Appendix E: Maps

This appendix to the Monterey County Multi-jurisdictional Hazard Mitigation Plan contains the figures that identify known hazard areas and the locations of previous hazard occurrences. The maps are listed below in the order that they appear in this appendix.

- E1: Location
- E2: Land Cover
- E3: Coastal Erosion
- E4: Dam Failure
- E5: Historic Earthquakes
- E6: Earthquake Groundshaking
- E7: Flood
- E8: Hazardous Materials
- E9: Landslide
- E10: Tsunami
- E11: Historic Wildland Fires
- E12: Wildland Fire
- E13: Windstorm
- E14: Population Density
- E15: Critical Facilities Infrastructure
- E16: Seal Level Rise

Figure E-1. Location

URS

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

Figure E-2. Land Cover

URS

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City

Monterey Bay

Pacific Ocean

Los Padres National Forest

Hunter Liggett Military Reservation

Camp Roberts Mil. Res.

Santa Cruz County
San Benito County
San Luis Obispo County
Fresno County

Pacific Grove
Marina
Sand City
Monterey
Seaside
Carmel-by-the-Sea
Del Rey Oaks
Salinas
Spreckels
Chualar
Gonzales
Soledad
Greenfield
King City
Bradley
San Lucas
San Ardo

Gonzales
Salinas
Soledad
King City
Greenfield

N
W
E
S

339.07 degree rotation for all views

County Map Scale

1 inch equals 4 miles

0 1 2 4 6 8

Miles

City Inset Map Scale

1 inch equals 1.5 miles

0 0.75 1.5 2.25 3

Miles

Legend

Census Designated Place

Jurisdictional Boundaries
- County Boundary
- City Limits, Monterey County
- National Forest
- Military Reservation

Circulation
- US Highway
- State Highway
- County Highway
- Major Roads
- Local Roads *(City Insets Only)*
- Active Railroad (Union Pacific)

Hydrology (Perennial and Intermittent)
- Lake or Pond
- River, Creek or Tributary
- Artifical Path, Canal/Ditch or Connector

Basemap
Hillshades created from USGS 1" (county-wide) and 1/3" (city insets) National Elevation Dataset.

Land Cover*
- Water
- Perennial Ice/Snow
- Low Intensity Residential
- High Intensity Residential
- Commercial / Industrial / Transportation
- Bare Rock / Sand / Clay
- Quarries / Strip Mines / Gravel Pits
- Transitional
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrubland
- Orchards / Vineyards / Other
- Grasslands / Herbaceous
- Pasture / Hay
- Row Crops
- Small Grains
- Fallow
- Urban / Recreational Grasses
- Woody Wetlands
- Emergent Herbaceous Wetlands

*USGS National Land Cover Data - Conforms North Land Cover Data Set. 1992 Landsat satellite TM imagery, 30-meter resolution. Publication Date: 2000, Edition 1

Data Sources: County of Monterey - GIS Department, URS Corporation, US Geological Survey (USGS), US Census Bureau, University of California Santa Barbara (UCSB), HAZUS-MH MR2

Figure E-3. Coastal Erosion Hazard Areas
Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan
URS
Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City
Monterey Bay
Pacific Ocean
Salinas
Gonzales
Soledad
Greenfield
King City
Los Padres National Forest
Hunter Liggett Military Reservation
Camp Roberts Mil. Res.
City of Seaside not considered in Plan
Legend
Census Designated Place
Jurisdictional Boundaries
County Boundary
City Limits, Monterey County
National Forest
Military Reservation
Circulation
US Highway
State Highway
County Highway
Major Roads
Local Roads (City Insets Only)
Active Railroad (Union Pacific)
Hydrology (Perennial and Intermittent)
Lake or Pond
River, Creek or Tributary
Artifical Path, Canal/Ditch or Connector
Basemap
Hillshades created from USGS 1" (county-wide) and 1/3" (city insets) National Elevation Dataset.
Coastal Erosion (100-year Projection)
4-inch Annual Erosion Rate
7-inch Annual Erosion Rate
33.6-inch Annual Erosion Rate
339.07 degree rotation for all views
County Map Scale
1 inch equals 4 miles
0 1 2 4 6 8
Miles
City Inset Map Scale
1 inch equals 1.5 miles
0 0.75 1.5 2.25 3
Miles
Data Sources: County of Monterey - GIS Department, URS Corporation, US Geological Survey (USGS), US Census Bureau, University of California Santa Barbara (UCSB), HAZUS-MH MR2

