Welcome!

The 2028 Update
State Hazard Mitigation Plan
Kick-off

Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

INTRODUCTIONS

Victoria LaMar-Haas,

Hazard Mitigation Planning Division Chief, Cal OES

Ryan Marth,

Senior Emergency Services Coordinator, State Mitigation Planning Unit, Cal OES

Aykanush Mikayelyan,

Emergency Services Coordinator, State Mitigation Planning Unit, Cal OES

Annika Braucher,

Associate Environmental Planner, State Mitigation Planning Unit, Cal OES

Safety Briefing

TODAY'S AGENDA

- Welcome
- Introductions
- Safety Briefing
- Opening Remarks – Leadership
- Why are you here today?
- What is the SHMP
- Overview of the SHMP
- 2028 Update and Timeline
- Partner Coordination
- FEMA 2025 Policy Guide Requirements
- Enhanced Elements Quarterly Validations
- 2028 SHMP Goals
- Identifying and Profiling the Hazards
- Hazards for the 2028 SHMP
- Break
- Risk Assessment
- Partner Speakers
- APG

OPENING REMARKS
LEADERSHIP

Robyn Fennig,

Deputy Director, Recovery, Cal OES

Melissa Boudrye,

Hazard Mitigation Resilience Branch Chief, Cal OES

Victoria LaMar-Haas,

Hazard Mitigation Planning Division Chief, Cal OES

WHY ARE YOU HERE?

- You're representing a state agency, and your agency is included in State Administrative Order
- Your agency has been designated as a participant in the SHMP
- You have been identified as an important partner in this process
- Your involvement helps ensure coordination, compliance, and effective mitigation strategies
- Your participation is valued for successful planning and implementation

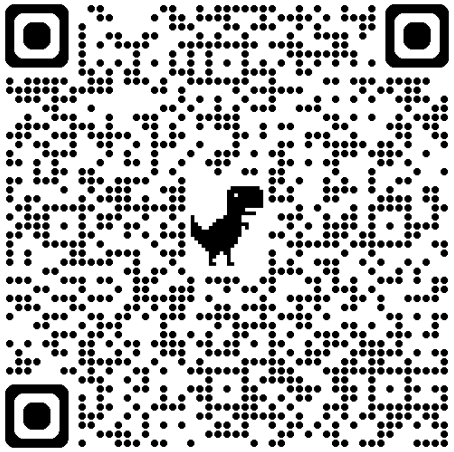
PARTICIPATION

We want your participation!

Please enter questions/comments in the chat

Questions will be addressed throughout the presentations

State Hazard Mitigation Plan



[State Mitigation Planning | California Governor's Office of Emergency Services]

SHMP UPDATE – REVIEW:

What is the SHMP?

- Primary hazard mitigation guidance document
- Describes California's:
  - Historical and current hazards
  - Mitigation strategies
  - Goals
  - Objectives
- Demonstrates the state's commitment to resilience
- Guide for decision makers
- Integral with local hazard mitigation planning (LHMP)

SHMP UPDATE OVERVIEW – BENEFITS

- Mitigation
- Statewide Disaster Funding Eligibility
- Resilience

SHMP UPDATE OVERVIEW – UPDATE PROCESS

5-Year Update

Monitor, evaluate, and update the SHMP every five years.

Setting mitigation goals and objectives.

Planning Process

Engaging partners.

Identifying hazards and vulnerabilities.

Developing a long-term strategy to reduce risk and future losses.

Implementing the plan, taking advantage of a wide range of resources.

Partners

Coordinating with State agencies and other private partners

Coordinating with subject matter experts.

Providing and receiving input from regional, local, and tribal partners.

Schedule

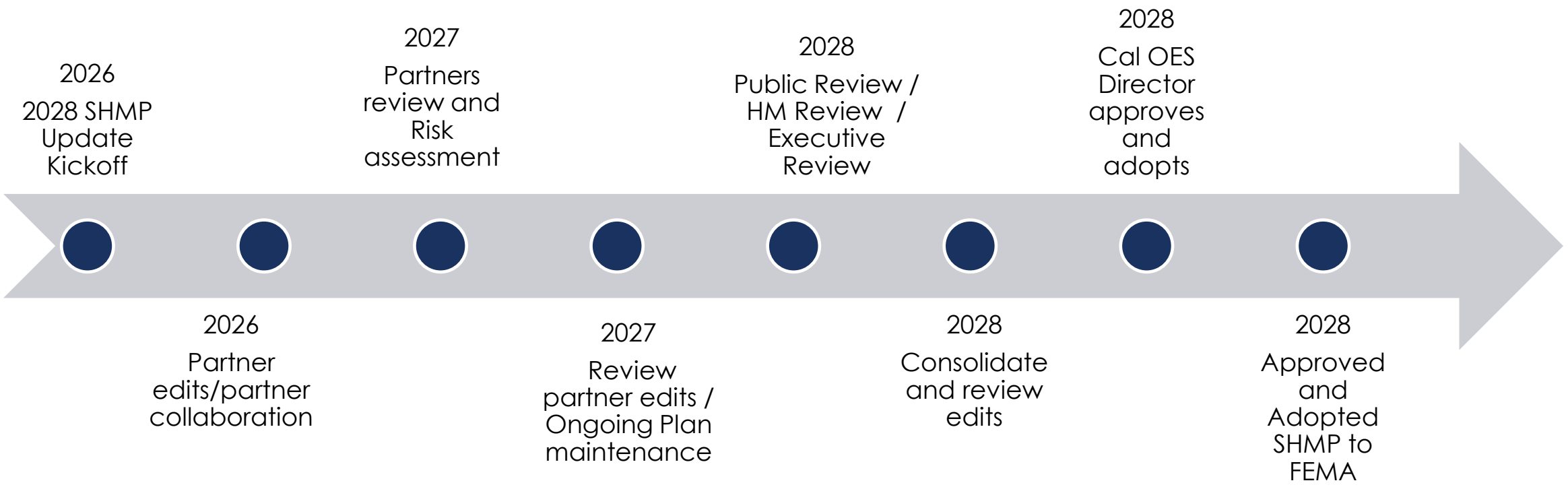
SHMP update Kick-off meeting

Meeting with partners

Review timelines and stay on track

2028 SHMP to be approved and adopted August of 2028.

2028 SHMP UPDATE TIMELINE SCHEDULE



PARTNER COORDINATION

SHMP Update

- Accordance with 44 CFR part 201

Partners

- Engaging with partners across State and Federal agencies, academia, private and public partners

Up to date Data sources

- Ensuring partner active data sources identified and used

Following the FEMA State Hazard Mitigation Policy Guide 2025

- Meet Standard plan requirements
- Meet Enhanced plan requirements

FEMA
STATE MITIGATION PLANNING POLICY GUIDE 2025

The State Mitigation Planning Policy Guide is the Federal Emergency Management Agency's (FEMA) official policy on and interpretation of the applicable statutes and mitigation planning regulations at 44 Code of Federal Regulations (CFR) Part 201.

State Mitigation Planning Policy Guide (2025)

FEMA
STANDARD STATE PLAN REQUIREMENTS

- Planning Process
- Hazard Identification and Risk Assessment
- State Mitigation Capabilities
- Mitigation Strategy
- Local Planning Coordination and Capability Building
- Review, Evaluation, and Implementation
- Adoption and Assurances

State Mitigation Planning Policy Guide

FEMA
HIGH HAZARD POTENTIAL DAMS REQUIREMENTS

- Funds rehabilitation, repair or removal of eligible dams
- Title 33 United States Code (USC) requires states to have an approved SHMP in place that includes all dam risks and complies with the Disaster Mitigation Act of 2000

https://www.fema.gov/grants/mitigation/learn/dam-safety/rehabilitation-high-hazard-potential-dams

FEMA
FIRE MANAGEMENT ASSISTANCE GRANTS REQUIREMENTS

- Provides assistance, grants, equipment, supplies, and personnel to any state or local government for the mitigation, management, and control of any fire on public or private lands

- Acts as an incentive for states to include wildfire hazards in their mitigation planning

https://www.fema.gov/assistance/public/fire-management-assistance

FEMA
ENHANCED STATE PLAN REQUIREMENTS

- **Meet Required Standard Plan Elements and Mitigation Planning Responsibilities**
- **Meet HMA Grants Management Performance Requirements**
- **Integrate Planning**
- **Demonstrate Commitment to Comprehensive State Mitigation Program**
- **Effective Use of Existing Mitigation Programs to Achieve Mitigation Goals**
- **Documentation of the State's Implementation Capability**

ENHANCED ELEMENTS QUARTERLY VALIDATIONS

Assessing Program and Project Status:

Milestones and Deliverables: Monitor the progress of specific hazard mitigation programs and projects outlined in the SHMP, including tracking key milestones, deliverables, and any challenges encountered.

Evaluating Risk and Compliance:

Compliance Checks: Ensure compliance of mitigation projects and initiatives with guidelines and standards to align with SHMP objectives.

Risk Assessments: Assess risks and mitigation efforts to identify areas requiring improvement to enhance the state's resilience to hazards.

Communicating with Partners:

Informing Partners: Share key findings and updates with partners to maintain transparency and align efforts with the SHMP's broader goals and objectives.

Driving Strategic Decisions:

Strategic Adjustments: Use the data to make strategic decisions about program adjustments, resource allocation, and future updates to the SHMP.

Capturing Miscellaneous Efforts:

Partner Reporting: Capture any additional efforts being taken by SHMP partners that are either not documented in the SHMP or not included explicitly in a SHMP mitigation action.

2028 SHMP GOALS

Goal 1—Significantly reduce risk to life, community lifelines, the environment, property, and infrastructure by planning and implementing whole-community risk reduction and resilience strategies.

Goal 2—Build capacity and capabilities to increase disaster resilience among historically underserved populations, individuals with access and functional needs, and communities disproportionately impacted by disasters and climate change.

Goal 3—Incorporate equity metrics, digital tools, and technological integration into all mitigation planning, policy, funding, outreach, and implementation efforts.

Goal 4—Apply the best available science authoritative data, and technology, including My Hazards and My Plan tools, to design, implement, and prioritize projects that enhance resilience to natural hazards and climate change impacts.

Goal 5—Integrate mitigation principles into laws, regulations, policies, and guidance to support equitable outcomes to benefit the whole community.

Goal 6— Significantly reduce barriers to timely, efficient, and effective hazard mitigation planning and action.

IDENTIFYING AND PROFILING HAZARDS

LOCATION

EXTENT

PREVIOUS OCCURRENCE

PROBABILITY OF FUTURE EVENTS

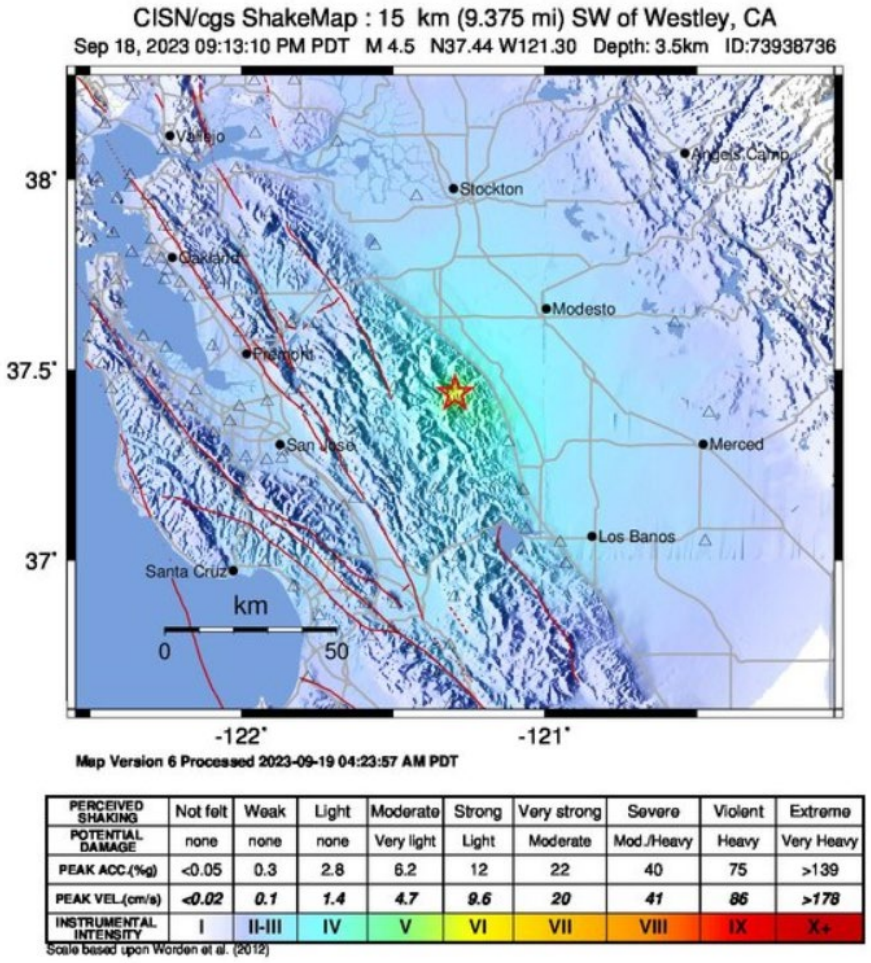
IMPACT ANALYSIS

VULNERABILITY ANALYSIS

IDENTIFYING AND PROFILING HAZARDS BY LOCATION

LOCATION

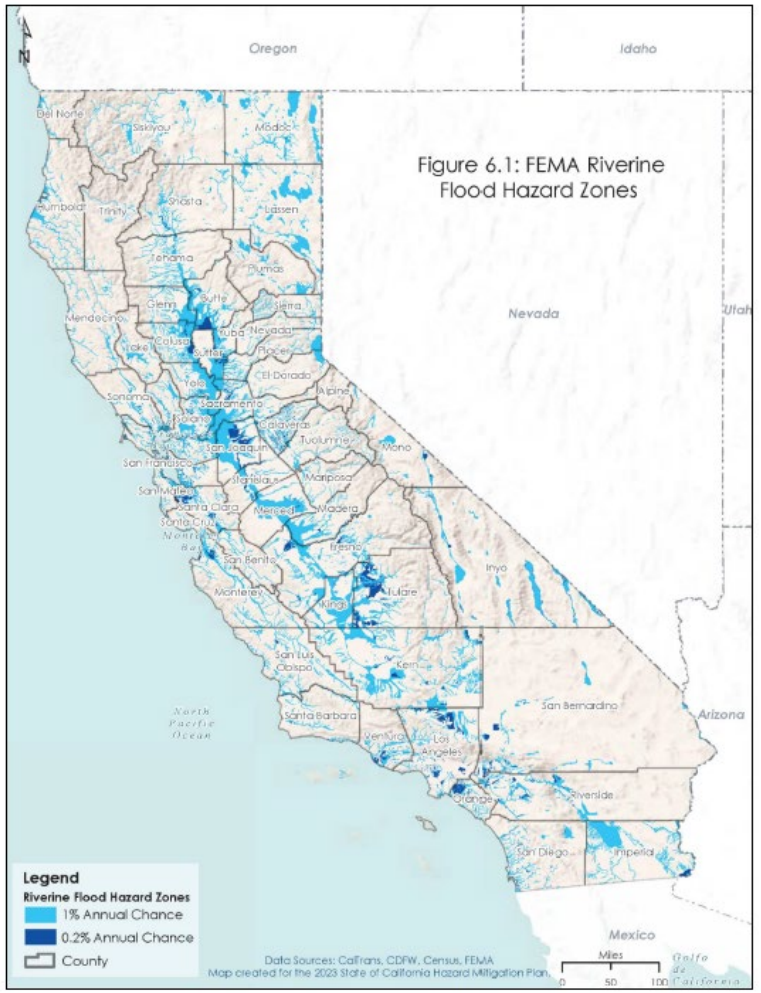
Location is the geographic areas within the state that are potentially affected by the hazard



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Figure 6-1. FEMA Riverine Flood Hazard Zones

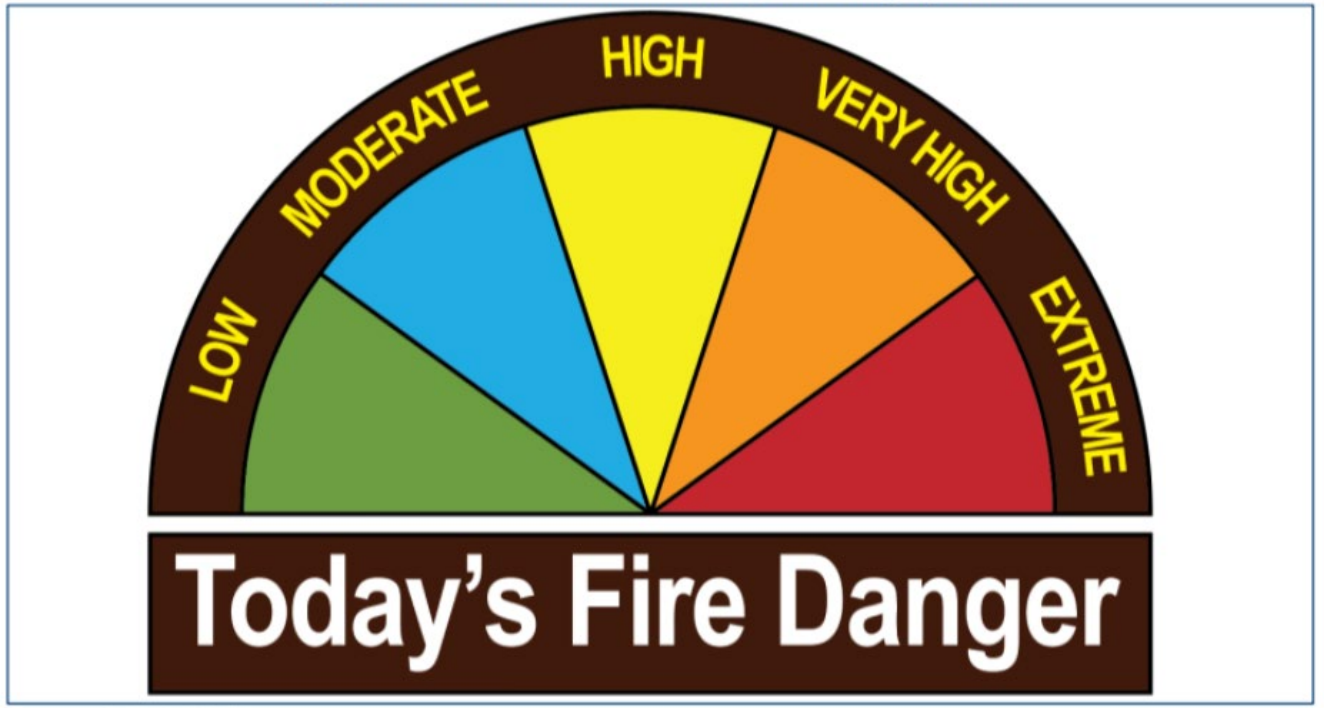


IDENTIFYING AND PROFILING HAZARDS BY EXTENT

EXTENT

Extent is the strength or magnitude of the hazard. Extent can be described in a combination of ways depending on the hazard, such as the value on an established scientific scale or measurement system

Figure 9-10. National Fire Danger Rating System



IDENTIFYING AND PROFILING HAZARDS BY PREVIOUS OCCURRENCES

Top 20 Deadliest California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP FIRE** *(Powerlines)*	November 2018	Butte	153,336	18,804	85
2	**GRIFFITH PARK** *(Unknown)*	October 1933	Los Angeles	47	0	29
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	2,900	25
4	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	5,643	22
5	**EATON** *(Under Investigation)**	January 2025	Los Angeles	14,021	9,413	19
6	**NORTH COMPLEX** *(Lightning)*	August 2020	Butte, Plumas, & Yuba	318,935	2,352	15
7	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	2,820	15
8	**RATTLESNAKE** *(Arson)*	July 1953	Glenn	1,340	0	15
9	**PALISADES** *(Arson)*	January 2025	Los Angeles	23,707	6,833	12
10	**LOOP** *(Unknown)*	November 1966	Los Angeles	2,028	0	12
11	**HAUSER CREEK** *(Human Related)*	October 1943	San Diego	13,145	0	11
12	**INAJA** *(Human Related)*	November 1956	San Diego	43,904	0	11
13	**IRON ALPS COMPLEX** *(Lightning)*	August 2008	Trinity	105,855	10	10
14	**REDWOOD VALLEY** *(Power Lines)*	October 2017	Mendocino	36,523	544	9
15	**HARRIS** *(Undetermined)*	October 2007	San Diego	90,440	548	8
16	**CANYON** *(Unknown)*	August 1968	Los Angeles	22,197	0	8
17	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	1614	8
18	**LNU Lightning Complex** *(Lightning/Arson)*	August 2020	Napa/Sonoma/Yolo/Stanislaus/ Lake	363,220	1,491	6
19	**ATLAS** *(Powerline)*	October 2017	Napa & Solano	51,624	781	6
20	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	1,003	6

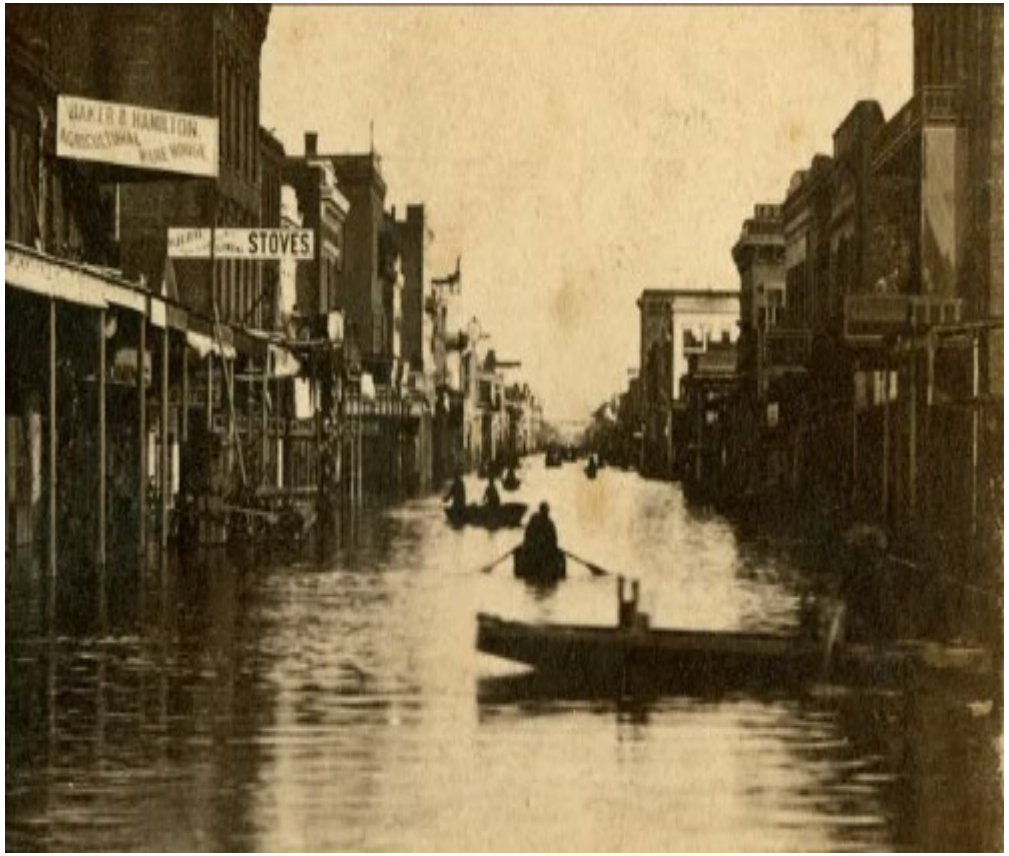
** Fires with the same death count are listed by most recent. Several fires have had 4 fatalties, but only the most recent are listed.
***This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.

