

Safety and Air Quality

Existing Conditions Overview

August 2023



Introduction

This report summarizes analysis of safety, natural-and human-caused hazards, and air quality in Marina. This analysis will serve as the baseline for the General Plan Update and environmental review, providing an important snapshot of where the community is now.

Topics addressed in this report include:

- Natural Hazards
- Human-caused Hazards
- Air Quality

The report concludes with key findings on the topic.

Natural Hazards

Planning and Regulatory Setting

The following list includes planning and regulatory documents related to safety and natural hazards.

- **Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)**
– Federal Disaster Assistance to States
- **Senate Bill 379** – Climate Change Adaptation
- **Senate Bill 1035** – New Information on Flood, Fire, & Climate Hazards
- **Assembly Bill 747** – Evacuation Routes Capacity
- **Senate Bill 99** – Residential Emergency Evacuation Routes
- **Alquist-Priolo Earthquake Fault Zoning Act** –Development in Fault Zones
- **Seismic Hazards Mapping Act** – Local Seismic Hazard Mapping
- **California Building Code** – State Building Design Standards

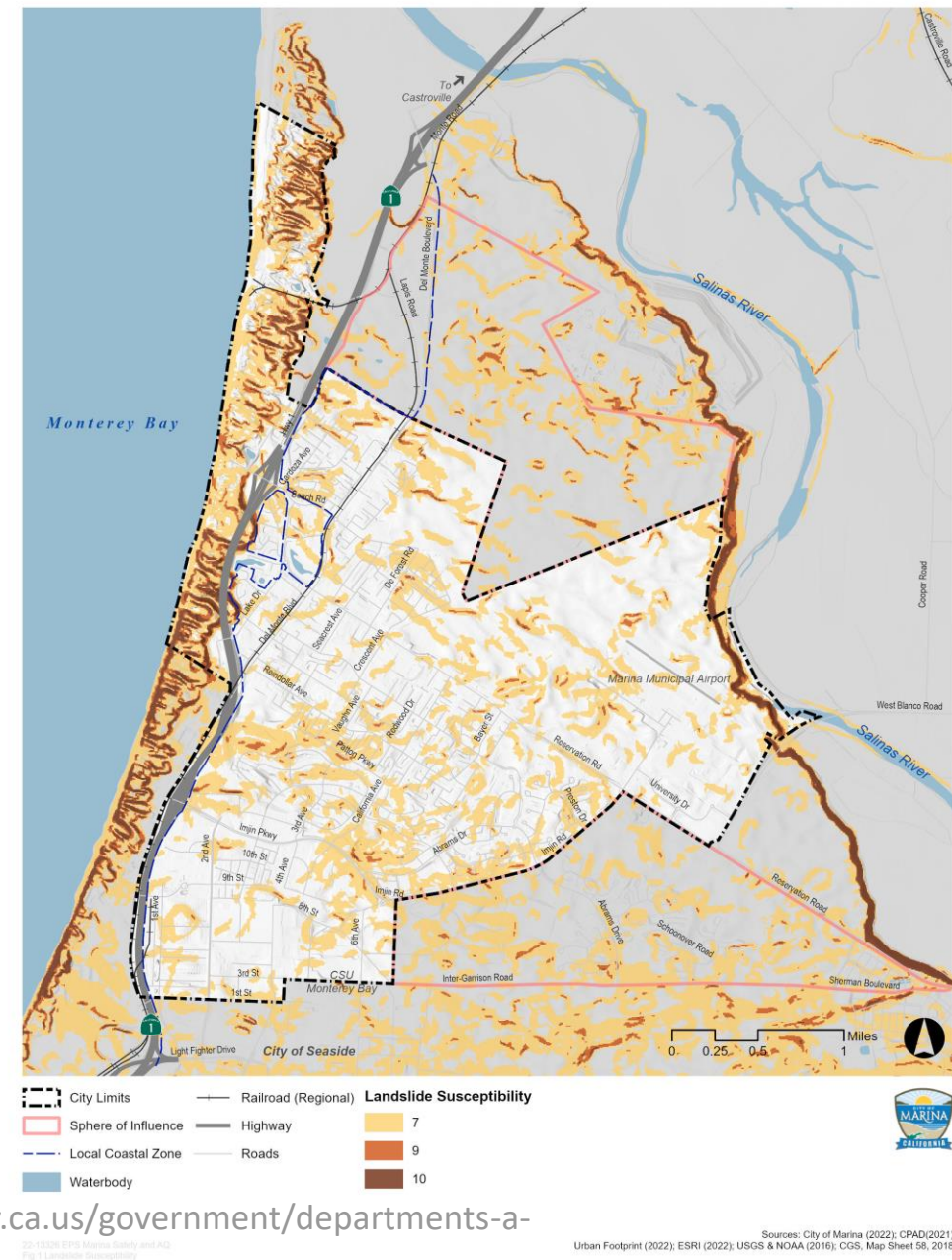
Existing Local and Regional Plans and Projects

The following are the local and regional planning documents that address the topics in this report.

- Monterey County Multi-Jurisdictional Hazard Mitigation Plan
- Monterey County Community Emergency Response Team
- City of Marina Emergency Operations Plan
- Monterey County Emergency Operations Plan
- City of Marina General Plan
- Monterey Bay Air Resources District Air Quality Management Plan
- City of Marina Airport Master Plan

Landslides

- A landslide is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline¹
- The California Geological Survey classifies landslide susceptibility on a scale from zero to ten, from low to high risk²
- Landslide susceptibility is highest in the western portions of Marina, between the Monterey Bay and Highway 1 and to the east along the Salinas River. These areas are mostly located away from residential and commercial areas. However, there are very localized areas located throughout the City.



¹ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-administrative-office/office-of-emergency-services/hazard-mitigation/2022-mjhmp>

² California Department of Conservation. 2022. DOC Maps: Geologic Hazards. <https://maps.conservation.ca.gov/geologic Hazards/>

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); CGS, Map Sheet 58, 2016.