Figure E-4. Dam Failure Hazard Areas

URS

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

Figure E-5. Historic Earthquakes

URS

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

Figure E-6. Earthquake Hazard Areas

URS

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

Note: This map shows the relative intensity of ground shaking and damage in California from anticipated future earthquakes. The Earthquake Shaking Potential model was calculated by the California Geological Survey from the USGS/CGS seismic hazards model (Frankel and others, 2002) considering amplification in near surface soils as shown by Wills and others (2000) and using the amplification factors recommended by the building Seismic Safety Council (1997).

Monterey County
Hazard Mitigation Plan
Flood Hazard
Jurisdictional Boundaries
County Boundary
City Limits
National Forest
Military Reservation
Hydrography
Lake, Pond, or Reservoir
Stream
Flood Inundation Area
1-Percent-Annual-Chance Flood
Transportation
U.S. Route
State Route
County Route
Other Route
Railroad
Data Sources:
Monterey County GIS: Flood Zones (2009), City Limits, Railroads, Roads
National Atlas: County Boundaries, Military Reservations, National Forest
USGS: National Elevation Dataset, National Hydrography Dataset
AECOM
Santa Cruz County
San Benito County
Fresno County
Kings County
San Luis Obispo County
Marina
Sand City
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Carmel-by-the-Sea
Salinas
Gonzales
Soledad
Greenfield
King City
Los Padres National Forest
Hunter Liggett Military Reservation
Camp Roberts Military Reservation
PLAHORN SLOUGH
SAN CLEMENTE RESERVOIR
LAKE SAN ANTONIO
Salinas River
Carmel River
0 5 10 15 20 Miles

Monterey County
Hazard Mitigation Plan
Technological Hazards:
Hazardous Materials Routes and
Extremely Hazardous Substance Locations
Jurisdictional Boundaries
County Boundary
City Limits
National Forest
Military Reservation
Transportation
U.S. Route
State Route
County Route
Other Route
Railroad
Hydrography
Lake, Pond, or Reservoir
Stream
Hazardous Materials
HAZMAT Routes 1-Mile Buffer
Extremely Hazardous Substance Locations
EHS 1-Mile Buffer
Data Sources:
Monterey County GIS: City Limits, Railroads, Roads
National Atlas: County Boundaries, Military Reservations, National Forest
USDOT: HAZMAT Routes
USGS: National Elevation Dataset, National Hydrography Dataset
AECOM
Santa Cruz County
San Benito County
Fresno County
Kings County
San Luis Obispo County
Salinas
Marina
Sand City
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Carmel-by-the-Sea
Gonzales
Soledad
Greenfield
King City
Los Padres National Forest
Hunter Liggett Military Reservation
Camp Roberts Military Reservation
SAN CLEMENTE RESERVOIR
LAKE SAN ANTONIO
Salinas River
Carmel River
ELKHORN SLOUGH
0 5 10 15 20 Miles

Figure E-9. Landslide Hazard Areas

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

URS

Monterey County
Hazard Mitigation Plan
Tsunami Hazard
Jurisdictional Boundaries
County Boundary
City Limits
National Forest
Military Reservation
Hydrography
Lake, Pond, or Reservoir
Stream
Tsunami Inundation Area
Tsunami Inundation Area
Transportation
U.S. Route
State Route
County Route
Other Route
Railroad
Data Sources:
Monterey County GIS: Tsunami Inundation, City Limits, Railroads, Roads
National Atlas: County Boundaries, Military Reservations, National Forest
USGS: National Elevation Dataset, National Hydrography Dataset
AECOM
Santa Cruz County
San Benito County
Fresno County
Kings County
San Luis Obispo County
Marina
Sand City
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Carmel-by-the-Sea
Salinas
Gonzales
Soledad
Greenfield
King City
Los Padres National Forest
Hunter Liggett Military Reservation
Camp Roberts Military Reservation
SAN CLEMENTE RESERVOIR
LAKE SAN ANTONIO
Salinas River
Carmel River
ELKHORN SLOUGH
0 5 10 15 20 Miles