10/9/2025

PREVIOUS OCCURRENCES

The history of previous hazard events for each hazard. This information helps estimate the likelihood of future events and predict potential impacts

IDENTIFYING AND PROFILING HAZARDS BY PREVIOUS OCCURRENCES



IDENTIFYING AND PROFILING HAZARDS BY PROBABILITY OF FUTURE EVENTS

Table 10-2. Probability of Future Severe Weather Events in California

Hazard Type	Events Between 1950 and 2022	Average Frequency
Coastal Storms and Hurricanes	10	About 1 per 7 years
Windstorm	>500	More than 7 per year
Hailstorm	>500	More than 7 per year
Thunderstorm and Lightning	>500	More than 7 per year
Tornado	466	About 7 per year
Winter Weather (snow and ice)	>500	More than 7 per year

Source: (FEMA 2022a), (NCEI 2022b), and (Cal OES 2018)

PROBABILITY OF FUTURE EVENTS

Probability is the likelihood of the hazard occurring in the future and can be described in a variety of ways

IDENTIFYING AND PROFILING HAZARDS BY IMPACT ANALYSIS

- Severity
- Warning Time
- Cascading Impacts
- Environmental Impacts
- Local Hazard Impacts

IMPACT ANALYSIS

IDENTIFYING AND PROFILING HAZARDS BY VULNERABILITY ANALYSIS

- Exposure of State-Owned or –Leased Facilities
- Exposure of Critical Facilities and Community Lifelines
- Estimate of Loss
- Buildable Lands
- General Populations and Equity Priority populations

Vulnerability analysis

Hazards for 2028 Update

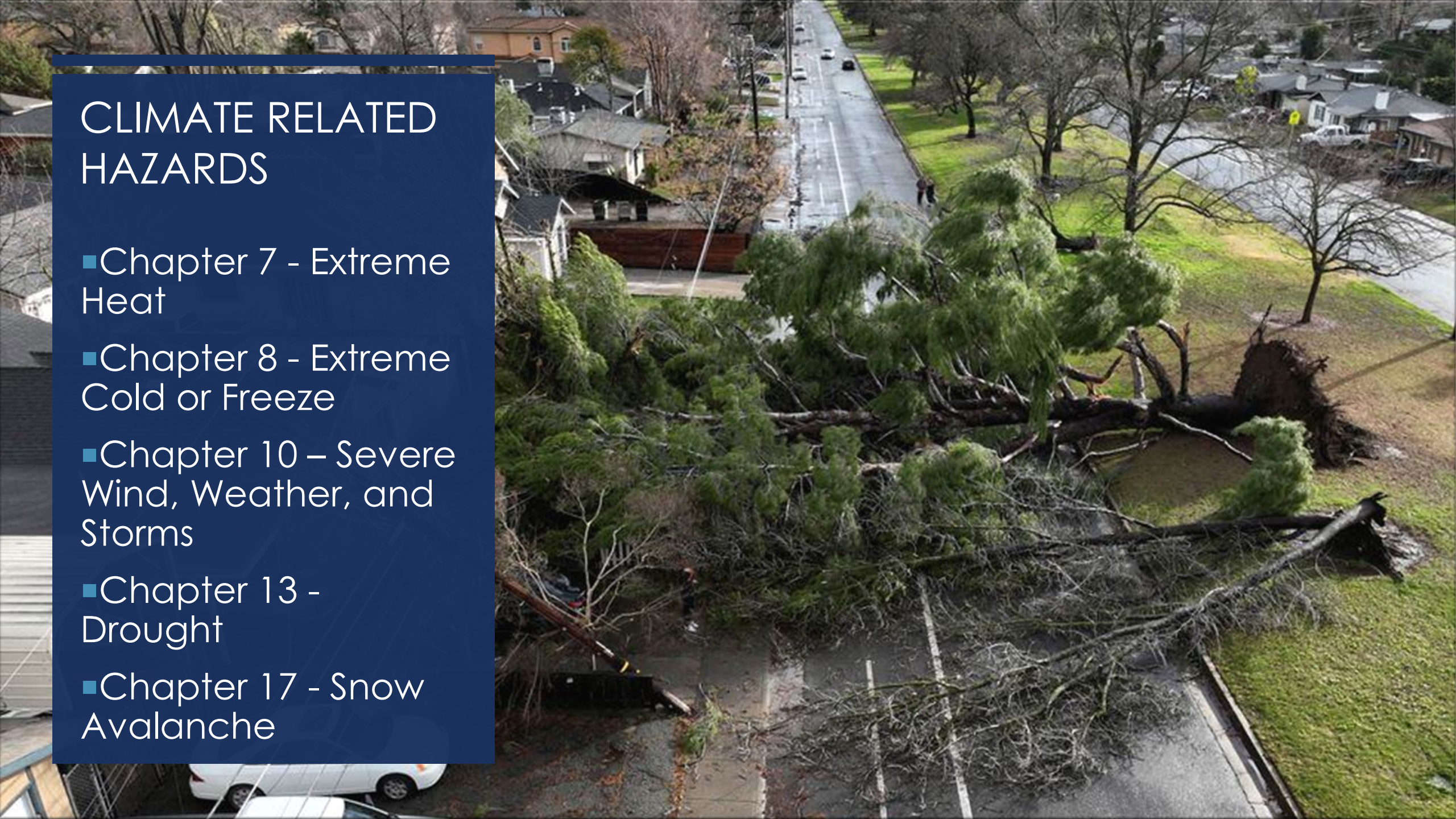
SEISMIC HAZARDS

- Chapter 5 - Earthquakes
- Chapter 12 - Landslides
- Chapter 14 - Tsunami & Seiche
- Chapter 18 - Subsidence
- Chapter 19 - Volcano

FLOOD HAZARDS

- Chapter 6 - Riverine, Stream, and Alluvial Flooding
- Chapter 11 - Sea-Level Rise, Coastal flooding, and erosion
- Chapter 15 - Dam failure
- Chapter 16 - Levee Failure

WILDFIRE HAZARD CHAPTER 9



CLIMATE RELATED HAZARDS

- Chapter 7 - Extreme Heat
- Chapter 8 - Extreme Cold or Freeze
- Chapter 10 – Severe Wind, Weather, and Storms
- Chapter 13 - Drought
- Chapter 17 - Snow Avalanche

All Other Hazards of Interest Identified

- Urban Structural Fires
- Other Potential Causes of Long-Term Electrical Outage
- Public Safety Power Shutoff (PSPS)
- Terrorism
- Air Pollution
- Energy Shortage
- Cyber Threats
- Tree Mortality
- Invasive & Nuisance Species
- Epidemic, Pandemic, and Vector-Borne Disease

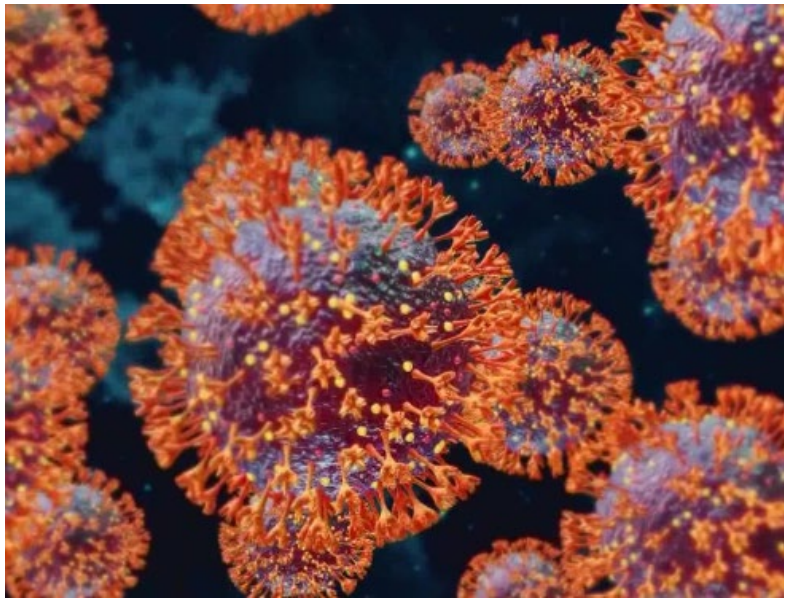
- Civil Disorder
- Natural Gas Pipeline Hazards
- Hazardous Materials Release
- Transportation Accidents Resulting in Exposures or Toxic Releases
- Well Stimulation and Hydraulic Fracturing
- Oil Spills
- Electromagnetic Pulse Attack
- Radiological Accidents
- Geomagnetic Storm (Space Weather)

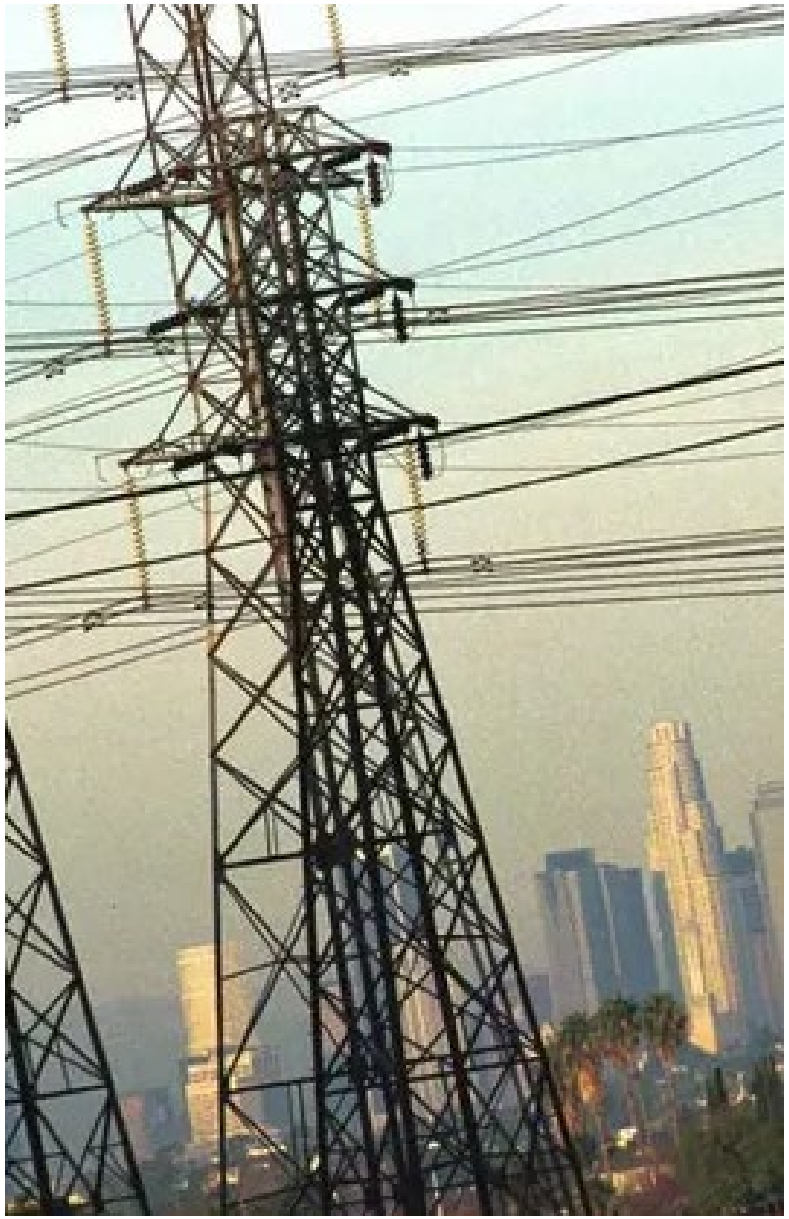
HUMAN-CAUSED HAZARDS

- Chapter 22 Urban Structural Fire
- Chapter 25 Terrorism
- Chapter 26 Air Pollution
- Chapter 28 Cyber Threats
- Chapter 32 Civil Disorder
- Chapter 33 Natural Gas Pipeline Hazards
- Chapter 34 Hazardous Materials Release
- Chapter 35 Transportation Accidents Resulting in Explosion
- Chapter 36 Well Stimulation and Hydraulic Fracturing
- Chapter 37 Oil Spills
- Chapter 39 Radiological Accidents

ADDITIONAL OTHER HAZARDS

- Chapter 24 Public Safety Power Shutoff
- Chapter 27 Energy Shortage
- Chapter 29 Tree Mortality
- Chapter 30 Invasive and Nuisance Species
- Chapter 31 Epidemic/Pandemic/Vector-Borne Disease





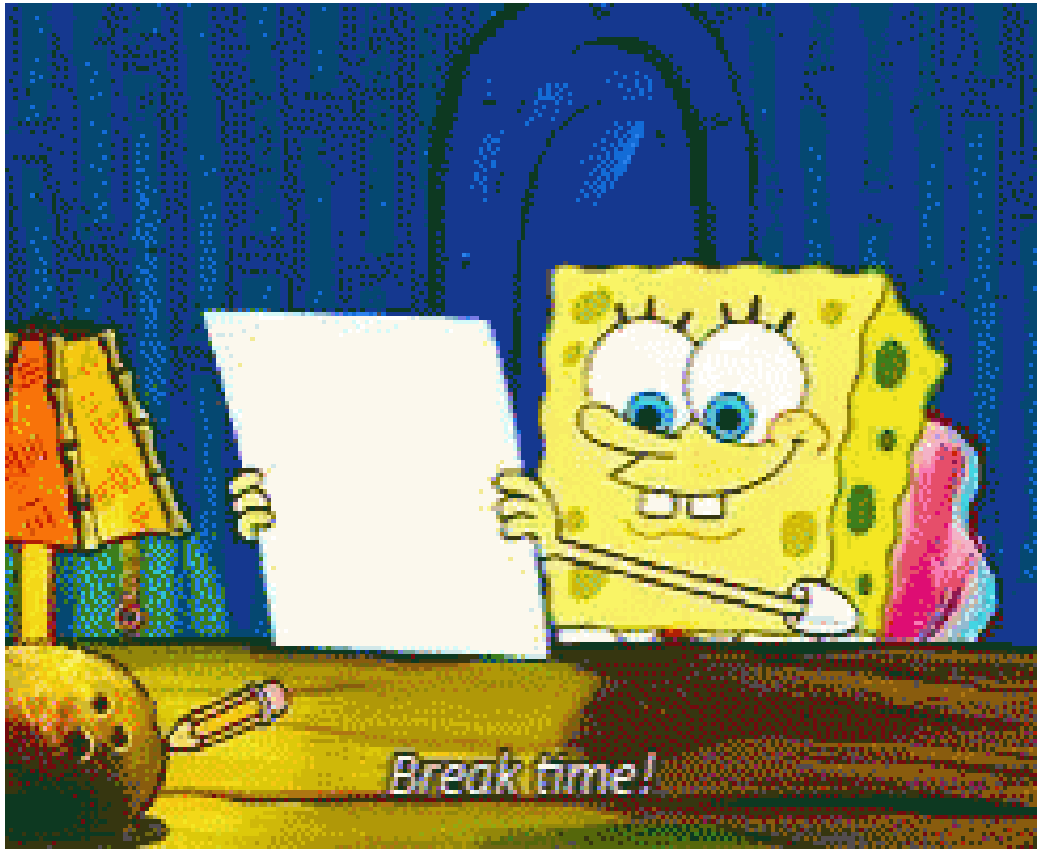
2023 CALIFORNIA LEGISLATION REQUIRED HAZARDS

- Chapter 38. Electromagnetic Pulse Attack

- Chapter 40. Geomagnetic Storm

- Chapter 23. Other potential causes of long-term electrical outage (per CA SB 1076, 2018)

BREAK



Risk Assessment Methodology

Risk Assessment Methodology

Cal OES · State Mitigation Planning Unit

WHAT IS A RISK ASSESSMENT? WHY IT IS IMPORTANT!

- A risk assessment is a process of determining which hazards are of concern and assessing the potential impacts of those hazards statewide.

- It helps communicate vulnerabilities, develop priorities, and inform decision-making for the hazard mitigation plan and other emergency management efforts.

RISK ASSESSMENT METHODOLOGY

STATE ASSETS

CRITICAL FACILITIES AND COMMUNITY LIFELINES

POPULATION AND EQUITY PRIORITY COMMUNITIES

BUILDABLE LANDS

STATE ASSETS

Asset Inventories

- State Facilities
- State Highways
- State Bridges
- State-Owned Dams
- State Water Project

Figure 4-2. State-Owned and State-Leased Facilities

CRITICAL FACILITIES AND COMMUNITY LIFELINES

Community lifelines

- Safety and Security
- Food, Water, and Shelter
- Health and Medical
- Energy
- Communications
- Transportation
- Hazardous Materials

Table 5-6. Critical Facilities and Community Lifelines Exposure to Earthquake Hazard Areas

Lifeline Category	Total Number of Facilities	Number of Facilities in Hazard Area			% of Total Facilities		
		NEHRP D & E	Liquefaction *	Significant Ground Shaking	NEHRP D & E	Liquefaction *	Significant Ground Shaking
Communications	42	30	13	24	71.4%	31.0%	57%
Energy	176	92	32	51	52.3%	18.2%	18%
Food, Water, Shelter	257	131	37	73	51.0%	14.4%	28%
Hazardous Material	56	35	12	8	62.5%	21.4%	14%
Health & Medical	47	20	9	23	42.6%	19.1%	49%
Safety & Security	46	20	6	16	43.5%	13.0%	35%
Transportation	131	84	40	46	64.1%	30.5%	35%
Total	**755**	**412**	**149**	**241**	**54.6%**	**19.7%**	**32%**

* Liquefactions zones are not yet mapped for the entire State.

POPULATION AND EQUITY PRIORITY COMMUNITIES

Used the U.S. Centers for Disease Control and Prevention (CDC)'s Social Vulnerability Index (SVI) dataset

Underserved and socially vulnerable populations include,

but are not limited to:

- Children (ages 5 and under)
- Older adults (ages 65 and over)
- People with disabilities
- Individuals with limited English proficiency
- Lower-income households
- Congregate living communities, such as multi-unit structures and multi-generational homes

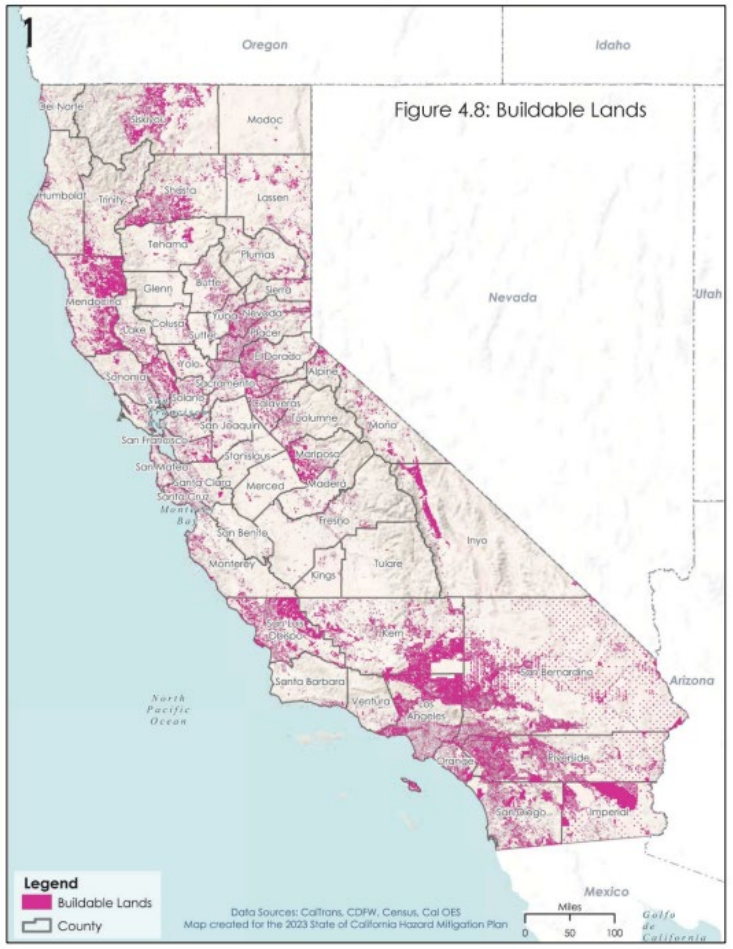
POPULATION AND EQUITY PRIORITY COMMUNITIES

BUILDABLE LANDS

Vacant Lands

- Commercial-Vacant Land
- Government-Vacant Land
- Industrial-Vacant Land
- Institutional-Vacant Land
- Multi-Family-Vacant Land
- Residential-Vacant Land
- Rural/Agricultural-Vacant Land

Figure 4-8. Buildable Lands



SHMP Partner Organizations Presentations

GIS - PRESENTATION

Eric Howard

Security, Data, and Geospatial Branch, IT Division

CA Governor's Office of Emergency Services

Cal OES

GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

MyHazards 2.0

Eric Howard

Overview

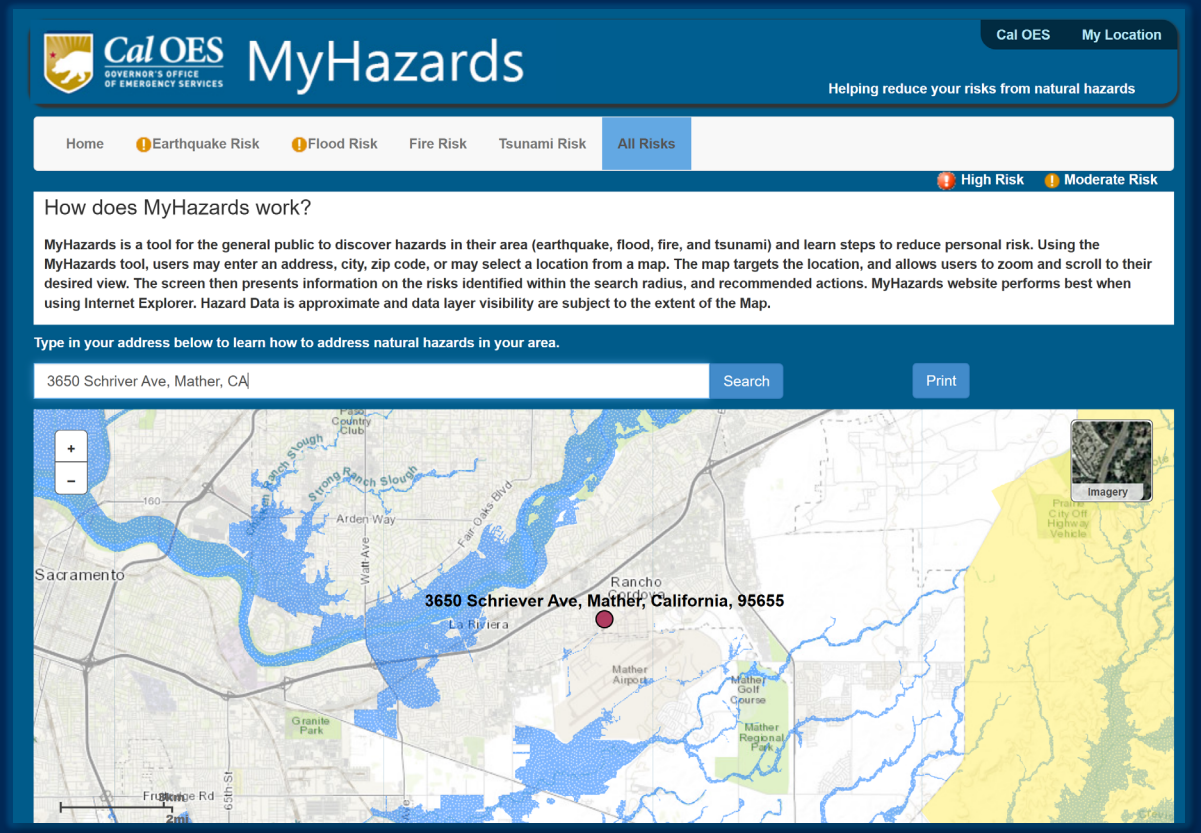
What is MyHazards?

Background & Why Updates Were Needed?

MyHazards 2.0 Functionality

What is MyHazards?

- Tool of the general public to discover hazards in their area.
- Tool to identify mitigation actions that individuals can take to reduce their personal risks.



