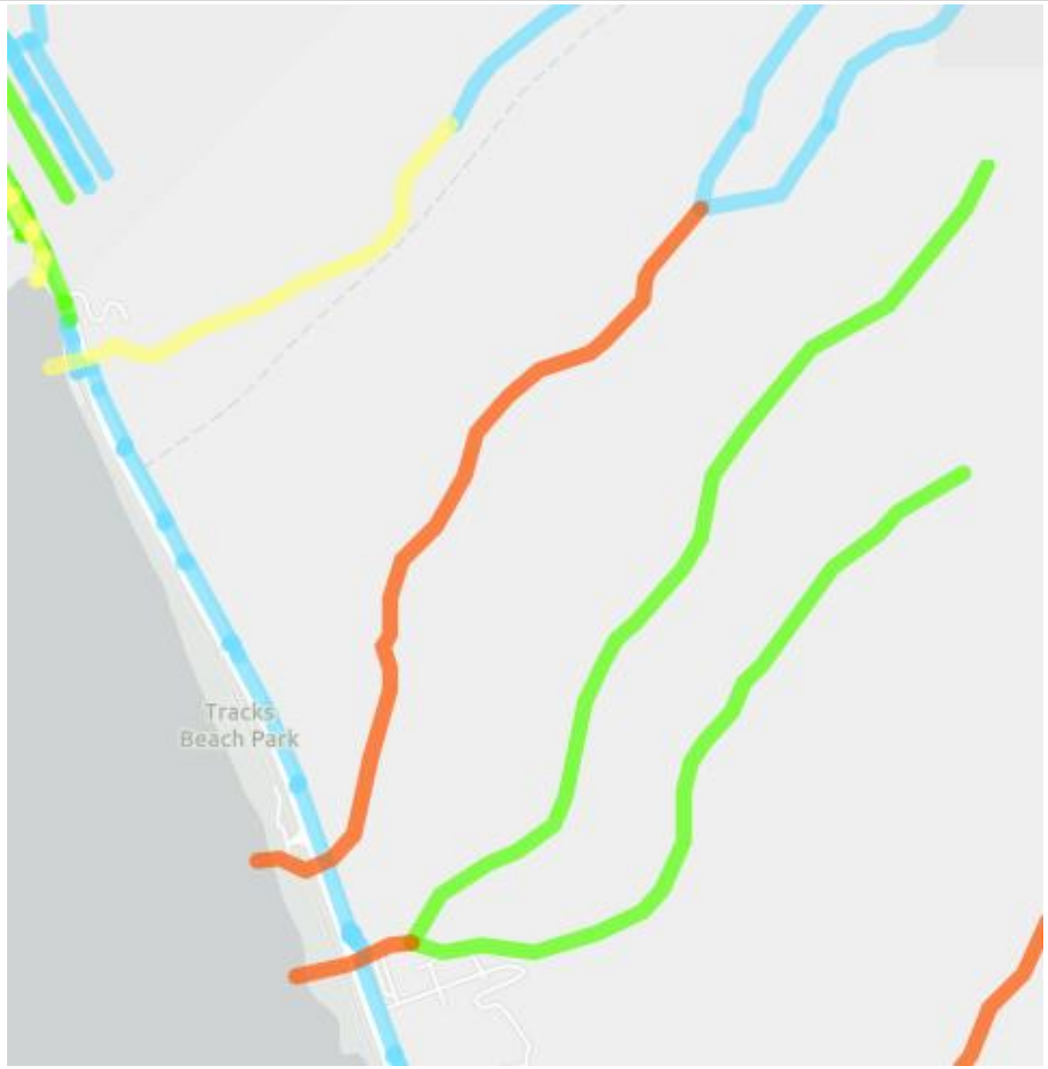
Location Information and Maps	
Location	Ko ‘Olina
Risk Score Map	

