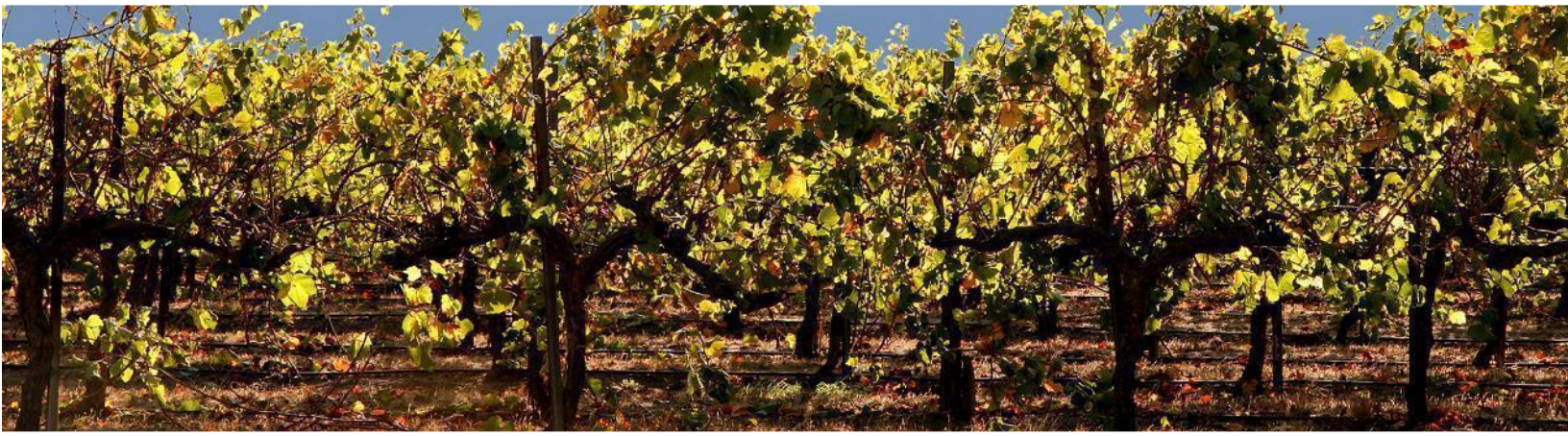
March 20, 2023 | # Multi-Jurisdictional Hazard Mitigation Plan






emergency planning consultants

Sonoma County Office of Education

# Credits

**Q&A | ELEMENT A: PLANNING PROCESS | A1c.**

**Q:** Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person's position or title and agency within the jurisdiction.) (Requirement §201.6(c)(1))

**A:** See **Hazard Mitigation Planning Team** below.

## *Multi-Jurisdictional Hazard Mitigation Executive Planning Team:*

| *Agency* | *Name* | *Title/Position* |
|---|---|---|
| Alexander Valley Union | Matt Reno | Superintendent-Principal |
| Bellevue Union | Roger Ferrell | Director of Maintenance and Operations |
| Bennett Valley Union | Sue Field | Superintendent |
| Cinnabar | Angel Judy | CBO |
| Cloverdale Unified | Rick Scaramella | Director of MOT |
| Cotati-Rohnert Park Unified | Josh Savage | Executive Director of Facilities, Maintenance and Operations |
| Dunham | Daniel Hoffman | Superintendent |
| Forestville Union | Renee Semik | Superintendent |
| Fort Ross | John Markatos | Superintendent (former) |
| Fort Ross | Jennifer Dudley | Superintendent |
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| Guerneville | Dana Pedersen | Superintendent |
| Harmony Union | Matthew Morgan | Superintendent-Principal |
| Healdsburg Unified | Robert Smith | Maintenance and Operations Supervisor |
| Horicon | Jeff McFarland | Superintendent-Principal |
| Kashia | Patti Pomplin | CBO |
| Kenwood | Bob Bales | Superintendent-Principal |
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| Monte Rio Union | Nathan Myers | Superintendent |
| Montgomery | Taryn Parmeter | District Secretary |
| Oak Grove | Amber Stringfellow | Superintendent |
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| Piner-Olivet Union | Felicia Koha | Chief Business Official |
| RESIG (non-participant) | Christine Dektor | Loss Prevention |
| Rincon Valley Union | Mike Moniot | M&O Supervisor |

| | | |
|---|---|---|
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| SCOE | Mark Silva | Director of Facilities |
| SCOE | Mary Downey | Deputy Superintendent, Business Services (former) |
| SCOE | Bonnie Brown | Department Administrative Specialist |
| Sebastopol Union | Brent Ono | Facilities Supervisor |
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| Two Rock Union | Michelle Panizzera | Chief Business Official |
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## Acknowledgements

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## Point of Contact

To request information or provide comments regarding this mitigation plan, please contact:

| | |
|---|---|
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| **Email** | bbrown@scoe.org |
| **Mailing Address** | 5340 Skylane Boulevard, Santa Rosa, CA 95403 |
| **Telephone Number** | 707-524-2628 |

## Consulting Services

### *Emergency Planning Consultants*

- ✓ Principal Planner: Carolyn J. Harshman, CEM, President
- ✓ Local Planning Officer: Don Silverek
- ✓ HAZUS Mapping: Alex Fritzler
- ✓ Research Analyst and Technical Writer: Megan Fritzler
- ✓ Emergency Management Specialist: Israel Estrada

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## Mapping

The maps in this plan were provided by the Sonoma County Office of Education (SCOE), other participating school districts, County of Sonoma, Federal Emergency Management Agency (FEMA), California Office of Emergency Services (Cal OES) or were acquired from public Internet sources. Care was taken in the creation of the maps contained in this plan, however they are provided "as is". The Project Area jurisdictions cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

## Mandated Content

In an effort to assist the readers and reviewers of this document, the jurisdiction has inserted "markers" emphasizing mandated content as identified in the Disaster Mitigation Act of 2000 (Public Law – 390). Following is a sample marker:

***EXAMPLE***

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A1a.** |
|---|
| **Q** Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))<br>**A:** |

# Table of Contents

# Part I: PLANNING PROCESS

## Introduction

**Q&A | ELEMENT A: PLANNING PROCESS | A1b.**

**Q:** Does the plan list the jurisdiction(s) participating in the plan that are seeking approval? (Requirement §201.6(c)(1))
**A:** See **Introduction** below.

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) since 2005 has required state and local governments (including special districts and joint powers authorities) to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the Project Area's emergency management planning programs. The Project Area includes the following 39 planning entities identified by "planning area":

Planning Area North: Cloverdale, Geyserville, Healdsburg, West Side, Alexander Valley, Windsor

Planning Area West: Horicon, Kashia, Montgomery, Guerneville, Monte Rio, Harmony, Twin Hills, Sebastopol, Gravenstein, West Sonoma County Unified High School District, Fort Ross, Forestville, Oak Grove

Planning Area Central: Santa Rosa City Schools, Piner-Olivet, Mark West, Bellevue, Wright, Roseland, Cotati-RP, Bennett Valley, Rincon Valley, Kenwood

Planning Area South: Petaluma, Sonoma Valley, Old Adobe, Cinnabar, Two Rock, Liberty, Dunham, Waugh, Wilmar, Sonoma County Office of Education

This is the first hazard mitigation plan for all the participating jurisdictions within the Project Area.

DMA 2000 was designed to establish a national program for pre-disaster mitigation, streamline disaster relief at the federal and state levels, and control federal disaster assistance costs. Congress believed these requirements would produce the following benefits:

- ✓ Reduce loss of life and property, human suffering, economic disruption, and disaster costs.
- ✓ Prioritize hazard mitigation at the local level with increased emphasis on planning and public involvement, assessing risks, implementing loss reduction measures, and ensuring critical facilities/services survive a disaster.
- ✓ Promote education and economic incentives to form community-based partnerships and leverage non-federal resources to commit to and implement long-term hazard mitigation activities.

The following FEMA definitions are used throughout this plan (Source: FEMA, 2002, *Getting Started, Building Support for Mitigation Planning*, FEMA 386-1):

Hazard Mitigation – "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards".

Planning – "The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit."

## Planning Approach

The four-step planning approach outlined in the FEMA publication, *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3) was used to develop this plan:

- ✓ **Develop mitigation goals and objectives -** The risk assessment (hazard characteristics, inventory, and findings), along with municipal policy documents, were utilized to develop mitigation goals and objectives.
- ✓ **Identify and prioritize mitigation actions -** Based on the risk assessment, goals and objectives, existing literature/resources, and input from participating entities, mitigation activities were identified for each hazard.
- ✓ **Prepare implementation strategy -** Generally, high priority activities are recommended for implementation first. However, based on organizational needs and goals, project costs, and available funding, some medium or low priority activities may be implemented before some high priority items.
- ✓ **Document mitigation planning process -** The mitigation planning process is documented throughout this plan.

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A3** |
|---|
| **Q:** Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))<br>**A:** See **Stakeholders** below. |

## Stakeholders

A Multi-Jurisdictional Executive Planning Team (Executive Planning Team) supported by SCOE staff and represented by the 39 participating agencies (SCOE and 38 districts), worked with Emergency Planning Consultants to create the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). **The Executive Planning Team served as the primary stakeholders throughout the planning process.**

As required by DMA 2000, the Executive Planning Team shared the MJHMP with their respective communities during the plan writing phase. The general public and external agencies were invited to contribute to the mitigation plan during the plan writing phase. The Second Draft Plan was announced and posted on the SCOE website on August 21, 2021. External agencies were emailed on the same day with information about accessing the Second Draft Plan on the SCOE website and instructions for inviting parents and staff to contribute to the plan. In order to avoid multiple invitations, SCOE staff took the lead on informing external agencies via email with an invitation to provide input.

***The general public and external agencies served as secondary stakeholders with opportunities to contribute to the plan during the Plan Writing Phase of the planning process.***

| Q&A \| ELEMENT C. MITIGATION STRATEGY \| C2 |
|---|
| **Q:** Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))<br>**A:** See **NFIP Participation** below. |

## National Flood Insurance Program

Established in 1968, the NFIP provides federally backed flood insurance to homeowners, renters, and businesses in communities that adopt and enforce floodplain management ordinances to reduce future flood damage. None of the participating jurisdictions have control over land use so has no floodplain management ordinance or a floodplain administrator. Furthermore, the Project Area and its facilities rely on infrastructure (roads, bridges, etc.) throughout an expansive area included in many Flood Insurance Rate Maps (FIRM) that show floodways, 100-year flood zones, and 500-year flood zones.

### *NFIP Participation*

Special districts are not allowed to participate in NFIP.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B4 |
|---|
| **Q:** Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Repetitive Loss Properties** below. |

### *Repetitive Loss Properties*

According to the Sonoma County Hazard Multijurisdictional Mitigation Plan (2021), the County has the highest number of repetitive flood loss properties in the State of California; the cost of which is higher than the next nine highest repetitive loss communities combined. Repetitive flood loss properties comprise only one percent of the flood insured properties but account for 25 to 30 percent of all claims paid by the National Flood Insurance Program (NFIP). The community with the largest number of repetitive loss properties is Guerneville, followed by Monte Rio and Forestville.

Repetitive Loss Properties (RLPs) are most susceptible to flood damages; therefore, they have been the focus of flood hazard mitigation programs. A repetitive loss property is one for which two or more claims of $1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten-year period. According to FEMA resources, none of the Project Area facilities are designated as a Repetitive Loss Property (RLPs).

None of the repetitive loss properties are owned or leased by the MJHMP participating agencies.

# Planning Process

The Executive Planning Team consisted of one representative from each of the participating agencies along with 3 representatives from SCOE. They met at the beginning of the project for a Kick-Off Meeting which also included a customized delivery of FEMA's Independent Study 318 – Mitigation Planning for Local and Tribal Communities. The course was customized and delivered by Emergency Planning Consultants. The second meeting of the Executive Planning Team was at the conclusion of the project to review and contribute to the First Draft Plan. In addition to the Executive Planning Team, four Area Planning Teams were created based on commonalities of hazards and geography. The Area Planning Teams included North, West, Central, and South and they met once for a project overview and hazard briefing. Following the Area meeting, each individual jurisdiction met one-on-one with Emergency Planning Consultants to begin work on a Mitigation Actions Matrix.

Throughout the project, the Executive Planning Team served as the primary stakeholder while also making a concerted effort to gather information from the Area Planning Teams, general public, external agencies (cities and county served, utility providers, and other special districts). In addition, the Executive Planning Team solicited information from agencies and people with specific knowledge of hazards and past historical events, as well as building codes and facilities maintenance planning. The hazard mitigation strategies contained in this plan were developed through an extensive planning process involving the Planning Team with input gathered from the Area Planning Teams, general public, and external agencies.

Following review and input by the Executive Planning Team to the First Draft Plan, next (still during the Plan Writing Phase), the Second Draft Plan was shared with the Area Planning Teams, general public and external agencies. The Area Planning Team, general public and external agencies served as the secondary stakeholders. Next, the comments gathered from the secondary stakeholders were incorporated into a Third Draft Plan which was submitted to Cal OES. Following the Cal OES review, revisions were incorporated into a Fourth Draft Plan which was once again shared with the external agencies and general public.

Next, the Executive Planning Team completed amendments to the Plan to reflect mandated input by Cal OES and FEMA. The Final Draft Plan was then posted in advance of decision maker hearings by SCOE's Board of Education as well as each of the 40 participating school districts. Any comments gathered were included in the staff report to the various Boards of Education. Following adoption by each of the Boards, proof of adoption was forwarded to FEMA with a request for approval. A singular FEMA Letter of Approval was included in the Final Plan. The planning process described above is portrayed below in a progression:

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A1a.** |
|---|
| **Q:** Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))<br>**A:** See **Plan Methodology and Planning Phases Progression** below. |
| **Q&A \| ELEMENT A: PLANNING PROCESS \| A3** |
| **Q:** Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))<br>**A:** See **Planning Phases Progression** below. |

**Table: Planning Phases Progression**

| PLANNING PHASES PROGRESSION | | | | |
|---|---|---|---|---|
| **Plan Writing Phase (First & Second Draft Plan)** | **Plan Review Phase (Third and Fourth Draft Plan)** | **Plan Adoption Phase (Final Draft Plan)** | **Plan Approval Phase (Final Plan)** | **Plan Implementation Phase** |
| • Executive Planning Team input – research, meetings, writing, review of First Draft Plan<br>• Incorporate input into Second Draft Plan<br>• Invite general public and external agencies to provide input to the Second Draft Plan<br>• Incorporate input into the Third Draft Plan | • Third and Fourth Draft Plan sent to Cal OES and FEMA for review<br>• Address any mandated revisions identified by Cal OES<br>• Fourth Draft Plan distributed to external agencies and general public<br>• FEMA issues approval pending adoption | • Post public notice of Board of Education meetings along with the Final Draft Plan<br>• Final Draft Plan distributed to Boards in advance of meeting<br>• Present Final Draft Plan to the Boards of Education for adoption<br>• Boards of Education adopt Plan | • Submit Proof of Adoptions to FEMA with request for final approval<br>• Receive FEMA Letter of Approval<br>• Incorporate FEMA approval and Board of Education resolutions into the Final Plan | • Conduct semi-annual Executive Planning Team meetings which will be integrated into an existing standing meeting<br>• Integrate mitigation action items into budget and other funding and strategic documents |

**Q&A | ELEMENT E: PLAN ADOPTION | E1**

**Q:** Does the plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

**A:** See **Plan Adoption Process** below.

## Plan Adoption Process

Adoption of the plan by the local governing body demonstrates the jurisdictions within the Project Area's commitment to meeting mitigation goals and objectives. Governing body approval legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

The Third Draft Plan was submitted to Cal OES and FEMA for review and approval. Following the review by Cal OES and related revisions, the Fourth Draft Plan was once again made available to external agencies and the general public.