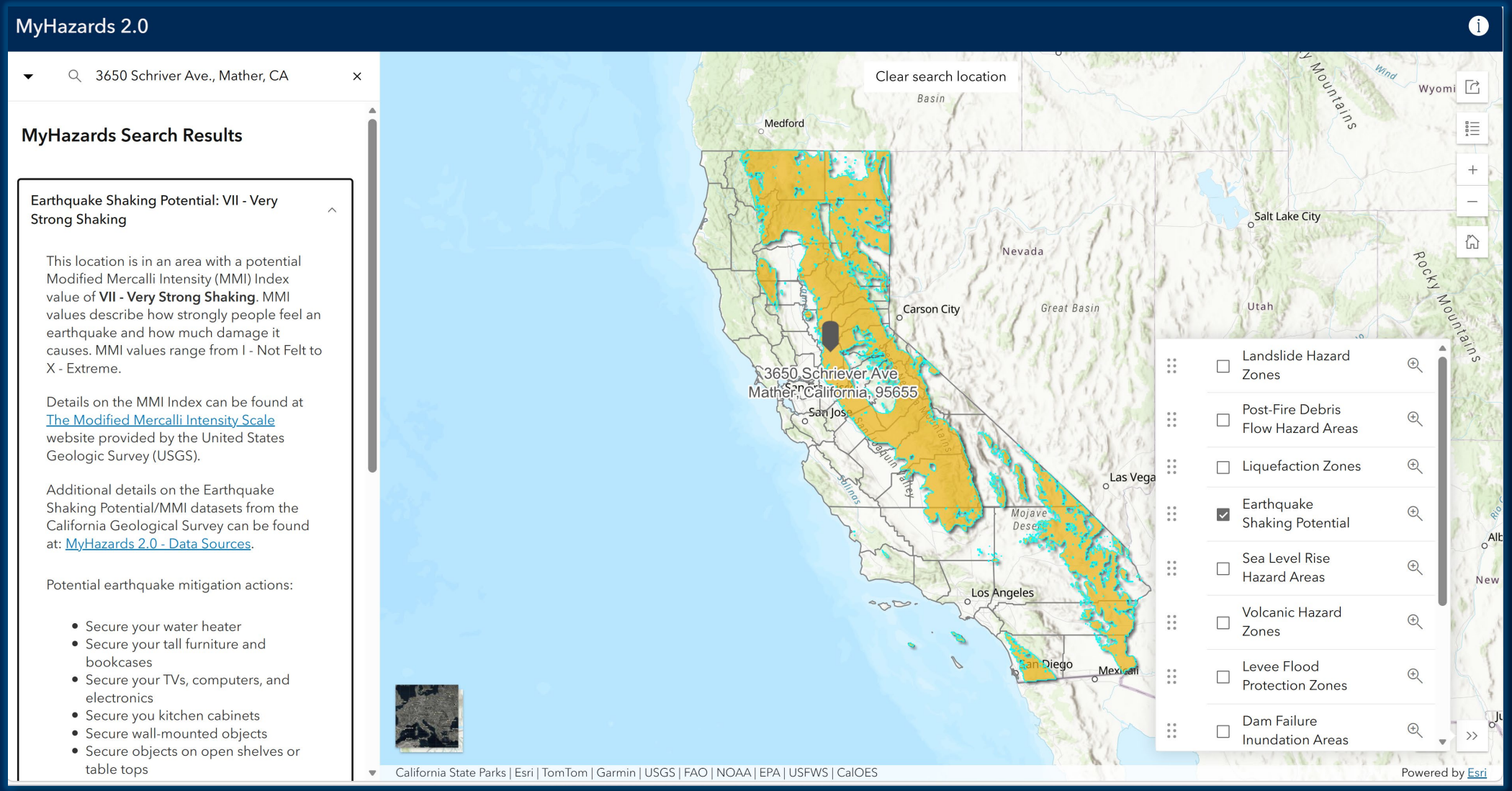
MyHazards 2.0 - Challenges

Need to modernize the application to meet current development standards

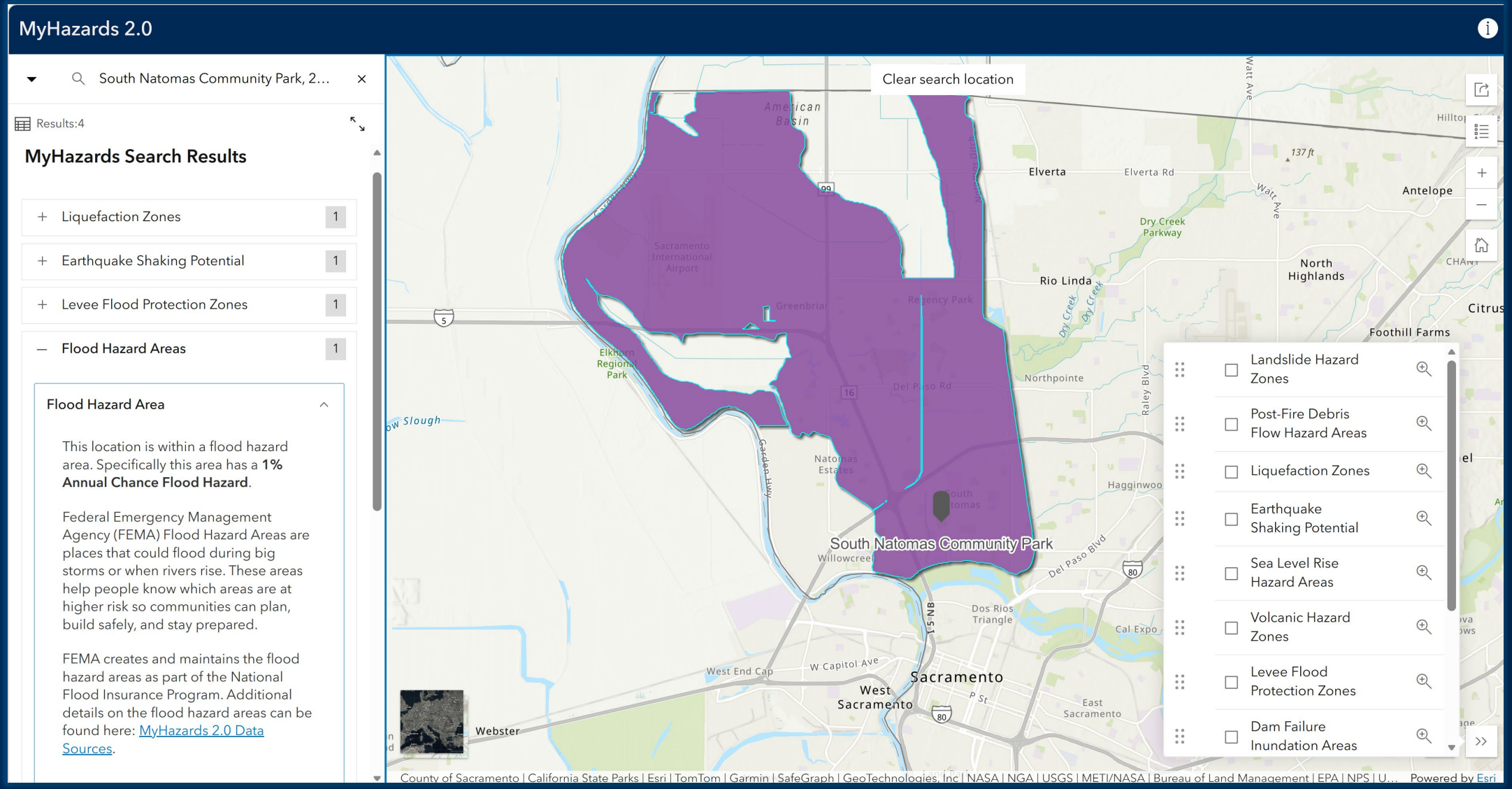
Clarification of application ownership

Simplify & automate the update process (hazard data and mitigation actions)

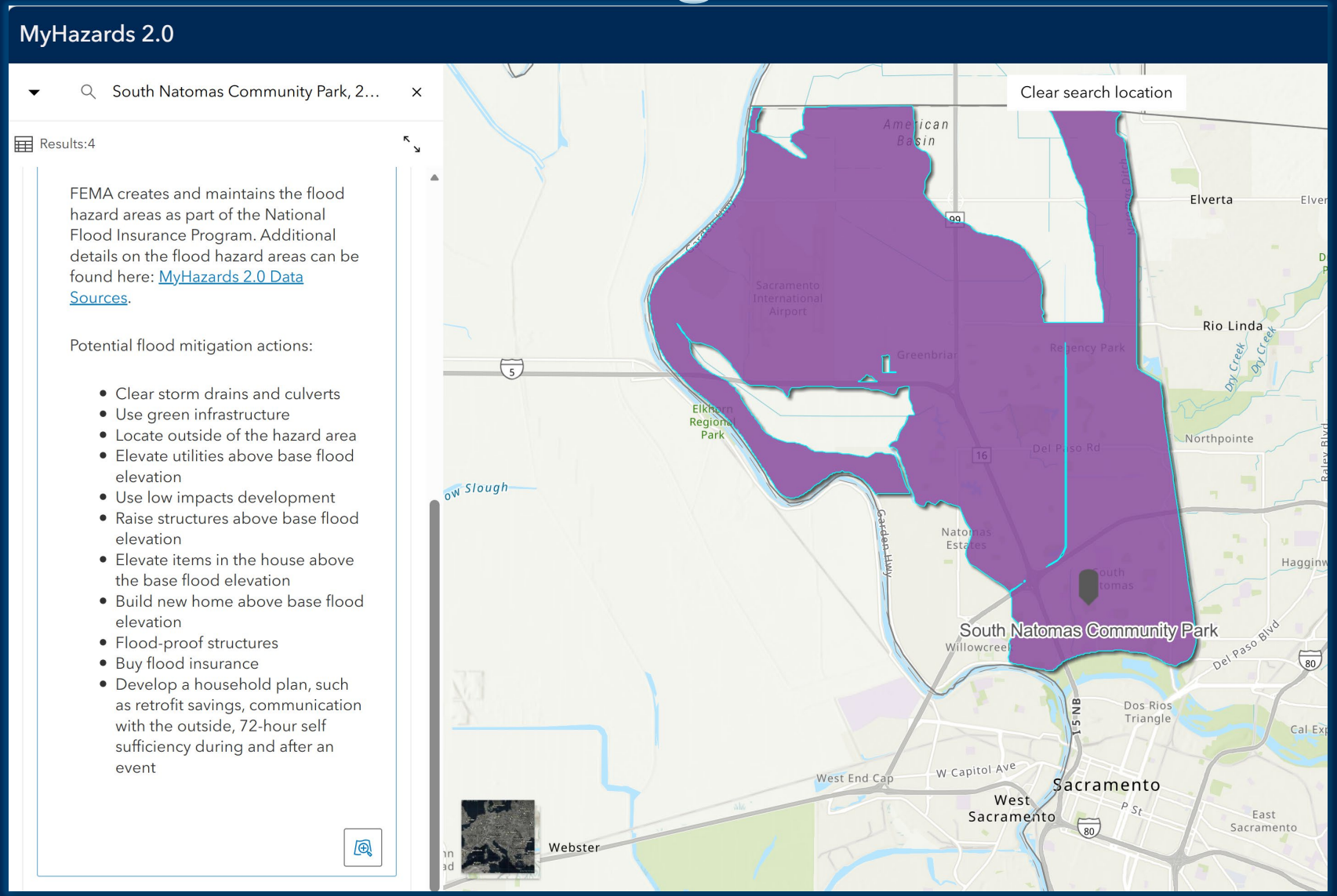
MyHazards 2.0 – Search Functionality



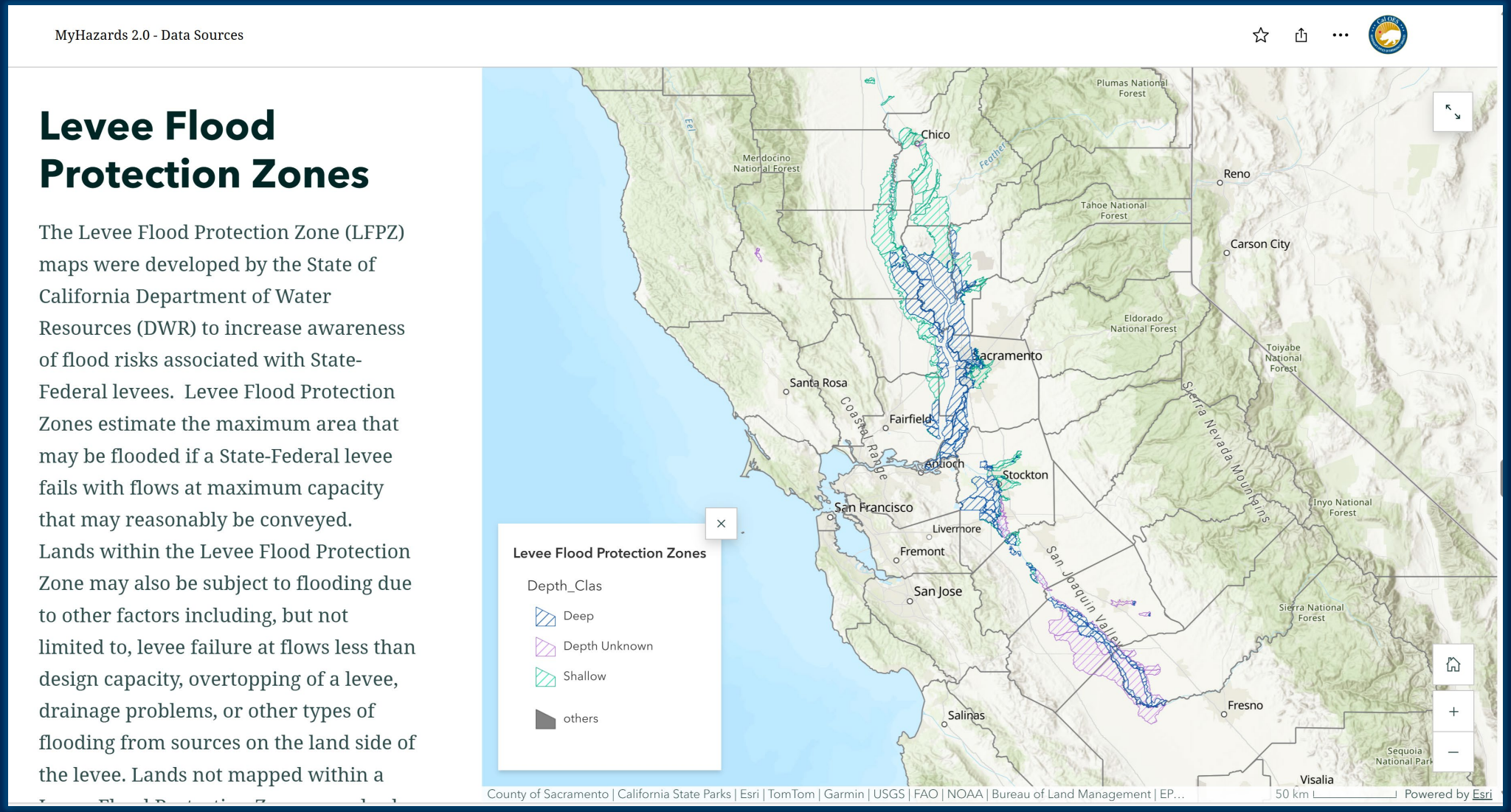
MyHazards 2.0 – Hazard Identification



MyHazards 2.0 – Mitigation Actions



MyHazards 2.0 – Data Sources StoryMap



Questions/Demo

DWR - PRESENTATION

Mike Mierzwa

CA Department of Water Resources

CA Dept. Water Resources Flood Risk Reduction Activities

2028 State Hazard Mitigation Plan Update Kick-Off
May 13, 2026

Image: Flood damage on CA-138 south of Phelan, CA, Dec. 2026.

Michael Mierzwa, P.E., Floodplain Management Advisor
CA Dept. of Water Resources, Division of Flood Operations

CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Outline of Today's Topics

- Update on DWR Statewide Flood Management Financial Assistance Programs
  - Dam Safety Climate and Resilience Program
- National Levee Safety Program
  - One-Time Screening of non-USACE levee systems
- San Joaquin Watershed Studies
- Flood Diversion and Recharge Enhancement
- State As A Community NFIP Compliance
- Best Available Maps (BAM)

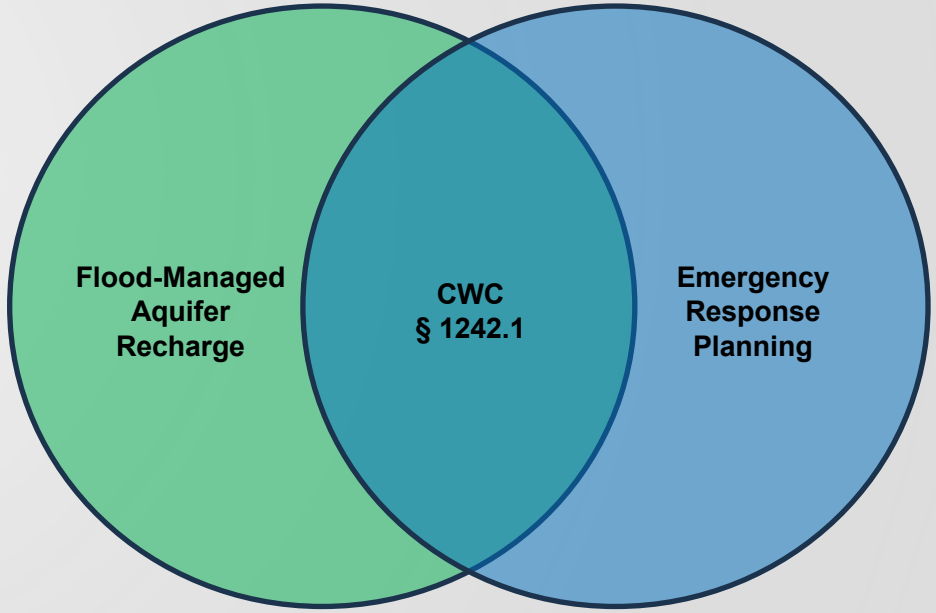


Image: Flood Emergency Diversions Venn Diagram

DWR's Flood Management Financial Assistance Programs

DWR Flood Risk Reduction Grant Program	Status	State Plan of Flood Control	Central Valley	Statewide	Current Fund Source
Statewide Flood Control Subventions Program*	**Ongoing**			✓	Proposition 1E & **Proposition 4**
Dam Safety Climate and Resilience Program*	**Draft Guidelines**			✓	**Proposition 4**
Local Levee Assistance Program	Legacy / Closed			✓	Proposition 1E
Flood Corridor Program	Legacy / Closed			✓	Proposition 13 & 84
Small Community Flood Risk Reduction Program*	**Draft Guidelines**	✓			**Proposition 4**
Regional Flood Management Planning (Directed Funding)	Funding Committed	✓			Propositions 1E & 68
Central Valley Tributaries Program	Funding Committed		✓		Proposition 1
Coastal Flood Risk Reduction Protection Program	Funding Committed			✓	Propositions 1 & 68
Floodplain Management Protection and Risk Awareness Program	Funding Committed	✓	✓	✓	Proposition 68
Conveyance Subsidence Program (Directed Funding)	Funding Committed		✓		General Fund
State Flood Emergency Response Program (Round 3)*	?			✓	Proposition 84

CALIFORNIA DEPARTMENT OF WATER RESOURCES

NOTE: These (*) programs may have future competitive funding rounds in the next several years.

Dam Safety and Climate Resilience Program

- Voters approved $450M in Prop 4 to start the new Dam Safety and Climate Resilience Program
- Prioritizes protection of public safety, restoration of water storage, flood risk reduction, enhancement of water supply reliability, protection of water quality, and enhancement, protection, or restoration of habitat for fish and wildlife
- DWR had to shift the development of the guidelines to a longer regulation process overseen by the State Office of Administrative Law (OAL)
- DWR-DSOD used this regulation process when preparing the requirements for dam owners SB92 mapping requirements
- **Project solicitations expected in 2027**

List of Screenings of Non-USACE Levees in CA

Levee System(s)	Community	Land Use Protected	Flood Hazard	Maintainer	Date(s) of Screening	Number of Systems Screened
Cosumnes River	Sacramento County / Wilton / Rancho Muretia	Rural / Ag	Riverine (Rain Flood)	RD 800	Feb 24, 2024, Apr 25, Jun 25 2025	6
Kern River	Bakersfield	Industrial	Riverine (Snow Melt)	Kern County Water Agency	Nov 23, 2024	1
City of Oroville, CA	Oroville	Urban	Riverine (Rain Flood and Snow Melt)	Oroville	May 25, 2025	1
San Pablo Bay Levee	San Rafael	Urban	Coastal	San Rafael	Jun 25, 2025	1
Mojave River Levee	Victorville	Urban	Riverine (Snow Melt – High Desert)	San Bernardino County	Jul 25, 2025	1
Sycamore Creek Levee	San Bernardino	Suburban	Debris (Mountain)	San Bernardino County	Jul 25, 2025	1
Ely Basin	Ontario	Urban	Riverine (Channelized) / Recharge Basin	San Bernardino County, Chino Basin Water Conservation District, Inland Empire Utilities Agency, & Chino Basin Watermaster	Nov 12 and 13, 2025	3
Pacheco Creek	San Benito	Rural / Ag	Riverine	San Benito County	May 19 – 21, 2026	1

Levee Review Report

Recommended Actions

Recommended Actions are intended to help the levee owner with levee risk management. Recommendations may include actions to better understand the levee (reducing data gaps), actions to reduce the likelihood and/or consequences of levee breach, communication efforts to build flood risk awareness, and activities related to levee operation and maintenance. The recommendations are listed in order of priority and include rough order of magnitude cost estimates.