Coastal Erosion

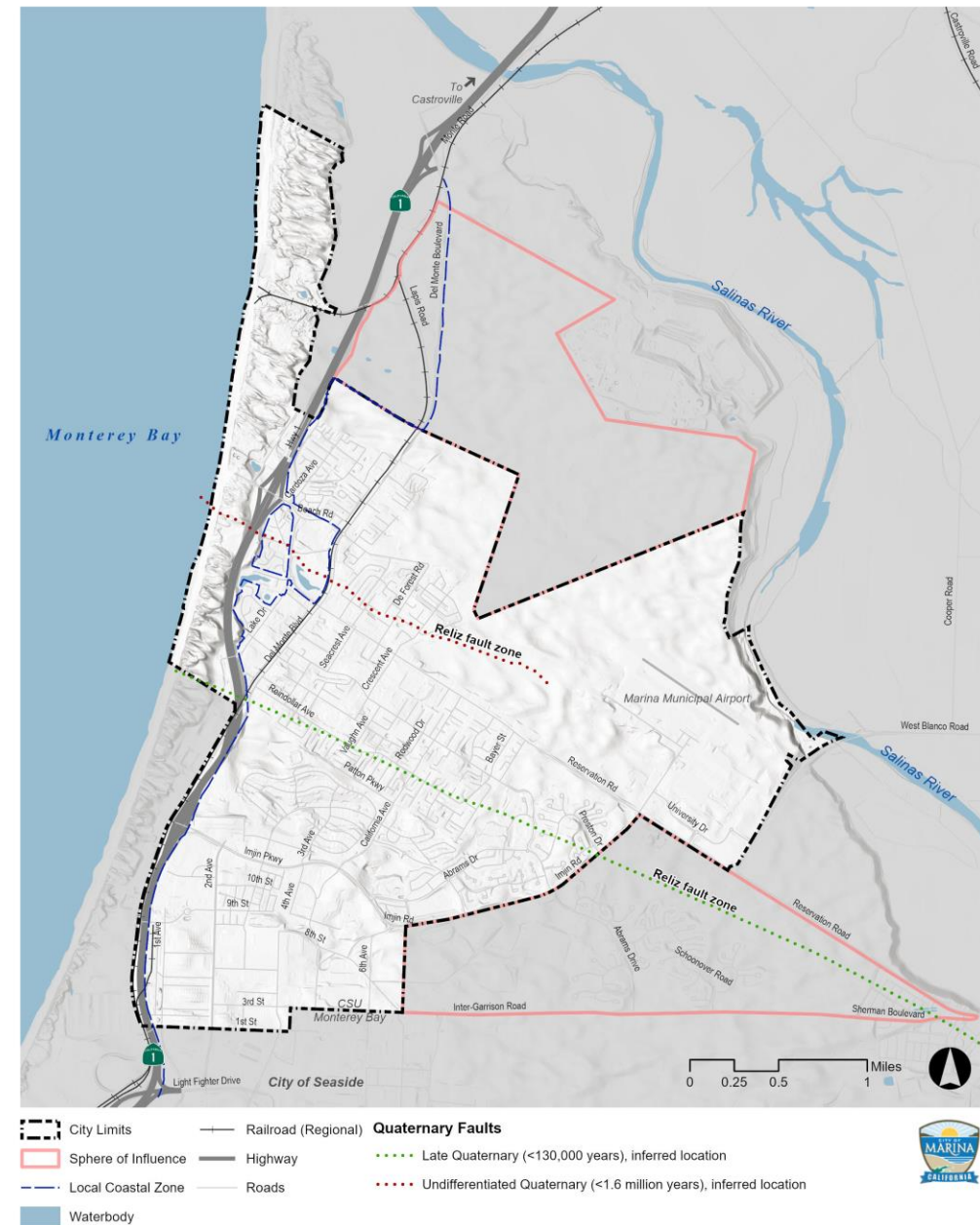
- Coastal erosion is the loss of sand, sediment, vegetation, or soil in the dunes or cliffs along the coast caused by repeated wave attack
- Marina has historically and will continue to face severe erosion along its coastline
- Impacted assets and infrastructure include:
 - Open spaces
 - Recreation
 - Dune Habitat along Marina State Beach
 - Wastewater and MCWD water infrastructure and facilities
- Future sea level rise is projected to worsen coastal erosion rates and further damage Marina's coastline, assets, and infrastructure
- However, closure of CEMEX sand mining operations in 2020 is expected to have reduced erosion rates in the city³

³ City of Marina. 2019. Existing Conditions and Sea Level Rise Adaptation Report.

https://www.cityofmarina.org/DocumentCenter/View/10614/Marina_ExistingConditionsAndAdaptationReport_vFINAL

Faults

- Marina is in a highly active seismic area due to the presence of faults within and near the City including:
 - An unnamed late quaternary fault and the Reliz Fault run through the middle of the city
 - Major fault lines located near the City include Tularcitos, to the south and the San Andreas Fault to the east⁴
- Given recent quake activity and the susceptibility of the region for seismic activity, earthquake hazards will continue to be a safety hazard for the city that should be addressed in the General Plan and hazard planning.