Threat Maps	   

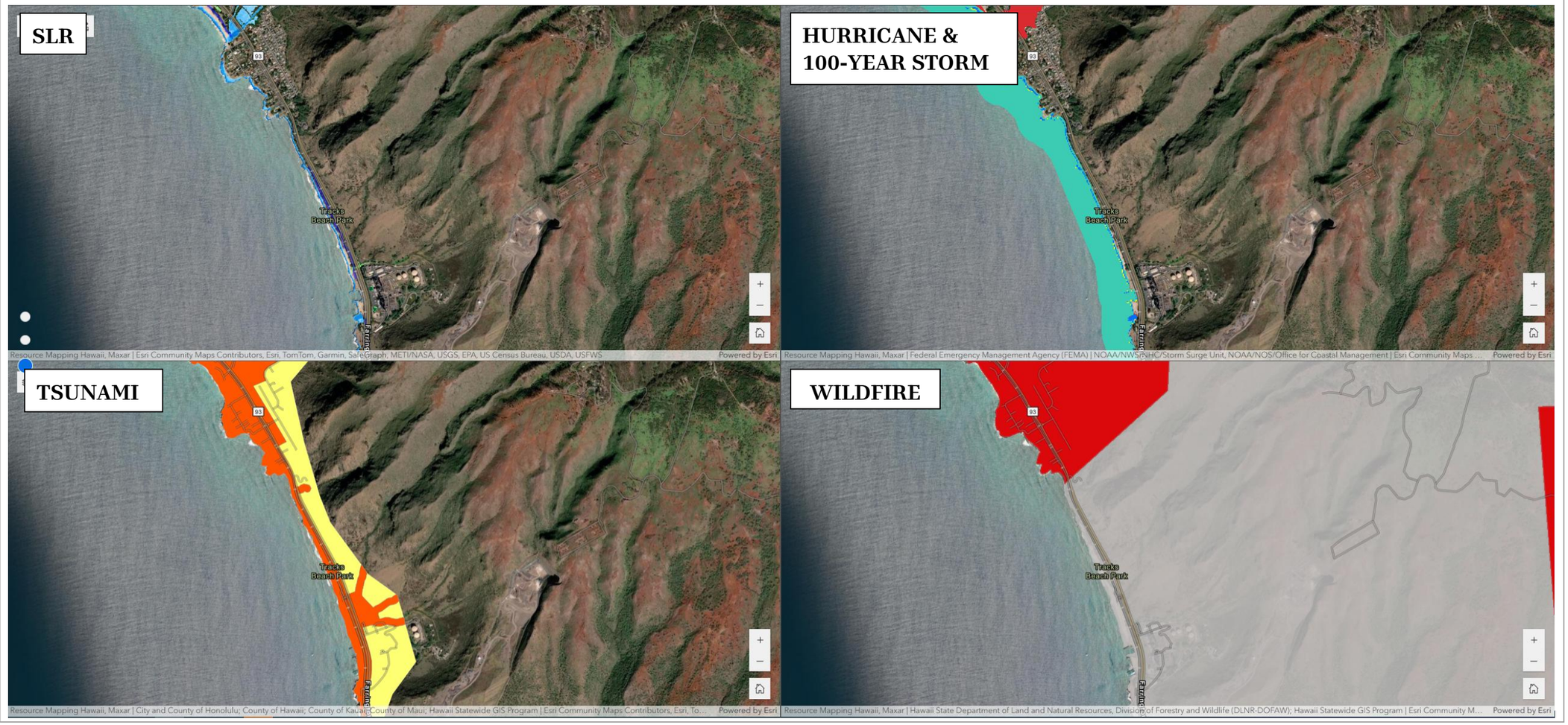
Ulua

Key Assets	
Wastewater	West Beach Resort #1 WWPS, 12 in. sewer force main, 15 in./12 in./8 in. sewer mains
Stormwater	18 in./54 in./66 in./96 in. SW conduit, Waimānalo gulch
Water	High risk pipelines
Major Streets	Farrington Hwy, Ali‘inui Dr, Military Railroad, Farrington Hwy/Ali‘inui Dr Bridge
Community Assets	Ko ‘Olina Golf Course, Resorts, Paradise Cove, Lanikūhonua Lagoon, Kohola Lagoon
Climate Threats	
SLR	• Coastal erosion at 1 ft SLR • 80% probability of passive flooding at 8 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone, no data in surrounding area
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Nearby Waimānalo Gulch Sanitary Landfill • High SoVI index • Erosion and sea level rise threaten coastal areas – Ko ‘Olina: Coastal resort area facing challenges from erosion and rising sea levels, critical for tourism resilience
Ongoing/Planned Projects	• None identified
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

7.2.8 KAHE POINT

Location Information and Maps	
Location	Ko ʻOlina/Nānākuli
Risk Score Map	

Threat Maps


SLR
HURRICANE & 100-YEAR STORM
TSUNAMI
WILDFIRE
Tracks Beach Park
Farrington
93
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Powered by Esri
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC/Storm Surge Unit, NOAA/NOS/Office for Coastal Management | Esri Community Maps ...
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Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Program | Esri Community M...
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Key Assets	
Wastewater	Lack of wastewater infrastructure
Stormwater	Piliokahe Gulch, Limaloa Gulch, Kahe Stream
Water	High risk pipelines
Major Streets	Farrington Hwy, Kahe stream/Farrington Hwy Bridge, Farrington Hwy/Piliokahe Bridge
Community Assets	Pili O Kahi (Tracks) Beach Park, Hawaiian Electric Beach, Kahe Point Beach Park
Climate Threats	
SLR	• Coastal erosion at 2 ft SLR • 80% probability of passive flooding at 8 ft of SLR • Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available
Hurricane	Partial inundation up to 3 ft under Cat 2 conditions
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High wildfire risk zone nearby, no data in immediate surrounding area
Drought	Medium drought risk zone
Extreme Heat	High afternoon extreme heat index (above 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• Nearby Hawaiian Electric Kahe Power Plant • High SoVI index • Erosion and sea level rise threaten coastal areas – Ko ʻOlina: Coastal resort area facing challenges from erosion and rising sea levels, critical for tourism resilience
Ongoing/Planned Projects	• None identified
Potential Gaps	• Flood protection (short-term) and potential relocation for residential areas (long-term) • Limited heat and wildfire mitigation efforts • Limited wind mitigation for above-ground utilities, such as powerlines

SECTION F.8: WAIʻANAE

F.8.1 CONSIDERATIONS FROM REGIONAL SUMMARY

The Waiʻanae region is predominantly rural, but also includes residential areas and commercial centers. It is home to some of the highest concentrations of Native Hawaiians on Oʻahu, alongside coastal farms and military lands within Makua Military Reservation and Lualualei Naval Magazine. Low rainfall drives dry, wildfire-prone conditions, with flash flooding risk in low-lying areas. The Waiʻanae and Mākaha Aquifer System Areas remain vital for ecosystem health and potable water. Key locations and concerns within the region are provided below. A complete regional summary can be found in Appendix C.8.

F.8.1.1 SPECIFIC LOCATIONS

Several communities and waterways across Waiʻanae face compounding challenges from flash flooding, water quality degradation, saltwater intrusion, and wildfire risk.