Figure E-11. Historic Wildland Fires
URS
Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan
Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City
Monterey Bay
Pacific Ocean
Los Padres National Forest
Hunter Liggett Military Reservation
Camp Roberts Mil. Res.
Salinas
Soledad
Gonzales
Greenfield
King City
Bradley
Pacific Grove
Monterey
Sand City
Seaside
Marina
Del Rey Oaks
Carmel-by-the-Sea
Carmel Valley village
Chualar
Spreckels
Greenfield
Bradley
San Lucas
Lockwood
Jolon
Parkfield
Cholame
Santa Clara County
San Benito County
San Luis Obispo County
Fresno County
Kern County
N
W
E
S
339.07 degree rotation for all views
County Map Scale
1 inch equals 4 miles
0 1 2 4 6 8
Miles
City Inset Map Scale
1 inch equals 1.5 miles
0 0.75 1.5 2.25 3
Miles
Legend
Census Designated Place
Jurisdictional Boundaries
County Boundary
City Limits, Monterey County
National Forest
Military Reservation
Circulation
US Highway
State Highway
County Highway
Major Roads
Local Roads (City Insets Only)
Active Railroad (Union Pacific)
Hydrology (Perennial and Intermittent)
Lake or Pond
River, Creek or Tributary
Artifical Path, Canal/Ditch or Connector
Basemap
Hillshades created from USGS 1" (county-wide) and 1/3" (city insets) National Elevation Dataset.
Fire Perimeters (1911 - 2005)
Fire Occurrence 1986 - 1996
Total Acres Burned
1 - 30
31 - 300
301 - 1000
1001 - 3000
3001 - 8850
Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City
City of Seaside Not Considered in Plan
Gonzales
Salinas
Soledad
King City
Greenfield
Data Sources: County of Monterey - GIS Department, URS Corporation, Us Geological Survey (USGS), US Census Bureau, University of California Santa Barbara (UCSB), HAZUS-MH MR2, Fire Sciences Laboratory - Rocky Mountain Research Station, Fire and Resource Assessment Program - California Department of Forestry and Fire Protection (CDF-FRAP)

Figure E-12. Wildland Fire Hazard Areas
URS
Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan
Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City
Monterey Bay
Pacific Ocean
Los Padres National Forest
Hunter Liggett Military Reservation
Gonzales
Soledad
Greenfield
King City
Salinas
Bradley
Camp Roberts Mil. Res.
San Luis Obispo County
Monterey County
Gonzales
Salinas
Soledad
King City
Greenfield
N
W
E
S
339.0° degree rotation for all maps
County Map Scale
1 inch equals 4 miles
0 1 2 4 6 8
Miles
City Inset Map Scale
1 inch equals 1.5 miles
0 0.75 1.5 2.25 3
Miles
Legend
Census Designated Place
Jurisdictional Boundaries
County Boundary
City Limits, Monterey County
National Forest
Military Reservation
Circulation
US Highway
State Highway
County Highway
Major Roads
Local Roads (City Insets Only)
Active Railroad (Union Pacific)
Hydrology (Perennial and Intermittent)
Lake or Pond
River, Creek or Tributary
Artifical Path, Canal/Ditch or Connector
Basemap
Hillshades created from USGS 1" (county-wide) and 1/3" (city insets) National Elevation Dataset.
Fuel Rank*
Non-Fuel
Moderate
High
Very High
*The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature).
Publication Date: 2005, Edition: 05_2.
Data Sources: County of Monterey - GIS Department, URS Corporation, US Geological Survey (USGS), US Census Bureau, University of California Santa Barbara (UCSB), HAZUS-MH MR2, California Department of Forestry and Fire Protection Fire Resource Assessment Program (CDF-FRAP)

Figure E-13. Windstorm Hazard Areas

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

URS

Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City

Monterey Bay

City of Seaside Not Considered in Plan

Gonzales

Salinas

Soledad

King City

Greenfield

Camp Roberts Mil Res

Los Padres National Forest

Hunter Liggett Military Reservation

Pacific Ocean

N
W
E
S

350.07 degree rotation for all views

County Map Scale

1 inch equals 4 miles

0 1 2 4 6 8

Miles

City Inset Map Scale

1 inch equals 1.5 miles

0 0.75 1.5 2.25 3

Miles

Legend

Census Designated Place

Jurisdictional Boundaries
- County Boundary
- City Limits, Monterey County
- National Forest
- Military Reservation

Circulation
- US Highway
- State Highway
- County Highway
- Major Roads
- Local Roads *(City Insets Only)*
- Active Railroad (Union Pacific)

Hydrology (Perennial and Intermittent)
- Lake or Pond
- River, Creek or Tributary
- Artifical Path, Canal/Ditch or Connector

Basemap
Hillshades created from USGS 1" (county-wide) and 1/3" (city insets) National Elevation Dataset.