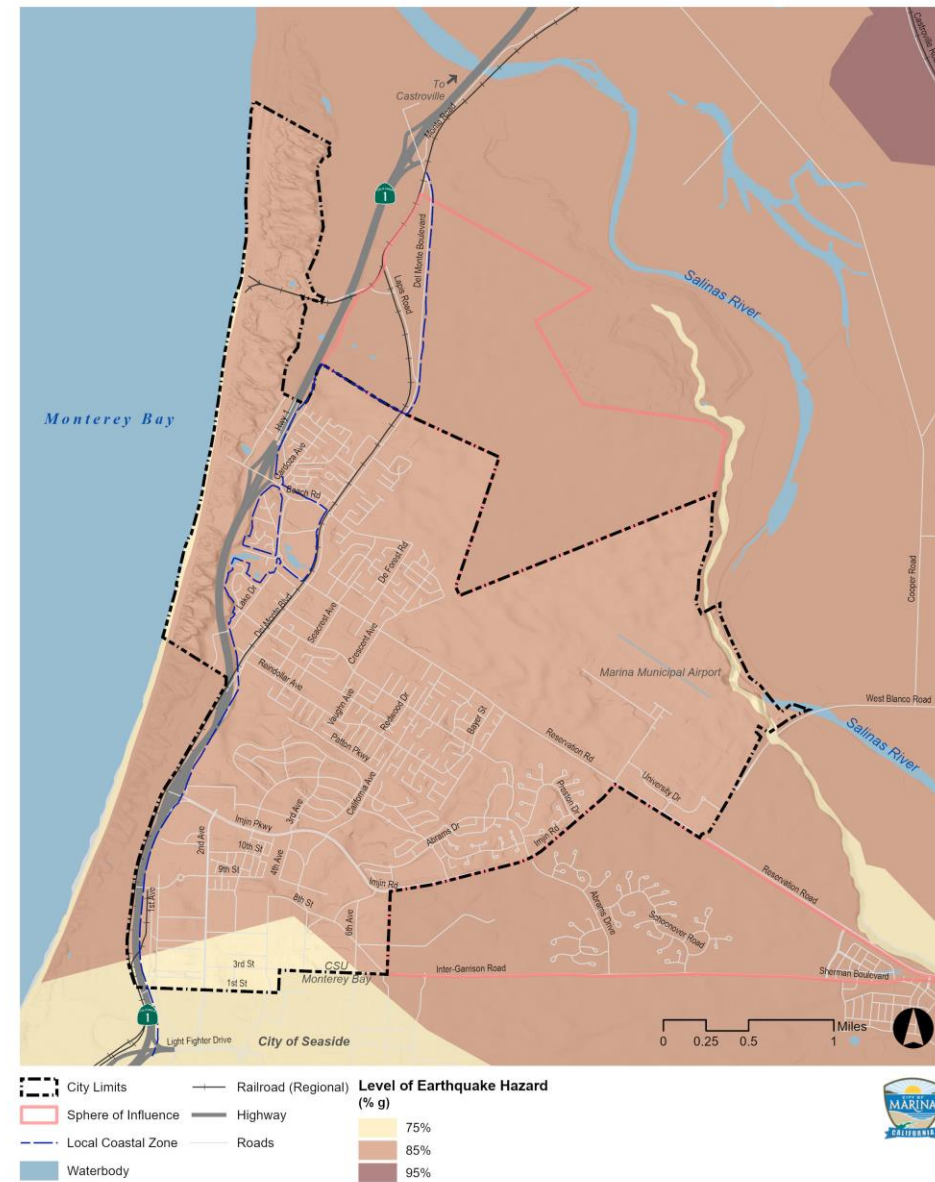
⁴ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-administrative-office-office-of-emergency-services/hazard-mitigation/2022-mjhmp>

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); USGS, 2020.



Ground Shaking

- The faults located in and around Marina have the potential to produce earthquakes that could cause severe damage from ground shaking.⁵
- Ground shaking intensity is projected to be at 85% intensity in a majority of the city and 75% intensity in the southern areas of the city and directly along the coastline.
 - Ground shaking intensity is measured on the modified Mercalli Intensity Scale, from 0-100%.⁶



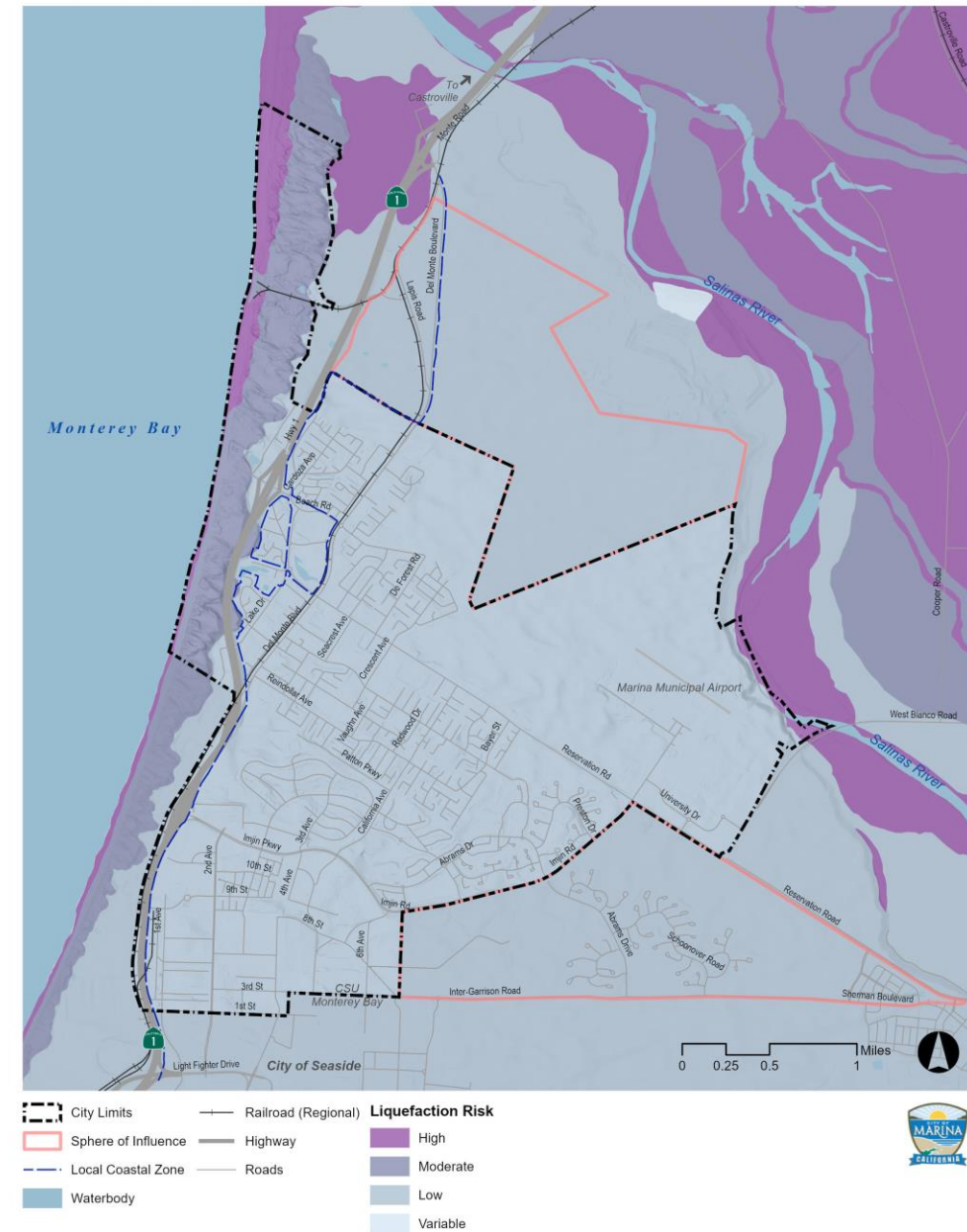
⁵ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-administrative-office/office-of-emergency-services/hazard-mitigation/2022-mjhmp>