FEMA issued an Approval Pending Adoption on _____ requiring the adoption of the Plan by the Boards of Education. The adoption resolutions were submitted to FEMA along with a request for a FEMA Letter of Approval.

In preparation for the public meeting with the Boards of Education, the Planning Team prepared a staff report including an overview of the Planning Process, Risk Assessment, Mitigation Goals, and Mitigation Actions. The staff presentation concluded with a summary of the input received

during the public review of the document. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions. Any input gathered was added to the Final Plan.

Each of the thirty-nine Boards of Education heard the item on (insert table with names and dates). The Boards voted to adopt the hazard mitigation plan. The Resolutions of adoption are in the **Attachments**.

## Plan Approval

FEMA issued an Approval Pending Adoption notice on _____. Upon adoption by the Boards of Education, the resolutions were forwarded to FEMA. The FEMA Letter of Approval was issued on _____. A copy of the FEMA Letter of Approval is in the **Attachments**.

## Plan Methodology

The Planning Team discussed knowledge of hazards and past historical events, as well as facilities maintenance plans.

The rest of this section describes the mitigation planning process including 1) Executive Planning Team involvement, 2) Area Planning Team, general public and external agency involvement; and 3) integration of existing data and plans.

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A1a.** |
|---|
| **Q:** Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))<br>**A:** See **Executive Planning Team Involvement** below. |

## Executive Planning Team Involvement

The Executive Planning Team served as the primary stakeholder throughout the planning process. The Area Planning Teams, general public, and external agencies served as secondary stakeholders in the planning process. The Executive Planning Team was responsible for the following tasks:

- ✓ Confirming planning goals,
- ✓ Prepare timeline for plan,
- ✓ Ensure plan meets DMA 2000 requirements,
- ✓ Organize and solicit involvement of public and external agencies,
- ✓ Analyze existing data and reports,
- ✓ Review hazard information,
- ✓ Review HAZUS loss projection estimates,
- ✓ Create Mitigation Action Items,
- ✓ Participate in Planning Team meetings and Board of Education public meeting, and
- ✓ Provide existing resources including maps and data.

The Executive Planning Team, with assistance from Emergency Planning Consultants, identified and profiled hazards; determined hazard rankings; estimated potential exposure or losses; evaluated development trends and specific risks; and developed mitigation goals and action items.

**Table: Level of Participation at Executive Planning Team, Area Planning Team, and Entity Level Meetings**

| Agency and Name of Attendee | Research and Writing of Plan | Executive Planning Team Kick-Off Meeting: February 11 or 12, 2020 | Area Planning Team Meeting: April 27 or 28, 2020 | One on One Meeting with Individual Planning Entity (May 2020) | Executive Planning Team Meeting to Review and Contribute to First Draft Plan (February 11 or 25, 2021) | Distribute Second Draft Plan to General Public and External Agencies | Review Input From Public, and External Agencies of the Second Draft Plan | Submit Third Draft Plan to Cal OES/FEMA for Approval Pending Adoption | Submit Fourth Draft Plan to External Agencies and General Public | Post Final Draft Plan in Advance of Board of Education Meetings | Present Final Draft Plan to Boards of Education at Public Meeting for Plan Adoption | Submit Proof of Adoptions to FEMA for Final Approval | Incorporate FEMA Approval into Final Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alexander Valley Union School District** | | | | | | | | | | | | | |
| Matt Reno | | X | | X | X | X | X | | | | | | |
| **Bellevue Union School District** | | | | | | | | | | | | | |
| Roger Farrell | | X | X | X | X | X | X | | | | | | |
| **Bennett Valley Union School District** | | | | | | | | | | | | | |
| Jimmy Hughes | | | | | X | X | X | | | | | | |
| Sue Field | | X | X | X | | | | | | | | | |
| **Cinnabar School District** | | | | | | | | | | | | | |
| Angel Judy | | X | X | X | X | X | X | | | | | | |
| Kristine Arcuri | | | | | X | | | | | | | | |
| **Cloverdale Unified School District** | | | | | | | | | | | | | |
| Rick Scaramella | | | X | X | X | X | X | | | | | | |
| **Cotati-Rohnert Park Unified School District** | | | | | | | | | | | | | |
| Josh Savage | | X | X | X | X | X | X | | | | | | |
| **Dunham School District** | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daniel Hoffman | | X | X | X | | | | | | | | | |
| Maggie Vasquez | | | | | X | X | X | | | | | | |
| **Forestville Union School District** | | | | | | | | | | | | | |
| Renee Semik | | X | X | X | X | X | X | | | | | | |
| **Fort Ross Elementary School District** | | | | | | | | | | | | | |
| John Markatos | | | | X | | | | | | | | | |
| Jennifer Dudley | | | | | X | X | X | | | | | | |
| **Geyserville Unified School District** | | | | | | | | | | | | | |
| Deborah Bertolucci | | X | X | X | | | | | | | | | |
| Christina Menicucci | | | | | X | X | X | | | | | | |
| **Gravenstein Union School District** | | | | | | | | | | | | | |
| Wanda Holden | | X | X | X | X | X | X | | | | | | |
| **Guerneville Elementary School District** | | | | | | | | | | | | | |
| Cherie Cahn | | | | | X | X | X | | | | | | |
| Dana Pedersen | | | X | X | | | | | | | | | |
| **Harmony Unified School District** | | | | | | | | | | | | | |
| Matthew Morgan | | X | X | X | X | X | X | | | | | | |
| **Healdsburg Unified School District** | | | | | | | | | | | | | |
| Robert Smith | | X | X | X | X | X | X | | | | | | |
| **Horicon Elementary School District** | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jeff McFarland | | X | X | X | | X | X | | | | | | |
| **Kashia School District** | | | | | | | | | | | | | |
| Patti Pomplin | | X | X | X | X | X | X | | | | | | |
| **Kenwood School District** | | | | | | | | | | | | | |
| Bob Bales | | X | X | X | X | X | X | | | | | | |
| **Liberty School District** | | | | | | | | | | | | | |
| Christopher Rafanelli | | X | X | X | X | X | X | | | | | | |
| **Mark West Union School District** | | | | | | | | | | | | | |
| Regina Cuculich | | X | | X | | X | X | | | | | | |
| **Monte Rio Union School District** | | | | | | | | | | | | | |
| Nathan Myers | | X | X | X | X | X | X | | | | | | |
| **Montgomery Elementary School District** | | | | | | | | | | | | | |
| Taryn Parmeter | | X | X | X | | | | | | | | | |
| Laurie Mason | | | | | X | X | X | | | | | | |
| **Oak Grove School District** | | | | | | | | | | | | | |
| Amber Stringfellow | | X | X | X | X | X | X | | | | | | |
| **Old Adobe Union School District** | | | | | | | | | | | | | |
| Lynda Williams | | X | X | X | X | X | X | | | | | | |
| **Petaluma City Schools** | | | | | | | | | | | | | |
| Chris Thomas | | X | X | X | X | X | X | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gary Callahan | | | | | X | | | | | | | | |
| **Piner-Olivet Union School District** | | | | | | | | | | | | | |
| Felicia Koha | | X | X | X | X | X | X | | | | | | |
| **RESIG (not a participant agency)** | | | | | | | | | | | | | |
| Christine Dektor | | X | X | | | | | | | | | | |
| Erin Tarkhanian | | X | | | | | | | | | | | |
| **Rincon Valley School District** | | | | | | | | | | | | | |
| Daniel Hebel | | X | X | X | | | | | | | | | |
| Mike Moniot | | | | | X | X | X | | | | | | |
| **Roseland Public Schools** | | | | | | | | | | | | | |
| Amy Jones-Kerr | | X | X | X | | | | | | | | | |
| Gail Ahlas | | | | | X | X | X | | | | | | |
| **Santa Rosa City Schools** | | | | | | | | | | | | | |
| Rick Edson | | X | X | X | X | X | X | | | | | | |
| Erik Oden | | | | X | X | | | | | | | | |
| **Sebastopol School District** | | | | | | | | | | | | | |
| Brent Ono | | X | X | X | X | X | X | | | | | | |
| **Sonoma County Office of Education** | | | | | | | | | | | | | |
| Bonnie Brown | | X | X | X | X | X | X | | | X | | | |
| Mary Downey | | X | X | X | X | X | X | | | | | | |
| Mark Silva | | X | X | X | X | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sonoma Valley Unified School District** | | | | | | | | | | | | | |
| David Sandoval | | X | X | X | | | | | | | | | |
| Doug Weidemann | | | | | X | X | X | | | | | | |
| **Twin Hills Union School District** | | | | | | | | | | | | | |
| Barbara Bickford | | X | X | X | X | X | X | | | | | | |
| Patty Nosecchi | | | | | X | | | | | | | | |
| **Two Rock Union School District** | | | | | | | | | | | | | |
| Betha MacClain | | X | X | X | | | | | | | | | |
| Michelle Panizzera | | | | | X | X | X | | | | | | |
| **Waugh School District** | | | | | | | | | | | | | |
| Sharon Battaglia | | | | | X | X | X | | | | | | |
| Mike Gardner | | | | X | X | | | | | | | | |
| **West Side Union School District** | | | | | | | | | | | | | |
| Kris Menlove | | X | X | X | | | | | | | | | |
| Mark Zastrow | | | | | X | X | X | | | | | | |
| **West Sonoma County Union High School District** | | | | | | | | | | | | | |
| Jennie Bruneman | | | X | X | X | X | X | | | | | | |
| Denise Fisher | | | | | X | | | | | | | | |
| **Wilmar Union School District** | | | | | | | | | | | | | |
| Sheila Garvey | | X | X | X | X | X | X | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Windsor Unified School District** | | | | | | | | | | | | | |
| Chris Canelake | | X | | | | | | | | | | | |
| Lois Standring | | | X | X | X | X | X | | | | | | |
| **Wright Elementary School District** | | | | | | | | | | | | | |
| Bill Jereb | | X | | | X | X | X | | | | | | |
| **EMERGENCY PLANNING CONSULTANTS** | | | | | | | | | | | | | |
| Carolyn Harshman | X | X | X | X | X | | X | X | | | | | |
| Don Silverek | X | X | X | | | | | | | | | | |

## Table: Executive Planning Team and Area Planning Team Timeline

| Tasks | December 2019 | January 2020 | February | March | April | May | June-December | January 2021 | February | March-May | April | May | June | July-December | January 2022 | February-March | April | September-May | June | July-December | January 2023 | February | March | April |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hazard Research, HAZUS-MH, Plan Writing, and Locational Maps** | | | | | | | | | | | | | | | | | | | | | | | | |
| Research for Risk and Vulnerability Assessment | X | X | | | | | | | | | | | | | | | | | | | | | | |
| HAZUS-MH Maps and Reports for each Area (3 hazard-specific scenarios for each of the 4 Planning Areas) | X | X | X | X | | | | | | | | | | | | | | | | | | | | |
| **Executive Planning Team Meetings** | | | | | | | | | | | | | | | | | | | | | | | | |
| Meeting #1 – Project Kickoff, Initial Hazard Briefing, Community Outreach Strategy, Hazard Mitigation Course (2 offerings) | | | X | | | | | | | | | | | | | | | | | | | | | |
| Meeting #2 – Review First Draft Plan | | | | | | | | | X | | | | | | | | | | | | | | | |
| **Area Planning Team Meetings (4 Areas)** | | | | | | | | | | | | | | | | | | | | | | | | |
| Area Meetings #1 – Project Timeline, Mitigation Concepts, Review Hazard Research and HAZUS-MH (4 meetings total) | | | | | X | | | | | | | | | | | | | | | | | | | |
| Area Meetings #2 – Individual Meetings with Participating Jurisdictions (41 meetings total) | | | | | | X | | | | | | | | | | | | | | | | | | |
| **Community Outreach** | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop Opportunities for External Agencies and General Public to Provide Input to the Third Draft Plan | | | | | | | | | | | | | X | X | X | X | | | | | | | | |
| Distribute Fourth Draft Plan to External Agencies and General Public | | | | | | | | | | | | | | | | | | | | X | | | | |
| **Formal Review, Approval, and Adoption of Plan** | | | | | | | | | | | | | | | | | | | | | | | | |
| Submit Third Draft Plan to Cal OES | | | | | | | | | | | | | | | | | X | | | | | | | |
| Work with Cal OES and FEMA on DMA 2000-Mandated Revisions to the Plan | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | |
| Receive FEMA Approval Pending Adoption | | | | | | | | | | | | | | | | | | | | | | | | |
| Present to SCOE Board of Education to Adopt the Final Draft Plan | | | | | | | | | | | | | | | | | | | | | | | | |
| Present to District Boards of Education to Adopt the Final Draft Plan | | | | | | | | | | | | | | | | | | | | | | | | |
| Submit Proof of Adoptions to FEMA | | | | | | | | | | | | | | | | | | | | | | | | |
| Receive FEMA Letter of Approval | | | | | | | | | | | | | | | | | | | | | | | | |
| Incorporate FEMA Letter of Approval and Adoption Documentation into Final Plan | | | | | | | | | | | | | | | | | | | | | | | | |

| Q&A \| ELEMENT A: PLANNING PROCESS \| A2a. |
|---|
| **Q:** Does the plan document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process? (Requirement §201.6(b)(2)) |
| **A:** See **Secondary Stakeholder Involvement** below. |
| **Q&A \| ELEMENT A: PLANNING PROCESS \| A2b.** |
| **Q:** Does the plan identify how the stakeholders were invited to participate in the process? (Requirement §201.6(b)(2)) |
| **A:** See **Secondary Stakeholder Involvement** below. |

## Secondary Stakeholder Involvement

In addition to the Planning Team, the secondary stakeholders also provided information, expertise, and other resources during the plan writing phase. The secondary stakeholders included the jurisdictional staff, general public and external agencies. All gathered input was incorporated into the Third Draft Plan prior to distribution to Cal OES and FEMA. Following review by Cal OES, a Fourth Draft Plan was distributed to the general Public and external agencies. For a specific accounting of the date, source, information gathered, and use of information during the Plan Writing Phase, please see the **Attachments**.