- Flash flooding occurs along streams and affects the roadway network, including **Farrington Highway and bridges, Kili Drive and other local Mākaha roads, Kepuʻe Street, Water Street, Mākaha Stream, and oceanfront drainage outlets**.
- Excessive sedimentation and pollution from nonpoint sources and impervious surfaces threaten the health of the ecosystem, streams, and nearshore waters, including **Mākaha Stream, Nānākuli, Lualualei, coastal areas/nearshore waters, anchialine ponds**.
- Saltwater inundation is threatening potable and brackish water sources.
  - **Nānākuli Shaft**
  - **Lualualei Shaft**
- Large areas of Waiʻanae are subject to Public Safety Power Shutoff (PSPS) by the Hawaiian Electric Company (HECO) during periods of high risk of wildfire and wildfire prevention is needed.
  - **Waiʻanae**
  - **Nānākuli**
  - **Maile**
  - **Mākaha**
- **Waiʻanae Stream and Valley** face challenges in water quality and managing perennial streams essential for local wildlife.

F.8.1.2 GENERAL CONCERNS ACROSS THE REGION

Beyond specific locations, Waiʻanae faces broader challenges related to aging infrastructure, water quality, and wildfire preparedness.

- Existing and future **development puts pressure on water and wastewater** infrastructure. **Stormwater/drainage** infrastructure is also affected.
- Cesspools contribute to **groundwater and nearshore water pollution**.
- There is a general need for **greater wildfire prevention and protection measures** both in land use/management and building designs and materials used.

F.8.2 IDENTIFIED HOTSPOTS

8.2.1 NĀNĀKULI STREAM

Location Information and Maps	
Location	Nānākuli
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

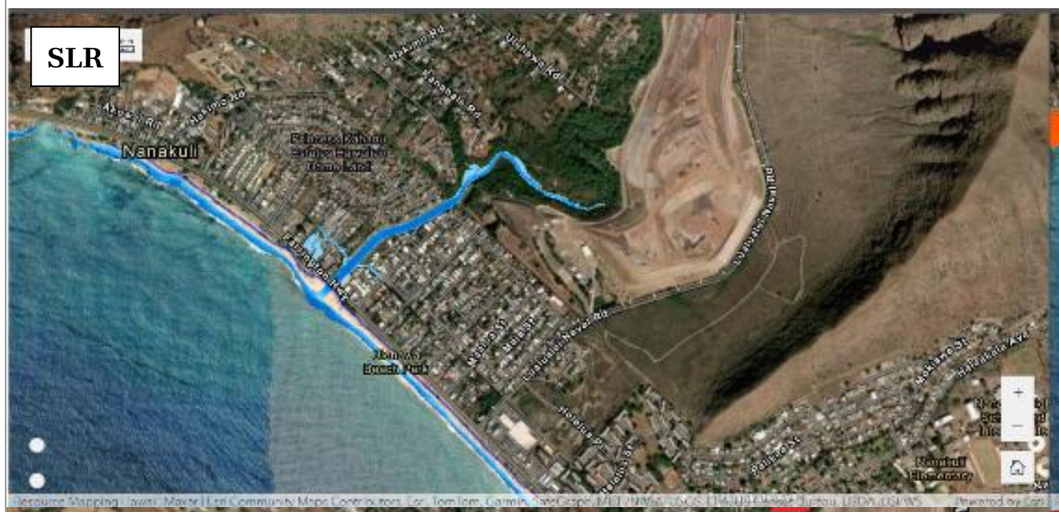
Threat Maps	   

Key Assets	
Wastewater	Nānākuli WWPS, 12 in. force main, 10 in./12 in./15 in./24 in. sewer main
Stormwater	Nānākuli Stream, Nānāikapono Stream, 18 in./24 in./30 in./36 in./42 in./48 in./54 in./60 in. SW conduits
Water	High risk pipelines
Major Streets	Farrington Hwy, Farrington Hwy/Nānāikapono Stream, Farrington Hwy/Nānākuli Stream Bridges
Community Assets	Nānākuli Beach, Ka Waihona o ka Naʻauao NCPCS Public School, Nānākuli Public Elementary School, Nānāikapono Elementary School, Nānākuli Public High and Intermediate School, Nānākuli Fire Station 28
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 7 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 3 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Hawaiian homestead • Water quality issues influenced by large, unhoused population (including potential challenges for rehabilitation in this area) • Sand berms at Ulehawa Channel • Loss of shoreline access, roadway accessibility • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation • Large areas of Waiʻanae are subject to PSPS by HECO during periods of high risk of wildfire and wildfire prevention is needed – Nānākuli • Saltwater inundation is threatening potable and brackish water sources – Nānākuli Shaft

Ongoing/Planned Projects	• BWS has a project to slip line a parallel transmission main in the old W24" that was taken out of service • Ulehawa Channel Dredging • Drought mitigation: Pursuing designation of the Waiʻanae Aquifer Sector Area as a Ground Water Management Area (BWS), Waiʻanae Watershed Management Plan Update (in progress, BWS)
Potential Gaps	• Current water quality issues (natural and human factors) • Sand berm breaching limited to during emergency conditions • Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines • Flood protection and potential relocation for residential areas (long-term)

3.2.2 ULEHAWA STREAM

Location Information and Maps	
Location	Nānākuli
Risk Score Map Very Low Risk Low Risk At Risk High Risk Very High Risk	