⁶ U.S. Geological Survey. N.d. The Modified Mercalli Intensity Scale. <https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale>

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); CGS, 2016.

Liquefaction

- Liquefaction is the loss of soil strength or stiffness due to a buildup of pore-water pressure during a seismic event. Liquefaction is associated primarily with relatively loose, saturated fine to medium-grained unconsolidated soils.
- During an earthquake, the seismic ground shaking of loose, granular soils that are saturated or submerged can cause the soils to temporarily “liquify” and behave as a dense fluid⁷
- Despite the presence of fault lines, most of the city is in a low liquefaction risk zone. However, areas of the city west of Highway 1 face moderate to high liquefaction susceptibility.



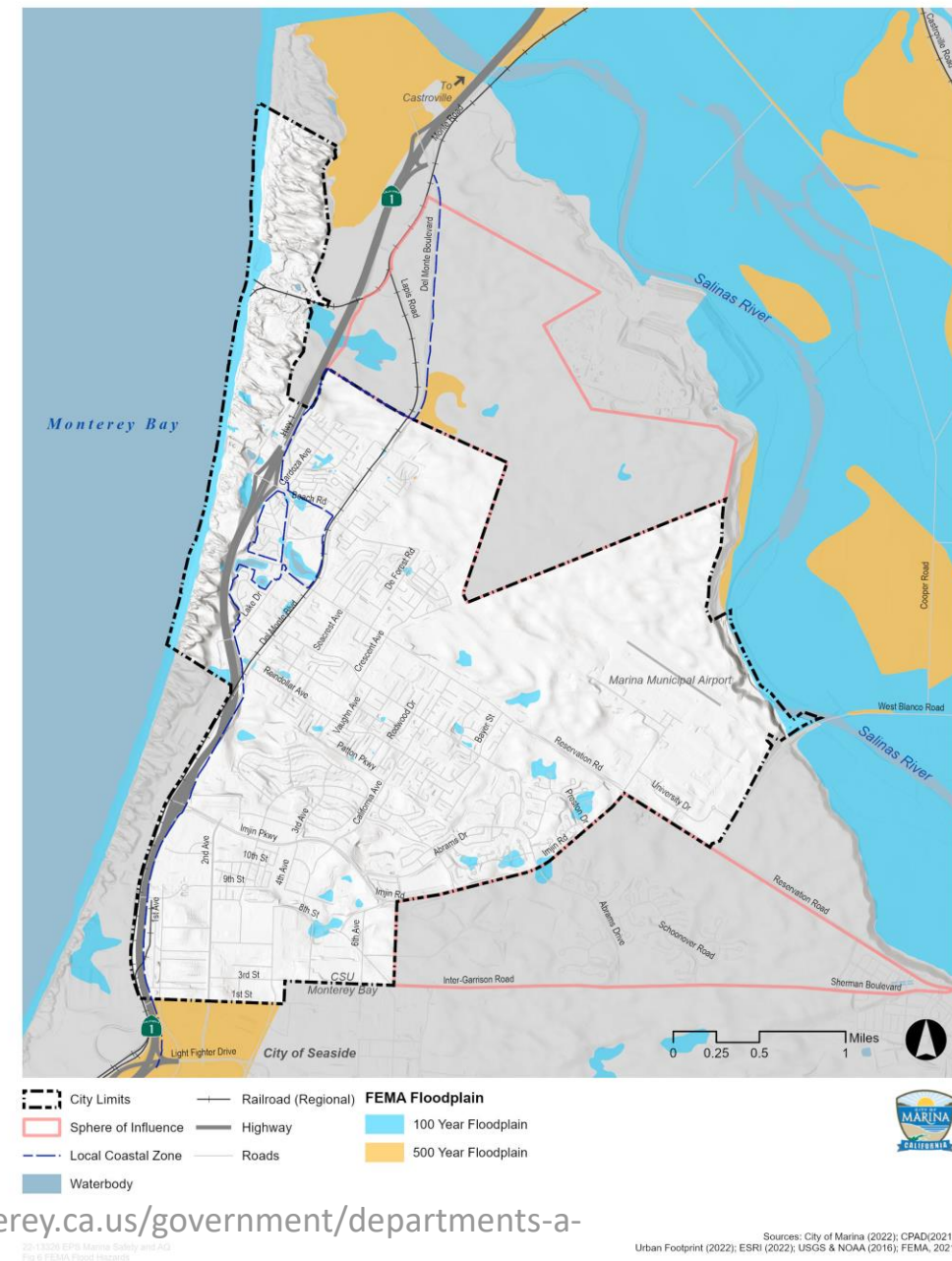
22-13328 EPS Marina Safety and AG
Fig 9.1 Liquefaction Risk

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); Monterey County, 2022.