In advance of the Board of Education public meetings, the same stakeholders were informed of the availability of the Final Draft Plan and encouraged to participate in the public meeting. Any comments gathered were noted in the Planning Team Staff Report and added to the Final Plan.

| Q&A \| ELEMENT C. MITIGATION STRATEGY \| C1a. |
|---|
| **Q:** Does the plan document each jurisdiction's existing authorities, policies, programs and resources? (Requirement §201.6(c)(3)) |
| **A:** See **Capability Assessment – Existing Processes and Programs** below. |

## Capability Assessment – Existing Processes and Programs

The districts and SCOE will incorporate mitigation planning as an integral component of daily operations. This will be accomplished by the Executive Planning Team member with their respective departments to integrate mitigation strategies into their planning documents and operational guidelines. FEMA identifies four types of capabilities: Planning and Regulatory, Administrative and Technical, Financial, and Education and Outreach. Following are explanations drawn from "Beyond The Basics" a website developed as part of a multi-year research study funded by the U.S. Department of Homeland Security, Coastal Resilience Center and led by the Center for Sustainable Community Design within the Institute for the Environment at the University of North Carolina at Chapel Hill and the Institute for Sustainable Coastal Communities at Texas A&M University. This excellent resource ties FEMA regulations together with best practices in hazard mitigation.

**Planning and Regulatory**

Planning and regulatory capabilities are based on the implementation of ordinances, policies, local laws and State statutes, and plans and programs that relate to guiding and managing growth and development. Examples of planning capabilities that can either enable or inhibit mitigation include comprehensive land use plans, capital improvements programs, transportation plans, small area development plans, disaster recovery and reconstruction plans, and emergency

preparedness and response plans. Plans describe specific actions or policies that support community goals and drive decisions. Likewise, examples of regulatory capabilities include the enforcement of zoning ordinances, subdivision regulations, and building codes that regulate how and where land is developed and structures are built. Planning and regulatory capabilities refer not only to the current plans and regulations, but also to the community's ability to change and improve those plans and regulations as needed.

**Administrative and Technical**
Administrative and technical capability refers to the community's staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. It also refers to the ability to access and coordinate these resources effectively. Think about the types of personnel employed by each jurisdiction, the public and private sector resources that may be accessed to implement mitigation activities in your community, and the level of knowledge and technical expertise from all of these sources. These include engineers, planners, emergency managers, GIS analysts, building inspectors, grant writers, floodplain managers, and more. For jurisdictions with limited staff resources, capacity should also be considered; while staff members may have specific skills, they may not have the time to devote to additional work tasks.

The planning team can identify resources available through other government entities, such as counties or special districts, which may be able to provide technical assistance to communities with limited resources. For example, a small town may turn to county planners, engineers, or a regional planning agency to support its mitigation planning efforts and provide assistance. For large jurisdictions, reviewing administrative and technical capabilities may involve targeting specific staff in various departments that have the expertise and are available to support hazard mitigation initiatives. The degree of 63 intergovernmental coordination among departments also affects administrative capability.

**Financial**
Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions. The costs associated with implementing mitigation activities vary. Some mitigation actions, such as building assessment or outreach efforts, require little to no costs other than staff time and existing operating budgets. Other actions, such as the acquisition of flood-prone properties, could require a substantial monetary commitment from local, state, and federal funding sources. Some local governments may have access to a recurring source of revenue beyond property, sales, and income taxes, such as stormwater utility or development impact fees. These communities may be able to use the funds to support local mitigation efforts independently or as the local match or cost-share often required for grant funding.

**Education and Outreach**
This type of capability refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Examples include fire safety programs that fire departments deliver to students at local schools; participation in community programs, such as Firewise, TsunamiReady or StormReady; and activities conducted as part of hazard awareness campaigns, such as Fire Prevention Month or Flood Awareness Month.

The table below includes a broad range of capabilities within SCOE to successfully accomplish mitigation. See **Annexes** for the district Capability Assessments.

**Table: Capability Assessment - Existing Processes and Programs for SCOE (Source: EPC and SCOE)**

| Type of Capability | | | | Name of Capability | Capability Description and Ability to Support Mitigation |
|---|---|---|---|---|---|
| Planning and Regulatory | Administrative and Technical | Financial | Education and Outreach | | |
| | | | | **SCOE Departments** | |
| | | | X | Administration Department | The Superintendent and Community Engagement Specialist both play critical roles in day-to-day and disaster operations. Since the mitigation plan is a new policy document, both staff will need to be directly involved in the plan's implementation. |
| | X | X | | Business Services Department | The purpose of Business Services is to provide the support and infrastructure needed by our schools to carry on the important work of educating the children of our community. Our number one job is to continuously improve the learning environment for all our students. Business Services addresses a wide range of issues and operations including risk management. Business Services will be instrumental in monitoring availability of grants and other funding sources to help implement the MJHMP. |
| X | X | X | X | Facilities Planning Department | Facilities Planning has the responsibility to provide the best possible facility-related environment for students and staff. This involves the continuous assessment of the needs of the schools and the development of plans to meet those needs. In addition, Facilities Planning works to identify all available fund sources required to make significant capital improvements for campuses. Working closely with architects and engineers, Facilities Planning develops detailed plans and specifications which must meet very stringent requirements. Facilities Planning can immediately incorporate many mitigation action items from the MJHMP into building designs. Also, they can share new mitigation-related building standards with the Executive Planning Team for inclusion in future updates to the plan. |
| | X | | X | Maintenance and Operations Department | The mission of Maintenance and Operations is to provide the support and services necessary to ensure the school environment is conducive to student learning and improved academic performance. The team provides safe, clean, well-maintained, functional, and aesthetically pleasing facilities for the students and staff members, as well as visitors and the community as a whole. Maintenance and Operations staff are the "boots on the ground" who witness the results of deferred maintenance and hazard-related damages to the buildings and infrastructure. This information is of great importance to any priority changes or updates to the MJHMP. Additionally, staff interface with each of the campuses and with that comes opportunity to "teach by showing" activities that help to minimize threats associated with hazards. |

| Type of Capability | | | | Name of Capability | Capability Description and Ability to Support Mitigation |
|---|---|---|---|---|---|
| Planning and Regulatory | Administrative and Technical | Financial | Education and Outreach | | |
| | X | | | Sonoma County Board of Education | The Sonoma County Board of Education is comprised of five elected representatives from trustee areas that roughly correspond to the Sonoma County Board of Supervisor districts. The Sonoma County Superintendent of Schools serves as the ex-officio secretary to the County Board. The Board's policy and funding support is critical to the Mitigation Plan. |
| | | | | **SCOE Plans and Programs** | |
| | X | | X | Comprehensive School Safety Plan | The CSSP consists of several components, including identifying hazards. Hazard-related information from the MJHMP will be added to the CSSP. |
| | X | | X | Emergency Response Plan | The ERP for SCOE identifies hazards and related response protocols. Various assignments are identified in the ERP which are assigned to staff. Training and exercises assist in informing the staff of their roles as well as sharing information about the various hazards. |
| | X | | X | Facilities Master Plan | The Facilities Master Plan is a compilation of information, policies, and statistical data about a school district. It is organized to provide (1) a continuous basis for planning educational facilities that will meet the changing needs of a community; and (2) provide alternatives in allocating facility resources to achieve district's goals and objectives. It is used for planning facilities needs for either pupil enrollment growth or decline. Many of the mitigation action items in the plan will be added to the Facilities Master Plan which is ensure the implementation of the MJHMP. |
| | | X | | Capital Improvement Program | Phased and other long-term constructions projects are managed through the Capital Improvement Program. Such projects are funded through taxation, impact fees, and general obligation bonds. |
| | X | | | Maintenance Program | The Annual Budget includes funds for staffing, equipment, and supplies intended to reduce risk (e.g., tree trimming, clearing drainage systems). |
| | X | X | X | Annual Budget | The Annual Budget and its associated review, update, and approval process provide a plethora of opportunities to explain details tasks, priorities, and spending allocations for the projects, programs, and equipment supporting the efforts of SCOE and the districts. Many of the ongoing mitigation items in the plan are supported through the Annual Budget. |
| X | | | | Building Code | SCOE adheres to the California Department of Education's "Field Act" that mandates minimum requirements for all buildings occupied with school children. |
| | | | | **SCOE External Agencies and Resources** | |

| Type of Capability | | | | Name of Capability | Capability Description and Ability to Support Mitigation |
|---|---|---|---|---|---|
| Planning and Regulatory | Administrative and Technical | Financial | Education and Outreach | | |
| | | | X | Community Support | Support for mitigation can be gathered from parent groups, local citizen groups, and non-profit organizations focusing on environmental protection, emergency preparedness, access, and functional needs populations, etc. |
| | X | | X | Cities, Towns, and Unincorporated Area Public Safety Entities | Within the project area there are numerous local governments providing law enforcement and fire suppression/prevention. Each entity provides technical expertise in a variety of public safety subject areas along with knowledge of regulatory requirements. Also, each maintains robust capabilities for education and outreach through a variety of venues and mediums. |

**Expanding and Improving on Capabilities**

Planning and Regulatory Capabilities - SCOE builds and maintains its own buildings and infrastructure according to the CDE "Field Act". Future plans are laid out in the Facilities Maintenance Plan. The funding of future construction often relies on successful bond measures where plans and justifications are shared with the public. Given the fact this is the first mitigation plan for SCOE, the topic of mitigation has been limited to Environmental Impact Reports tied to major development projects. Although mitigation is new, schools are highly experienced in adhering to federal, state, and local mandate, and comply with a wide array of reporting requirements pertinent to school operations and student performance. That well-practiced experience positions the school's community as prepared to participate and respond as mitigation weaves itself into the school culture. Once complete, the MJHMP will be shared with the Sonoma County Office of Emergency Services which will result in more effective emergency planning. With all of the county's school district under one umbrella in the MJHMP, SCOE will take a more active role in coordinating and planning for all of the schools.

Administrative and Technical –

Existing SCOE capabilities are limited. Adding grant writing, GIS, mutual aid agreements, and a warning/notification system would greatly enhance the Office's capabilities. Grant writing capabilities will be especially important once the mitigation plan is approved by FEMA. That approval will trigger eligibility for a range of federal and state grants. Also, the Board of Education could form a sub-committee dedicated to land use matters and mitigation plan implementation. The Plan's opportunities for success will be increased by the Board's involvement. Perhaps in the future, SCOE will consider adding a staff position dedicated to overseeing all of the emergency planning efforts which could include the Comprehensive School Safety Plans, Emergency Response Plans, and updates to the MJHMP.

Finance -

School systems have a number of funding resource acquisition mechanisms that can be utilized for mitigation planning. Aside from the ability to levy taxes, charge impact fees, and initiate

general obligation bonds, schools and students are favored targets for philanthropic support. And while the need for fiscal resources for the school community in Sonoma County is at an all-time high as repetitive disaster plague the region, SCOE knows that the outcomes that hazard mitigation planning and project execution bring are transformative in making schools operationally safer. As student and staff safety is our number one priority, the mitigation planning effort and partnership with the County will serve to prioritize funding capture efforts to meet the objectives and initiatives undertaken herein. We envision inter-school and inter-agency collaborations and funding applications where mutual benefits are found, as well as regular solicitation of our business, industry, and private donor partners to satisfy the financial obligations found in executing hazard mitigation activities.

Education and Outreach –
Utilize parent groups, local citizen groups, and non-profit organizations to support and encourage SCOE mitigation as well as home and business mitigation. Enlist the Superintendent and Community Engagement Specialist in learning and talking about the MJHMP.

**Q&A | ELEMENT A: PLANNING PROCESS | A4**

**Q:** Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))
**A:** See **Use of Existing Data** below.

## Use of Existing Data

The Planning Team gathered and reviewed existing data and plans during plan writing and specifically noted as "sources". Numerous electronic and hard copy documents were used to support the planning process:

**Sonoma County Office of Education**
https://www.scoe.org/
*Applicable Incorporation: Board Members, Maps, Location, and the Environment*

**Sonoma County Multijurisdictional Hazard Mitigation Plan Update (2021)**
https://permitsonoma.org/longrangeplans/adoptedlong-rangeplans/hazardmitigation
*Applicable Incorporation: Maps, Location, Environment, Plans, Programs*

**State of California Hazard Mitigation Plan (2018)**
https://www.caloes.ca.gov/
*Applicable Incorporation: Used to identify hazards posing the greatest threat to State.*

**HAZUS Maps and Reports**
Created by Emergency Planning Consultants
*Applicable Incorporation: Numerous HAZUS maps and reports have been included for Earthquake to determine specific risks and impacts to the Project Area.*

**FEMA "How To" Mitigation Series (386-1 to 386-9)**
www.fema.gov/media
*Applicable Incorporation: Mitigation Measures Categories and 4-Step Planning Process are quoted in the Executive Summary.*

**National Flood Insurance Program**
www.fema.gov/national-flood-insurance-program
*Applicable Incorporation: Used to confirm repetitive loss properties within the Project Area.*

**Local Flood Insurance Rate Maps**
https://msc.fema.gov/portal/home
*Applicable Incorporation: Provided by FEMA and included in Flood Hazard section.*

**California Department of Forestry and Fire Protection (CAL FIRE)**
www.fire.ca.gov
*Applicable Incorporation: Wildfire hazard mapping.*

**California Department of Conservation**
www.conservation.ca.gov/cgs
*Applicable Incorporation: Seismic hazards mapping.*

**U.S. Geological Survey (USGS)**
www.usgs.gov
*Applicable Incorporation: Earthquake records and statistics.*

**Using HAZUS for Mitigation Planning (2018)**
https://www.fema.gov/media-library-data/1540479624999-ab1eca852448e271f0de82cf2031a01b/Using_Hazus_in_Mitigation_Planning_20180820_Final_508_Compliant.pdf
*Applicable Incorporation: HAZUS Information.*

**NOAA National Centers for Environmental Information, Climate at a Glance (2019)**
https://www.ncdc.noaa.gov/cag/county/time-series
*Applicable Incorporation: Data Image.*

**Beyond the Basics (website)**
https://mitigationguide.org/
*Applicable Incorporation: Definitions of Capability Assessment Categories.*

# Part II: RISK ASSESSMENT

## Project Area Profile

### Overview

The Sonoma County Office of Education (SCOE) is a strategic partner to the County of Sonoma's 38 school districts including 165 schools serving roughly 71,000 students (K-12). SCOE maintains a total of 12 buildings valued at $51 million and 325 occupants. Each of the districts is autonomous and governed by its own board of trustees/education. The Sonoma County Office of Education's area of responsibility (Project Area) is the same as the County's boundaries.