500-foot Contour

Surface Exposure to the Northwest*

High
Low

*Surface exposure to prevailing surface winds from the northwest was calculated for the Salinas Valley floor up to an elevation of 500-feet. The narrowing valley creates a wind tunnel effect with increasing wind velocity in the central and southern portions of Salinas Valley. Wind direction was calculated from 90 to 180 degrees.

Data Sources: County of Monterey - GIS Department, URS Corporation, US Geological Survey (USGS), US Census Bureau, University of California Santa Barbara (UCSB), HAZUS-MH MR2

Figure E-14. Population Density

Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan

URS

Figure E-15. Critical Facilities and Infrastructure
URS
Monterey County, California
Multi-Jurisdictional Hazard Mitigation Plan
Carmel-by-the-Sea
Marina
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Sand City
Monterey Bay
Pacific Ocean
Los Padres National Forest
Hunter Liggett Military Reservation
Camp Roberts Mil. Res.
Gonzales
Soledad
Greenfield
King City
Salinas
Santa Cruz County
San Luis Obispo County
Fresno County
Kings County
N
W
E
S
339.07 degree rotation for all views
County Map Scale
1 inch equals 4 miles
0 1 2 4 6 8
Miles
City Inset Map Scale
1 inch equals 1.5 miles
0 0.75 1.5 2.25 3
Miles
Legend
Census Designated Place
Jurisdictional Boundaries
County Boundary
City Limits, Monterey County
National Forest
Military Reservation
Circulation
US Highway
State Highway
County Highway
Major Roads
Local Roads (City Insets Only)
Active Railroad (Union Pacific)
Hydrology (Perennial and Intermittent)
Lake or Pond
River, Creek or Tributary
Artificial Path, Canal/Ditch or Connector
Basemap
Hillshades created from USGS 1" (county-wide) and 1/3" (city insets) National Elevation Dataset.
Critical Facilities
Bridge
Airport
City Government
City Hall
City Electric Facility
City Public Works
County Government
Community Facility
School
Assisted Living Facility
Hospital
Emergency Operation Center
Fire Station
Police Station
Harbor Facility
Marine / Environmental Facility
Electric Power Plant
Potable Water Administration Office
Potable Water Facility
Pump Station
Wastewater Adminstration Office
Wastewater Treatment Plant
Data Sources: County of Monterey - GIS Department, URS Corporation, US Geological Survey (USGS), US Census Bureau, University of California Santa Barbara (UCSB), HAZUS-MH MRC, Google Earth
King City
Greenfield

Monterey County
Hazard Mitigation Plan
Sea Level Rise Hazard
Jurisdictional Boundaries
County Boundary
City Limits
National Forest
Military Reservation
Hydrography
Lake, Pond, or Reservoir
Stream
Sea Level Rise Inundation Area
5 feet
Transportation
U.S. Route
State Route
County Route
Other Route
Railroad
Data Sources:
Monterey County GIS: City Limits, Railroads, Roads
National Atlas: County Boundaries, Military Reservations, National Forest
NOAA: Sea Level Rise Inundation Area
USGS: National Elevation Dataset, National Hydrography Dataset
AECOM
Santa Cruz County
ELKHORN SLOUGH
Marina
Sand City
Pacific Grove
Seaside
Del Rey Oaks
Monterey
Carmel-by-the-Sea
Carmel River
SANCHEZ RESERVOIR
Salinas
Gonzales
Soledad
Greenfield
King City
San Benito County
Los Padres National Forest
Hunter Liggett Military Reservation
LAKE SAN ANTONIO
Salinas River
Fresno County
Camp Roberts Military Reservation
Kings County
San Luis Obispo County
0 5 10 15 20 Miles