#	Recommendation	Impact	Cost Range*
1	Improve community awareness of the levee and its function through outreach and risk communication. Encourage flood insurance purchase.	Consequences. Improved community risk perception and reduced time for protective action initiation.	$235K
2	Develop a levee specific emergency action plan. Develop clear action triggers. Incorporate hospital and other critical facilities in planning. Develop evacuation messaging.	Consequences. Improved evacuation planning with triggers, pre-scripted messaging, and special consideration for critical infrastructure can reduce the warning delay and increase the advance warning time for successful evacuation.	$195K
3	Erosion repair of existing damage and mitigation against future erosion at NW corner of Basin #1. [Approx 150 LF]	Performance. Reduced likelihood of failure from riverine erosion.	$300K-$720K
4	Improve understanding of hydraulics and hydrology; extreme event likelihood and information rainfall-based evacuation triggers. Participate in future planned studies including FEMA mapping revisions.	Hazard. Detailed hydrology and hydraulics study can reduce uncertainty in the hydrologic loading, specifically with regards to overtopping flow and frequency. Can also inform evacuation triggers.	No Cost Available
5	Continue animal abatement program and repairs.	Performance. Preventative measure to maintain low likelihood of failure from internal erosion.	$84K Annually
6	Install camera on Basin #3 spillways to remotely monitor for levee operation and performance issues.	Performance. Improved emergency response and floodfighting time and increased likelihood of successful intervention. Remote monitoring capabilities can also provide advanced hazard warning notice to improve evacuation.	No Cost Available
7	Video inspect the interior condition of all culverts through and beneath the levee. Consider installation of outlet gates to prevent backwater. [Cost does not include the gate installation.]	Performance. Reduced uncertainty in pipe condition and identification of potential flaws that can lead to internal migration or concentrated leak erosion failure modes.	$6K

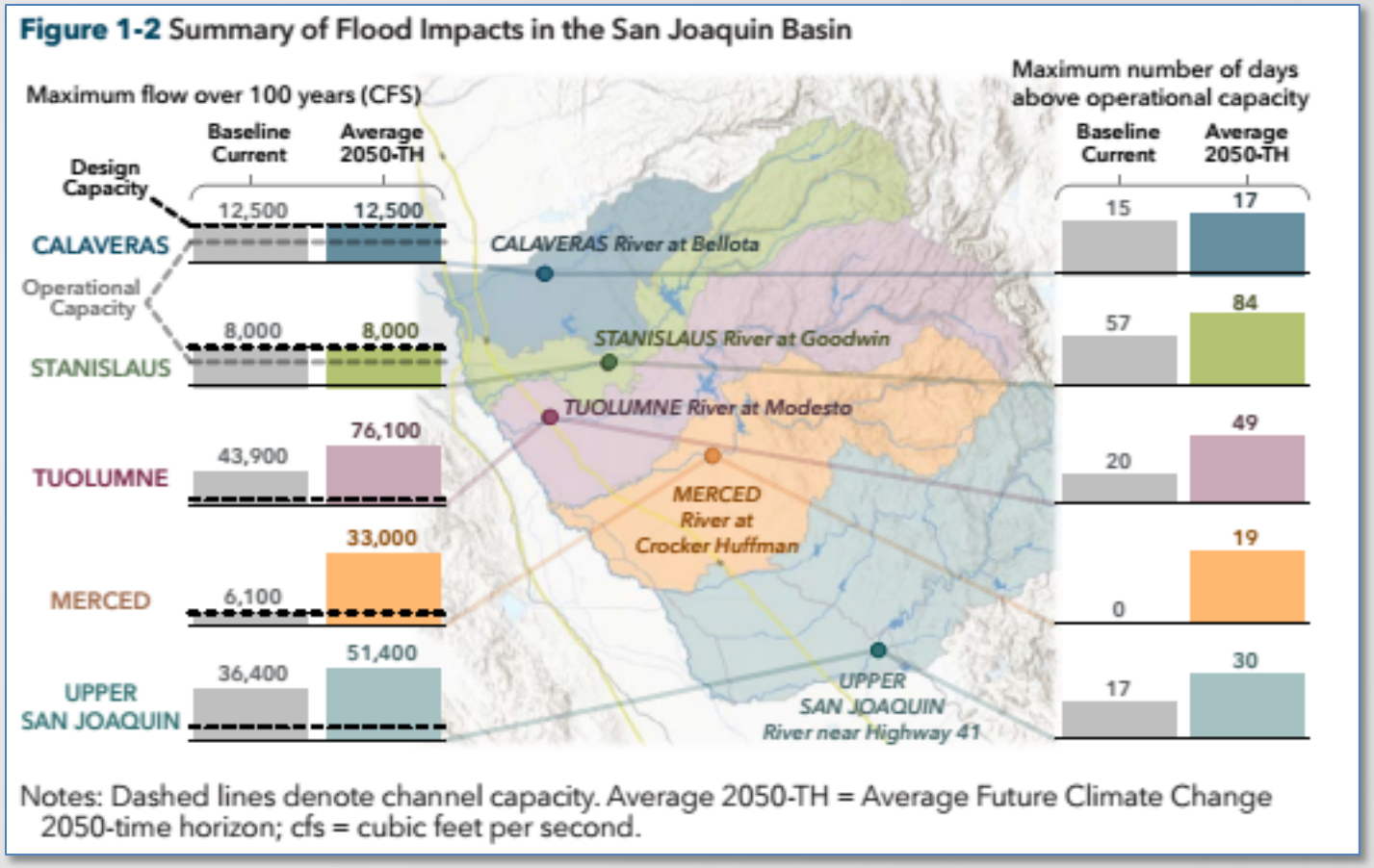
**Cost Estimates developed from "Summary of Costs Associated with Levee-related Activities" dated November 2023. Available at www.leveesafety.org. Cost Estimate Limitation: Each levee system has large variability. Users should view the low and high range of costs as a general guide. Actual costs will depend on levee-specific circumstances. Adjustments to account for specific local conditions should be made as necessary. Price level date: March 2023.*

- Recommended actions
- Data input into National Levee Database
  - Historical data
  - Screening data
- Risk relative to national inventory of levees

San Joaquin Watershed Studies

- ***Bottom-line up front:***
  Studies are promoting Integrated Forecast Informed Resource Management (I-FIRM)

- Studies provide maps showing where there are opportunities to recharge groundwater using floodwater for future conditions in two scenarios:
  1. existing operations
  2. enhanced forecast based upstream reservoir operations



CALIFORNIA DEPARTMENT OF WATER RESOURCES

SB 122 / CWC 1242.1 Background

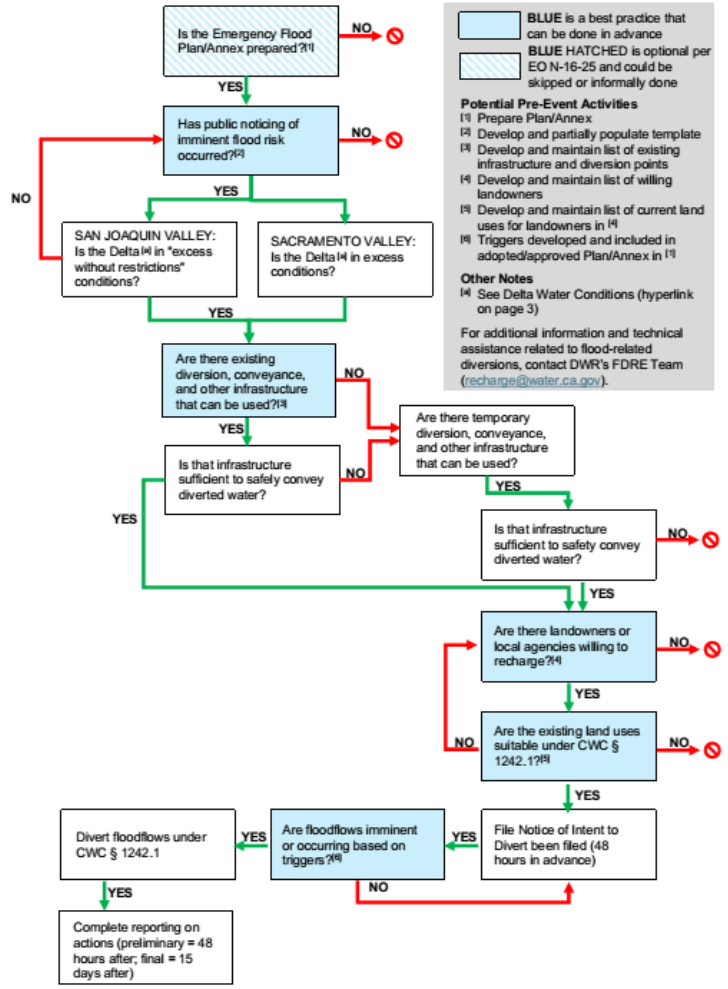
- CWC 1242.1 permits local entities to adopt plans to facilitate the dual objectives timely diversions of floodwater to promote groundwater recharge (which addresses future water supply issues) and to address anticipated downstream or localized flood losses

- Review SWRCB Technical Guide at: https://waterboards.ca.gov/waterrights/water_issues/programs/groundwater-recharge/docs/1242-1-tech-guidance.pdf

- Local agency must have considered flood risk as part of an adopted general plan or for urban areas within the Sacramento-San Joaquin Drainage District an adopted local plan of flood control (per CWC 8201)

FDRE Quick Reference

Diverting Floodwater for Recharge–Taking an Action Under CWC § 1242.1



Background

In response to powerful winter storms and flood emergencies, Governor Newson issued multiple Executive Orders (EO) in 2023 that allowed for the diversion of floodflows without a water right. Later that year, Senate Bill (Senate Bill) 122 modified the California Water Code (CWC), enacting some of the EO language.

Highlights from CWC § 1242.1 and the most recent EO (EO N-16-25) are included below. Hyperlinks to the full texts, along with other references, are included on page 3.

Purpose of This Document

The purpose of this document is to assist local and regional entities that are considering development and implementation of an action under CWC § 1242.1 by providing general guidance; related information and definitions; and a flowchart of questions to consider.

This document is intended to supplement discussions with and information from the California Department of Water Resources (DWR), State Water Resources Control Board (SWB), other agencies, local/regional entities, legal counsel, etc.

CWC § 1242.1 Highlights

What

- Allows for diversions of floodflows for the purpose of recharge without the need of a water right, when all stated conditions are met.
- Does not create a water right (no ownership or control of recharged water).

Who

- Any party can utilize this provision in the CWC, and diverters are required to comply with CWC § 1242.1 conditions.

When

- Local or regional agency must make public notice of imminent risk of flooding.
- **Flood determination is based on flood risk in the agency's most recent adopted local flood control or general plan.**
- For diversions in the Sacramento watershed, the Delta must be in excess conditions. For diversions in the San Joaquin watershed, the Delta must be in "excess without restrictions "conditions.
- Sunset date of January 1, 2029.

How

- Existing diversion infrastructure or pumps, or temporary pumps with fish screens.
- No new construction or permanent diversion infrastructure.

Where

- Not allowed in certain areas (e.g., animal facilities, applied fertilizer, native landscapes).

Temporary pump for flood diversions for groundwater recharge (Dunnigan Water District)

EO N-16-25 Highlights

- Enacted in early 2025.
- Suspends the requirement for an adopted flood plan to divert excess water, but all other CWC § 1242.1 conditions apply.
- Only applies in select counties.

FDRE Quick Reference

Managed Aquifer Recharge

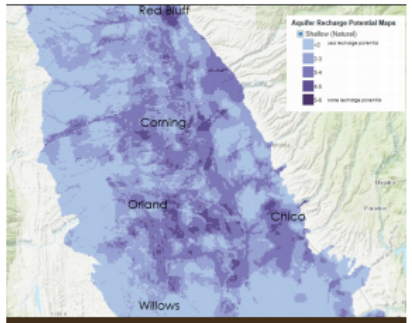
Managed Aquifer Recharge (MAR) is water intentionally infiltrated from the land surface or directly injected into an aquifer for replenishment, later use, and/or long-term water resources management. An aquifer system commonly includes three recharge and discharge elements:

Recharge areas where surface water moves to groundwater.

Storage media (sands, gravels, silt, and clay) that store groundwater.

Discharge areas consisting of wells, springs, and surface water bodies such as rivers, lakes, and wetlands.

As with many natural systems, these elements interact in numerous ways.



Map of potential aquifer recharge locations in the Sacramento Valley. Developed by DWR's Basin Characterization Program (hyperlink on page 3).

Roles and Responsibilities

As described in an emergency flood diversion plan (or annex to an existing emergency plan), many entities have roles and responsibilities to divert water under CWC § 1242.1.

DIVERTER

- Diverts water
- Enters into agreement with landowner(s) (if needed)
- Submits notice and report(s) to applicable GSA(s) and SWB

OWNER(S) OF PUBLIC ASSET(S) EXPOSED TO FLOODING (e.g., Reclamation District or Resource Conservation District)

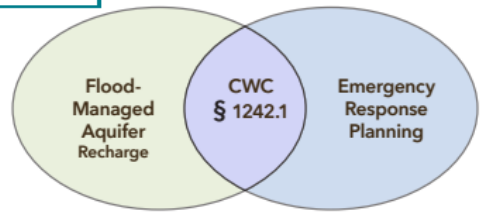
- Makes emergency declaration and/or prepares to take emergency actions in anticipation of a loss of service/function

EMERGENCY RESPONSE ENTITY (FOR COMMUNITIES AT RISK)

- Identifies flood diversion triggers and adopts or approves emergency flood diversion plan (or annex)
- Gives notice of imminent flood risk

SWB AND GSA(S)

- Receives reports



Emergency Flood Diversion Plan (or Annex to Emergency Operations Plan) Elements

Though not a requirement of CWC § 1242.1, developing an Emergency Flood Diversion Plan (or Annex) is a best practice. This Plan (or Annex) addresses the intent of a local plan of flood protection (CWC § 8201) or a general plan. This Plan (or Annex) describes "what is needed and who does it" related to diverting floodwater for recharge under CWC § 1242.1. Prepared in advance, it is intended to help streamline the process.

1. Statement of emergency authorities and responsibilities (including the need for a local emergency declaration).
2. Identification of all types of flood hazards.
3. Identification of recent flood impacts including (1) available photos, (2) assets at risk, (3) parcel information for inundation areas, or (4) location of the compromised existing flood defense system.
4. Identification of flood defense systems (e.g., levees, detention basins, floodways, waterways, dams with flood control space)
5. Identification of potential diversion and recharge areas.
6. Description of land uses in areas of impact and areas of recharge.
7. List of communities at risk of flooding that could benefit from emergency diversions and resulting future water supplies.
8. Discussion of consistency of existing emergency response plans for the communities (see #7), regional Groundwater Sustainability Plans, and evacuation plans for the recharge areas.
9. Identification of flood diversion triggers (both on and off) based on the identified flood hazards (see #2). Triggers may be associated with forecasted water levels/river stages, forecasted flow rates/reservoir releases, upstream precipitation (observed or forecasted), or observed inundation areas.
10. Discussion of the status of coordination with water suppliers (including Groundwater Sustainability Agencies) on how the management of floodflows could bolster local water supplies.
11. Process for recording and reporting on the time, duration, and volume of water diverted and any observed abnormalities associated with the water course. (Hyperlink to SWB reporting form below.)

Resources and More Information

Additional resources and information can be obtained from the following sources:

- FDRE Initiative Brochure (DWR)
- Groundwater Recharge and Related Activities (DWR)
- Basin Characterization Program (DWR)
- California Water Code Section 1242.1 Guidance (SWB)
- Permits for Groundwater Recharge (SWB)
- Sustainable Conservation's Technical Resource Library
- CWC § 1242.1 full text
- EO N-16-25 full text
- Delta Water Conditions
- Flood Recharge Diversions (CWC §1242.1 Reporting Forms (SWB)
- DWR Sustainable Groundwater Management Office email: recharge@water.ca.gov
- DWR Division of Flood Operations email: michael.mierzwa@water.ca.gov

Example: Small Creek Flooding

Location of Flood Impact		
Redding, CA		
40.563947, -122.352406 (est)		
KRCR reported flooding in Redding near I-5 resulting in closure (for several hours) of one southbound on ramp near Cypress Ave of I-5 and the northbound lanes, as well as multiple local road closures. A city fire station reported over 5" of local rainfall on Dec. 21, 2025 due to an atmospheric river event, resulting in a tributary to Churn Creek and other local drainage features (example of a FEMA mapped ditch near Hartnell Ave shown below) overflowing within the area between Cypress Ave and Hartnell Ave. Flooding led to at least one documented fatality and stranding multiple vehicles in deep water that led to water rescues for the trapped motorists. Churn Creek is *not* listed as a principle flood problem watershed in the 2024 FEMA FIS.		

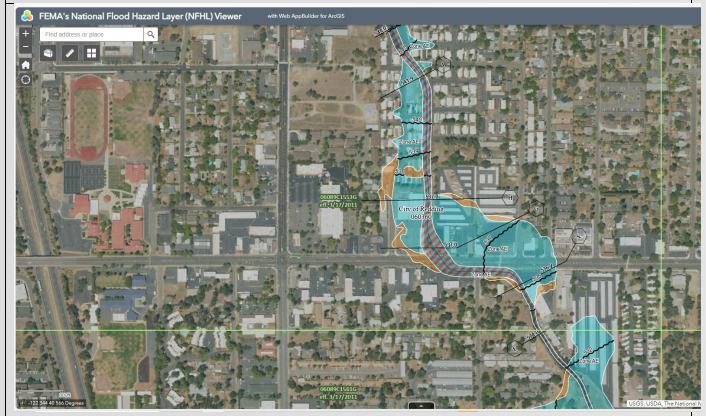
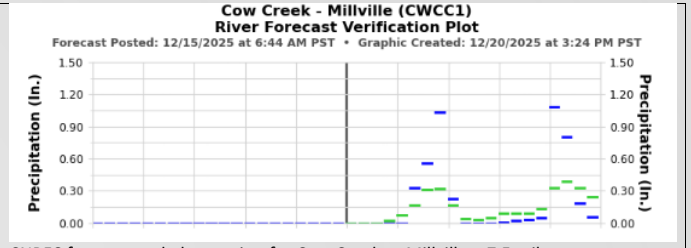


Image: Screen shot from FEMA Map Service Center, Dec. 22, 2025

Date & Timing of Event		
Dec. 12, 2025	**Duration of Flooding**	***unknown***
Flooding Source		
Tributary to Churn Creek		
unknown		
Yes	**Link to Map**	***n/a***
Zone AE / Floodway	**Effective Date**	1985
Unknown	**Link to Map**	***Unknown***

Community Information		
Shasta		
Redding		
Drain ditches and culverts for internal drainage on Churn Creek watershed, limited levees for Sacramento River only protect ag land, no accredited levees on Churn Creek watershed, upstream dams (Shasta) for flood protection on Sacramento River		
Nearby Weather Stations		
CWCC1	**Distance of Forecast from Impact Location**	7.43 mi
~1.35" / 30 hr starting Dec. 19, 2025 on Dec. 15, 2025 Forecast	**Peak Date**	Dec. 19, 2025
CWCC1	**Distance of Observation from Impact Location**	7.43 mi
2.10" / 30 hrs	**Peak Date**	Dec. 19, 2025
Redding Firestation	**Distance of Observation from Impact Location**	***unknown***
5" unknown duration	**Peak Date**	***unknown***
Roles and Responsibilities		
City of Redding	**Maintenance and Recovery Entity**	City of Redding
Records of Impacts		

Image: KRCR Dec. 21, 2025
(One fatality confirmed as flooding swamps Redding)



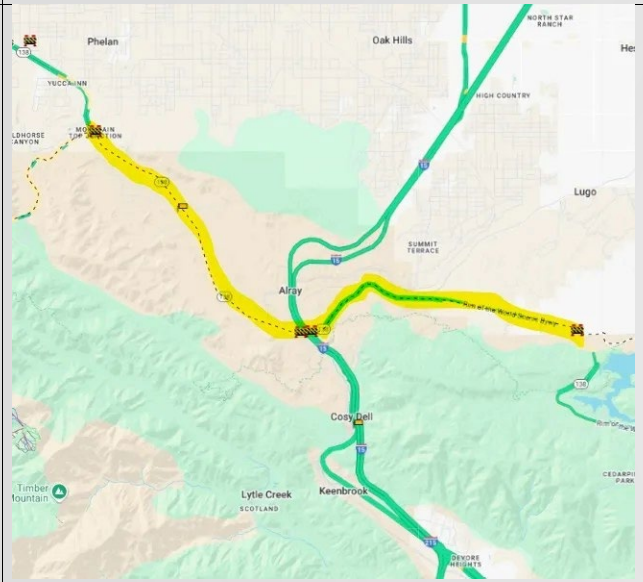
CNRFC forecast and observation for Cow Creek at Millville, ~7.5 miles away

Heavy rainfall floods South Market Street in Redding, Calif., on Sunday, Dec. 21, 2025. (Cheyenne Kibby/KRCR Chime In)

Other Reports / Records	***Unknown***		
Version Control			
Original Date Prepared	2025.12.22	**Date of Latest Update**	2025.12.22

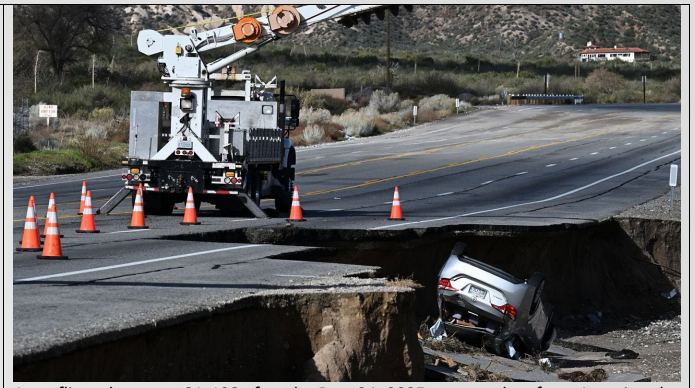
CALIFORNIA DEPARTMENT OF
WATER RESOURCES

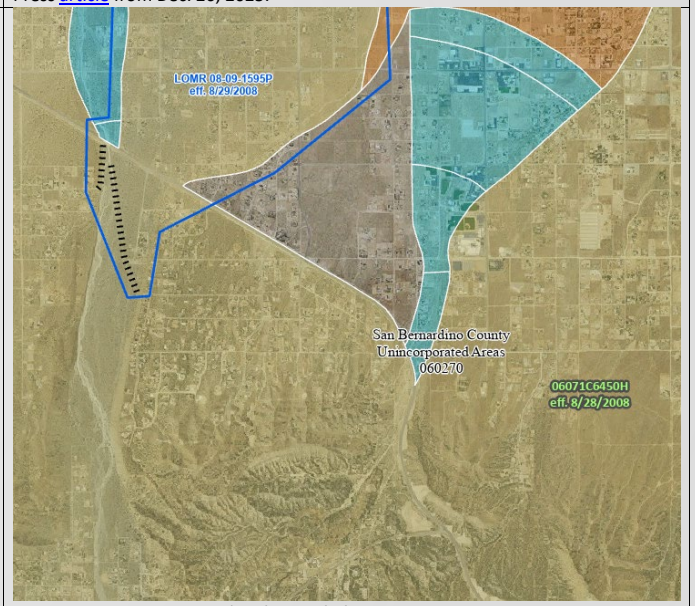
Example: Debris Flooding

Location of Flood Impact			
Location Name	Phelan, CA (south of)		
Lat / Long	34.3, -117.5 (est)		
Description of Assets Flooded	Flooding in the San Bernardino mountains on 24 Dec, 2025 resulted in bulking of flood water that took out homes and undercut portions of CA-138 between Phelan, CA and Victorville, CA (I-15). CA-138 was closed for approximately 4 days while Cal Trans made emergency repairs. CA-2 at the junction with CA-138 will be closed longer.		
Map of Location	 unknown		
Date & Timing of Event			
Date of Flooding	Dec. 24, 2025	**Duration of Flooding**	***unknown***
Flooding Source			
Waterbody Name	Sheep Creek		
Previous Flood Events	***unknown***		
FEMA Mapped Floodplain	Zone AO, Zone D, and Zone X	**Link to Map**	Zones near CA-138 and Phelan
FEMA SFHA	unknown	**Effective Date**	Unknown
Other Mapped Floodplain	***Unknown***	**Link to Map**	***Unknown***

Community Information		
San Bernardino		
Phelan, Pinos, Wrightwood		
Drainage ditches		
Nearby Weather Stations		
MVVC1	**Distance of Forecast from Impact Location**	11 miles (est) to east
3.1” (est) to east	**Peak Date**	Dec. 24, 2025
BPI (CDEC)	**Distance of Observation from Impact Location**	5 miles (est) to west
8.4” of rainfall in 24 hours	**Peak Date**	Dec. 24, 2025
unknown	**Distance of Observation from Impact Location**	***unknown***
unknown	**Peak Date**	***unknown***
Roles and Responsibilities		
San Bernardino County Fire	**Maintenance and Recovery Entity**	San Bernardino County
Records of Impacts		

Mudflow undercutting CA-138 on Dec. 24, 2025, taken from CalTrans on Dec. 29, 2025.

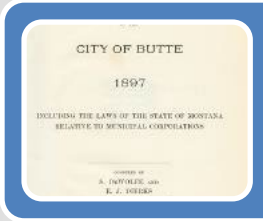

A car flipped over on CA-138 after the Dec. 24, 2025 storm, taken from Associated Press article from Dec. 26, 2025.



FEMA Map Service Center detail near Phelan, CA.