⁷ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-a-h/administrative-office/office-of-emergency-services/hazard-mitigation/2022-mjhmp>

Localized and Riverine Flooding

- Localized flooding is caused by brief periods of intense rainfall or sustained rainfall over a long period of time. Flooding is often the most intense in low lying part of a region, near existing waterways and in developed areas of the city, where there are high concentration of impervious surfaces that prevent the natural absorption of rainfall and runoff⁸
- The map at right shows, the 100- and 500-year flood zones. Despite the presence of the Salinas River and the coastline, the majority of the City is not in either a 100- or 500-year flood zone. However, there are isolated pockets throughout the City.



⁸ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-administrative-office/office-of-emergency-services/hazard-mitigation/2022-mjhmp>

⁹ FEMA. 2017. Flood Insurance Study.

https://www.cityofsalinas.org/sites/default/files/departments_files/public_works_files/flood_insurance_study_2017_volume_1_of_5.pdf

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); FEMA, 2021.

Coastal Flooding

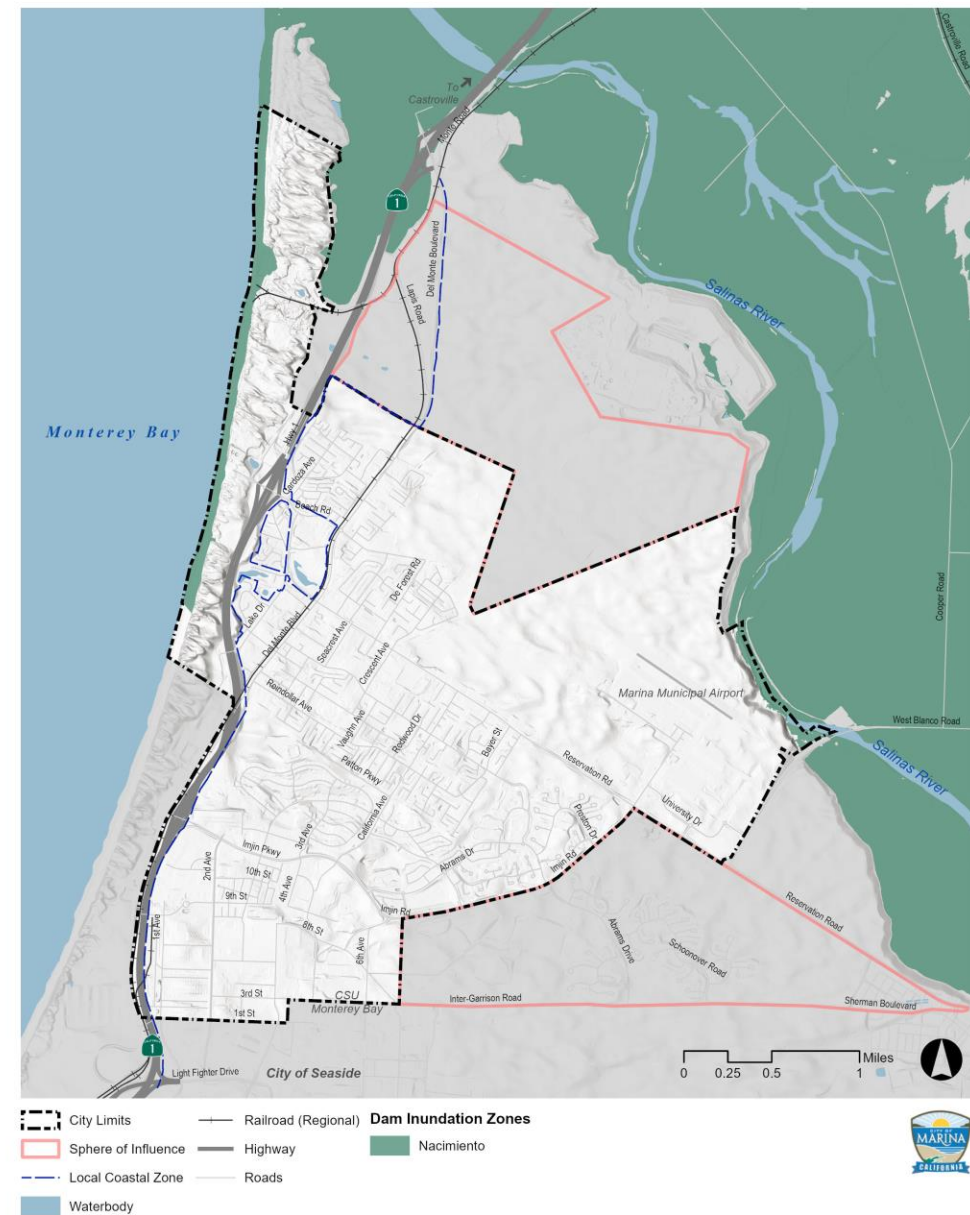
- Marina faces potential risk from coastal flooding along its western border, adjacent to the Monterey Bay, and into neighborhoods through to the Reservation Road/Highway 1 underpass
- Coastal flooding is caused by wave run-up that occurs during high tide amidst a large 100-year storm (a storm with a one percent chance of occurring in any given year). Depending on severity, wave run-up can cause damage to the environment, infrastructure, or structures along the coast.
- Coastal storm flooding has and is expected to continue to cause erosion of bluffs and dunes along Marina's coastal as they become exposed to high velocity wave flooding. However, the dunes protect the majority of the City from coastal flooding. More specifically, as of 2019, FEMA repetitive loss data states that there have not been any parcels in Marina with multiple claims against the National Flood Insurance Program.¹⁰

¹⁰ City of Marina. 2019. Existing Conditions and Sea Level Rise Adaptation Report.

https://www.cityofmarina.org/DocumentCenter/View/10614/Marina_ExistingConditionsAndAdaptationReport_vFINAL