**Table: Sonoma County Office of Education Assets (Source: SCOE 2023)**

| Sonoma County Office of Education Facilities | # Occupants | # Buildings | $ Property Value (millions) | $ Contents Value (millions) | $ Total Value (millions) |
|---|---|---|---|---|---|
| **SCOE** | | | | | |
| SCOE Main Facility – Santa Rosa | 220 | 1 | 10 | 3 | 13 |
| SCOE Legal Facility – Santa Rosa | 10 | 1 | 3 | 0.3 | 3.3 |
| SCOE Overflow Parking Lot – Santa Rosa | 0 | 0 | 2 | 0.0 | 2 |
| SCOE Valley of the Moon – Santa Rosa (includes SELPA) | 15 | 1 | 7 | 0.5 | 7.5 |
| SCOE Juniper Shop Facility – Santa Rosa | 5 | 1 | 1 | 0.1 | 1.1 |
| SCOE - CBI | 5 | 1 | 1 | 0.1 | 1.1 |
| SCOE Sonoma Valley – Sassari Elementary | 5 | 1 | 1 | 0.1 | 1.1 |
| SCOE Petaluma City – 4C's McDowell Elementary | 5 | 1 | 1 | 0.1 | 1.1 |
| **SCOE SELPA Properties** | | | | | |
| SELPA Lewis Opportunity School – Santa Rosa | 5 | 1 | 1 | 0.1 | 1.1 |
| SELPA Headwaters Academy – Petaluma (includes Alternative Education) | 20 | 1 | 7 | 0.5 | 7.5 |
| Sonoma Community Center (SE) | 5 | 1 | 1 | 0.1 | 1.1 |
| **SCOE Alternative Education Properties** | | | | | |
| Satellite Office Space – Rohnert Park | 0 | 1 | 1 | 0.1 | 1.1 |
| Amarosa Academy – Santa Rosa | 30 | 1 | 9 | 1 | 10 |
| **Totals** | **325** | **12** | **$45 million** | **$6 million** | **$51 million** |

According to the LCAP for SCOE, Sonoma County covers over 1,700 square miles with an estimated 502,146 residents. There are 38 separate school districts, nine separate cities and large unincorporated rural and semi-rural areas. Socio-economic conditions within the county vary widely, including a spectrum from wealthy winery owners and retired corporate millionaires to suburban families, migrant farm workers and Native American residents living on isolated reservations. Highway 101 serves as a corridor linking the north county communities to Santa Rosa, the county's primary urban area with a population of 167,815 and the southernmost city of Petaluma.

Although the majority of the county's population (63.5%) is white, 38% of the county's population is made up of minorities, with Latinos representing 27% of the total. In the county schools, Latinos represent 45.5% of the total youth population and 50% of the total youth population is considered economically disadvantaged. While enrollment in Sonoma County schools had been decreasing since 2001, it began slowly increasing again in 2013-14, with a subsequent decrease in the 2016-17 and 2017-18 school years. In 2017-18, enrollment in Sonoma County schools was 70,449.
The Sonoma County Office of Education (SCOE) Alternative Education Program provides education for students (grades 7-12) who have had difficulty in the traditional school setting or in the community. Daily academic instruction is provided for students who are detained or referred by districts because of expulsion, who self-select, or who benefit from a program based on alternative instructional strategies. The program has two "schools": Court School and Community School.

The Court School Program provides educational services to students who are incarcerated. The Juvenile Justice Center serves girls and boys, ages 12 to 18, who have been arrested and booked on criminal charges and are serving time or awaiting disposition by the court. The Probation Youth Camp classroom serves 16 to 18 year-old males and features vocational and school-to-career instruction. The Court School program served 311 students (unduplicated count) in the 2017-18 school year and 259 students to date in the 2018-19 school year.

The Community School Program provides an alternative learning environment for 12 to 18 year-old students in grades 7–12 who may be experiencing difficulties in a traditional school setting or who may be exhibiting negative behavior patterns in school or in the community. This program serves students who have been expelled from school, identified as habitually truant, placed on probation by the court, or otherwise referred by a school district, probation, or social service agency. The Community School program includes an Independent Study option and a Teen Parent Program. The emphasis of the Community School Program is to reestablish the educational direction of students and to transition them to a learning environment that meets their needs. Counseling and other support services are provided by public and community agencies. The Community School program served 142 students (unduplicated count) in the 2017-18 school year and 132 students to date in the 2018-19 school year.

| Q&A \| ELEMENT B3: |
| --- |
| **Q:** Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(b)(3))<br>**A:** See **Geography and Climate** below. |

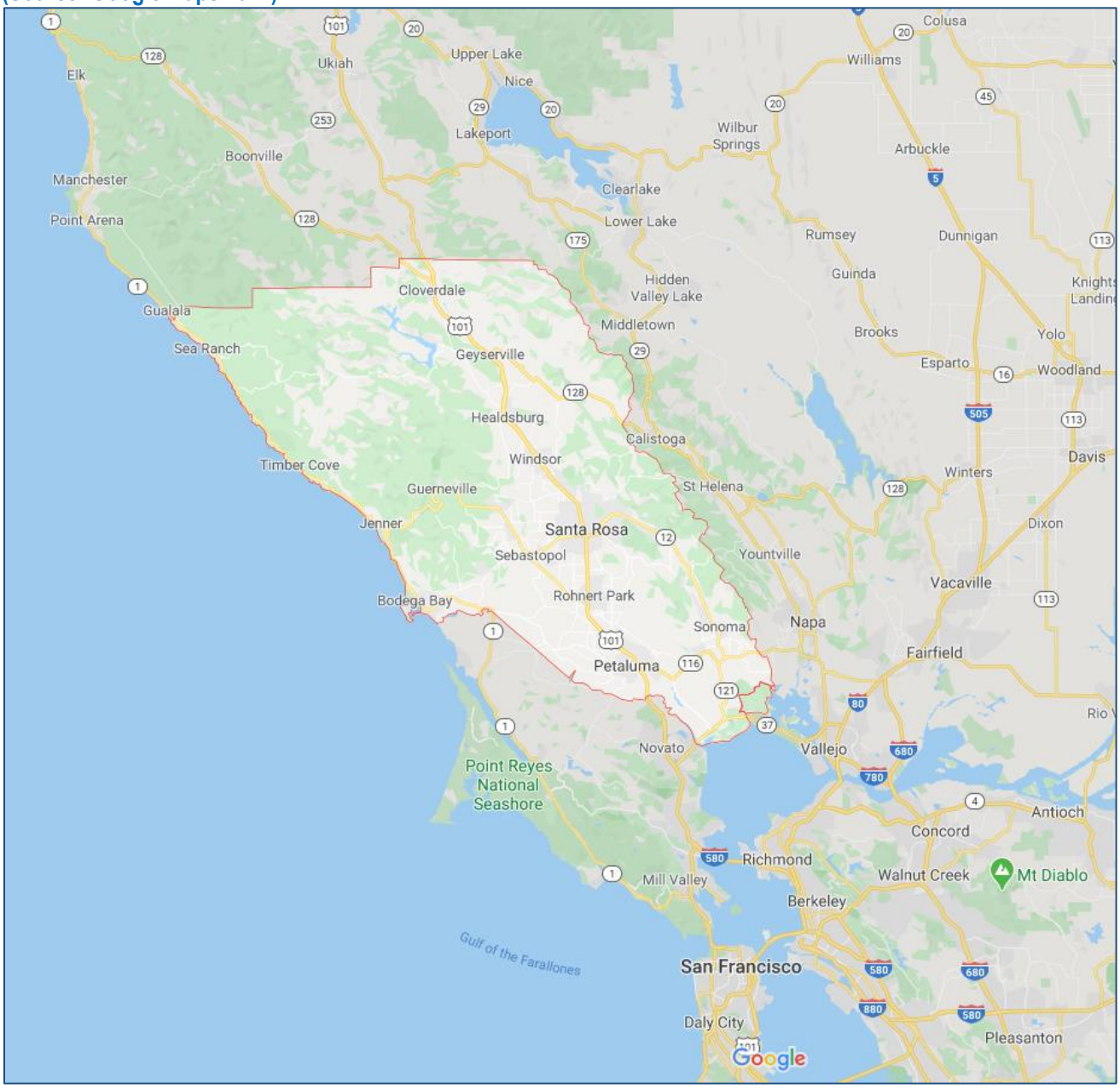
## Geography and Climate

According to the 2021 Sonoma County Multijurisdictional Hazard Mitigiation Plan, the county (also the project area) is the most northerly of nine counties in the San Francisco Bay Region, located along the Pacific coastline about forty miles north of San Francisco. Sonoma County is just over 1,500 square miles, making it the largest of the nine Bay Area counties. The Project Area are bordered by the Pacific Ocean on the west, Marin County and San Pablo Bay to the south, Solano, Napa and Lake Counties to the east, and Mendocino County to the north.

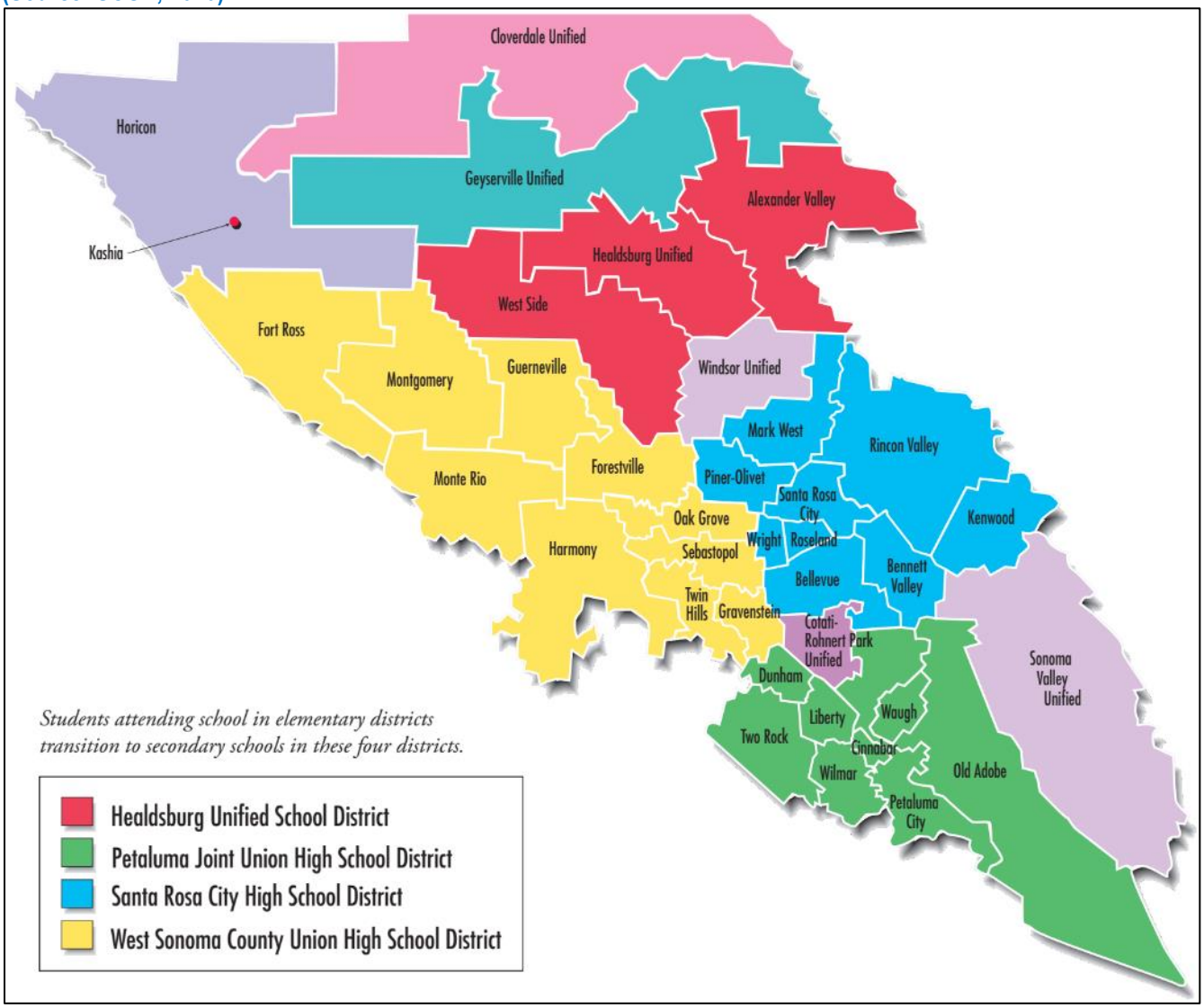
Topography within the Project Area is varied and includes mountainous areas, rolling hills and broad flat river valleys, and bay flats. The valleys and foothills are predominantly in agricultural uses with some urbanized areas and with a dense population. The area contains numerous watersheds, but the Russian River is the largest and most significant, draining over 1,485 square miles as it flows to the Pacific Ocean. The Russian River is the primary water supply and a key attraction to many communities along its banks. Approximately half of the project area is in rugged rural areas with limited access and most of the development in these areas is limited to open space and timber/natural resource production.

According to the Sonoma County Climate Action Plan (2016), the project area has a typical mediterrannean climate with hot, dry summers and cool, wet winters. Rainfall and humidity are low. The annual average precipitation for the area is approximately 31 inches.