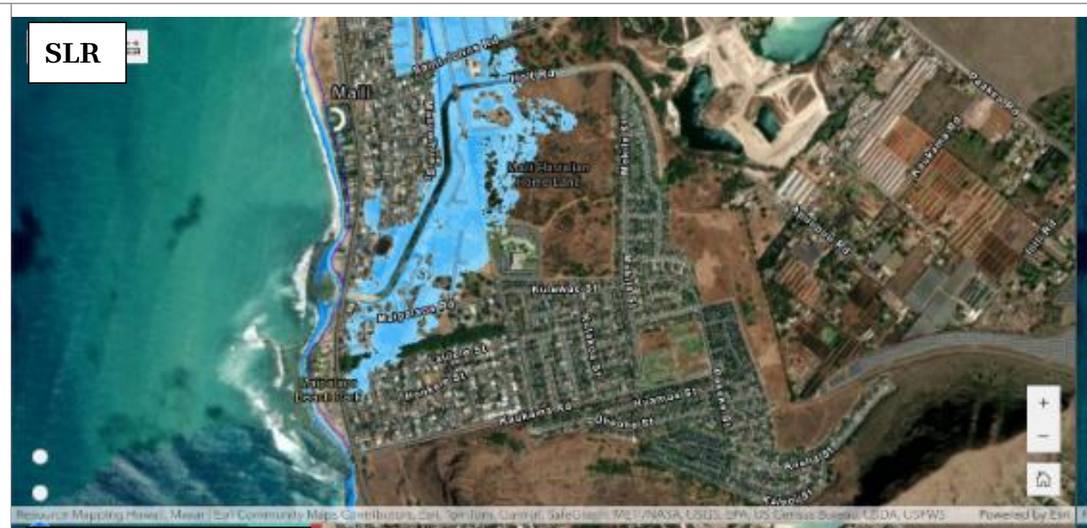
Threat Maps	   

Key Assets	
Wastewater	Lualualei WWPS, 10 in./12 in./24 in. sewer main, 12 in./20 in. force main
Stormwater	Ulehawa stream, 12 in./18 in./24 in./30 in./36 in./42 in./48 in. SW conduits
Water	High risk pipelines
Major Streets	Farrington Hwy, Princess Kahanu Ave, Mohihi St/Ulehawa Channel Bridge, Kahau Pl/Ulehawa Channel Bridge, Auyong Homestead Rd/Ulehawa Channel Bridge, Maʻaloa St/Ulehawa Channel Bridge, Aulani Pl, Maʻaloa St
Community Assets	Ulehawa Beach Park, Kaiser Nānāikeola Clinic
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 7 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Hawaiian homestead • Water quality issues influenced by large, unhoused population (incl. potential challenges for rehabilitation in this area) • Sand berms at Ulehawa Channel • Loss of shoreline access, roadway accessibility • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation • Large areas of Waiʻanae are subject to PSPS by HECO during periods of high risk of wildfire and wildfire prevention is needed – Nānākuli • Saltwater inundation is threatening potable and brackish water sources. – Nānākuli Shaft

Ongoing/Planned Projects	• BWS has a project to slip line a parallel transmission main in the old W24 that was taken out of service • Ulehawa Channel Dredging • Drought mitigation: Pursuing designation of the Waiʻanae Aquifer Sector Area as a Ground Water Management Area (BWS), Waiʻanae Watershed Management Plan Update (in progress, BWS)
Potential Gaps	• Current water quality issues (natural and human factors) • Sand berm breaching limited to during emergency conditions • Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines • Flood protection and potential relocation for residential areas (long-term)