Dam Inundation

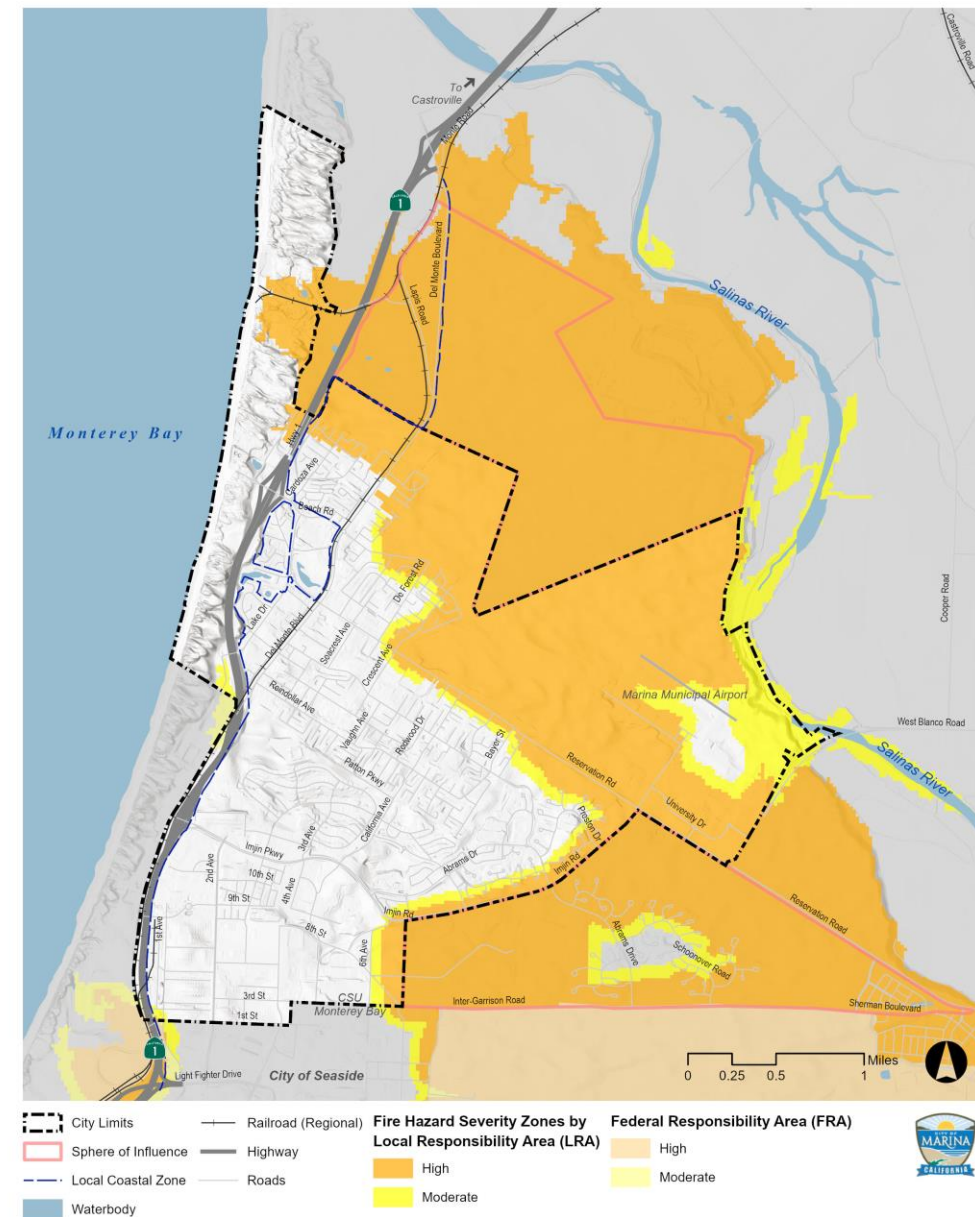
- Dams can fail in a variety of ways including earthquakes, structural failures, and negligence
- The Nacimiento Dam, located in San Luis Obispo County, and the San Antonio Dam, located in Monterey County, pose a relatively low risk of dam failure to the City, as is evidenced in the map to the right.
- More specifically, five Marina residents may be exposed to flooding risk in the event of a Nacimiento Spillway, San Antonio Spillway, or San Antonio Dam failure; an estimated population of 39 Marina residents may be exposed to flooding risk in the event of a Nacimiento Dam failure. At risk residents are located along the north end of the coast.¹¹



¹¹ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-administrative-office/office-of-emergency-services/hazard-mitigation/2022-mjhm>

Wildfire

- Wildfires post a risk to the eastern boundary of the City. Specifically, the northeastern and eastern areas of Marina are characterized by California Department of Forestry and Fire Protection (CAL FIRE) as either High or Moderate Fire Hazard Severity Zones.
- Further, areas along the north, east, and south boundaries of the city are in the Wildland Urban Interface (WUI) since development is encroaching onto wildland areas. These areas are of greater risk to wildfire due to how easily wildfire travels from the undeveloped areas to buildings in urbanized areas.¹³
- This map indicates some of the risks of growing into the Sphere of Influence Areas on the north and south sides of the City.



¹³ Office of the State Fire Marshal. 2023. Fire Hazard Severity Zones. <https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/>

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); CalFire, 2007.

Historic Wildfire

- While Marina itself has not experienced notable wildfire events over the past 50 years, there have been several regional fires in proximity to the city.
- Most recently, in 2020, the River Fire came within approximately seven miles of Marina's southeast border. Between August 16, 2020, and September 4, 2020, this fire burned 50,214 acres, destroyed 30 structures and damaged 20 additional structures. Four individuals were injured.
- The fire also created regional air quality impacts for several weeks in August and September 2020.¹⁴

¹⁴ CAL FIRE. 2023. River Fire. <https://www.fire.ca.gov/incidents/2020/8/16/river-fire>

Fire Protection Resources

- Fire and emergency services are provided by the City of Marina Fire Department (MFD). MFD serves a population of around 22,535 residents and protects an area of approximately 10 square miles.
- As of 2021, MFD operates two fire stations which utilize seven response apparatus, including reserve apparatus.
- As of 2019, MRD has an Insurance Service Office (ISO) rating of 3 out of 10, with 1 as the highest level of fire protection and 10 as being unprotected. (Note: the ISO reviews and ranks fire protection resources within cities and provides a Community Fire Protection system. This system often serves as the basis for insurance rates).¹⁵

¹⁵ City of Marina Fire Department. 2021. Standards of Cover: Deployment Analysis.
<https://cityofmarina.org/DocumentCenter/View/12375/City-of-Marina-SOC-Final---6-13-21>

Human-Caused Hazards

Planning and Regulatory Setting

The following list includes planning and regulatory documents related to human-caused hazards.