**Map: Sonoma County Boundary (same as MJHMP project area)**
**(Source: Google Maps 2021)**



**Map: Sonoma County School Districts**
**(Source: SCOE, 2020)**



# Risk Assessment

## What is a Risk Assessment?

Conducting a risk assessment can provide information regarding: the location of hazards; the value of existing land and property in hazard locations; and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the five levels of a risk assessment are as follows:

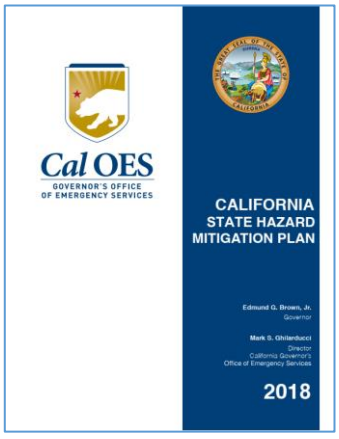
1. *Hazard Identification*
2. *Profiling Hazard Events*
3. *Vulnerability Assessment/Inventory of Existing Assets*
4. *Risk Analysis*
5. *Assessing Vulnerability/Analyzing Development Trends*

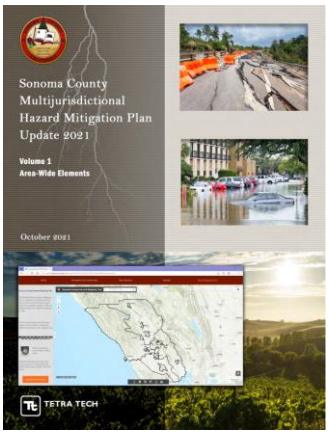
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1a.** |
|---|
| **Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i)) |
| **A:** See **Hazard Identification** below. |

### *1) Hazard Identification*

This section is the description of the geographic extent, potential intensity, and the probability of occurrence of a given hazard. Maps are used in this plan to display hazard identification data. The Planning Team utilized the categorization of hazards as identified in California's State Hazard Mitigation Plan, including Earthquakes, Floods, Levee Failures, Wildfires, Landslides and Earth Movements, Tsunami, Climate-Related Hazards, Volcanoes, and Other Hazards. Additionally, the Planning Team considered the hazards identified in the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021) including Dam Failure, Drought, Earthquake, Flooding, Landslide/Mass Movement, Sea Level Rise, Severe Weather, Tsunami, Wildfire, and Climate Change.

Next, the Planning Team reviewed existing documents to determine which of the hazards posed the most significant threat to the Project Area and its ability to deliver services. In other words, which hazard would likely result in a local declaration of emergency.



The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021).

The following hazards identified in the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021) that have been omitted from inclusion in the SCOE MJHMP:

- ✓ Sea Level Rise – The Planning Team chose not to address this issue since there are no agency-owned facilities within the areas mapped as being prone to sea level rise.
- ✓ Climate Change – The Planning Team chose to break out what they perceived as the greatest areas of concern into the Utility Related Events Hazard Specific Chapter.

The following hazards identified in the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021) that have not been omitted from the plan but were not fully profiled or CPRI ranked due to their low priority and the organization's limited capability to mitigate.

- ✓ Drought – The Planning Team chose to address this issue in the Utility Related Hazard-Specific Chapter.
- ✓ Dam Failure – The Planning Team included within the Flooding Hazard-Specific Chapter.
- ✓ Severe Weather – The Planning Team chose to address this issue in the Utility Related Hazard-Specific Chapter.

Equally important was the Planning Team's decision to add two hazards to the research and mitigation action items. The two hazards not included in the Sonoma County Multijurisdictional Hazard Mitigation Plan are Utility Related Events because of the Project Area's recent experience with Public Safety Power Shutoff (PSPS), and Epidemic / Pandemic / Vector-Borne Disaster Hazards because of the Project Area's recent experience with COVID-19.

Based on the reasoning above, the Planning Team identified the following hazards for research and analysis:

**Earthquake | Flood | Landslide | Wildfire | Tsunami**

**Epidemic/Pandemic/Vector-Borne Diseases | Utility Related**

Next, the Planning Team utilized the Calculated Priority Risk Index to rank the selected hazards. The hazard ranking system is described in **Table: Calculated Priority Risk Index**, while the actual ranking is shown in **Table: Calculated Priority Risk Index Ranking for the Project Area.** It's important to note that "maximum credible events" were used for each of the hazards. In other words, an event of such significance that the jurisdiction would declare a local emergency.

**Table: Calculated Priority Risk Index**
**(Source: Federal Emergency Management Agency)**

| CPRI Category | Degree of Risk | | | Assigned Weighting Factor |
|---|---|---|---|---|
| | Level ID | Description | Index Value | |
| Probability | Unlikely | Extremely rare with no documented history of occurrences or events.<br>Annual probability of less than 1 in 1,000 years. | 1 | 45% |
| | Possibly | Rare occurrences.<br>Annual probability of between 1 in 100 years and 1 in 1,000 years. | 2 | |
| | Likely | Occasional occurrences with at least 2 or more documented historic events.<br>Annual probability of between 1 in 10 years and 1 in 100 years. | 3 | |
| | Highly Likely | Frequent events with a well-documented history of occurrence.<br>Annual probability of greater than 1 every year. | 4 | |
| Magnitude/ Severity | Negligible | Negligible property damage (less than 5% of critical and non-critical facilities and infrastructure. Injuries or illnesses are treatable with first aid and there are no deaths.<br>Negligible loss of quality of life. Shut down of critical public facilities for less than 24 hours. | 1 | 30% |
| | Limited | Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shut down of critical public facilities for more than 1 day and less than 1 week. | 2 | |
| | Critical | Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shut down of critical public facilities for more than 1 week and less than 1 month. | 3 | |
| | Catastrophic | Severe property damage (greater than 50% of critical and non-critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths.<br>Shut down of critical public facilities for more than 1 month. | 4 | |
| Warning Time | > 24 hours | Population will receive greater than 24 hours of warning. | 1 | 15% |
| | 12–24 hours | Population will receive between 12-24 hours of warning. | 2 | |
| | 6-12 hours | Population will receive between 6-12 hours of warning. | 3 | |
| | < 6 hours | Population will receive less than 6 hours of warning. | 4 | |
| Duration | < 6 hours | Disaster event will last less than 6 hours | 1 | 10% |
| | < 24 hours | Disaster event will last less than 6-24 hours | 2 | |
| | < 1 week | Disaster event will last between 24 hours and 1 week. | 3 | |
| | > 1 week | Disaster event will last more than 1 week | 4 | |

**Table: Calculated Priority Risk Index Total and Priority Ranking for the Project Area (Source: MJHMP Planning Team)**

| Hazard | Probability | Weighted 45% (x.45) | Magnitude/Severity | Weighted 30% (x.3) | Warning Time | Weighted 15% (x.15) | Duration | Weighted 10% (x.1) | CPRI Total | Hazard Priority Ranking (H-High, M-Medium, L-Low) * |
|---|---|---|---|---|---|---|---|---|---|---|
| **Earthquake** | 3 | 1.35 | 4 | 1.20 | 4 | 0.6 | 1 | 0.1 | 3.25 | H |
| **Wildfire** | 4 | 1.80 | 2 | 0.6 | 1 | 0.15 | 3 | 0.3 | 2.85 | H |
| **Utility Related** | 3 | 1.35 | 2 | 0.6 | 4 | 0.6 | 2 | 0.2 | 2.75 | M |
| **Epidemic/Pandemic/Vector-Borne Diseases** | 3 | 1.35 | 2 | 0.6 | 4 | 0.6 | 2 | 0.2 | 2.75 | M |
| **Flood** | 3 | 1.35 | 2 | 0.6 | 2 | 0.3 | 3 | 0.3 | 2.55 | M |
| **Landslide** | 3 | 1.35 | 1 | 0.3 | 4 | 0.6 | 2 | 0.2 | 2.45 | L |
| **Tsunami** | 1 | 0.45 | 2 | 0.6 | 4 | 0.6 | 2 | 0.2 | 1.85 | L |

***Hazard Priority Ranking***
***High=CPRI score for probability + magnitude/severity (impact) = 6 or higher***
***Medium=CPRI score for probability + magnitude/severity (impact) = 5***
***Low=CPRI score for probability + magnitude/severity (impact) = 3 or 4***
***N/A=CPRI score for probability + magnitude/severity (impact) = 2***

## *2) Profiling Hazard Events*

This process describes the causes and characteristics of each hazard and the Project Area facilities, infrastructure, and environment that may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in the Hazard Analysis. **Table: Hazard Profile of Location, Extent, Probability, and Recent Occurrence for the Project Area** indicates a generalized perspective of the community's vulnerability of the various hazards according to extent (or degree), location, probability, and most recent occurrence.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1b. |
|---|
| **Q:** Does the plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area? (Requirement §201.6(c)(2)(i))<br>**A:** See **Table: Hazard Profile of Location, Extent, Probability, and Recent Occurrence for the Project Area** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1c.** |
| **Q:** Does the plan include a description of the **location** for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Table: Hazard Profile of Location, Extent, Probability, and Recent Occurrence for the Project Area** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1d.** |
| **Q:** Does the plan include a description of the **extent** for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Table: Hazard Profile of Location, Extent, Probability, and Recent Occurrence for the Project Area** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B2a.** |
| **Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Table: Hazard Profile of Location, Extent, Probability, and Recent Occurrence for the Project Area** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B2b.** |
| **Q:** Does the plan include information on the **probability** of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Table: Hazard Profile of Location, Extent, Probability, and Recent Occurrence for the Project Area** below. |

**Table: Hazard Profile: Location, Extent, Probability, and Recent Occurrence for the Project Area**

| Hazard | Location (Where) | Extent (How Big an Event) | Probability (How Often) * | Recent Occurrence |
|---|---|---|---|---|
| Earthquake | Entire Project Area | The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7 % probability that an earthquake of M6.7 or greater will hit California within 30 years.[1] | Likely | 2014 – West Napa Earthquake M6.0 |
| Epidemic/Pandemic/ Vector-Borne Diseases | Entire Project Area | Uncontrollable virus infecting a large portion of the population with fatality rates greater than 2.0%. | Likely | 2020 – Present COVID-19 Pandemic |
| Flood | District facilities located within 100-year flood zones. See hazard chapter for most vulnerable sites. | 100-Year Flood Zone areas subject to inundation, flooding, and flash flooding. | Highly Likely | 2019 – Russian River |
| Landslide | Four Districts have facilities located near landslide hazard zones. | Earthquake-induced and rain-induced landslide events possibly impacting dozens of structures. | Likely | 2017 – Guerneville |
| Wildfire | Varies by location within the Project Area – see Wildfire Hazards chapter (Table: Map: Fire Hazard Severity Zones) for specific locations. | Ranges from Very Low to Very High Fire Hazard Severity Zone Ratings. | Likely | 2020 - LNU Lightning Complex Fire |
| Tsunami | Pacific Ocean Coastline | Sonoma County identifies the entire project area as being outside of the Tsunami Risk Zone, with the exception of portions of the coastline. | Unlikely | No previous occurrences. |
| Utility Related | Entire Project Area | Impacts would range from mild to severe throughout the project area. | Likely | 2019 – Kincade Fire |
| * Probability is defined as: Unlikely = 1:1,000 years, Possibly = 1:100-1:1,000 years, Likely = 1:10-1:100 years, Highly Likely = 1:1 year | | | | |
| [1] Uniform California Earthquake Rupture Forecast | | | | |

## HAZUS-MH


The hazard maps in the Mitigation Plan were generated by Emergency Planning Consultants using FEMA's Hazards United States – Multi Hazard (HAZUS-MH) software program. Please see **Attachments – HAZUS** (Attached Separately) for complete reports. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up. It's important to note that the "project area" is based on Census Tracts not jurisdictional boundaries.

As per FEMA's HAZUS Guidebook, HAZUS is a GIS-based software that can be used to estimate potential damage, economic loss, and social impacts from earthquakes, floods, tsunamis and hurricane wind hazards. The HAZUS software includes nationwide general GIS datasets, and a model for the four natural disasters below. The model results can support the risk assessment piece of mitigation planning.

**Graphic: Model Results to Support Risk Assessment for Mitigation Planning (Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)**

| | |
|---|---|
| **Earthquake model** | Estimates damages and losses to buildings, essential facilities, transportation, and utility lifelines from a single scenario or probabilistic earthquake analysis. There are also tools that allow the user to integrate earthquake hazard data generated outside of Hazus into the earthquake model. This model estimates debris generation, shelter requirements, casualties, and fire following an earthquake disaster. |
| **Flood model** | Generates flood hazard data using nationwide hydrological datasets. There are also tools that allow the user to integrate flood hazard data generated outside of Hazus software into the flood model. This model estimates the expected levels of damage to infrastructure and buildings. Debris generation and shelter requirements, as well as agricultural losses, can be calculated with this model. |
| **Tsunami model** | Can produce analyses that have several pre-tsunami and/or post-tsunami applications. Use of the methodology will generate an estimate of the consequences to a county or region of a "scenario tsunami," i.e., a tsunami with a specified inundation depth, velocity, and location. The resulting "loss estimate" generally will describe the scale and extent of damage and disruption that may result from the scenario tsunami. |
| **Hurricane wind model** | Can create the wind hazard data from a historical or real-time event, probabilistic event, or from a user-defined scenario. Estimates of potential damage and economic loss to buildings can then be calculated. The storm surge analysis combines the wind and coastal flood model to simulate storm surge for historical, and manual hurricanes. The model combines the wind and flood losses. |

HAZUS is packaged with datasets that include building inventories and infrastructure for the entire United States. Because HAZUS is currently built on GIS technology, the inventory and infrastructure datasets can be mapped and intersected with the hazard information created from the four models.

Following the intersection, HAZUS determines the effects of wind, ground shaking, and water depths on buildings and infrastructure to calculate losses and damages. The outputs and estimates can be used in hazard mitigation planning, emergency response, and planning for recovery and reconstruction.

Losses estimated in HAZUS are based on the accuracy of input data. Basic analysis can be developed using the default data and parameter data provided within HAZUS. Users can conduct more advanced analysis using more accurate data that is specific to the region, hazard, population, etc. User-supplied data improves the accuracy of inventories and/or parameters.

Advanced-level analyses may also incorporate data from third-party studies. The user must determine the appropriate level of analysis to meet the user's needs and resources.

HAZUS analysis can be performed at three different levels:

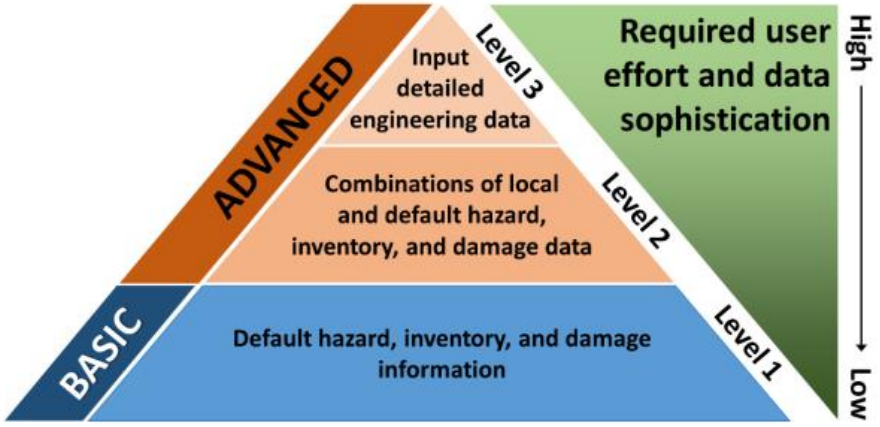
- A Level 1 basic analysis can be performed simply using the default data provided. This level of analysis is very coarse, and because the results will be subject to a much higher level of uncertainty, this should serve primarily as a baseline for further study. The user will still be able to produce basic maps and results. Limited additional data will be required to complete the flood analysis. Site specific input data produces more accuracy in vulnerability identification and loss estimation amounts. If the data is available, it is highly recommended that a user integrate site specific data to reduce uncertainty associated with the results of default data. Using a user defined depth grid, in the flood model, against default state data is classified as a level 1 analysis and is the recommendation of HAZUS Program.