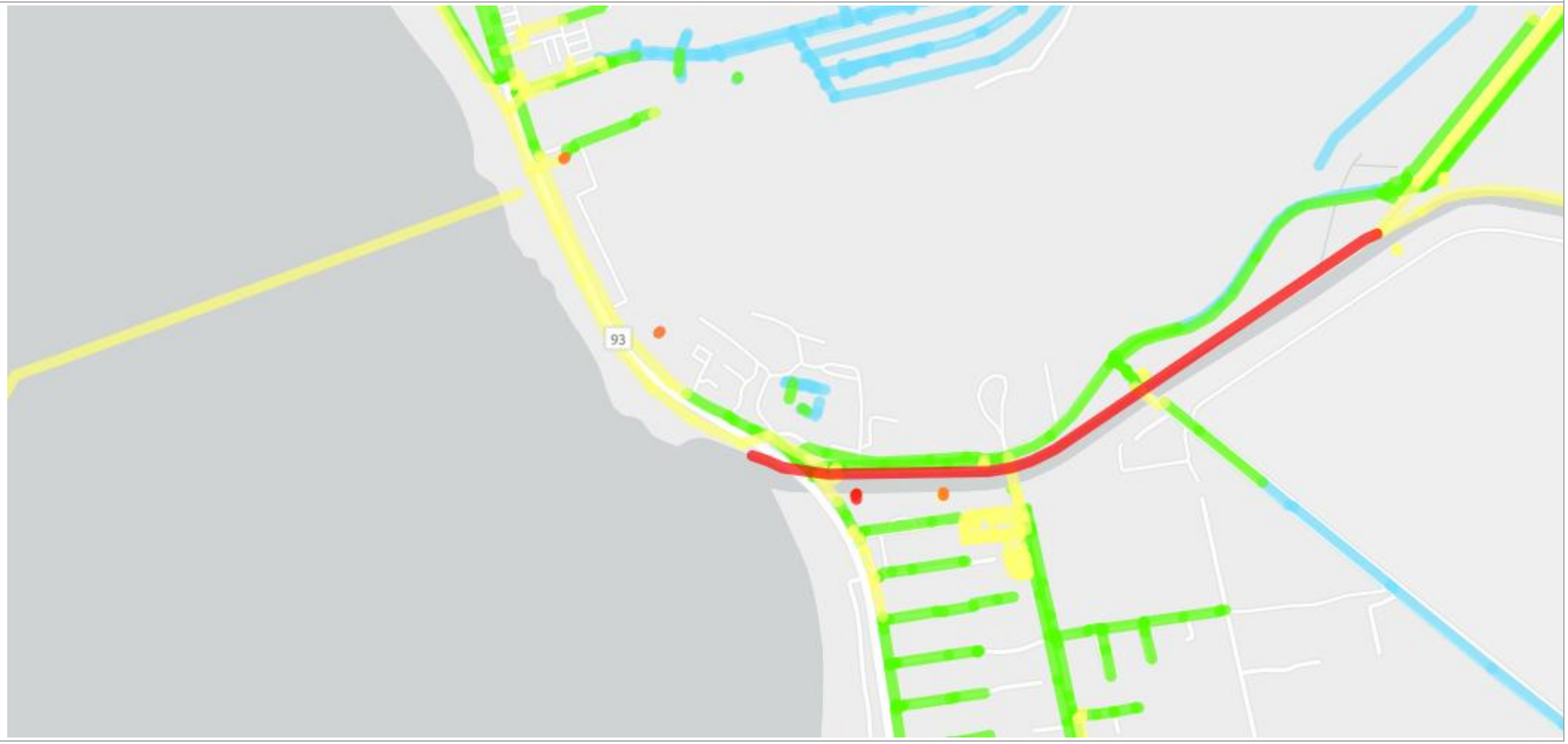
3.2.3 MĀʻILI

Location Information and Maps	
Location	Māʻili
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	10 in./18 in./21 in./24 in./30 in./36 in. sewer main
Stormwater	Maipalaoa Stream, 18 in./24 in./30 in./36 in./48 in. SW conduits
Water	High risk pipelines, nearby BWS Water Base Yard
Major Streets	Farrington Hwy, Hoʻokele St, Maipalaoa Rd, Manuaihue St, St Johns Rd Bridge, Kulaʻaupuni St Bridge, Farr Hwy/Maipalaoa Strean Bridge, Maʻaloa St/Māʻili Channel Bridge
Community Assets	Māʻili Public Elementary School, Māʻili Bible Private School, Maipalaoa Beach, Māʻili Beach Park
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 7 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Hawaiian homelands • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation
Ongoing/Planned Projects	• Drought mitigation: Pursuing designation of the Waiʻanae Aquifer Sector Area as a Ground Water Management Area (BWS), Waiʻanae Watershed Management Plan Update (in progress, BWS)
Potential Gaps	• Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited drainage backflow mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines • Flood protection and potential relocation for residential areas (long-term)

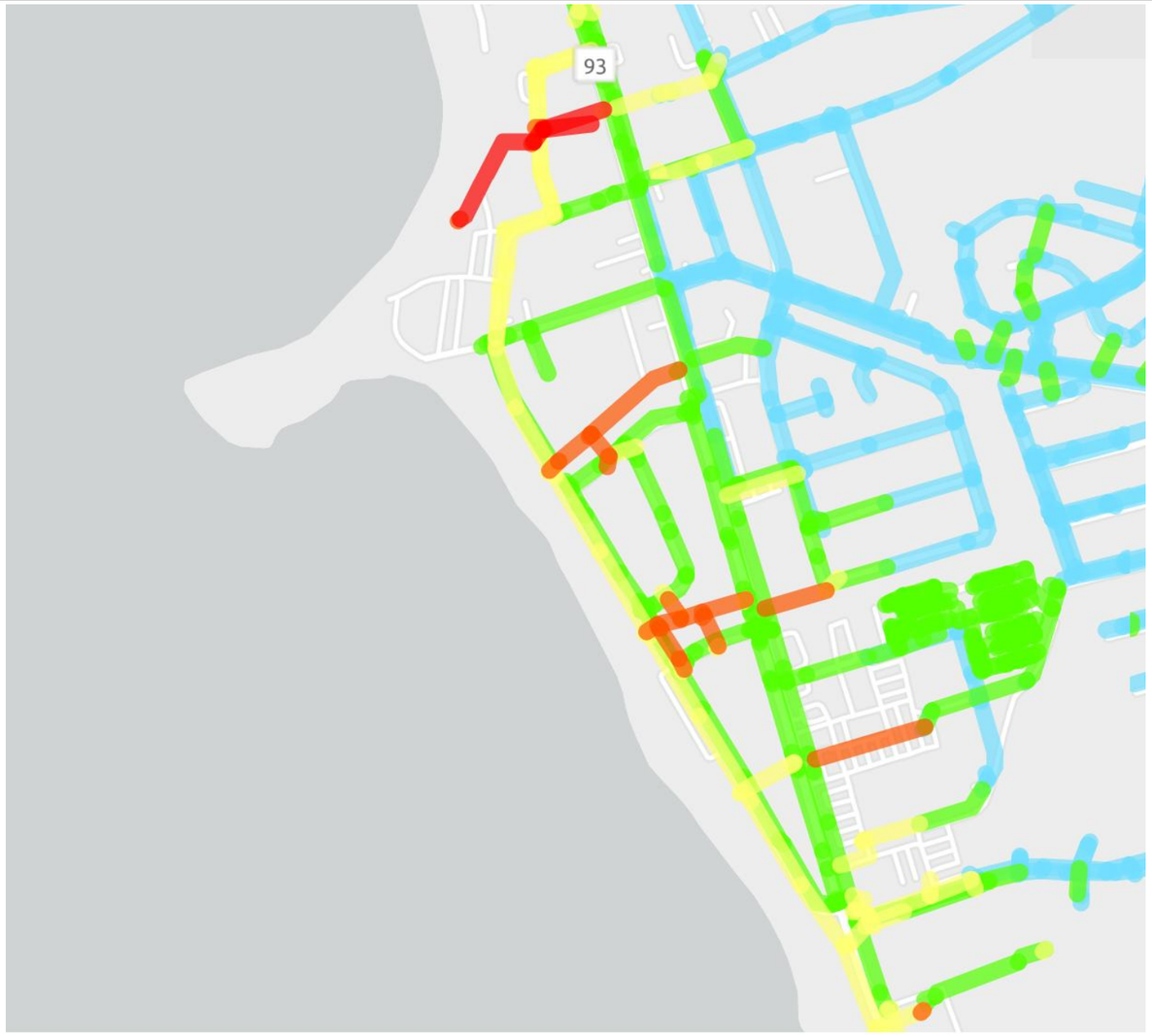
3.2.4 MĀʻILIʻILI STREAM AND WAIʻANAE WWTP