CALIFORNIA DEPARTMENT OF WATER RESOURCES

State & Local Roles for NFIP Implementation



Adoption of the NFIP (Authorities)

Land Use Regulations

Building Code Regulations

Implementation & Enforcement

- Local (i.e. Community)
  - Participate in FEMA mapping studies
  - Adopt updated FEMA maps
  - Adopt CA Building Code
  - Review permits for “development” within floodplains for consistency with local land use & building regulations
  - Take enforcement action on “development” that is inconsistent with the NFIP
- State
  - **Responsible for State-owned facilities as a “Community” (above)**
  - Audit communities once every 5-years and report findings to FEMA
  - Provides technical assistance to communities

CALIFORNIA DEPARTMENT OF WATER RESOURCES

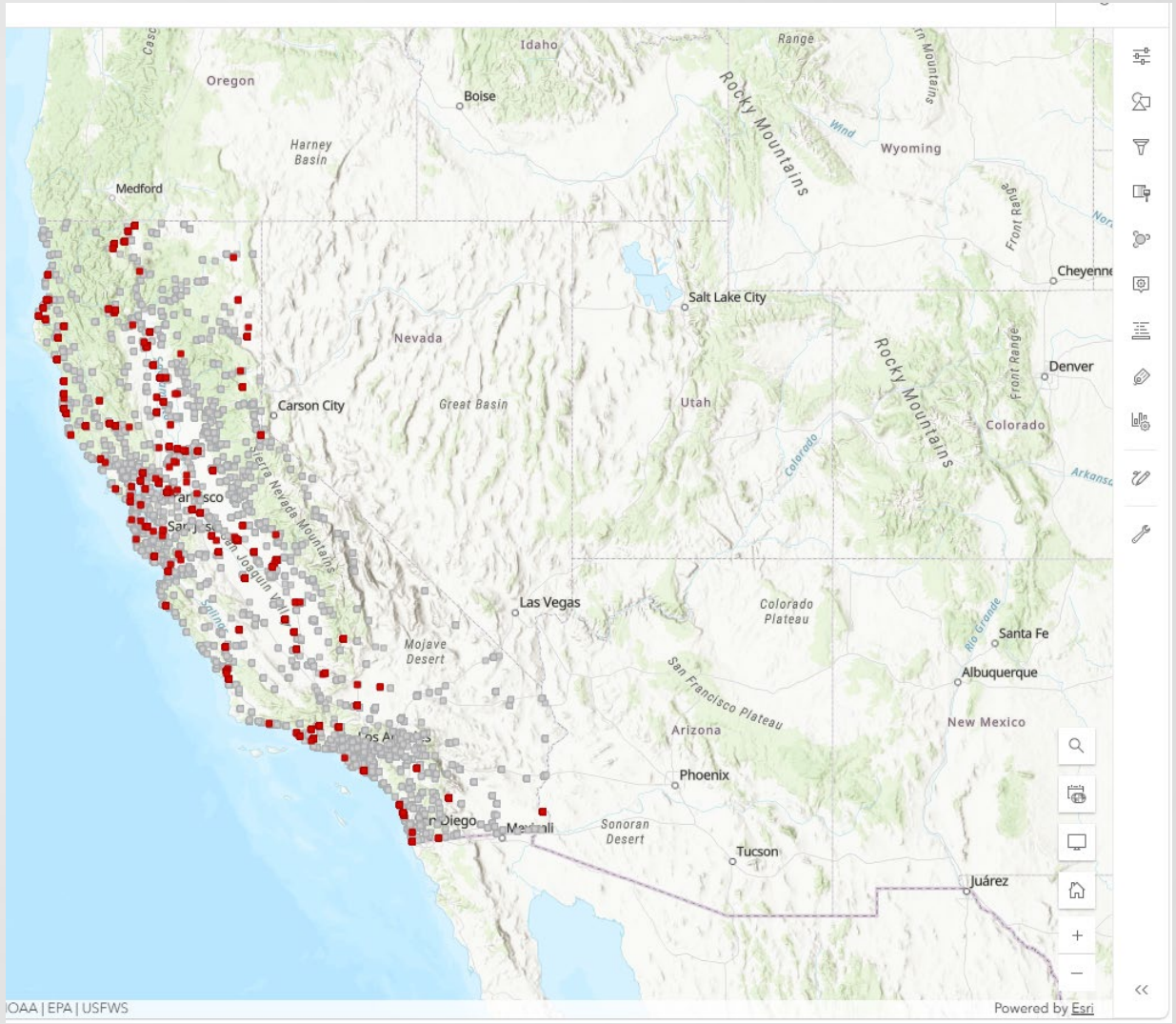
Building Codes for Risk Categories

- CA adopted changes to the International Building Code once every 3 years; and the I-Codes incorporate ASCE standards, which incorporate NFIP requirements
- **Minimum elevation requirements linked to mean recurrence intervals (includes SFHAs including Shaded X Zone, i.e. 500-year floodplains)**
- Design elevation needs to incorporate historic SLR and additional guidance on coastal flood elevation design
- Provides table to determine design flood elevations based on best available data using 500-yr, 100-yr, and 10-yr elevation site data

Risk Category	Mean Recurrence Interval (years)
I	100
II	500
III	750
IV	1,000

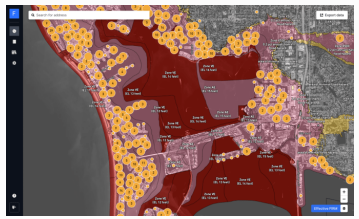
UC Davis State Facility Interactive Map

- UCD prepared an interactive web site featuring ~24,000 State-owned facilities within FEMA's 100-yr floodplains
  - https://www.arcgis.com/apps/mapviewer/index.html?webmap=0a772d1cd5a9423a91bf4482f6806582
- The list of state owned facilities was provided to DWR by DGS, and then shared with UCD
- 1787 facilities were in FEMA 100-yr floodplains
- 192 of these facilities were built after the local city or county adopted FEMA's final Flood Insurance Rate Map (FIRM) → so these facilities are subject to the NFIP building code requirements unless they are substantially improved or repaired



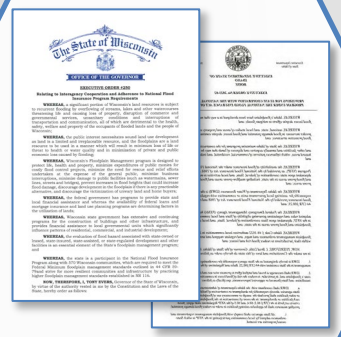
CALIFORNIA DEPARTMENT OF WATER RESOURCES

Elements of CA NFIP Compliance Workplan



State-Owned Property & Floodplain Database

FEMA: #4

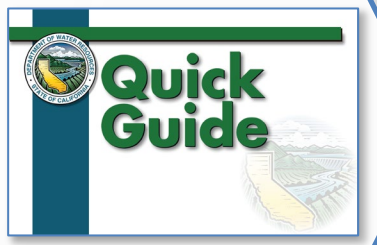


CA Building Code & NFIP Building Standards Alignment

FEMA: #1 & 2

Process for State Property NFIP Consistency & Enforcement

FEMA: #4



State NFIP Authorities

FEMA: #1 & 2

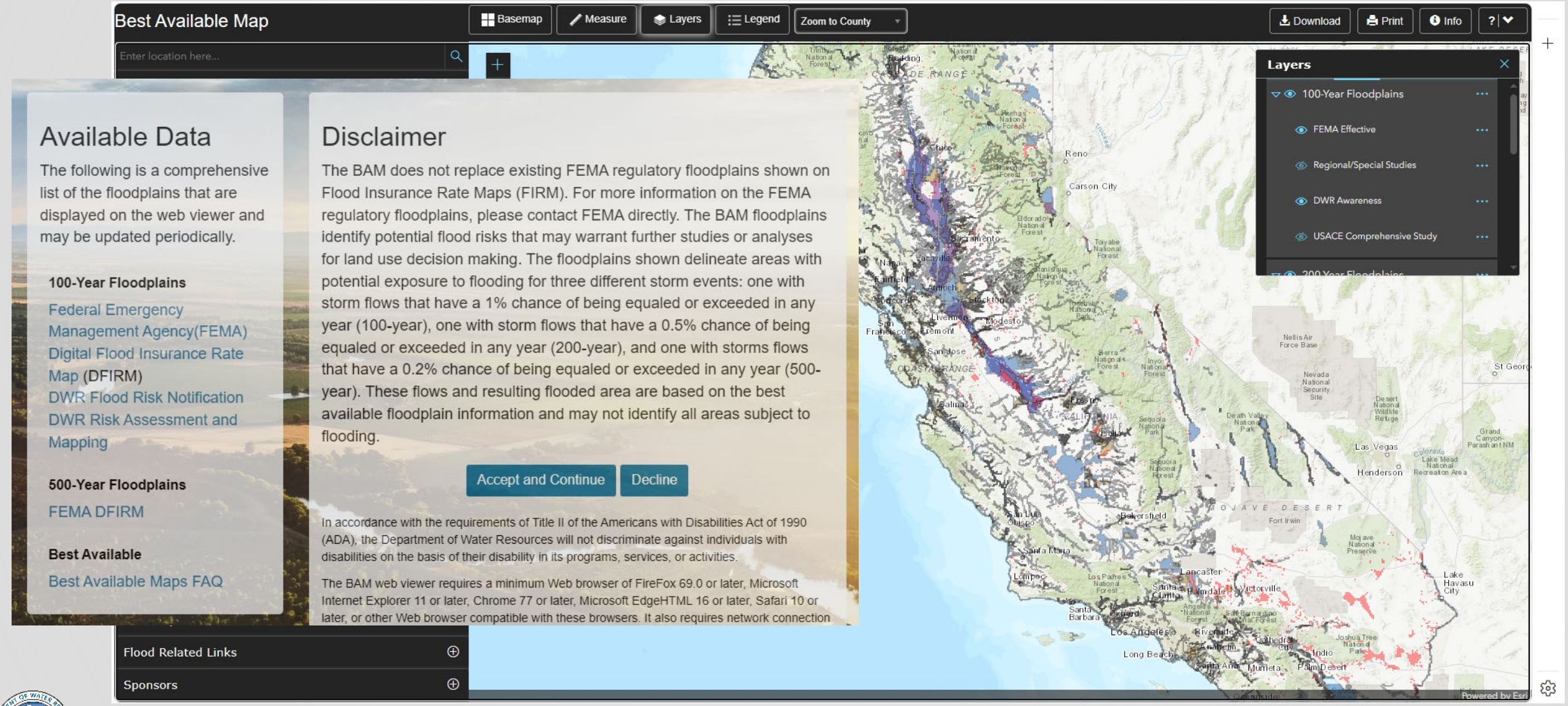
CALIFORNIA DEPARTMENT OF WATER RESOURCES

Alluvial Fan Studies

- Highest resolution recent DWR/USGS LIDAR availability (QL1/ QL2)
- Underserved community downstream
- Flooding history
- Age of alluvial Fan deposits/susceptibility to flash flooding and mud flow etc.
- Potential impacts on lives/lifelines/structures

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Map Portals: DWR Best Available Maps



CALIFORNIA DEPARTMENT OF WATER RESOURCES

DWR Technical Assistance

- Contact Info:
  Michael Mierzwa (Division of Flood Operations)
  Michael.mierzwa@water.ca.gov
  - or -
  DWR FDRE Team
  Recharge@water.ca.gov

- Virtual meetings to:
  - Look for potential flow thresholds to include in flood diversion & recharge plan
  - Provide assistance in preparing flood diversion & recharge plan

EARTHQUAKE / SEISMIC - PRESENTATION

Kristopher White

CA Governor's Office of Emergency Services

Seismic Hazards Branch

EARTHQUAKE WARNING CALIFORNIA

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

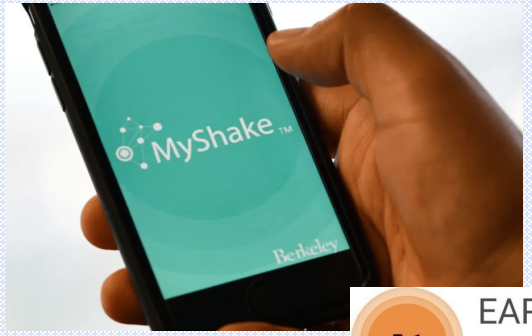
Cal OES Seismic Hazards Branch

Branch Goals:

- Work with partners to increase resiliency through education and outreach, and mitigation.
- Use science as a foundation to prepare, respond, and recover from seismic disasters.

Earthquake, Tsunami, Volcano Program (ETVP)

Earthquake Early Warning Program (EEW)



Earthquake, Tsunami, Volcano Program

Improving the safety of California's residents and visitors before disaster strikes by enhancing earthquake, tsunami, and volcano awareness and preparedness.

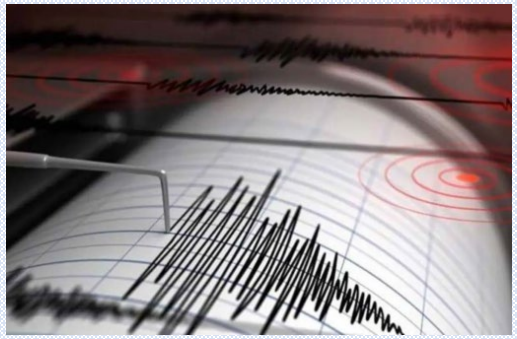
Earthquake Program

15,700
Known faults in California

500+
Active faults in California

30
Most Californians live within 30 miles of an active fault

>99%
Chance of 1 or more M6.7 or greater earthquakes striking CA*



Strongest in 10 Years

M7.1
July 5, 2019
Ridgecrest

Major Earthquakes Since December 2022		
Ferndale, CA	M6.4	December 20, 2022
Almanor, CA	M5.5	May 11, 2023
Ojai, CA	M5.1	August 20, 2023
Lamont, CA	M5.2	August 6, 2024
Offshore Cape Mendocino	M7.0	December 5, 2024
Yerington, NV	M5.7	December 9, 2024
Julian, CA	M5.2	April 14, 2025
Indio, CA	M4.9	January 19, 2026
Boulder Creek, CA	M4.6	April 2, 2026

Earthquake Program

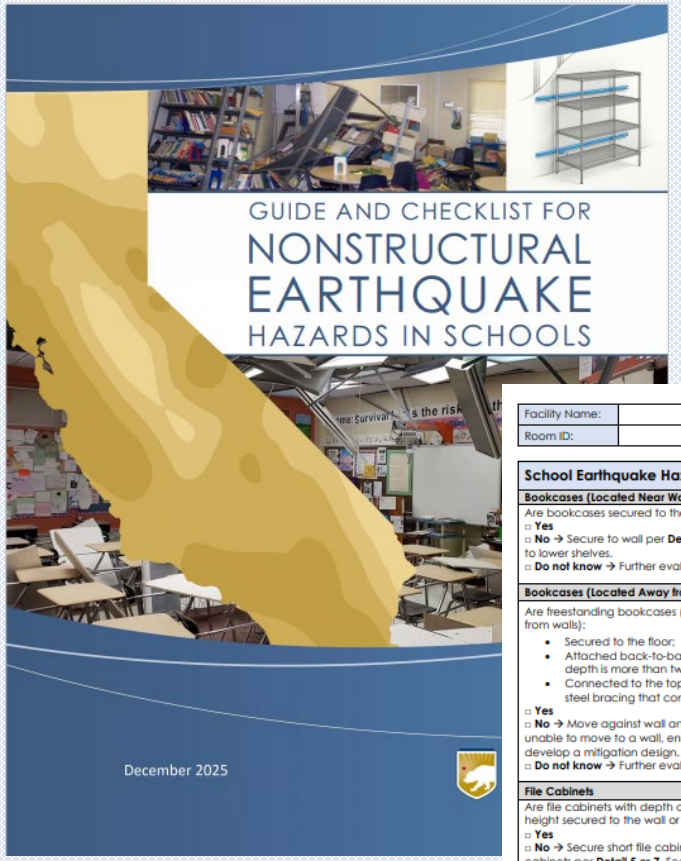
nehrp

California State Polytechnic University, Humboldt · 1913

California Department of Conservation
California Geological Survey

Earthquake Country Alliance

DRB Toolkit
Disaster Resistant Business



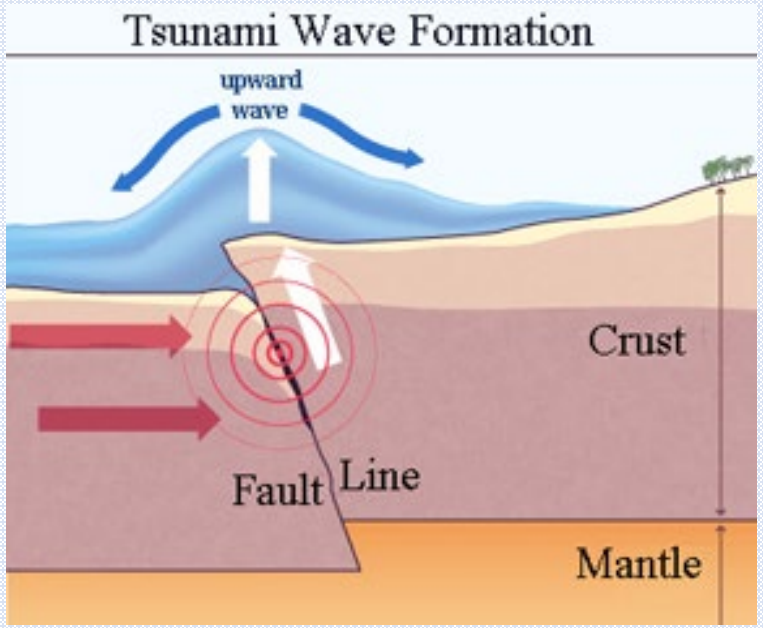
Facility Name:		Survey Date:	
Room ID:		Surveyor ID:	

School Earthquake Hazard Checklist: *Furniture and Contents* (5 pages)

Bookcases (Located Near Walls)	☐ **Not present**
Are bookcases secured to the wall or floor? ☐ **Yes** ☐ **No** → Secure to wall per **Detail 1, 3, or 4.** Move heavy items to lower shelves. ☐ **Do not know** → Further evaluation required.	**Notes:**
Bookcases (Located Away from Walls)	☐ **Not present**
Are freestanding bookcases (i.e., bookcases located away from walls): • Secured to the floor; • Attached back-to-back such that the combined depth is more than two-thirds the height; **or** • Connected to the tops of adjacent bookcases with steel bracing that connects to a wall or floor above? ☐ **Yes** ☐ **No** → Move against wall and secure per **Detail 1, 3,** or **4.** If unable to move to a wall, engage a design professional to develop a mitigation design. ☐ **Do not know** → Further evaluation required.	**Notes:**
File Cabinets	☐ **Not present**
Are file cabinets with depth or width less than two thirds the height secured to the wall or floor? ☐ **Yes** ☐ **No** → Secure short file cabinets per **Detail 2.** Secure tall file cabinets per **Detail 5 or 7.** Secure lateral file cabinets per **Detail 6.** ☐ **Do not know** → Further evaluation required.	**Notes:**
Lockers	☐ **Not present**
Are lockers secured to the wall? ☐ **Yes** ☐ **No** → Secure to wall per **Detail 8.** ☐ **Do not know** → Further evaluation required.	**Notes:**
Teacher's Cabinets	☐ **Not present**
Are teacher's cabinets secured to a wall? ☐ **Yes** ☐ **No** → Secure to wall per **Detail 9.** ☐ **Do not know** → Further evaluation required.	**Notes:**

Continues on next page.

Tsunami Program



California Tsunami History

1700 Cascadia subduction zone (CSZ) earthquake and tsunami impacted northern California and is a source for oral histories of the first peoples. *Left: 1700 CSZ Tsunami sand deposit in coastal Washington (USGS). Right: NOAA Tsunami model for a CSZ earthquake (PTWC).*

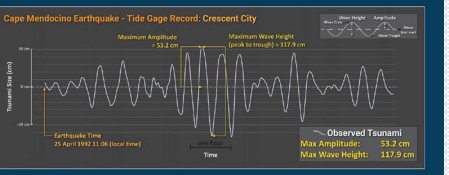
1812 An earthquake near Santa Barbara caused a tsunami which caused the first peoples (Chumash) to move their habitation sites from Santa Rosa Island to the La Purisma Mission near Santa Barbara.

1946 A magnitude M8.6 Alaska/Aleutian earthquake triggered tsunami flooded portions of Half Moon Bay, CA and other locations, caused damages in excess of $150,000 (2022 dollars), and led to 1 fatality in CA. Left: *Photo taken by Howard Anderson showing damage to boats and buildings in Half Moon Bay.*

1960 Crescent City, CA, was inundated by tsunami from the magnitude M9.5 earthquake in Chile that led to 1 death in the state and nearly $1,000,000 (2022 dollars) in damages. *Left: photo from Orville Magoon photo collection.*

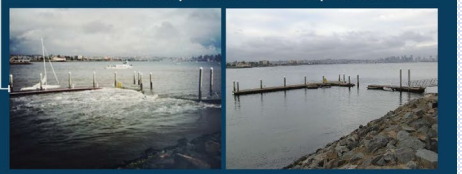
1964 Crescent City, CA, was inundated by tsunami generated by the magnitude M9.2 Good Friday earthquake in Alaska that led to 13 deaths in the state. Damage in CA exceeded $160 million (2022 dollars). *Left: Aerial Image from Orville Magoon photo collection showing buildings moved off of foundations during the tsunami.*

1992 The most recent locally sourced tsunami generated by the magnitude M7.2 Cape Mendocino earthquake caused waves to be recorded on NOAA tide gages statewide.