- A Level 2 advanced analysis increases the accuracy and precision of an analysis by incorporating user-supplied data relevant to a given hazard. While the data included with the HAZUS software can be utilized to run a basic level one analysis, level two inputs are supplied by local sources and contain a higher level of detail. This can include datasets that model the hazards in more detail, or datasets that increase the accuracy of the inventory information. Incorporating more detailed data will improve the quality of the results. Level 2 is broadly defined as the incorporation of user-defined hazard and updated GBS or site-specific data.

- A Level 3 advanced analysis achieves the highest degree of precision and involves modifying or substituting the model parameters and/or equations, relevant to a given hazard. Users can modify inputs depending on the time and resources available. Keeping track of the data used is suggested so that any relationships between input and results is documented. It is usually done by advanced users experienced with both the hazard and the HAZUS software.

FEMA's Natural Hazard Risk Assessment Program (NHRAP) encourages users to conduct Level 2 or 3 analyses to improve the accuracy of results and recommends the use of user defined data (e.g., depth grids for all flood analysis) for mitigation planning.

**Graphic: HAZUS Analysis Levels**
**(Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)**




HAZUS creates credible estimates for losses and damages; datasets created on the local level typically provide greater detail than the datasets that are packaged with HAZUS (Level 1). Incorporating local datasets into the analysis will improve the results.

## *HAZUS Outputs*

The user plays a major role in selecting the scope and nature of the output of a HAZUS analysis. A variety of maps can be generated for visualizing the extent of the losses. Numerical results may be examined at the level of the census block or tract or may be aggregated by county or region. There are three main categories of HAZUS outputs: direct physical damage, induced damage, and direct losses. Direct physical damage includes general building stock (GBS), essential facilities, high potential loss facilities, transportation systems, utility systems, and user defined facilities. Induced damage includes building debris, tree debris generation and fire following disaster occurrence. Direct losses include losses for buildings, contents, inventory, income, crop damage, vehicle loss, injuries, casualties, sheltering needs and displaced households.

**Graphic: HAZUS Outputs**
**(Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)**

| Hazus Capabilities | **Earthquake** Ground Shaking Ground Failure | **Flood** Frequency \| Depth Riverine \| Coastal Surge | **Hurricane** Wind \| Surge | **Tsunami** Depth \| Momentum Flux \| Runup \| Velocity |
|---|---|---|---|---|
| **Inputs** | | | | |
| Historic | ✓ | | ✓ | |
| Deterministic | ✓ | ✓ | ✓ | ✓ |
| Probabilistic | ✓ | ✓ | ✓ | |
| User-supplied | ✓ | ✓ | ✓ | ✓ |
| Other supported inputs | Real-time & scenario USGS ShakeMaps | Risk MAP, User-supplied depth grids (ArcGRID, GeoTIFF, IMAGINE), HEC-RAS (.FLT) | Hurrevac, User-supplied wind files (.dat) | NOAA PMEL SIFT, State models |
| **Direct Damage** | | | | |
| General Building Stock | ✓ | ✓ | ✓ | ✓ |
| Essential Facilities | ✓ | ✓ | ✓ | |
| Transportation Systems | ✓ | ✓ | | |
| Utility Systems | ✓ | ✓ | | |
| User-Defined Facilities | ✓ | ✓ | ✓ | ✓ |
| **Induced Damage** | | | | |
| Fire Following | ✓ | | | |
| Debris Generation | ✓ | ✓ | ✓ | |
| **Direct Losses** | | | | |
| Cost of Repair | ✓ | ✓ | ✓ | ✓ |
| Income Loss | ✓ | ✓ | ✓ | ✓ |
| Agricultural | | ✓ | | |
| Casualties | ✓ | | | ✓ |
| Shelter and/or Evacuation Needs | ✓ | ✓ | ✓ | ✓ |
| Average Annualized Loss (AAL) | ✓ | ✓ | ✓ | |

### *3) Vulnerability Assessment/Inventory of Existing Assets*

A Vulnerability Assessment in its simplest form is a simultaneous look at the geographical location of hazards and an inventory of the underlying land uses (populations, structures, etc.). Facilities that provide critical and essential services following a major emergency are of particular concern because these locations house staff and equipment necessary to provide important public safety, emergency response, and/or disaster recovery functions.

## Critical Facilities

FEMA separates critical buildings and facilities into the five categories shown below based on their loss potential. All of the following elements are considered critical facilities:

**Essential Facilities** are essential to the health and welfare of the whole population and are especially important following hazard events. Essential facilities include hospitals and other medical facilities, police and fire stations, emergency operations centers and evacuation shelters, and schools.

**Transportation Systems** include airways – airports, heliports; highways – bridges, tunnels, roadbeds, overpasses, transfer centers; railways – trackage, tunnels, bridges, rail yards, depots; and waterways – canals, locks, seaports, ferries, harbors, drydocks, piers.

**Lifeline Utility Systems** such as potable water, wastewater, oil, natural gas, electric power and communication systems.

**High Potential Loss Facilities** are facilities that would have a high loss associated with them, such as nuclear power plants, dams, and military installations.

**Hazardous Material Facilities** include facilities housing industrial/hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

**Table: Hazard Proximity to Critical and Essential Facilities** below illustrates the hazards with potential to impact critical facilities owned by or providing services to the Project Area.

## Table: Hazard Proximity to Critical and Essential Facilities (Source: Emergency Planning Consultants)

**Y** – Yes, area is within hazard zone **N** – No, area is not within hazard zone

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| **Alexander Valley Union School District** | | | | | | | |
| Alexander Valley Union School District Office | Y | N | N | N | N | Y | Y |
| Alexander Valley School | Y | N | N | N | N | Y | Y |
| **Bellevue Union School District** | | | | | | | |
| Bellevue Union School District Office | Y | N | N | Y | N | Y | Y |
| Bellevue School | Y | N | N | N | N | Y | Y |
| Kawana Springs Elementary School | Y | N | N | N | N | Y | Y |
| Meadow View School | Y | N | N | N | N | Y | Y |
| Taylor Mountain School | Y | N | N | N | N | Y | Y |
| **Bennett Valley Union School District** | | | | | | | |
| Bennett Valley Union School District Office | Y | N | N | Y | N | Y | Y |
| Strawberry School | Y | N | N | Y | N | Y | Y |
| Yulupa School | Y | N | N | Y | N | Y | Y |
| **Cinnabar School District** | | | | | | | |
| Cinnabar School District Office | Y | N | N | N | N | Y | Y |
| Cinnabar Elementary School | Y | N | N | N | N | Y | Y |
| **Cloverdale Unified School District** | | | | | | | |
| Cloverdale Unified School District Office | Y | N | N | N | N | Y | Y |
| Cloverdale High School | Y | N | N | N | N | Y | Y |
| Jefferson School | Y | N | N | N | N | Y | Y |
| Johanna Echols-Hansen Continuation High School | Y | N | N | N | N | Y | Y |
| Washington School | Y | N | N | N | N | Y | Y |
| **Cotati-Rohnert Park Unified School District** | | | | | | | |
| Cotati-Rohnert Park Unified School District Office | Y | N | N | N | N | Y | Y |
| El Camino Continuation High School | Y | N | N | N | N | Y | Y |
| El Colegio (SE) | Y | N | N | N | N | Y | Y |
| Evergreen Elementary School | Y | N | N | N | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| John Reed School | Y | N | N | N | N | Y | Y |
| Lawrence E. Jones Middle School (SE) | Y | N | N | N | N | Y | Y |
| Marguerite Hahn Elementary School | Y | N | N | N | N | Y | Y |
| Monte Vista Elementary School | Y | N | N | N | N | Y | Y |
| Rancho Cotate High School (SE) | Y | N | N | N | N | Y | Y |
| Richard Crane Elementary | Y | N | N | N | N | Y | Y |
| Technology High School | Y | N | N | N | N | Y | Y |
| Technology Middle School | Y | N | N | N | N | Y | Y |
| Thomas Page Academy | Y | N | N | N | N | Y | Y |
| University Elementary at La Fiesta | Y | N | N | N | N | Y | Y |
| LaBath (SE) | Y | N | N | N | N | Y | Y |
| **Dunham School District** | | | | | | | |
| Dunham School District Office | Y | N | N | N | N | Y | Y |
| Dunham School | Y | N | N | N | N | Y | Y |
| Dunham Charter School | Y | N | N | N | N | Y | Y |
| **Forestville Union School District** | | | | | | | |
| Forestville Union School District Office | Y | Y | N | N | N | Y | Y |
| Forestville Academy | Y | Y | N | N | N | Y | Y |
| Forestville School | Y | Y | N | N | N | Y | Y |
| **Fort Ross Elementary School District** | | | | | | | |
| Fort Ross Elementary School District | Y | Y | Y | N | N | Y | Y |
| Fort Ross School | Y | Y | Y | N | N | Y | Y |
| **Geyserville Unified School District** | | | | | | | |
| Geyserville Unified School District Office | Y | Y | N | Y | N | Y | Y |
| Buena Vista High School | Y | Y | N | Y | N | Y | Y |
| Geyserville Elementary School | Y | Y | N | Y | N | Y | Y |
| Geyserville New Tech Academy | Y | Y | N | Y | N | Y | Y |
| **Gravenstein Union School District** | | | | | | | |
| Gravenstein Union School District | Y | N | N | Y | N | Y | Y |
| Gravenstein Community Day School | Y | N | N | Y | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| Gravenstein Elementary School | Y | N | N | Y | N | Y | Y |
| Gravenstein First | Y | N | N | Y | N | Y | Y |
| Hillcrest Middle School | Y | N | N | N | N | Y | Y |
| **Guerneville School District** | | | | | | | |
| Guerneville School District Office | Y | Y | Y | Y | N | Y | Y |
| Guerneville School | Y | Y | Y | Y | N | Y | Y |
| **Harmony Union School District** | | | | | | | |
| Harmony Elementary School District Office | Y | Y | Y | N | N | Y | Y |
| Harmony Elementary School | Y | Y | Y | N | N | Y | Y |
| Salmon Creek School: A Charter School | Y | Y | Y | N | N | Y | Y |
| **Healdsburg Unified School District** | | | | | | | |
| Healdsburg High School District Office | Y | N | N | Y | N | Y | Y |
| Healdsburg Charter School-Fitch Mountain Campus | Y | N | N | Y | N | Y | Y |
| Healdsburg Charter School-HES Campus | Y | N | N | Y | N | Y | Y |
| Healdsburg High School | Y | N | N | Y | N | Y | Y |
| Healdsburg Junior High School | Y | N | N | Y | N | Y | Y |
| HES–Fitch Mountain Campus | Y | N | N | Y | N | Y | Y |
| HES-Healdsburg Campus | Y | N | N | Y | N | Y | Y |
| Marce Becerra Academy | Y | N | N | Y | N | Y | Y |
| **Horicon School District** | | | | | | | |
| Horicon School District Office | Y | N | N | N | N | Y | Y |
| Horicon School | Y | N | N | N | N | Y | Y |
| **Kashia School District** | | | | | | | |
| Kashia School District Office | Y | N | N | N | N | Y | Y |
| Kashia School | Y | N | N | N | N | Y | Y |
| **Kenwood School District** | | | | | | | |
| Kenwood School District Office | Y | N | N | N | N | Y | Y |
| Kenwood School | Y | N | N | N | N | Y | Y |
| **Liberty School District** | | | | | | | |
| Liberty School District Office | Y | N | N | N | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| Liberty Elementary School | Y | N | N | N | N | Y | Y |
| Liberty Primary School | Y | N | N | N | N | Y | Y |
| **Mark West Union School District** | | | | | | | |
| Mark West Union School District Office | Y | Y | N | N | N | Y | Y |
| John B. Riebli Elementary School | Y | Y | N | N | N | Y | Y |
| Mark West Charter School | Y | N | N | N | N | Y | Y |
| Mark West Elementary School | Y | N | N | N | N | Y | Y |
| San Miguel Elementary School (SE) | Y | N | N | N | N | Y | Y |
| **Monte Rio Union School District** | | | | | | | |
| Monte Rio Union School District Office | Y | Y | N | Y | N | Y | Y |
| Monte Rio Union School | Y | Y | N | Y | N | Y | Y |
| **Montgomery Elementary School District** | | | | | | | |
| Montgomery Elementary School District Office | Y | Y | Y | N | N | Y | Y |
| Montgomery School | Y | Y | Y | N | N | Y | Y |
| **Oak Grove Union School District** | | | | | | | |
| Oak Grove Union School District Office | Y | Y | N | Y | N | Y | Y |
| Oak Grove Elementary School | Y | Y | N | N | N | Y | Y |
| Willowside Middle School | Y | Y | N | Y | N | Y | Y |
| **Old Adobe Union School District** | | | | | | | |
| Old Adobe Union School District Office | Y | Y | N | Y | N | Y | Y |
| La Tercera School (SE) | Y | Y | N | Y | N | Y | Y |
| Loma Vista Immersion Academy (SE) | Y | Y | N | Y | N | Y | Y |
| Miwok Valley Elementary Charter School | Y | Y | N | Y | N | Y | Y |
| Old Adobe Charter School | Y | Y | N | Y | N | Y | Y |
| Sonoma Mountain Charter School | Y | Y | N | Y | N | Y | Y |
| **Petaluma City Schools District** | | | | | | | |
| Petaluma City School District Office | Y | N | N | N | N | Y | Y |
| Grant School | Y | N | N | N | N | Y | Y |
| McDowell School | Y | N | N | N | N | Y | Y |
| McKinley School | Y | N | N | N | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| McNear School | Y | N | N | N | N | Y | Y |
| Penngrove School | Y | N | N | N | N | Y | Y |
| Valley Vista School | Y | N | N | N | N | Y | Y |
| Carpe Diem High School | Y | N | N | N | N | Y | Y |
| Casa Grande High School | Y | N | N | N | N | Y | Y |
| Kenilworth Junior High School | Y | N | N | N | N | Y | Y |
| Mary Collins at Cherry Valley Charter School | Y | N | N | N | N | Y | Y |
| Petaluma Accelerated Charter School | Y | N | N | N | N | Y | Y |
| Petaluma High School (SE) | Y | N | N | N | N | Y | Y |
| Petaluma Junior High School | Y | N | N | N | N | Y | Y |
| San Antonio High School | Y | N | N | N | N | Y | Y |
| Sonoma Mountain High School | Y | N | N | N | N | Y | Y |
| Valley Oaks High School | Y | N | N | N | N | Y | Y |
| **Piner-Olivet Union School District** | | | | | | | |
| Piner-Olivet Union School District Office | Y | Y | N | N | N | Y | Y |
| Jack London School (SE) | Y | Y | N | N | N | Y | Y |
| Northwest Prep at Piner-Olivet (SE) | Y | Y | N | N | N | Y | Y |
| Olivet Elementary (SE) | Y | Y | N | N | N | Y | Y |
| Piner-Olivet Charter School | Y | Y | N | N | N | Y | Y |
| Schaefer (Morrice) Charter School | Y | Y | N | N | N | Y | Y |
| **Rincon Valley Union School District** | | | | | | | |
| Rincon Valley Union School District Office | Y | N | N | N | N | Y | Y |
| Austin Creek School | Y | N | N | N | N | Y | Y |
| Binkley School | Y | N | N | N | N | Y | Y |
| Douglas L. Whited School | Y | N | N | N | N | Y | Y |
| Madrone Elementary School | Y | N | N | N | N | Y | Y |
| Rincon Valley Charter School: Matanzas (SE) | Y | N | N | N | N | Y | Y |
| Rincon Valley Charter School: Sequoia | Y | N | N | N | N | Y | Y |
| Sequoia School | Y | N | N | N | N | Y | Y |
| Spring Creek Matanzas Charter | Y | N | N | N | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| Village School | Y | N | N | N | N | Y | Y |
| **Roseland Public Schools** | | | | | | | |
| Roseland School District Office | Y | N | N | Y | N | Y | Y |
| Roseland Creek Elementary School | Y | N | N | N | N | Y | Y |
| Roseland Elementary School | Y | N | N | N | N | Y | Y |
| Sheppard Accelerated School | Y | N | N | N | N | Y | Y |
| **Santa Rosa City Schools** | | | | | | | |
| Santa Rosa City Schools District Office | Y | N | N | N | N | Y | Y |
| Abraham Lincoln School | Y | N | N | N | N | Y | Y |
| Albert F. Biella Elementary (SE) | Y | N | N | N | N | Y | Y |
| Brook Hill School | Y | N | N | Y | N | Y | Y |
| Cesar Chavez Language Academy | Y | N | N | N | N | Y | Y |
| Helen Lehman School | Y | N | N | N | N | Y | Y |
| Hidden Valley School | Y | Y | N | N | N | Y | Y |
| James Monroe School | Y | N | N | N | N | Y | Y |
| Luther Burbank School | Y | N | N | Y | N | Y | Y |
| Proctor Terrace School | Y | N | N | Y | N | Y | Y |
| Santa Rosa Accelerated Charter School | Y | Y | N | N | N | Y | Y |
| Santa Rosa French-American Charter School (SE) | Y | N | N | Y | N | Y | Y |
| Steele Lane School | Y | N | N | N | N | Y | Y |
| Comstock (Hilliard) Middle School (SE) | Y | N | N | N | N | Y | Y |
| Cook (Lawrence) Middle School (SE) | Y | N | N | N | N | Y | Y |
| Elsie Allen High (SE) | Y | N | N | N | N | Y | Y |
| Maria Carrillo High (SE) | Y | Y | N | N | N | Y | Y |
| Montgomery High School | Y | N | N | Y | N | Y | Y |
| Piner High School | Y | Y | N | N | N | Y | Y |
| Ridgway High School | Y | N | N | N | N | Y | Y |
| Rincon Valley Middle School | Y | Y | N | N | N | Y | Y |
| Santa Rosa High School | Y | N | N | N | N | Y | Y |
| Santa Rosa Middle School (SE) | Y | N | N | N | N | Y | Y |