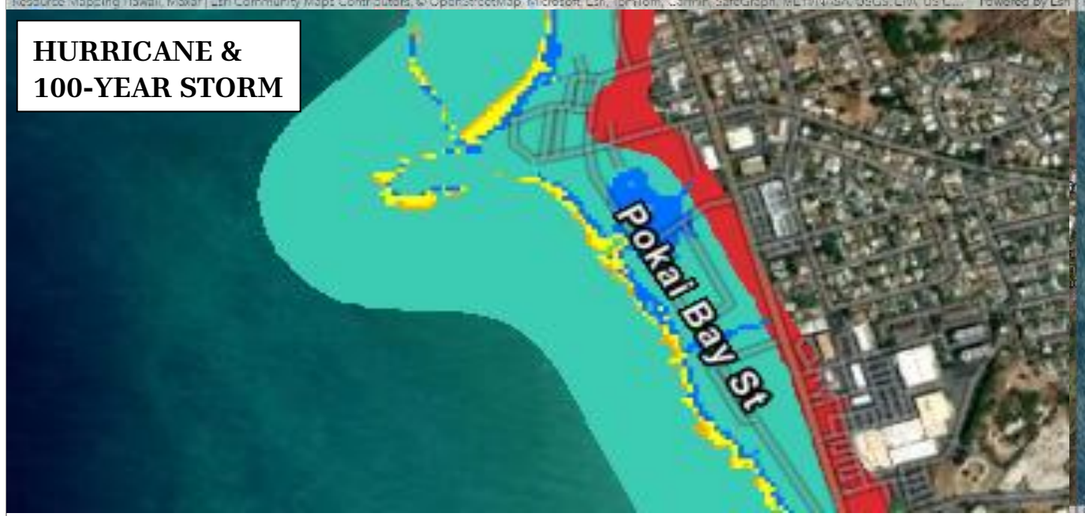
Location Information and Maps	
Location	Māʻili
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	Waiʻanae WWTP, Waiʻanae WWTP Influent PS, Waiʻanae WWTP 36 in. outfall, 36 in./42 in. sewer main, 18 in./24 in. sewer force main
Stormwater	18 in./24 in. SW conduits, Māʻiliʻilii Stream, Lualualei Reservoir, DFM Road Maintenance Base Yard
Water	Very high risk/high risk pipelines
Major Streets	Farrington Hwy, Farr Hwy/Māʻiliʻilii Stream Bridge, Paʻakea Rd/Māʻiliʻilii Channel Bridge, Māʻiliʻilii Rd/Māʻiliʻilii Channel Bridge, Māʻiliʻilii Rd
Community Assets	Waiʻanae Coast Comprehensive Health Center, Malila Beach
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 8 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 1 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Hawaiian homelands • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation
Ongoing/Planned Projects	• Drought mitigation: Pursuing designation of the Waiʻanae Aquifer Sector Area as a Ground Water Management Area (BWS) • Waiʻanae Watershed Management Plan Update (in progress, BWS) • Waiʻanae Wastewater Treatment Plant improvements and upgrades were recently completed (ENV)
Potential Gaps	• Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited drainage backflow mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines • Flood protection and potential relocation for residential areas (long-term)

3.2.5 PŌKAʻI BAY STREET

Location Information and Maps	
Location	Waiʻanae
Risk Score Map	

Threat Maps	 SLR Waianae Valley Rd Lualualei Homestead Rd Alamihi St Anolipo St Farrington Hwy Pokai Bay St Moeliu St Lehua St Lehoku St Pokaikena Way Waianae Kai Hawaiian Home Land  TSUNAMI Waianae Valley Rd Lualualei Homestead Rd Alamihi St Anolipo St Pokai Bay St Farrington Hwy Moeliu St Lehua St Lehoku St Pokaikena Way Waianae Kai Hawaiian Home Land  HURRICANE & 100-YEAR STORM Pokai Bay St  WILDFIRE Waianae Valley Rd Lualualei Homestead Rd Alamihi St Anolipo St Pokai Bay St Farrington Hwy Moeliu St Lehua St Lehoku St Pokaikena Way Waianae Kai Hawaiian Home Land