- **Monterey County Certified Unified Program Agency** – Hazardous Waste Management
- **Superfund Amendments and Reauthorization Act Title III, the Emergency Planning and Community Right to Know Act** – Local Toxic Hazards Awareness
- **Resource Conservation and Recovery Act** – Hazardous Waste Inspections
- **The Federal Insecticide, Fungicide, and Rodenticide Act** – Pesticide Standards
- **Hazardous Waste Operations and Emergency Response** – Hazardous Waste Response Requirements
- **CA Department of Toxic Substances Control Cortese List** – List of Hazardous Materials Release Sites

Planning and Regulatory Setting

The following are the local and regional planning documents that address human-caused hazards.

- **Hazardous Waste Control Act** – State Hazardous Waste Standards
- **Comprehensive Environmental Response, Compensation and Liability Act** – Superfund Cleanups
- **CalEPA Unified Program** – Hazardous Waste Management Regulatory Program
- **California Air Toxic “Hot Spots” (AB 2588) Program** – Site Specific Air Toxins Emissions and Health Risk Inventory

Hazardous Materials Management

- A variety of products, chemical and purified chemical compounds, and elements considered hazardous, or toxic are used in households, commercial businesses, and industrial operations and processes. Improper use and management of hazardous materials can pose a potential threat to the community and the environment¹⁶
- Three agencies regulate hazardous materials management in Marina.
 - The Monterey County Health Department oversees all hazardous materials management and disposal plans and projects in the City.¹⁷
 - The Marina Fire Department provides regulatory oversight for hazardous materials permitting in Marina.¹⁸
 - Monterey County's Hazardous Materials Management Services is designated as the local Certified Unified Program in Monterey County, including Marina.¹⁹

¹⁶ County of Monterey. 2022. Multi-Jurisdictional Hazard Mitigation Plan. <https://www.co.monterey.ca.us/government/departments-a-h/administrative-office/office-of-emergency-services/hazard-mitigation/2022-mjhmp>

¹⁷ City of Marina. 2005. General Plan. <https://www.cityofmarina.org/DocumentCenter/View/178/City-of-Marina-Gen-Plan-123105?bidId=>

¹⁸ City of Marina Fire Department. N.d. Permits. <https://cityofmarina.org/226/Permits>

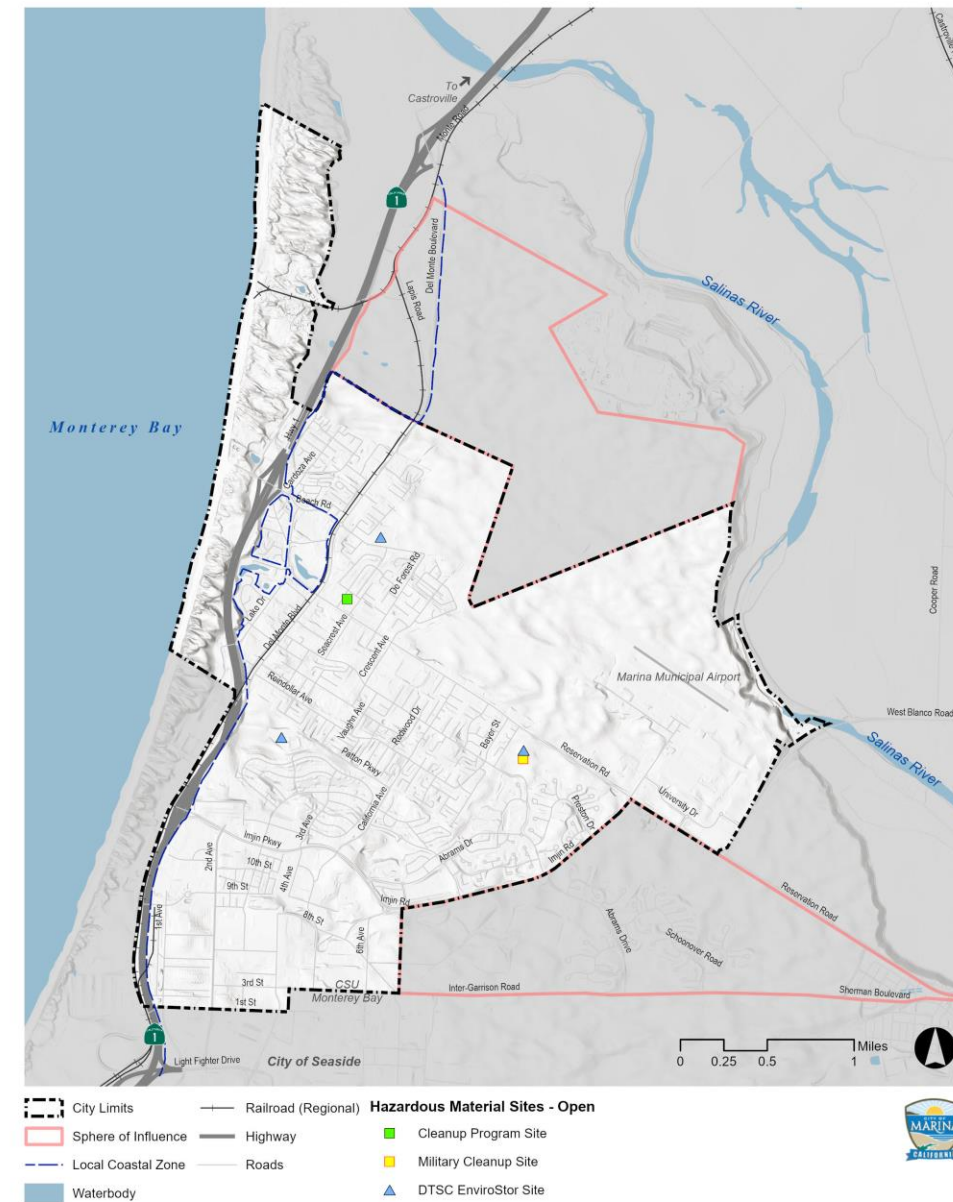
¹⁹ County of Monterey Health Department. 2023. CUPA Programs. <https://www.co.monterey.ca.us/government/departments-a-h/health/environmental-health/hazardous-materials-management/cupa-programs>

Hazardous Materials

- According to the State Water Board GeoTracker there is one open military cleanup site (former Fort Ord) and one open cleanup program site (Mission Dry Cleaner Marina), where regulatory oversight activities are being conducted.
- The map also shows where two Department of Toxic Substances Control (DTSC) Envirostor sites are located (see next slide).