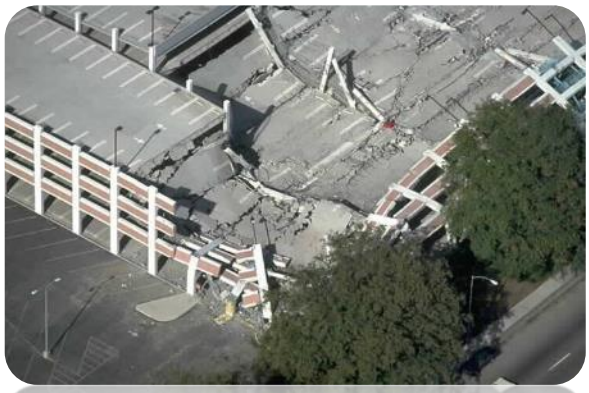
| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| Slater (Herbert) Middle School | Y | N | N | N | N | Y | Y |
| **SCOE** | | | | | | | |
| SCOE Main Facility – Santa Rosa | Y | N | N | N | N | Y | Y |
| SCOE Legal Facility – Santa Rosa | Y | N | N | N | N | Y | Y |
| SCOE Overflow Parking Lot – Santa Rosa | Y | N | N | N | N | Y | Y |
| SCOE Valley of the Moon – Santa Rosa | Y | Y | N | N | N | Y | Y |
| SCOE Juniper Shop Facility – Santa Rosa | Y | N | N | N | N | Y | Y |
| SCOE - CBI | Y | N | N | N | N | Y | Y |
| SCOE Sonoma Valley – Sassari Elementary | Y | N | N | N | N | Y | Y |
| SCOE Petaluma City – 4C's McDowell Elementary | Y | N | N | N | N | Y | Y |
| **SCOE SELPA Properties** | | | | | | | |
| SELPA Lewis Opportunity School – Santa Rosa | Y | N | N | N | N | Y | Y |
| SELPA Headwaters Academy – Petaluma | Y | N | N | Y | N | Y | Y |
| SELPA Valley of the Moon – Santa Rosa | Y | Y | N | N | N | Y | Y |
| Sonoma Community Center (SE) | Y | N | N | Y | N | Y | Y |
| **SCOE Alternative Education Properties** | | | | | | | |
| Headquarters Academy – Petaluma | Y | N | N | Y | N | Y | Y |
| Satellite Office Space – Rohnert Park | Y | N | N | N | N | Y | Y |
| Amarosa Academy – Santa Rosa | Y | N | N | N | N | Y | Y |
| **Sebastopol Union School District** | | | | | | | |
| Sebastopol Union School District Office | Y | Y | N | N | N | Y | Y |
| Brook Haven School | Y | Y | N | N | N | Y | Y |
| Park Side School | Y | Y | N | N | N | Y | Y |
| **Sonoma Valley Unified School District** | | | | | | | |
| Sonoma Valley Unified School District Office | Y | N | N | N | N | Y | Y |
| Adele Harrison Middle School | Y | N | N | N | N | Y | Y |
| Altimira Middle School (SE) | Y | N | N | N | N | Y | Y |
| Creekside High School | Y | N | N | N | N | Y | Y |
| Dunbar School | Y | N | N | N | N | Y | Y |
| El Verano School | Y | N | N | N | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| Flowery School | Y | Y | N | N | N | Y | Y |
| Prestwood School | Y | N | N | N | N | Y | Y |
| Sassarini School | Y | N | N | N | N | Y | Y |
| Sonoma Valley High School | Y | N | N | N | N | Y | Y |
| **Twin Hills Union School District** | | | | | | | |
| Twin Hills Union School District Office | Y | N | N | N | N | Y | Y |
| Apple Blossom School | Y | N | N | N | N | Y | Y |
| Orchard View School | Y | N | N | N | N | Y | Y |
| SunRidge Charter School | Y | N | N | N | N | Y | Y |
| Twin Hills Charter Middle School | Y | N | N | N | N | Y | Y |
| **Two Rock Union School District** | | | | | | | |
| Two Rock Union School District Office | Y | N | N | N | N | Y | Y |
| Two Rock Union School | Y | N | N | N | N | Y | Y |
| **Waugh School District** | | | | | | | |
| Waugh School District Office | Y | Y | N | N | N | Y | Y |
| Corona Creek School | Y | Y | N | N | N | Y | Y |
| Meadow School | Y | Y | N | N | N | Y | Y |
| **West Side Union School District** | | | | | | | |
| West Side Union School District | Y | N | N | Y | N | Y | Y |
| West Side School | Y | N | N | Y | N | Y | Y |
| **West Sonoma County High School District** | | | | | | | |
| West Sonoma County High School District Office | Y | N | N | Y | N | Y | Y |
| Analy High School | Y | N | N | Y | N | Y | Y |
| El Molino High School | Y | N | N | N | N | Y | Y |
| Laguna High School | Y | N | N | Y | N | Y | Y |
| **Wilmar Union School District** | | | | | | | |
| Wilmar Union School District | Y | N | N | N | N | Y | Y |
| Wilson School | Y | N | N | N | N | Y | Y |
| **Windsor Unified School District** | | | | | | | |
| Windsor Unified School District Office | Y | N | N | Y | N | Y | Y |

| Agency and Facility | Earthquake | Wildfire | Landslide | Flooding | Tsunami | Utility Related Events | Epidemic/Pandemic/ Vector-borne Diseases |
|---|---|---|---|---|---|---|---|
| Brooks Elementary School | Y | N | N | Y | N | Y | Y |
| Cali Calmécac Language Academy | Y | N | N | Y | N | Y | Y |
| Mattie Washburn Elementary School | Y | N | N | Y | N | Y | Y |
| North Bay Met Academy | Y | N | N | Y | N | Y | Y |
| Windsor High School | Y | N | N | Y | N | Y | Y |
| Windsor Middle School (SE) | Y | N | N | Y | N | Y | Y |
| **Wright Elementary School District** | | | | | | | |
| Wright Elementary School District Office | Y | N | N | Y | N | Y | Y |
| J.X. Wilson School (SE) | Y | N | N | Y | N | Y | Y |
| Robert L. Stevens School | Y | N | N | Y | N | Y | Y |
| Wright Charter School | Y | N | N | Y | N | Y | Y |
| Wright Preschool | Y | N | N | Y | N | Y | Y |

# Earthquake Hazards

## Hazard Definition



An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure.

One tool used to describe earthquake "intensity" is the Magnitude Scale. The Magnitude Scale is sometimes referred to as the Richter Scale. The two are similar but not exactly the same. The Magnitude Scale was devised as a means of rating earthquake strength and is an indirect measure of seismic energy released. The Scale is logarithmic with each one-point increase corresponding to a 10-fold increase in the amplitude of the seismic shock waves generated by the earthquake. In terms of actual energy released, however, each one-point increase on the Richter scale corresponds to about a 32-fold increase in energy released. Therefore, a Magnitude 7 (M7) earthquake is 100 times (10 X 10) more powerful than a M5 earthquake and releases 1,024 times (32 X 32) the energy.

**Table: Mercalli Scale and Peak Ground Acceleration Comparison**
**(Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)**

| Modified Mercalli Scale | Perceived Shaking | Potential Structure Damage | | Estimated PGA[a] (%g) |
|---|---|---|---|---|
| | | Resistant Buildings | Vulnerable Buildings | |
| I | Not Felt | None | None | <0.17% |
| II-III | Weak | None | None | 0.17% - 1.4% |
| IV | Light | None | None | 1.4% - 3.9% |
| V | Moderate | Very Light | Light | 3.9% - 9.2% |
| VI | Strong | Light | Moderate | 9.2% - 18% |
| VII | Very Strong | Moderate | Moderate/Heavy | 18% - 34% |
| VIII | Severe | Moderate/Heavy | Heavy | 34% - 65% |
| IX | Violent | Heavy | Very Heavy | 65% - 124% |
| X – XII | Extreme | Very Heavy | Very Heavy | >124% |

a. PGA = peak ground acceleration. Measured in percent of g, where g is the acceleration of gravity
*Sources: USGS, 2008; USGS, 2010*

Another tool used to describe earthquakes is in terms of "magnitude". An earthquake's magnitude is a measure of the energy released at the source of the earthquake. Magnitude is commonly expressed by ratings on the moment magnitude scale (Mw), the most common scale used today (USGS, 2017). This scale is based on the total moment release of the earthquake

(the product of the distance a fault moved and the force required to move it). The scale is as follows:

- Great—Mw > 8
- Major—Mw = 7.0 – 7.9
- Strong—Mw = 6.0 – 6.9
- Moderate—Mw = 5.0 – 5.9
- Light—Mw = 4.0 – 4.9
- Minor—Mw = 3.0 – 3.9
- Micro—Mw < 3

## Earthquake Related Hazards

Ground shaking, landslides, and liquefaction are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

### *Ground Shaking*

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

### *Earthquake-Induced Landslides*

Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

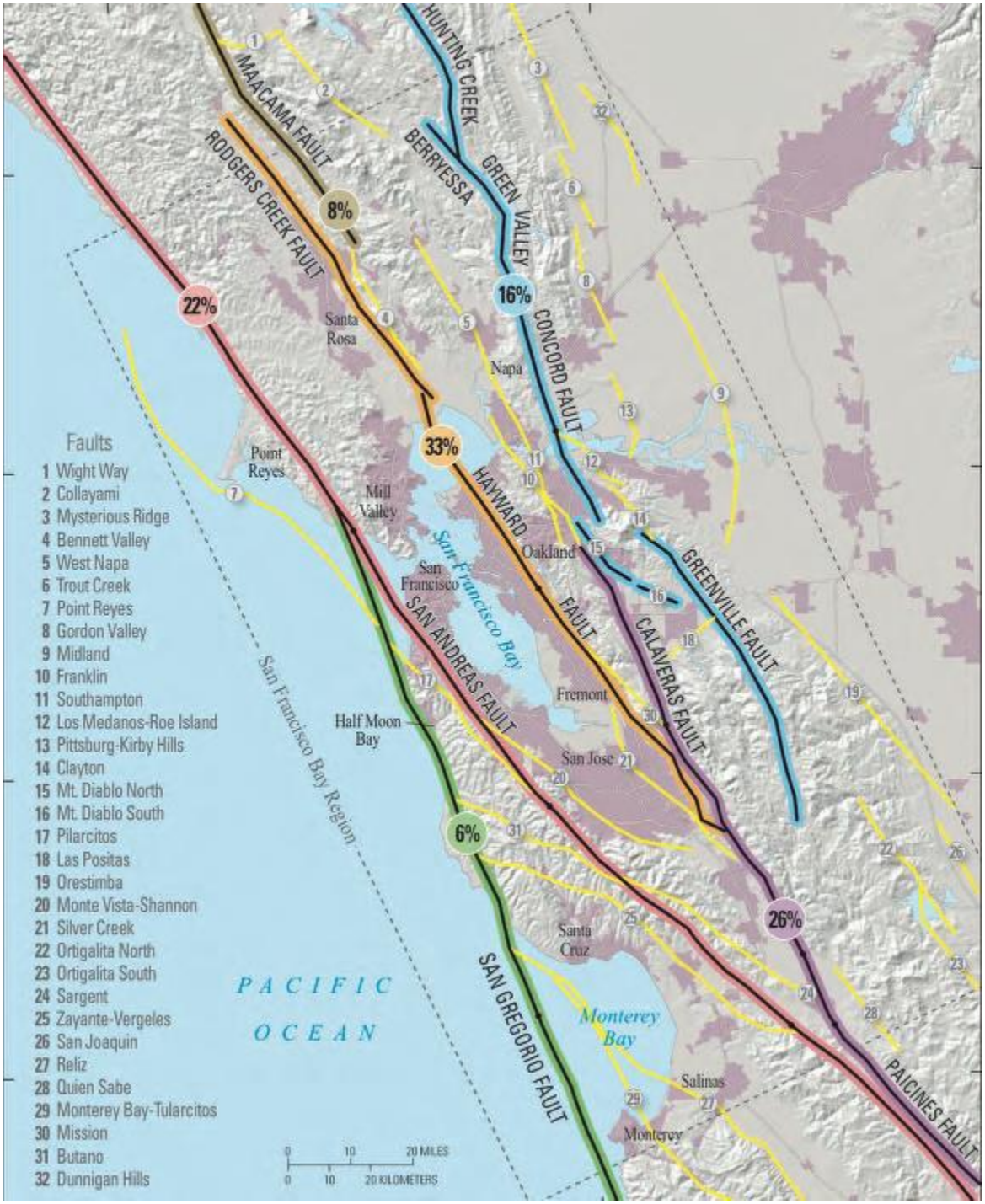
Rock falls may happen suddenly and without warning but are more likely to occur in response to earthquake induced ground shaking, during periods of intense rainfall, or as a result of human activities, such as grading and blasting. Ground acceleration of at least 0.10g in steep terrain is necessary to induce earthquake-related rock falls.