2006 Tsunami sourced from the magnitude M8.3 Kuril Islands earthquake in the NW Pacific Ocean generated strong currents and caused $20 million in damage in Crescent City, CA. *Left: photo from Lori Dengler.*

2010 A magnitude M8.8 earthquake in Chile generated tsunami waves that caused millions in damage in CA. *Left: Photo taken during the tsunami as it caused damage to docks at Shelter Island, San Diego, CA. Right: photo after the tsunami. Both photos from Rick Wilson photo collection.*

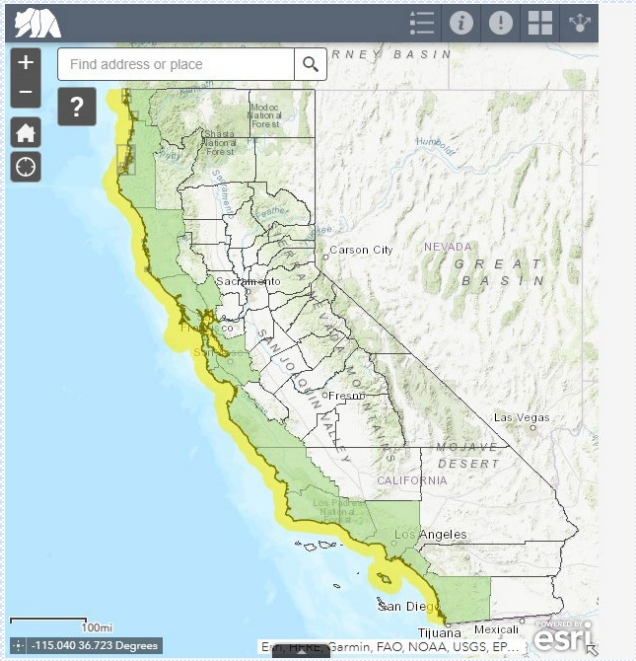


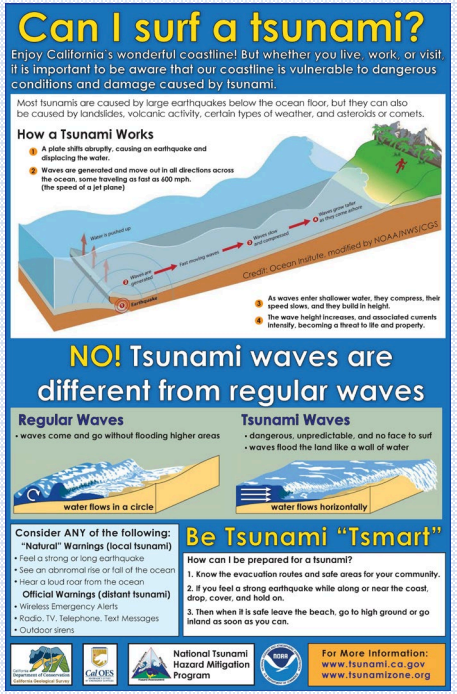
2011 The Great East (Tōhoku-oki) Japan earthquake and tsunami caused hazardous currents and surges in CA resulting in over $100 million in damage to marinas and harbors. *Below Left: Bodega Bay, CA from Pamela J. Boehand, USCG; Below Right: Crescent City, CA from NOAA NWS.*

2022 Collapse of a volcano in the Kingdom of Tonga produced tsunami flooding along the coast of CA, generated strong currents, and caused $8-10 million in damage. *Left to Right: Santa Cruz (from Jacqueline Bott), Moss Landing (from Nicholas Graehl), Ventura (from Michael DeFrisco).*

Tsunami Program

Alert level	Action	Hazard	
WARNING	Get to high ground or inland IMMEDIATELY! Follow evacuation signage	DANGER! A TSUNAMI IS IMMINENT. Flooding & dangerous currents	3+ feet or 1+ meter
ADVISORY	Stay out of the water and away from the shore	STRONG CURRENTS & DANGEROUS WAVES! In or near coastal waters	1 - 3 feet or 0.3 - 1 meter
WATCH	Prepare to take action. Monitor local TV, radio, social media, NOAA weather radio	A TSUNAMI IS POSSIBLE. Arrival time is several hours away. Prepare now. Alert level may change.	Prepare
INFORMATION STATEMENT	NO action needed	NO tsunami impact expected.	Relax

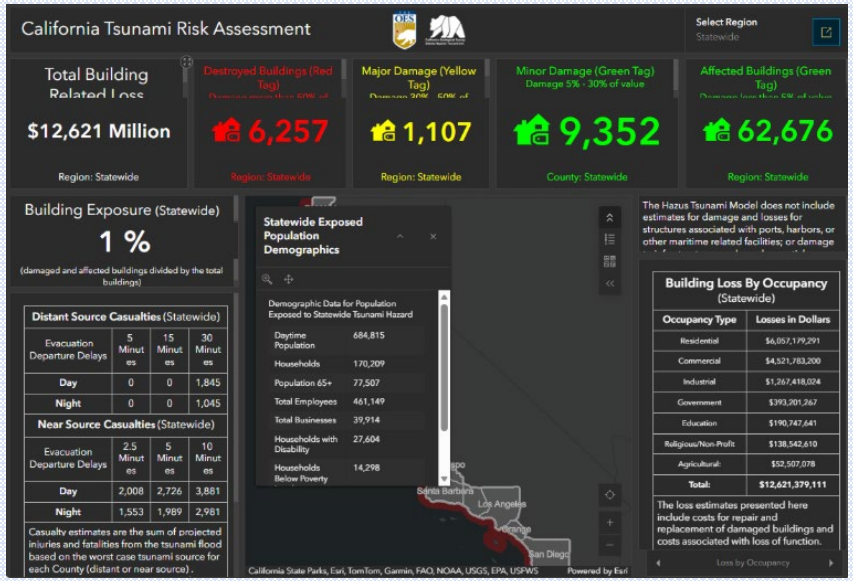


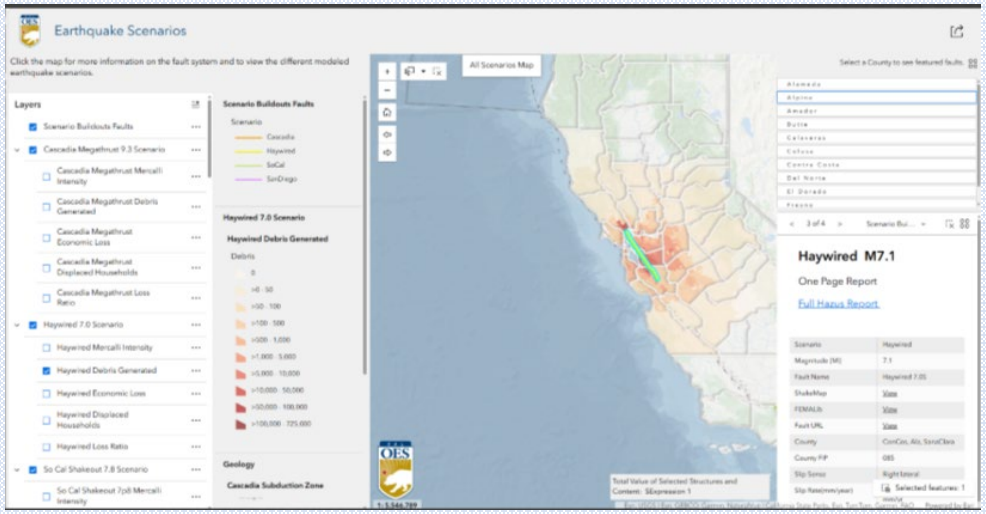


EARTHQUAKE WARNING CALIFORNIA

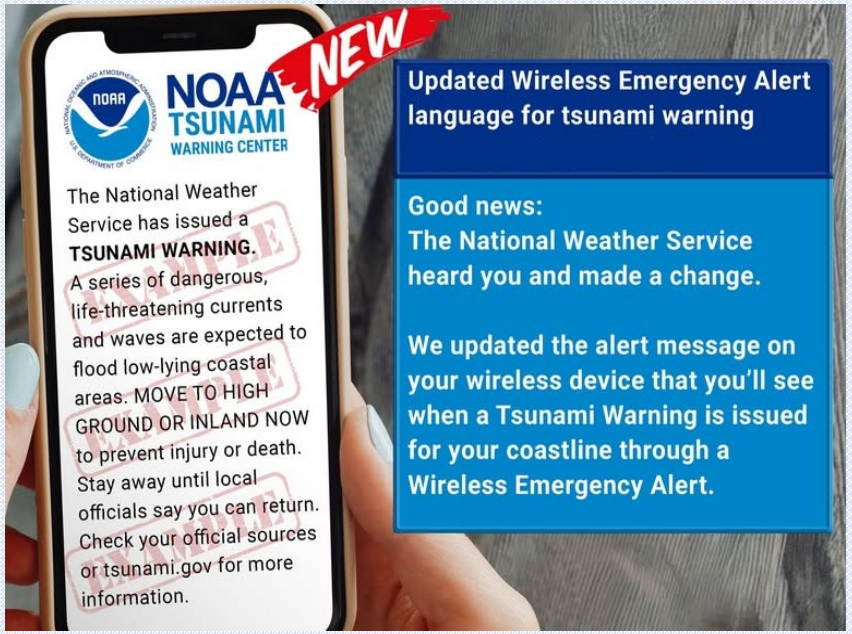
Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

Tsunami Program

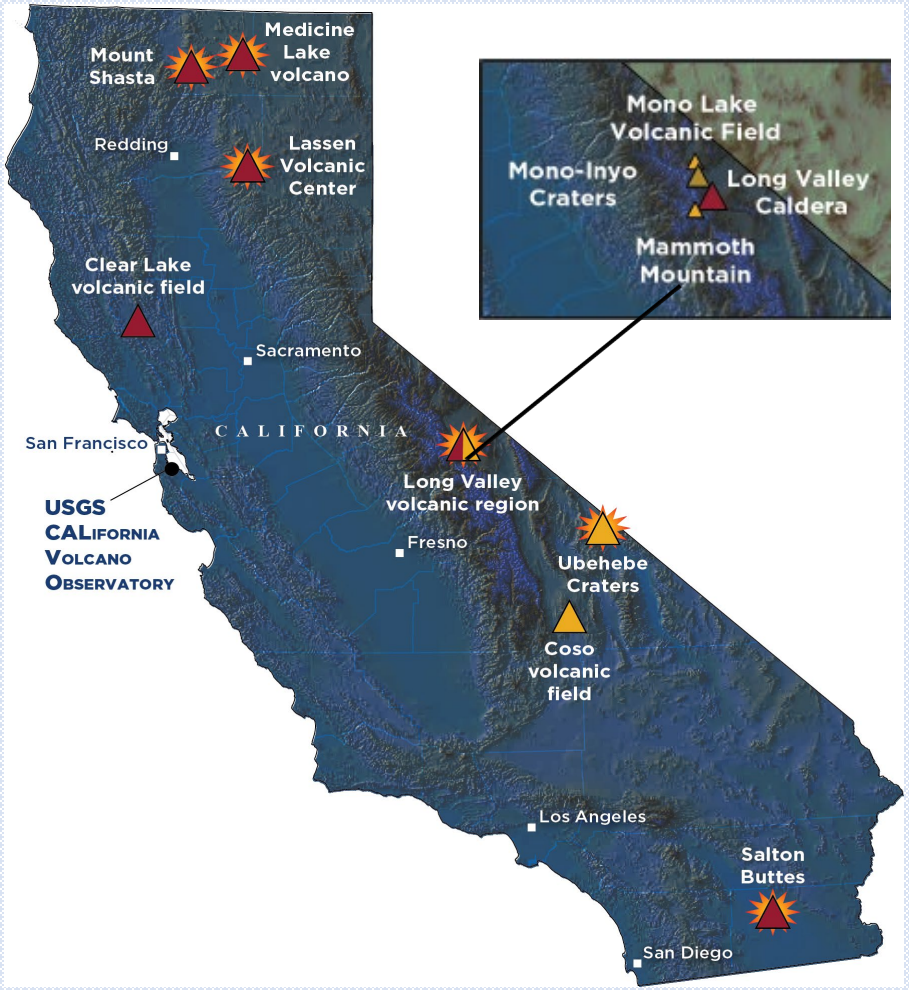




- Tsunami Risk Assessment
- Hazus Mapping
- Response and Debris Planning and Mapping
- Alert Messaging



Volcano Program

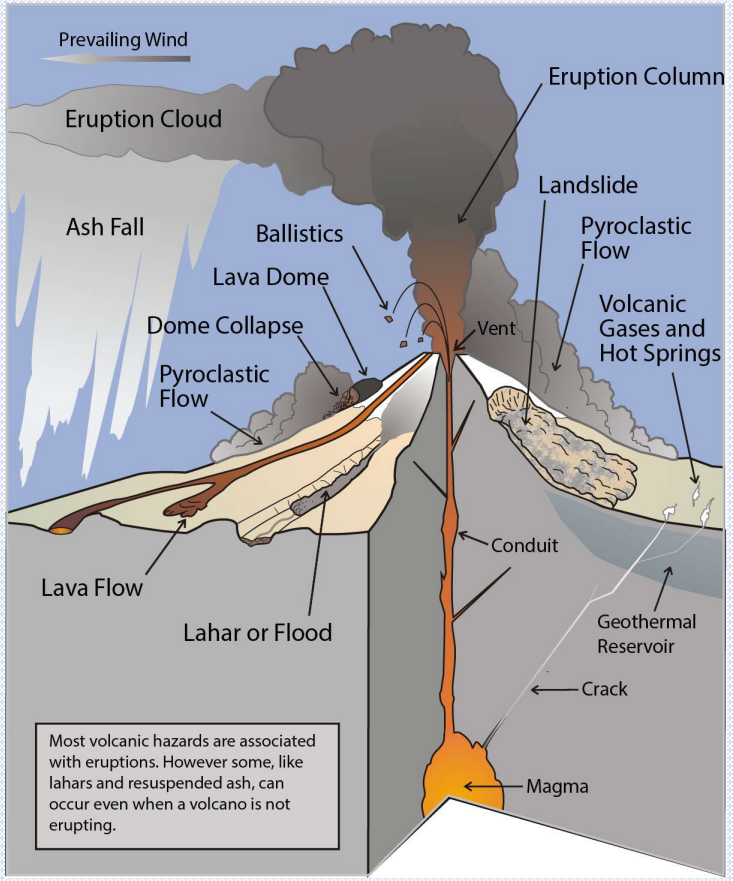


VOLCANIC AREA	THREAT LEVEL
Medicine Lake Volcano	High
Mount Shasta	Very High
Lassen Volcanic Center	Very High
Clear Lake Volcanic Field	High
Long Valley Volcanic Region	Very High
Salton Buttes	High
Ubehebe Craters	Moderate
Coso Volcanic Field	Moderate

Common Hazards

- Pyroclastic Flows
- Lava Flows
- Lahars And Floods
- Volcanic Ash
- Ballistics
- Volcanic Gases

VOLCANIC HAZARDS

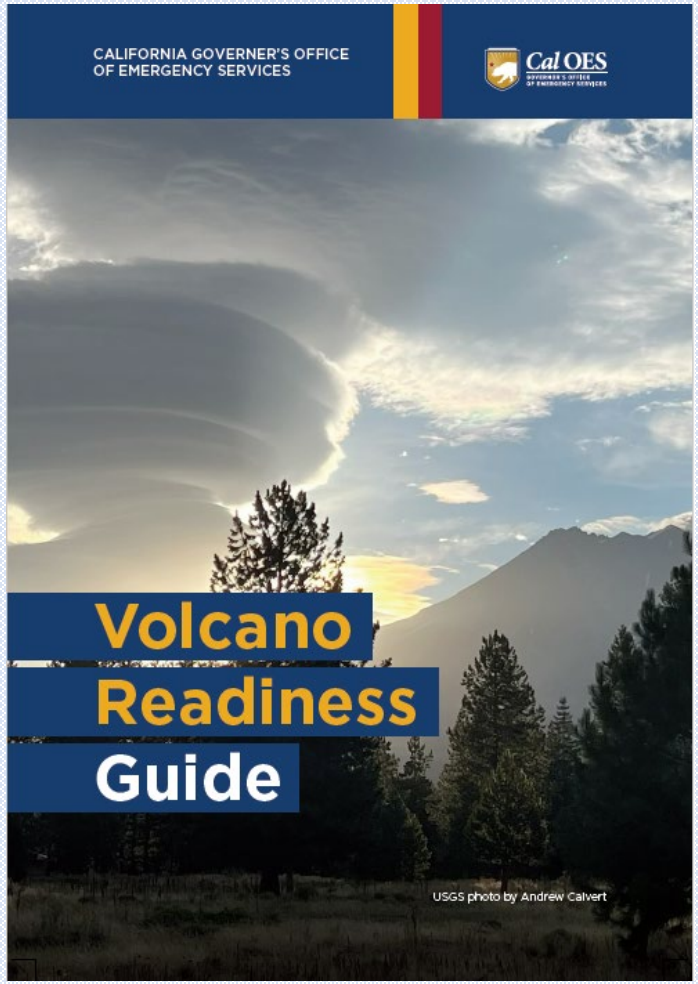


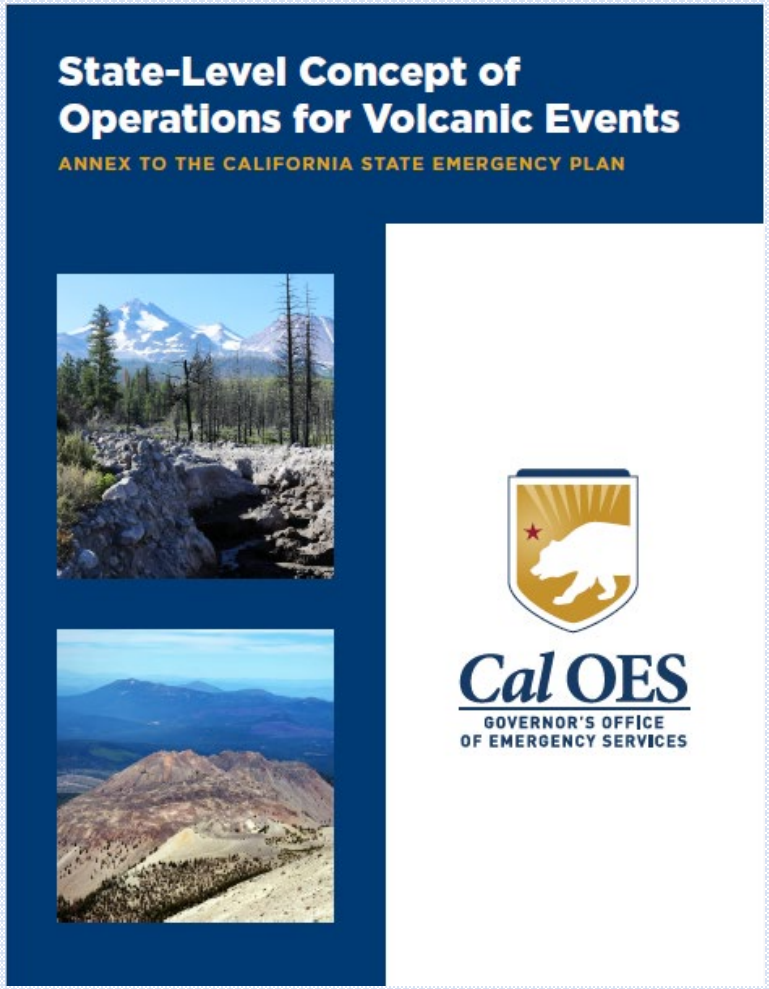
Volcano Program

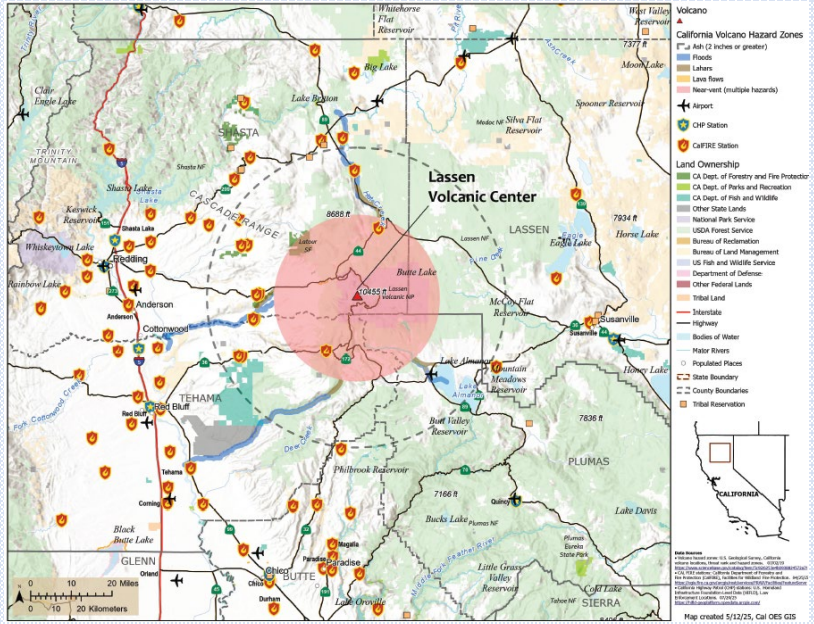
ALERT-LEVEL TERMS	
NORMAL	Volcano is in typical background, noneruptive state or, after a change from a higher level, volcanic activity has ceased, and volcano has returned to noneruptive background state.
ADVISORY	Volcano is exhibiting signs of elevated unrest above known background level or, after a change from a higher level, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
WATCH	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe is uncertain, or eruption is underway but poses limited hazards.
WARNING	Hazardous eruption is imminent, underway, or suspected.

AVIATION COLOR CODES	
GREEN	Volcano is in typical background, non-eruptive state or, after a change from a higher level, volcanic activity has ceased, and volcano has returned to noneruptive background state.
YELLOW	Volcano is exhibiting signs of elevated unrest above known background level or, after a change from a higher level, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
ORANGE	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe is uncertain, or eruption is underway with no or minor volcanic-ash emissions [ash-plume height specified, if possible].
RED	Eruption is imminent with significant emission of volcanic ash into the atmosphere likely or eruption is underway or suspected with significant emission of volcanic ash into the atmosphere [ash-plume height specified, if possible].

Volcano Program



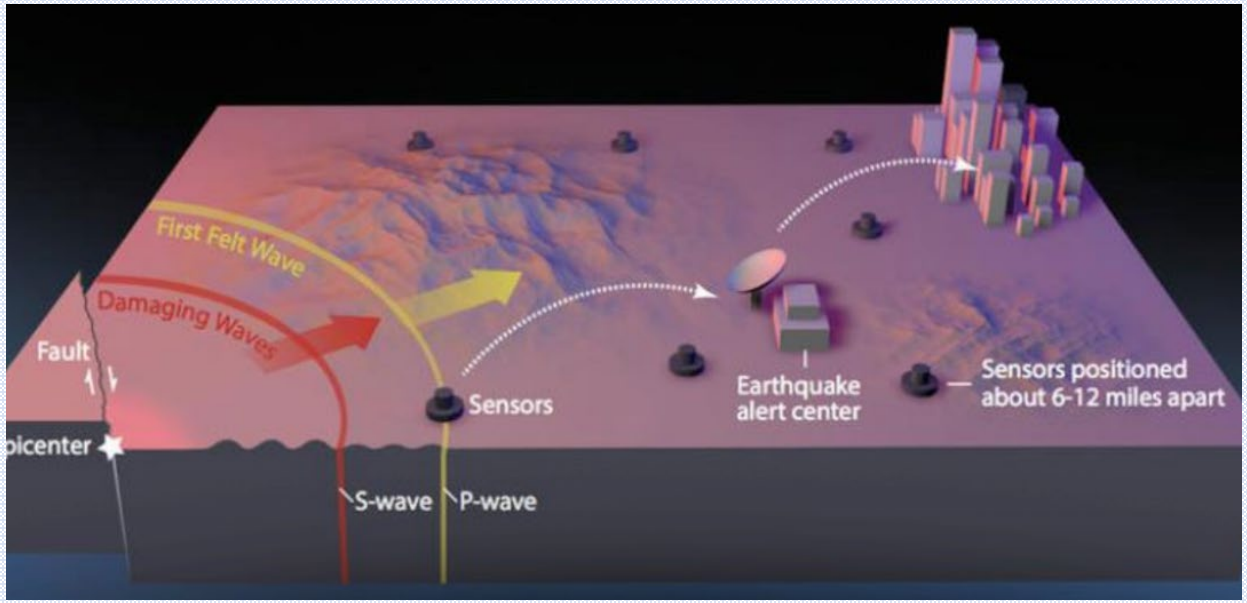




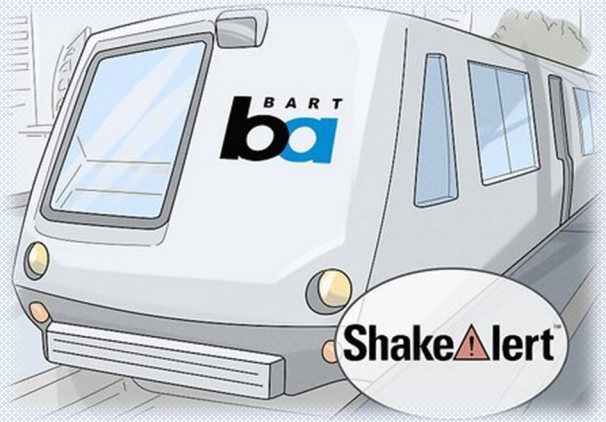
- Outreach Materials
- Updated Plans
- Updated Website with Interactive Maps
- Trainings and Exercises

Earthquake Early Warning (EEW)

Uses ground motion sensors statewide to detect earthquakes before humans can feel shaking and can send notification to “Drop, Cover, and Hold On” seconds before the earthquake.