Key Assets	
Wastewater	10 in./12 in./36 in. sewer main
Stormwater	18 in./24 in./30 in. SW conduits
Water	High risk pipelines
Major Streets	Farrington Hwy, Pōkaʻī Bay St
Community Assets	Adventist Mālama Private Elementary School, Pōkaʻī Bay, Kūʻīlioloa Heiau, Waiʻanae police substation, Lualualei Beach Park, Pōkaʻī Bay Beach Park, DPR Adopt A Park agreement with Kingdom Pathways (Kuilioloa Heiau Waimea Bay/Pūpūkea)
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 4 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 3 conditions, some areas greater than 3 ft, some areas greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Hawaiian homelands • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation • Large areas of Waiʻanae are subject to PSPS by HECO during periods of high risk of wildfire and wildfire prevention is needed. – Waiʻanae
Ongoing/Planned Projects	• Pōkaʻi Bay Street Box Culvert Improvements • Drought mitigation: Pursuing designation of the Waiʻanae Aquifer Sector Area as a Ground Water Management Area (BWS), Waiʻanae Watershed Management Plan Update (in progress, BWS)
Potential Gaps	• Limited drainage backflow mitigation measures • Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines

	• Flood protection and potential relocation for residential areas (long-term)

3.2.6 SHINYEI NAKAMINE AND 100TH INFANTRY BATTALION WAI'ANAE DISTRICT PARK

Location Information and Maps	
Location	Wai'anae
Risk Score Map	

Threat Maps	   

Key Assets	
Wastewater	12 in./21 in./42 in. sewer main
Stormwater	15 in./18 in./24 in./30 in./36 in./42 in./54 in. SW conduits, Kaupuni Stream, Kawiwi Stream
Water	Very high risk/high risk pipelines
Major Streets	Farrington Hwy, Farr Hwy/Kaupuni Stream Bridge, Plantation Rd/Kaupuni Channel Bridge, Kāwili St/Kaupuni Channel Bridge
Community Assets	DOT Base Yard, Herbert K. Pililā‘au Community Park, Shinyei Nakamine and 100th Infantry Battalion Wai‘anae District Park, Wai‘anae Fire Station 26, Wai‘anae Public Elementary School, Wai‘anae Public Intermediate School, Kamaile Public Elementary School, Wai‘anae Public High School, Wai‘anae Boat Harbor, Pōka‘i Bay
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 8 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 3 conditions, some areas greater than 3 ft, and some greater than 6 ft
100-Year Storm	Partial inundation
Tsunami	Within extreme tsunami evac zones
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High priority cesspools • High SoVI index • Hawaiian homelands • Potential community displacement
Ongoing/Planned Projects	• Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation • Drought mitigation: Pursuing designation of the Wai‘anae Aquifer Sector Area as a Ground Water Management Area (BWS), Wai‘anae Watershed Management Plan Update (in progress, BWS)
Potential Gaps	• Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited drainage backflow mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines

	• Flood protection and potential relocation for residential areas (long-term)

3.2.7 MAUNA LAHILAHI/PAPAONEONE BEACH

Location Information and Maps	
Location	Mākaha
Risk Score Map	

Threat Maps	 SLR Makaha Makaha Elementary School Makaha Valley Hawaiian Home Land Maunalahilahi Botanical Garden Maunalahilahi Beach Park Water St Upena St Ikuone Pl Nohollo Rd Makaha Valley Rd Mokuhano St Jade St Lahaina St Hanai St Kaulawaha Rd Kaulawaha Rd Kaulilli Rd Hana St Makaha Valley Rd Maiuu Rd Mahinaau Rd Resource Mapping Hawaii, Maxar | Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS Powered by Esri  TSUNAMI Makaha Makaha Elementary School Makaha Valley Hawaiian Home Land Maunalahilahi Botanical Garden Maunalahilahi Beach Park Water St Upena St Ikuone Pl Nohollo Rd Makaha Valley Rd Mokuhano St Jade St Lahaina St Hanai St Kaulawaha Rd Kaulawaha Rd Kaulilli Rd Hana St Makaha Valley Rd Maiuu Rd Mahinaau Rd Resource Mapping Hawaii, Maxar | City and County of Honolulu, County of Hawaii, County of Kauai, County of Maui, Hawaii Statewide GIS Program | Esri Community Powered by Esri  HURRICANE & 100-YEAR STORM Maunalahilahi Botanical Garden  WILDFIRE Makaha Makaha Elementary School Makaha Valley Hawaiian Home Land Maunalahilahi Botanical Garden Maunalahilahi Beach Park Water St Upena St Ikuone Pl Nohollo Rd Makaha Valley Rd Mokuhano St Jade St Lahaina St Hanai St Kaulawaha Rd Kaulawaha Rd Kaulilli Rd Hana St Makaha Valley Rd Maiuu Rd Mahinaau Rd

Key Assets	
Wastewater	10 in./12 in./15 in./30 in. sewer main
Stormwater	18 in./24 in./SW conduits, Eku Stream
Water	High risk pipelines, nearby wells
Major Streets	Farrington Hwy, Lahilahi St, Mākaha #2A Bridge, Mākaha #2 Bridge
Community Assets	Mauna Lahilahi Beach, Papaoneone Beach, Maunalahilahi Botanical Garden
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 9 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Partial inundation up to 3 ft under Cat 3 conditions, some areas greater than 3 ft, and some greater than 6 ft
100-Year Storm	Complete inundation
Tsunami	Within tsunami evac zone
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • Nearby Hawaiian homestead • High priority cesspools • Loss of shoreline access, roadway accessibility • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation • Local Mākaha Roads: Essential for community access and connectivity, these roads require improvements to address flooding and capacity issues (Kepuʻe and Water Street specifically noted)
Ongoing/Planned Projects	• Mauna Lahilahi coastal erosion • Drought mitigation: Pursuing designation of the Waiʻanae Aquifer Sector Area as a Ground Water Management Area (BWS), Waiʻanae Watershed Management Plan Update (in progress, BWS)