Project Name	Status	Site Type	Address
Former Fort Ord	Open - Remediation	Military Cleanup Site	Not Available
Mission Dry Cleaner Marina	Open - Site Assessment	Cleanup Program Site	3170 Vista Del Camino

Source: State Water Resources Control Board. 2021.



23-13228 EPS Marina Safety and AID
Fig 5 Hazardous Material Sites

Sources: City of Marina (2022); CPAD(2021); Urban Footprint (2022); ESRI (2022); USGS & NOAA (2016); GeoTracker, 2023.

Hazardous Materials

- EnviroStor is the Department of Toxic Substances Control's data management system for tracking cleanup, permitting, enforcement and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons to investigate further.
- According to the EnviroStor database, there are three sites located in Marina that handle hazardous materials. All three sites are currently vacant, and the Olson Elementary School Expansion site is within the Marina Station Specific Plan area.

Project Name	Status	Site Type	Address	EnviroStor ID
Central Coast High School Expansion Site	Inactive - Needs Evaluation	School	2995 Rendova Road	60000346
Olson Elementary School Expansion	Inactive - Needs Evaluation	School	175-011-038	60000345
Reservation Road High School	Inactive - Needs Evaluation	School	Fora Parcels E5A.1 And E5A.2	60000344

Source: State Water Resources Control Board. 2021. GeoTracker



Air Quality

Planning and Regulatory Setting

- The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources to control air pollution in the United States.
- Under the CAA, the U.S. Environmental Protection Agency (US EPA) establishes limits on criteria pollutants through the National Ambient Air Quality Standards: Ozone, Carbon Monoxide, Nitrogen Dioxide, Sulfur Dioxide, Lead, Particulate Matter (PM10, particulate matter 10 micrometers or less in diameter), Particulate Matter (PM2.5, particulate matter 2.5 micrometers or less in diameter).²²

²² US EPA. 2022. Summary of the Clean Air Act. <https://www.epa.gov/laws-regulations/summary-clean-air-act>

Planning and Regulatory Setting

- The City of Marina is within the North Central Coast Air Basin (Air Basin) and is under the jurisdiction of the Monterey Bay Air Resources District (MBARD).
- MBARD is the lead air quality regulatory agency for the Air Basin and has jurisdiction over all point and area sources (except for mobile sources, consumer products, and pesticides) in the basin.
- The MBARD Air Quality Management Plan provides a plan to improve air quality, protect public health and reduce GHG emissions in the North Central Coast Air Basin.²³

²³ Monterey Bay Air Resources District. 2017. Air Quality Management Plan.
https://www.mbard.org/files/6632732f5/2012-2015-AQMP_FINAL.pdf

Air Quality Standards

- The Air Basin is currently in non-attainment for the State and Federal ozone standards, the State and Federal PM2.5 standards, and the State PM10 standards.
 - Non-attainment areas do not meet the California or National Ambient Air Quality Standards for one or more criteria air pollutants.
- Specifically, emissions data collected between 2019 through 2021 shows one exceedance of the Federal PM10 standard in 2020, five exceedances of the State PM10 standard in 2021, one exceedance of the Federal PM2.5 standard in 2019, and nine exceedances of the Federal PM2.5 standard in 2020 at nearby air pollution monitoring stations. The table on the following page provides detailed information on the standards and exceedences.²⁴
- Frequent exceedances may indicate increased risk of adverse health and environmental effects in the Air Basin.

²⁴ California Air Resources Board. 2022. iADAM: Air Quality Data Statistics-Top 4 Summary. <https://www.arb.ca.gov/adam/topfour/topfour1.php>

Marina Annual Air Quality Data

Pollutant	2019	2020	2021
Ozone, ppm - Worst Hour ¹	0.072	0.073	0.064
Number of days of State exceedances (>0.09 ppm) ¹	0	0	0
Ozone, ppm – Worst 8 Hours ¹	0.063	0.057	0.057
Number of days of State exceedances (>0.070 ppm) ¹	0	0	0
Number of days of Federal exceedances (>0.075 ppm) ¹	0	0	0
Particulate Matter <10 microns, µg/m ³ Worst 24 Hours ²	130.7	159.0	128.8
Number of days of State exceedances (>50 µg/m ³) ²	*	*	5
Number of days of Federal exceedances (>150 µg/m ³) ²	0	1	0
Particulate Matter <2.5 microns, µg/m ³ Worst 24 Hours ¹	53.0	87.0	19.7
Number of days of Federal exceedances (>35 µg/m ³) ¹	1	9	0

Notes: *= There was insufficient (or no) data available to determine the value.

¹ Data sourced from CARB at the nearest monitoring station with available data at the Salinas #3 station in Salinas.

² Data sourced from CARB at the nearest monitoring station with available data at the Hollister-Fairview Road in Hollister.

Source: California Air Resources Board. 2022. iADAM: Air Quality Data Statistics-Top 4 Summary.

<https://www.arb.ca.gov/adam/topfour/topfour1.php>

Key Findings

Key Findings

- Marina is highly susceptible to impacts from local and regional earthquakes, which pose risk to structures, infrastructure, and residents.
- Marina is subject to high coastal erosion rates, coastal flooding, and flooding from the mouth of the Salinas River.
- Regional wildfires have and will likely continue to impact air quality in the city.
- Several hazardous materials facilities in Marina pose potential environmental and public health risks.