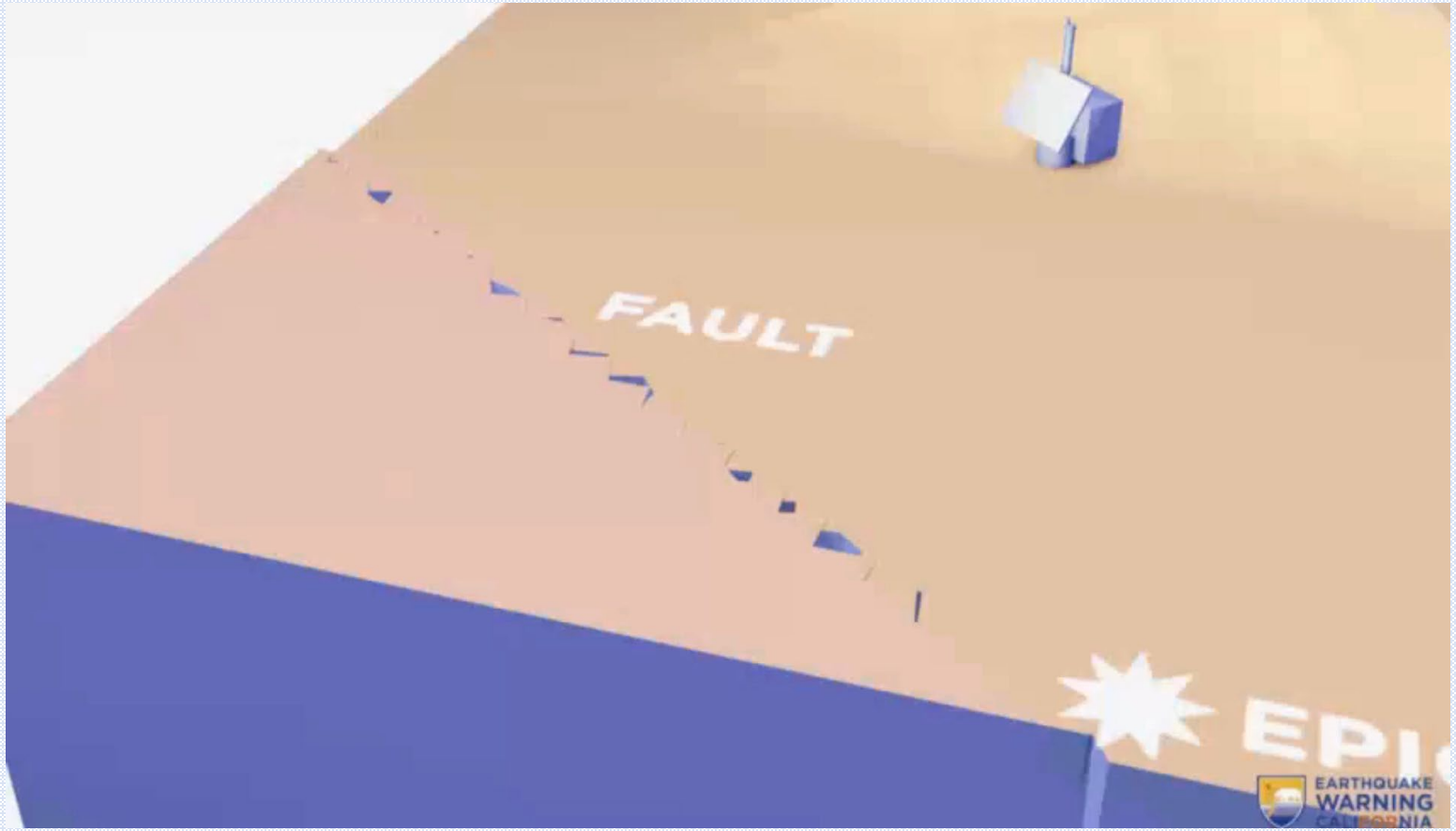


MyShake



System Operations

Works with partners from the California Integrated Seismic Network on the build-out and maintenance of 1,115 seismic stations.



MyShake App

October 19
MyShake launch. Available for download. Initial Downloads: 216,237

2019

December 17
First MyShake Alert. M4.4 – Monterey County, CA. 41 alerts

June 4
1 Million Downloads

2020

2022

October 25
Most downloads in a single day: 77,244

October 26
2 Million Downloads

January 19
3 Million Downloads

September 13
MyShake on Chromebook

December 6
Largest alert by magnitude: 468,247 devices. M7.0 Offshore Cape Mendocino, CA

December 13
MyShake on MacOS

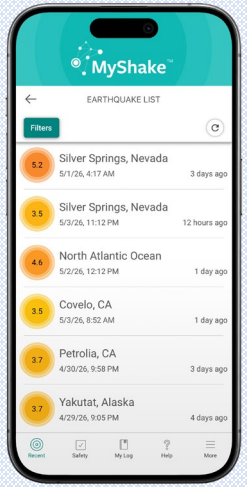
2024

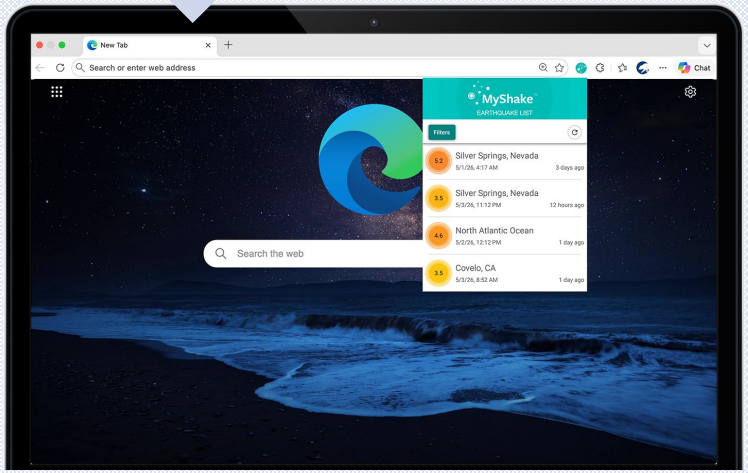
2025

April 14
Largest alert by number of devices: 693,044 devices. M5.2 near Julian, CA

April 18
4 Million Downloads

- Available in 5 languages.
- Alerts of incoming ground shaking and protective actions.
- Service expands to Oregon and Washington.
- Free statewide app, also available as desktop extension.





4.4 MILLION DOWNLOADS

MyShake Extension

Expanded Access

MyShake now supports alerts on work laptops through Microsoft Edge.

Statewide Expansion

Governor's Office OKRs call to expand MyShake deployment to additional state agencies in 2026.

Deployment Toolkit

Cal OES and CGS have used the toolkit approach to support low-lift deployment across managed devices.

Edge extension deployment | Chrome guidance added | Cal OES & CGS pilot/ positive feedback

Automated Actions

EEW Automated Actions Include:

- Warning Alarm
- Power Supply and Safety Shut-Off
- Elevators and Escalator
- Recall/Stop Water Control/Supply
- Shut-Off Gas Valve Adjustment/Shut-Off

Research and Development

Researching, learning, and developing new ways to improve the safety of California residents and visitors before disaster strikes.

Fire Station Pilot Project

Airport Feasibility Study

Research and Development

Fire Station Pilot Project

Implement and integrate EEW technology and automated actions within fire stations, including bay door automation.

May reduce property damage and quickly restore operations.

Research and Development

Airport Feasibility Study

Potential Benefits of EEW in Airports

- Provides real-time warnings to personnel and passengers
- Reduces injuries by allowing passengers and personnel to take protective actions
- Enables automated safety actions (e.g., shutting down fuel lines and stopping elevators)
- Minimizes service disruptions by allowing airports to initiate emergency protocols before severe shaking occurs.

Liquefaction

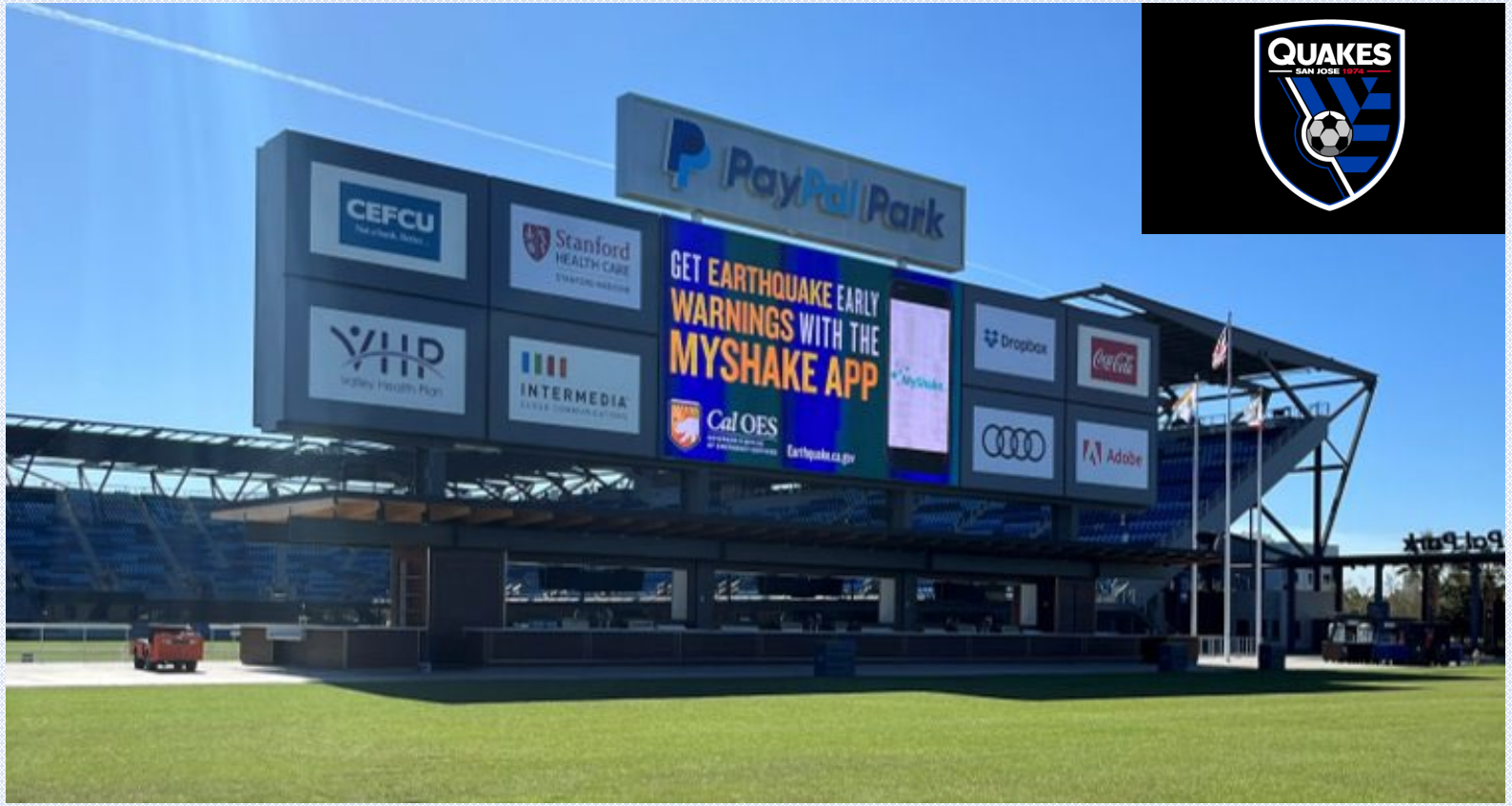
Fuel and Pipeline Damage

Application	PSP			LAX		
	Benefit ($M)	Cost ($M)	BCR	Benefit ($M)	Cost ($M)	BCR
Smartphone Alert	0.150	0.077	2.0	3.10	0.12	25.8
Gas Shutoff	11.5000	0.123	93.5	3.60	0.21	17.1
Fire Station Bay Doors	0.044	0.068	0.6	1.05	0.07	15.0
Elevator Stop	0.0048	0.13	0.04	0.07	0.29	0.2
Fuel Shutoff	0	0	NA	3.64	0.18	20.2
Water Shutoff	0.009	0.508	0.02	0.12	0.10	1.2
Baggage System Cutoff	NA	0.078	NA	NA	0.27	NA
Backup Power	NA	0.078	NA	NA	0.065	NA

Education and Outreach

- Community Outreach Grants
- Outreach Materials
- Rapid Response/ Media Interviews
- Social Media Messaging
- Community Outreach Events
- Large Venue Events

Education and Outreach



Education and Outreach

Great California ShakeOut

2025

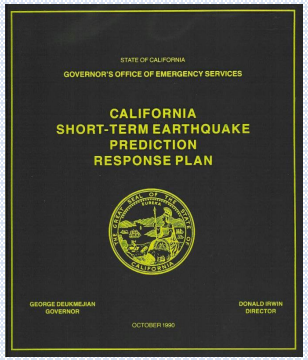
ShakeOut Tour Metrics

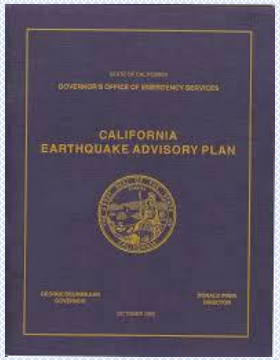
- 4 Cities + ShakeOut Day
- $320K in TV Ad Equivalency
- 200+ Simulator Experiences
- Nearly 35 Media Interviews
- 190+ Total Media Placements
- Over 34,000 MyShake Downloads

California Earthquake Prediction Evaluation Council

Chaired by the California State Geologist, CEPEC:

- Advises Cal OES Director:
  - On continued earthquake or volcanic hazards that may warrant alerts or emergency actions.





- Provides expert scientific guidance in:
  - Evaluating the validity of earthquake and volcanic eruption predictions.
  - Assessing short-term probabilities of seismic or volcanic events.
  - Reviewing new scientific developments that affect long-term seismic risk.

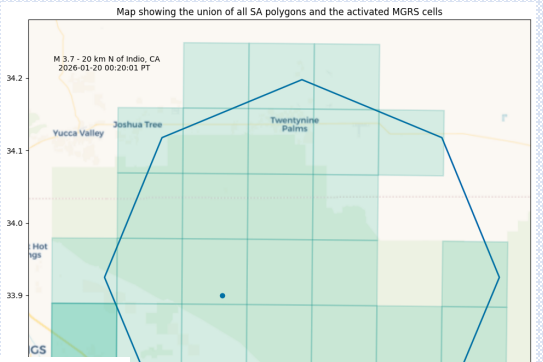
Duty Officer Program

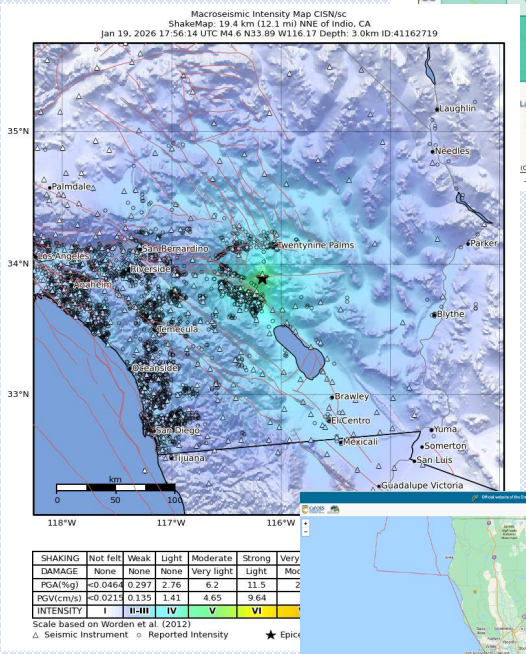
The Seismic Hazards Duty Officer is responsible for:

- Reporting to the EDO
- Monitoring and sharing seismic hazard information
- Gathering initial intelligence about earthquake, tsunami, or volcanic activity
- Serving as a subject matter expert
- Generating initial situation report and executive briefs (15-30 minutes)
- Facilitating information sharing and coordination with scientific partners

DO NOT PROVIDE DAMAGE ESTIMATION OR ASSESSMENT

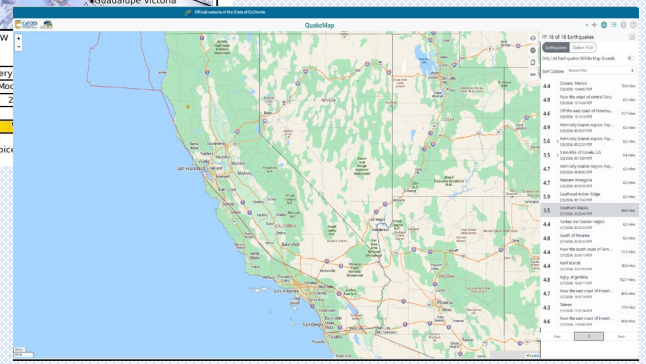
SHB DO coordinates with Cal OES Tribal Unit





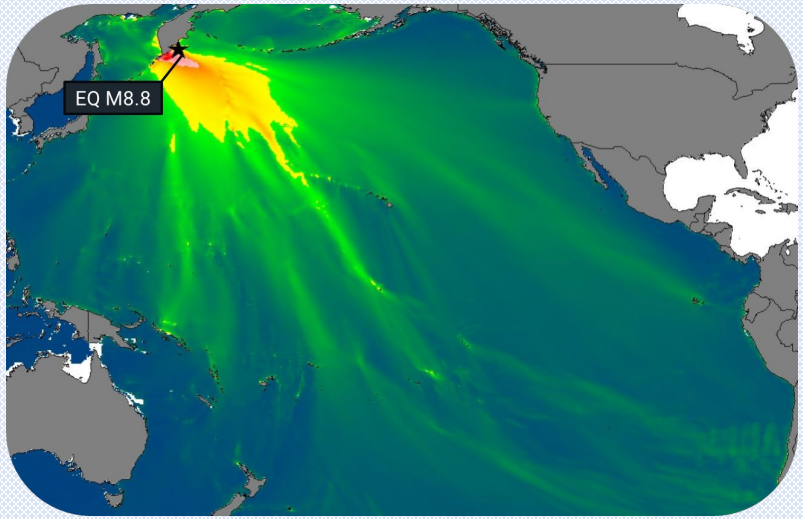
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very
DAMAGE	None	None	None	Very light	Light	Mod
PGA(%g)	<0.0464	0.297	2.76	6.2	11.5	2
PGV(cm/s)	<0.0215	0.135	1.41	4.65	9.64	
INTENSITY	I	II-III	IV	V	VI	

Scale based on Worden et al. (2012)
△ Seismic Instrument ○ Reported Intensity ★ Epic



Duty Officer Program

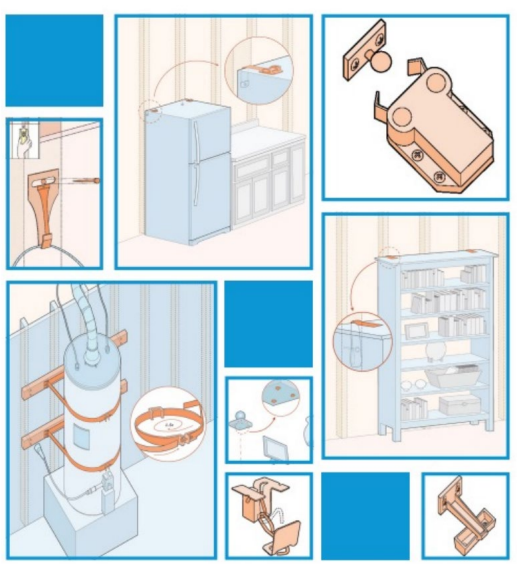
Lessons Learned From the Kamchatka Earthquake and Tsunami



- 39 Hours of Response Activities
- 35 NTWC Bulletins
- 23 NTWC Conference Calls
- 20 CA State Coordination Calls
- NO CASUALTIES IN CALIFORNIA

- Updated SOPs
- CA State Coordination Call PowerPoint
- Updated WEA Language

Resources and Contacts



Secure Your Space

MyShake

Download on the App Store

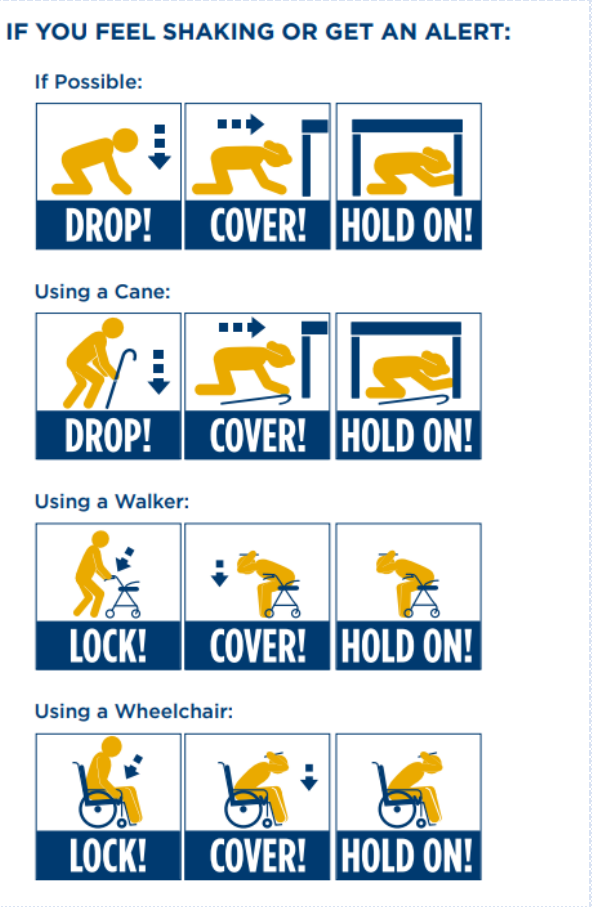
GET IT ON Google Play

WIRELESS EMERGENCY ALERTS

Websites:

- Earthquake.ca.gov
- Cal OES Earthquake Preparedness webpage
- Tsunami.gov

Be Safe and Get Involved



- Earthquakes can happen anytime, anywhere. We must practice to be safe.
- Drop, Cover and Hold On (DCHO) is the most important immediate response to an earthquake to protect yourself and help keep loved ones safe.
- The 2026 Great California ShakeOut will occur on October 15. Join millions of people across California practicing earthquake safety.