Potential Gaps	• Limited drainage backflow mitigation measures • Water quality issues from cesspool and other onsite waste sites • Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines • Flood protection and potential relocation for residential areas (long-term)

3.2.8 MĀKAHA STREAM/FARRINGTON HWY

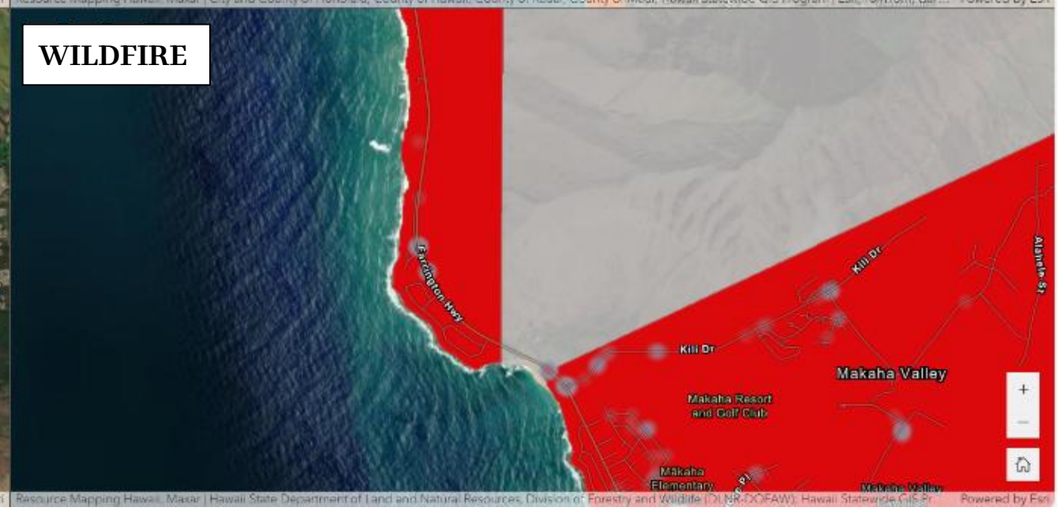
Location Information and Maps	
Location	Mākaha Stream/Farrington Hwy
Risk Score Map	

Threat Maps


SLR
Farrington Hwy
Kili Dr
Alahele St
Makaha Valley
Makaha Resort and Golf Club
Makaha Elementary
Resource Mapping Hawaii, Maxar | Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, USFWS
Powered by Esri


TSUNAMI
Farrington Hwy
Kili Dr
Alahele St
Makaha Valley
Makaha Resort and Golf Club
Makaha Elementary
Resource Mapping Hawaii, Maxar | City and County of Honolulu; County of Hawaii; County of Kauai; County of Maui; Hawaii Statewide GIS Program | Esri, TomTom, Gar...
Powered by Esri


HURRICANE & 100-YEAR STORM
Farrington Hwy
Kili Dr
Alahele St
Makaha Valley
Makaha Resort and Golf Club
Makaha Elementary
Resource Mapping Hawaii, Maxar | Federal Emergency Management Agency (FEMA) | NOAA/NWS/NHC Storm Surge Unit, NOAA/NOS/Office for Coastal Manageme...
Powered by Esri


WILDFIRE
Farrington Hwy
Kili Dr
Alahele St
Makaha Valley
Makaha Resort and Golf Club
Makaha Elementary
Resource Mapping Hawaii, Maxar | Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW); Hawaii Statewide GIS Pr...
Powered by Esri

Key Assets	
Wastewater	10 in./12 in./15 in./18 in./30 in. sewer main
Stormwater	18 in./24 in./42 in./48 in./54 in./60 in. SW conduits, Mākaha Stream North & South, Keaau Stream
Water	High priority water lines
Major Streets	Farrington Hwy, Mākaha #3A Bridge, Mākaha #3 Bridge, Farr Hwy/Waikomo Stream Bridge, BROW at Moua St, BROW at Upena St, BROW at Makau St
Community Assets	Mākaha Beach Park, nearby Mākaha Community Park, nearby Mākaha Public Elementary School, nearby Mākaha Resort and Golf Club
Climate Threats	
SLR	• Groundwater inundation data in this area not available • Annual high wave-driven flooding data in this area not available • 80% probability of passive flooding at 7 ft SLR • Coastal erosion at 1 ft SLR
Hurricane	Complete inundation up to 3 ft under Cat 2 conditions, some areas greater than 3 ft
100-Year Storm	Partial inundation
Tsunami	Within tsunami evac zone
Wildfire	High risk
Drought	Medium risk
Extreme Heat	Extreme afternoon heat index (greater than 90 °F)
Known Areas of Concern Inputs	
Other Risks/Issues	• High SoVI index • High priority cesspools • Within dam evacuation zone • Nearby Hawaiian homelands • Potential community displacement • Farrington Highway noted as critical for flood prevention during heavy rains/coastal inundation • Local Mākaha Roads: Essential for community access and connectivity, these roads require improvements to address flooding and capacity issues (Kepu‘e and Water Street and Kili Drive specifically noted)
Ongoing/Planned Projects	• Drought mitigation: Pursuing designation of the Wai‘anae Aquifer Sector Area as a Ground Water Management Area (BWS), Wai‘anae Watershed Management Plan Update (in progress, BWS)

Potential Gaps	• Water quality issues from cesspool and other onsite waste sites • Community impacts during a storm/tsunami event (accessibility) • Fire prevention and heat mitigation measures • Limited wind mitigation for above-ground utilities, such as powerlines • Flood protection and potential relocation for residential areas (long-term)