PLEASE REACH OUT WITH ANY QUESTIONS

Kris White

Earthquake Specialist

EarthquakeInfo@caloes.ca.gov

CAL FIRE - PRESENTATION

Brian Olsen

Community Wildfire Mitigation Assistance Program (CWMAP)

CAL FIRE
Office of the State Fire Marshal (OSFM)
Community Wildfire Preparedness and Mitigation Division

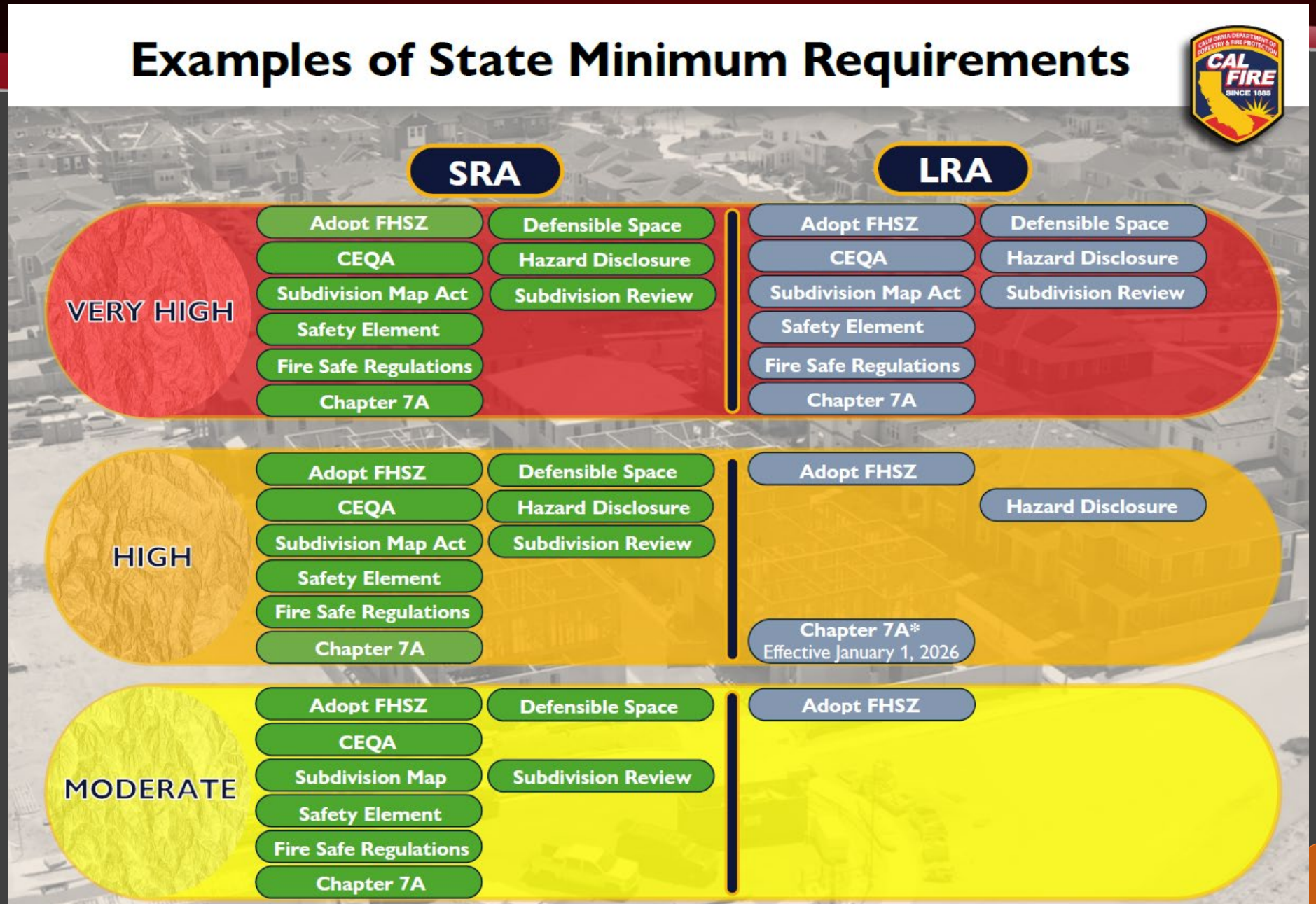
Community Wildfire Mitigation Assistance Program

Fire Hazard Severity Zones (FHSZ)

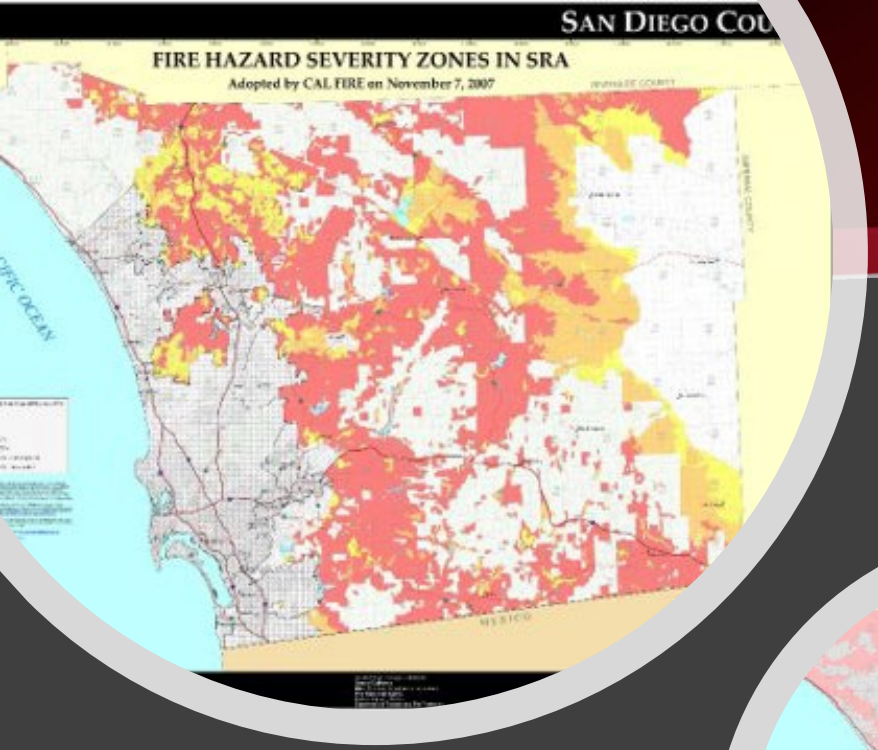
- State Responsibility Area
  Adopted April 1, 2024

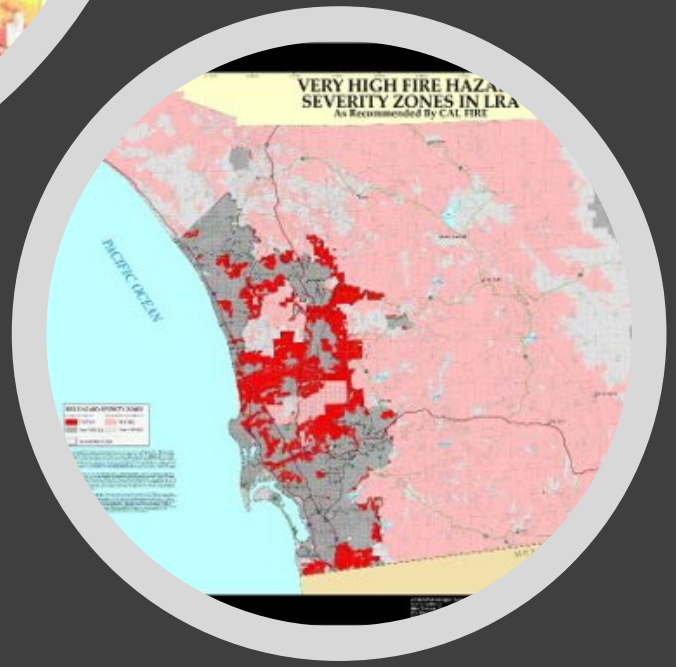
- Local Responsibility Area
  Phased rollout 2025

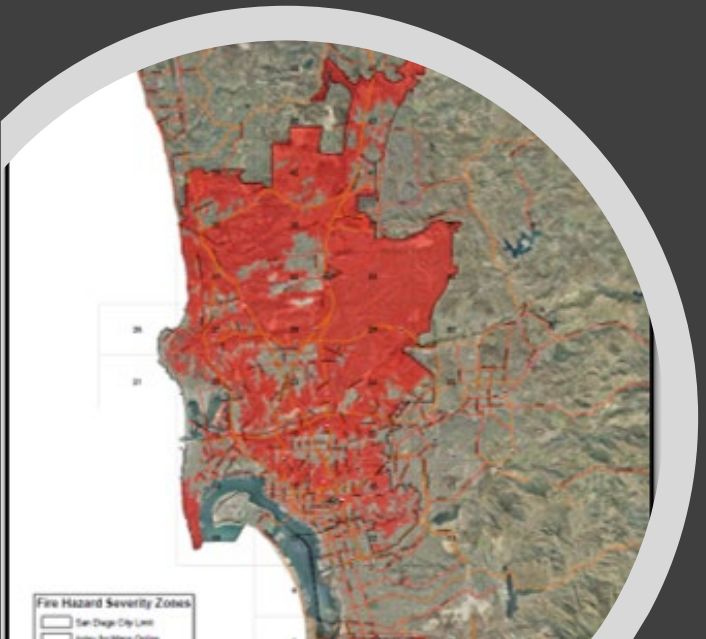
Fire Hazard Severity Zones (FHSZ)



General Plans Safety Elements







- Senate Bill 1241(2012)
  - Very High Fire Hazard Severity Zones must comply with Government Code Section 65302(g)(3).
- Protect the community from unreasonable risk of wildfire.
- Draft Element review State Board of Forestry and Fire Protection.
- State Board of Forestry & Fire Protection may recommend changes.

NFPA FIREWISE USA

- NFPA Firewise USA®
- Firewise USA® is a national recognition program administered by the National Fire Protection Association (NFPA).

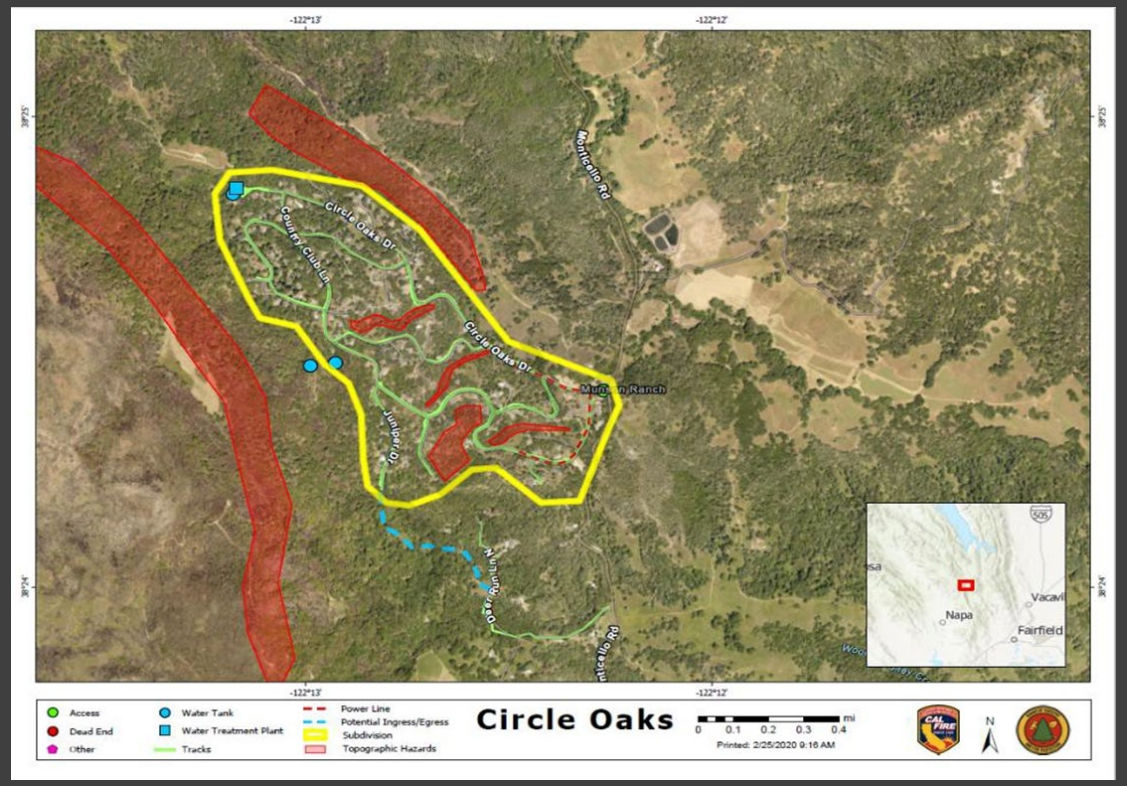
- In California, it is supported and coordinated by CAL FIRE via the CWMAP.

- The program offers a framework for neighborhoods, communities, HOAs, etc., to organize and take concrete steps to reduce their wildfire risk.

Subdivision Review Program

Assembly Bill 2911 Subdivision Review Program

- The Subdivision Review Program was formed as a result of Assembly Bill 2911 (Friedman, 2018)
- This bill added Section 4290.5 to the Public Resource Code
- In-person survey of the subdivision
- ESRI based Apps and Web App
- Final Report Notifications:
  - Board
  - Local AHJ
  - Residents
  - Other Stakeholders



COMMUNITY WILDFIRE PREPAREDNESS AND MITIGATION DIVISION

2026 CALIFORNIA State Adaptation Planning Guide

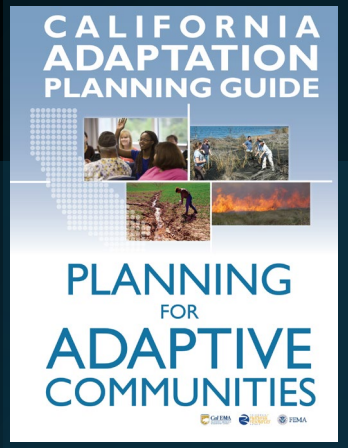
ANNIKA BRAUCHER

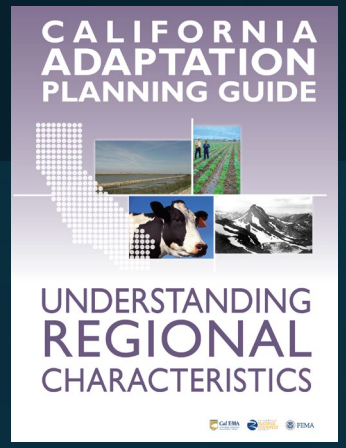
CALIFORNIA OFFICE OF EMERGENCY SERVICES,
STATE MITIGATION PLANNING

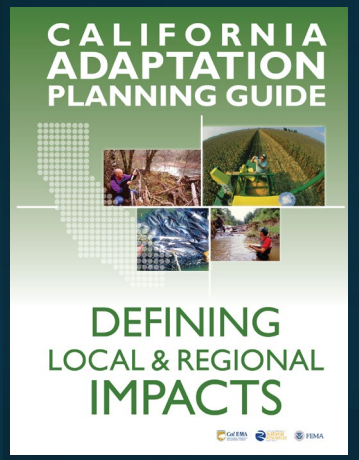
2028 California State Hazard Mitigation Plan Kickoff
May 15, 2026

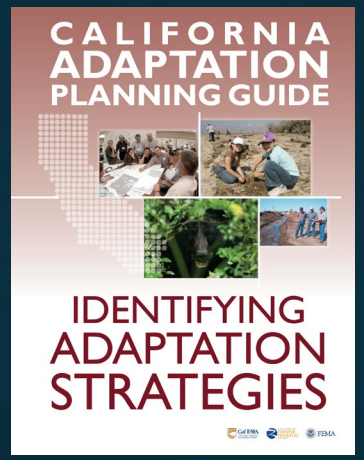
Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

History of California's Adaptation Planning Guide & SB 246









2012: First APG released

- Developed by Cal OES with state agencies, universities, and local experts

2015 – SB 246

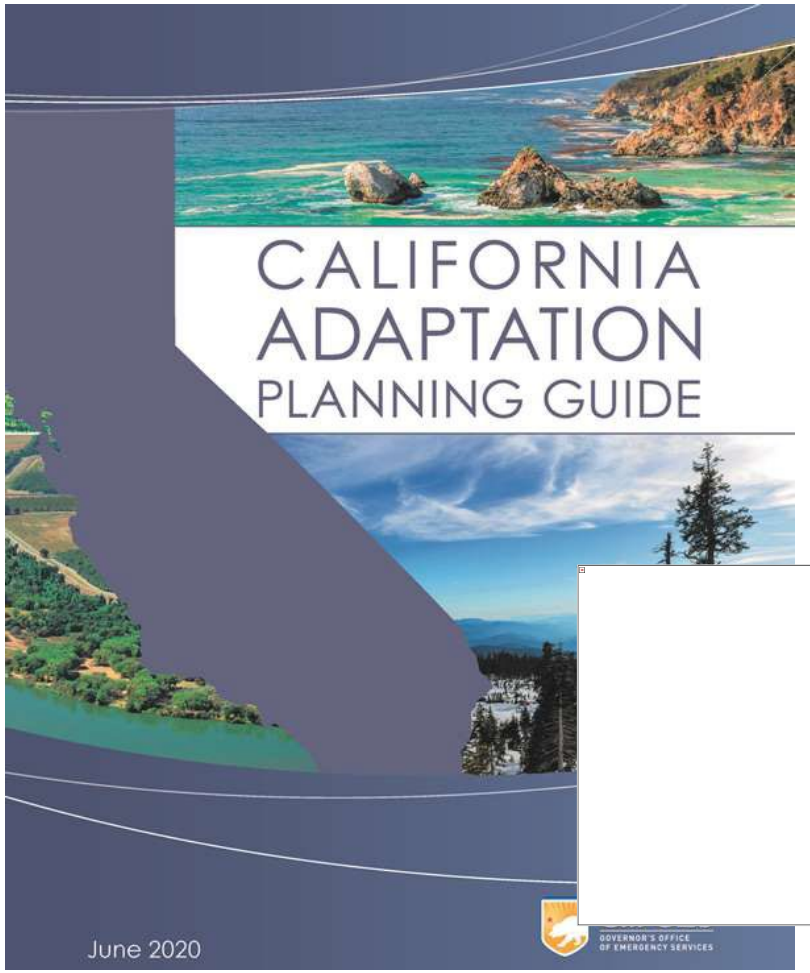
- Required APG to align with updates to the *Safeguarding California Plan*

2020 – APG Update

- Integrated updated science, tools, and alignment with state climate plans

Purpose and Function of the Adaptation Planning Guide

- Intended to support local, regional, and tribal governments coordinate adaptation and mitigation planning in California
- Addresses natural hazards under a changing climate and future conditions.
- Linking and integrating climate considerations into local level planning documents:
  - Local and Tribal Hazard Mitigation Plans
  - Climate Action/Adaptation Plans
  - General Plan Safety Elements
- Provides planning guidance, best practices, tools, and resources to help jurisdictions plan for climate change impacts.
- It integrates equity, community engagement, and climate science into the adaptation planning process.



Target Users

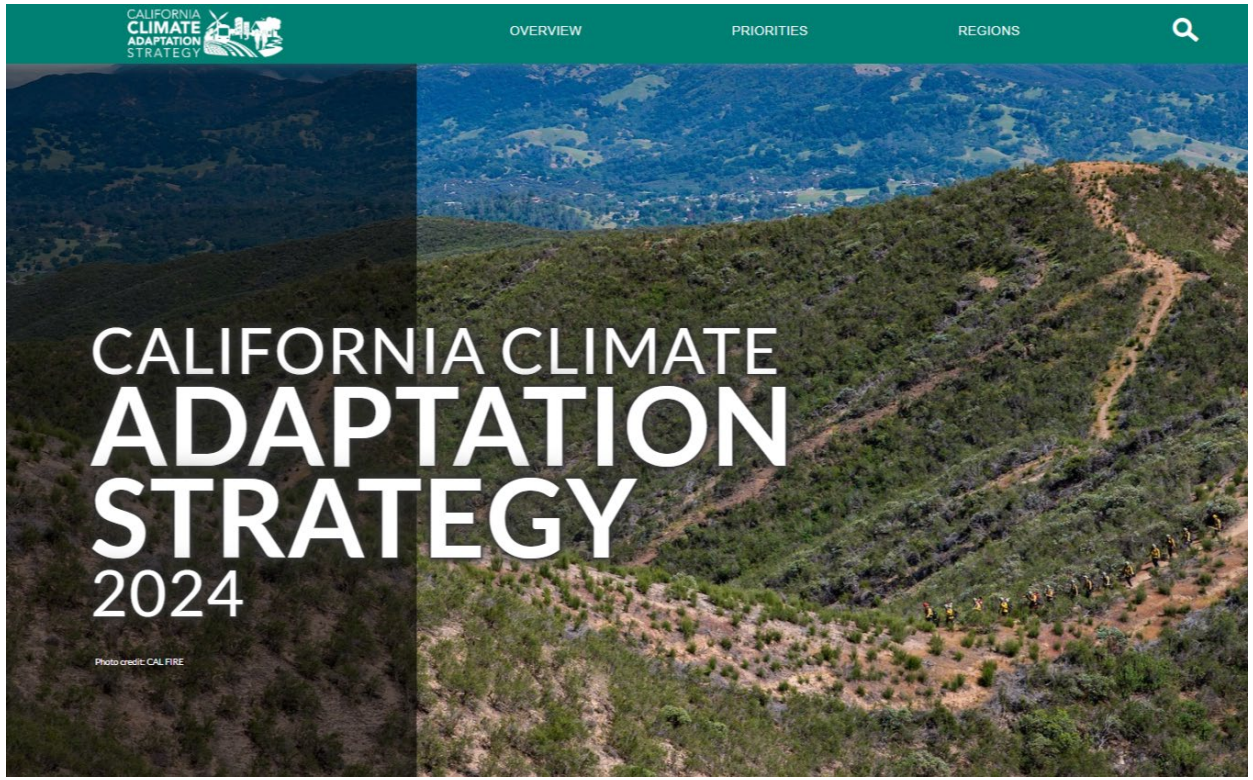
Primary

- Local governments, tribal governments, regional planning agencies
- Planners, emergency managers, public work staff, public health workers, and water management agencies

Secondary

- State agencies, private sector practitioners, community-based organizations, academic institutions, quasi-governmental organizations

2024 California Climate Adaptation Strategy



- The most recent Climate Adaptation Strategy was released in September 2025, prompting a full APG review.
- Climate Adaptation Strategy shifts from a sector-based approach to a region-based approach
- Visit ClimateResilience.ca.gov to read the new Strategy

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

Highlight of APG 3.0 Changes

Aligned with 2024 Strategy
shifts from sector-focused framing, incorporates nature-based solutions

Integrates New State Resources:
CA 5th Assessment • Vulnerable Communities Platform • State Hazard Mitigation Plan

Focus on Implementation
Expanded *guidance on project design, prioritization and financing*

Updated Case Studies
New and refreshed examples from diverse California communities, highlighting innovative plans and projects

Expanded Appendices
3 new appendices on outreach & engagement, data integration, supporting worksheets & tools

Tribal Hazard Mitigation Plans
First time inclusion of tribal hazard mitigation planning

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

Adaptation Planning Guide 3.0
2026 Review Timeline

Draft released for State Agency Review #1

Review Period:
June 1 - June 15, 2026
(2 weeks)

Draft released for Public Comment

Public Comment Period:
July 13 - August 27, 2026
(45 days)

Final Plan Published

November, 2026

How You Can Help

- **Provide Feedback on Drafts** Support plan development during the state agency review period **beginning June 1**
- **Broaden Our Reach** Help identify opportunities to engage additional stakeholders and the public *(e.g., working groups, NGOs, CBOs, regional partners, academia)*
- **Promote Public Workshops** Scheduled for July–August 2026 *(details coming soon)*
- **Share the APG Public Input Survey**

Stakeholder Input

Seeking input from the government and community-based leaders in local and regional climate preparedness through:

- *APG Update Needs Assessment Survey*
- *Additional engagement channels coming soon*

Scan & Share
APG Needs Assessment Survey to share your insights and local experiences

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

APG Aligns with the Enhanced SHMP Requirements

INTEGRATED PLANNING

E6. Does the plan demonstrate integration, to the extent practicable, with other state and/or regional planning initiatives and FEMA mitigation programs and initiatives?

[44 CFR § 201.5(b)(1)]

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

APG Aligns with the Enhanced SHMP Requirements

DEMONSTRATING COMMITMENT

E7. Does the state demonstrate commitment to a comprehensive mitigation program?

[44 CFR §§ 201.3(c), 201.5(b)(4) and 201.6(d)]

EFFECTIVE USE OF MITIGATION PROGRAMS TO ACHIEVE MITIGATION GOALS

E8. Is the state effectively using existing mitigation programs to achieve mitigation goals?

[44 CFR §§ 201.5(a) and 201.5(b)(3)]

APG Aligns with the Enhanced SHMP Requirements

APG REQUIRES

Local planning to consider equity and impacts of climate change … even when not required by National policies and frameworks

Thank You!

Project Coordinator:

Annika Braucher
State Mitigation Planning Unit, Cal OES
Annika.Braucher@CalOES.ca.gov, (916) 639-3619

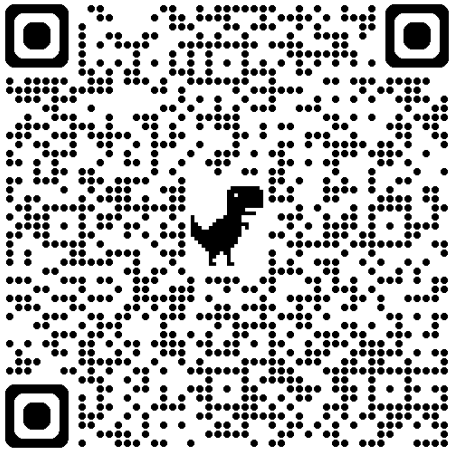
Organizational Contact: APG@CalOES.ca.gov

CA Adaptation Planning Guide | California Governor's Office of Emergency Services

State Hazard Mitigation Plan Contact: SHMP@caloes.ca.gov

Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

State Hazard Mitigation Plan



[State Mitigation Planning | California Governor's Office of Emergency Services]

Questions?

Contact Information

State Mitigation Planning

Ryan Marth, Sr. ESC, ryan.marth@caloes.ca.gov

Aykanush Mikayelyan, ESC, aykanush.mikayelyan@caloes.ca.gov

Annika Braucher, Associate Environmental Planner Annika.Braucher@CalOES.ca.gov

State Hazard Mitigation Plan Inbox SHMP@CalOES.ca.gov

THANK YOU!

WE APPRECIATE YOUR ENGAGEMENT TODAY AND IN THE FUTURE.

CONTACT US AT
SHMP@CALOES.CA.GOV