### *Liquefaction*

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other events. Liquefaction occurs in saturated soils, which are soils in which the space between individual soil particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low lying areas. Typically, liquefaction is associated with shallow groundwater, which is less than 50 feet beneath the earth's surface.

The potential for liquefaction in the Project Area exists primarily in the low-lying areas adjacent to San Pablo Bay; along the Russian and Petaluma Rivers, Santa Rosa and Sonoma Creeks; the Laguna de Santa Rosa and Santa Rosa Plains. **Map: Major Earthquake Faults & Areas of Liquefaction** shows the areas of liquefaction risk within the Project Area.

**Map: Mapped Faults in Sonoma County**
**(Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)**



**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.**

**Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Previous Occurrences of Earthquakes in the Project Area** below.

## Previous Occurrences of Earthquakes in the Project Area

According to the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021), significant earthquakes have impacted the region historically, specifically the 1906 San Francisco Earthquake and the 1989 Loma Prieta Earthquake.

**Table: Historical Earthquakes in Sonoma County**
**(Source: Sonoma County Multijurisdictional Hazard Mitigation Plan, 2021)**

| Year | Magnitude and Fault | Impact |
|---|---|---|
| **1868** | M7.2 Hayward Fault | Minimal damage due to sparse population at the time. |
| **1898** | M6.7 Rodgers Creek Fault | Minimal damage due to sparse population at the time. |
| **1906** | M8.3 San Andreas Fault | The only reported casualties in Sonoma County were in the City of Santa Rosa, where 65 persons died and 12 remained missing. The shaking lasted for about fifty seconds. The Santa Rosa Courthouse was destroyed by the shaking and ensuing fire, as were approximately eight blocks of commercial buildings. It was reported that almost all non-wood buildings were destroyed by the shaking alone. |
| **1969** | M5.7 Rodgers Creek/Healdsburg | Total property damage estimated at $6 million including severe damage to multiple County buildings and schools. Fortunately, there was no loss of life from the earthquakes, which can be attributed to the earthquakes striking in the evening hours, when most residents were at home. |
| **1989** | M6.9 Loma Prieta Earthquake | Total property damage is estimated at $6 billion. The quake killed 63 people and injured 3,757 throughout Northern California. It caused a total of over 16,700 housing units to be uninhabitable throughout the Monterey and San Francisco Bay Areas and left some 3,000-12,000 people homeless. |
| **2014** | M6.0 West Napa Fault | The epicenter was located about six miles southwest of the City of Napa and nine miles southeast of the City of Sonoma. 257 people were injured during the quake and one person was killed. 163 structures, many in downtown Napa, were severely damaged and red-tagged by Inspectors. Several structures in eastern Sonoma County were also severely damaged. An additional 3,517 structures were inspected, of which 1,749 were identified as being moderately damaged. Napa, Solano, and Sonoma County experienced electrical and water service disruptions. |
| **2016** | M5.0 The Geysers Earthquake | A 5.0 magnitude earthquake occurred 4 miles west of The Geysers and 14 miles southwest of Clearlake on December 14, 2016, following a series of medium size earthquakes in Mammoth Lakes and the Central Coast. This event was primarily felt in the Clearlake and Santa Rosa areas but was also felt throughout the Bay Area. |

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1a. |
|---|
| **Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Local Conditions** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b.** |
| **Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Local Conditions** below. |

## Local Conditions

The Sonoma County Office of Education is in an area of high seismic activity and several faults have the potential to cause damage to the region. The Project Area is located along the west coast of California where the Pacific Plate is slowly moving to the northwest. It grinds against the west-moving North American Plate creating large stresses. When the stress exceeds the strength of the earth materials, fault rupture occurs. As a result, the project area is seismically active, and several major faults traverse the region.

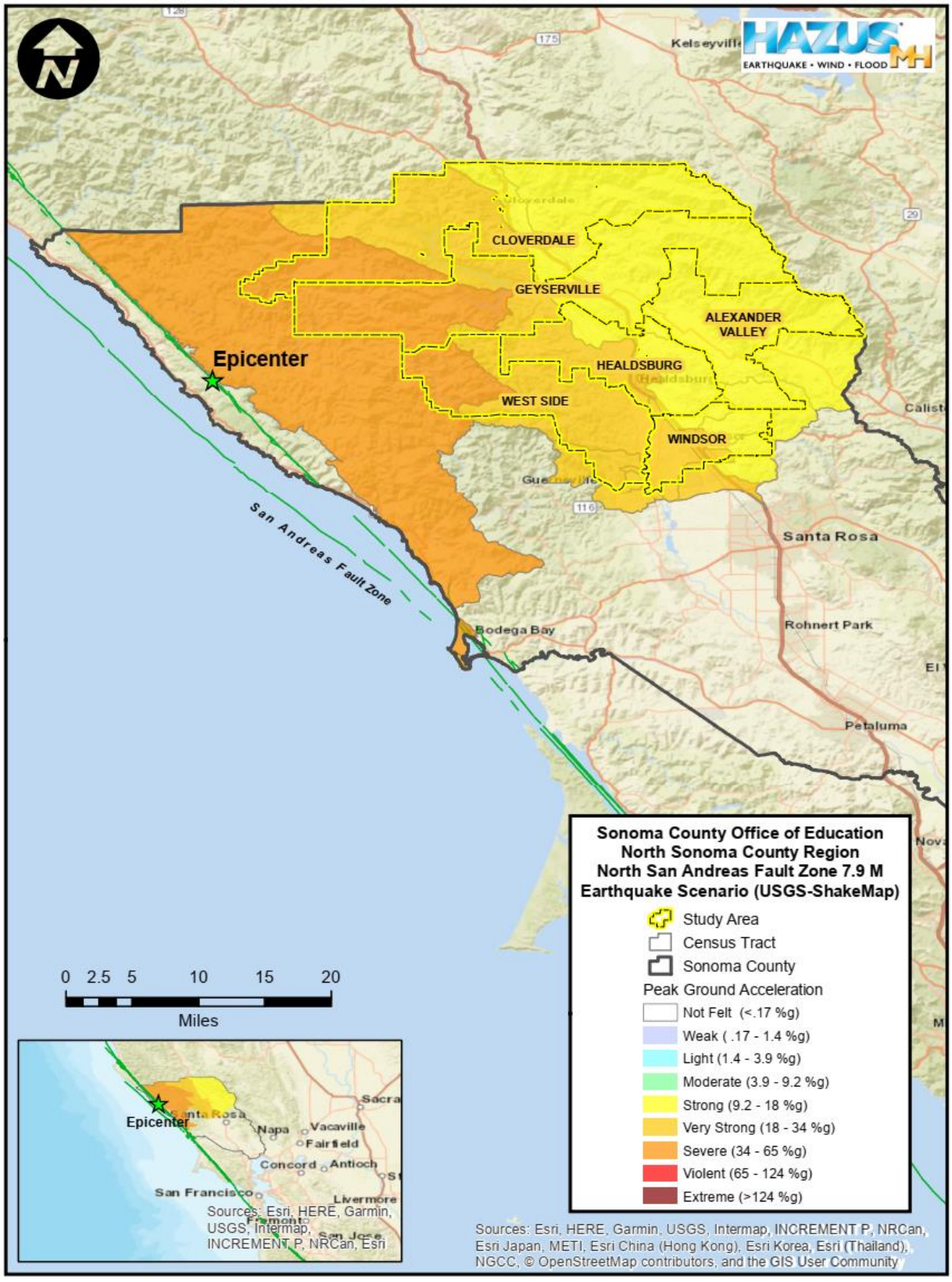
According to the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021), three earthquake faults run the length of the County. The Northern Segment of the San Andreas Fault (plate boundary) crosses Sonoma County land at Bodega Bay but continues northward offshore. It appears to land again at Fort Ross and continues past the community of The Sea Ranch to the County's northern border. The Rodgers Creek Fault connects southward to other faults that merge into the San Andreas Fault. The Maacama Fault lies to the east of the Healdsburg Fault and continues northward, passing east of the City of Cloverdale. The faults are all right lateral strike-slip faults, meaning that the land on the western side of the fault moves north in an earthquake. The locations of these faults are shown in **Map: Mapped Earthquake Faults** above. Seismic activity along other active regional faults, or unknown faults in the area could also affect the region.

Earthquakes that could significantly impact the Project Area would most likely originate from the San Andreas, Healdsburg, or Rodgers Creek Fault Zones. These faults are close enough in proximity or expected to generate strong enough shaking that could affect the District.

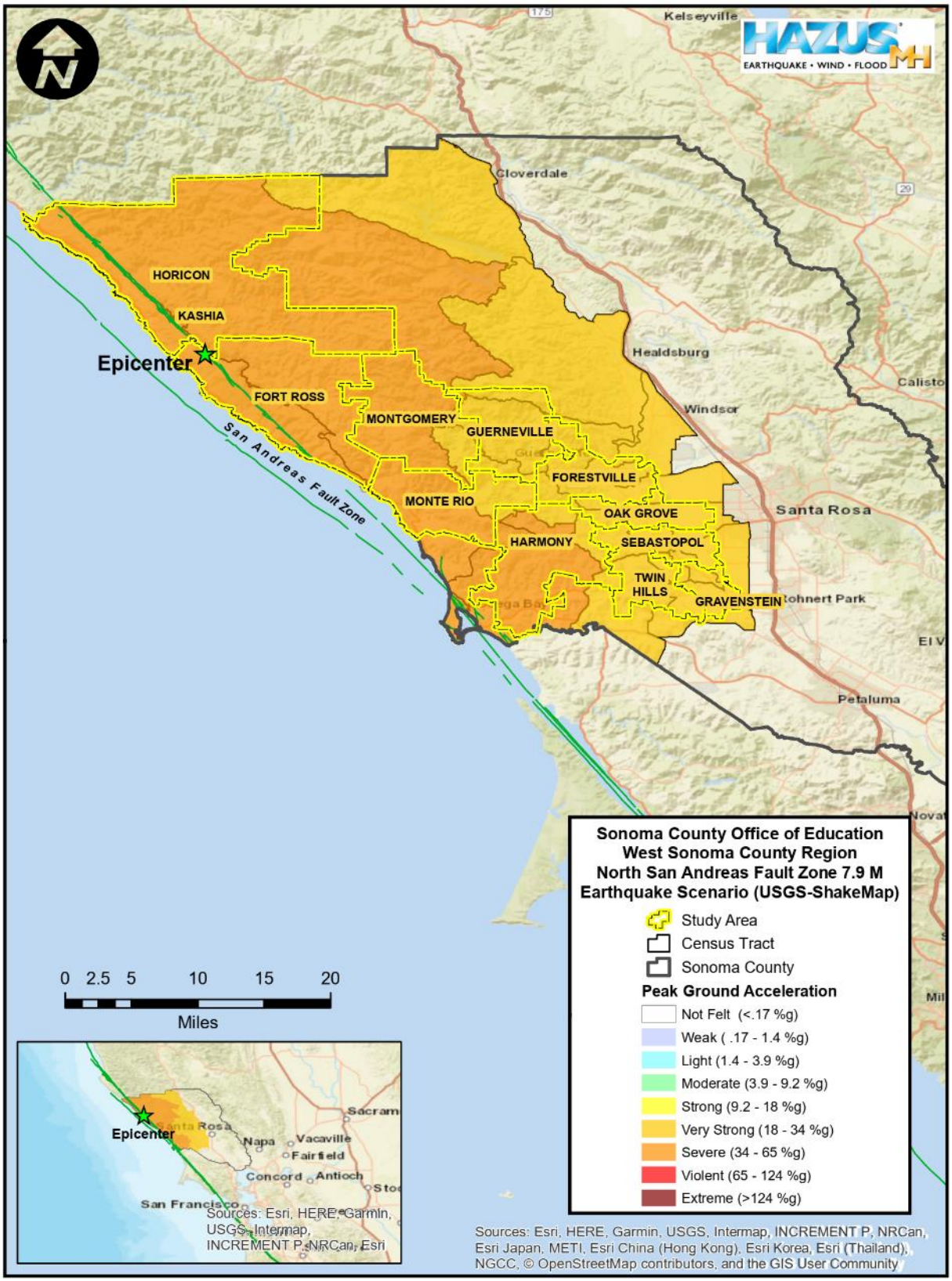
### *San Andreas Fault Zone*

The San Andreas Fault Zone falls West and Southwest of SCOE. This fault zone extends from the Gulf of California northward to the Cape Mendocino area where it continues northward along the ocean floor. The total length of the San Andreas Fault Zone is approximately 750 miles. The activity of the fault has been recorded during historic events, including the 1906 (M8.0) event in San Francisco and the 1857 (M7.9) event between Cholame and San Bernardino, where at least 250 miles of surface rupture occurred. These seismic events are among the most significant earthquakes in California history. Geologic evidence suggests that the San Andreas Fault has a 50 percent chance of producing a magnitude 7.5 to 8.5 quake (comparable to the great San Francisco earthquake of 1906) within the next 30 years.

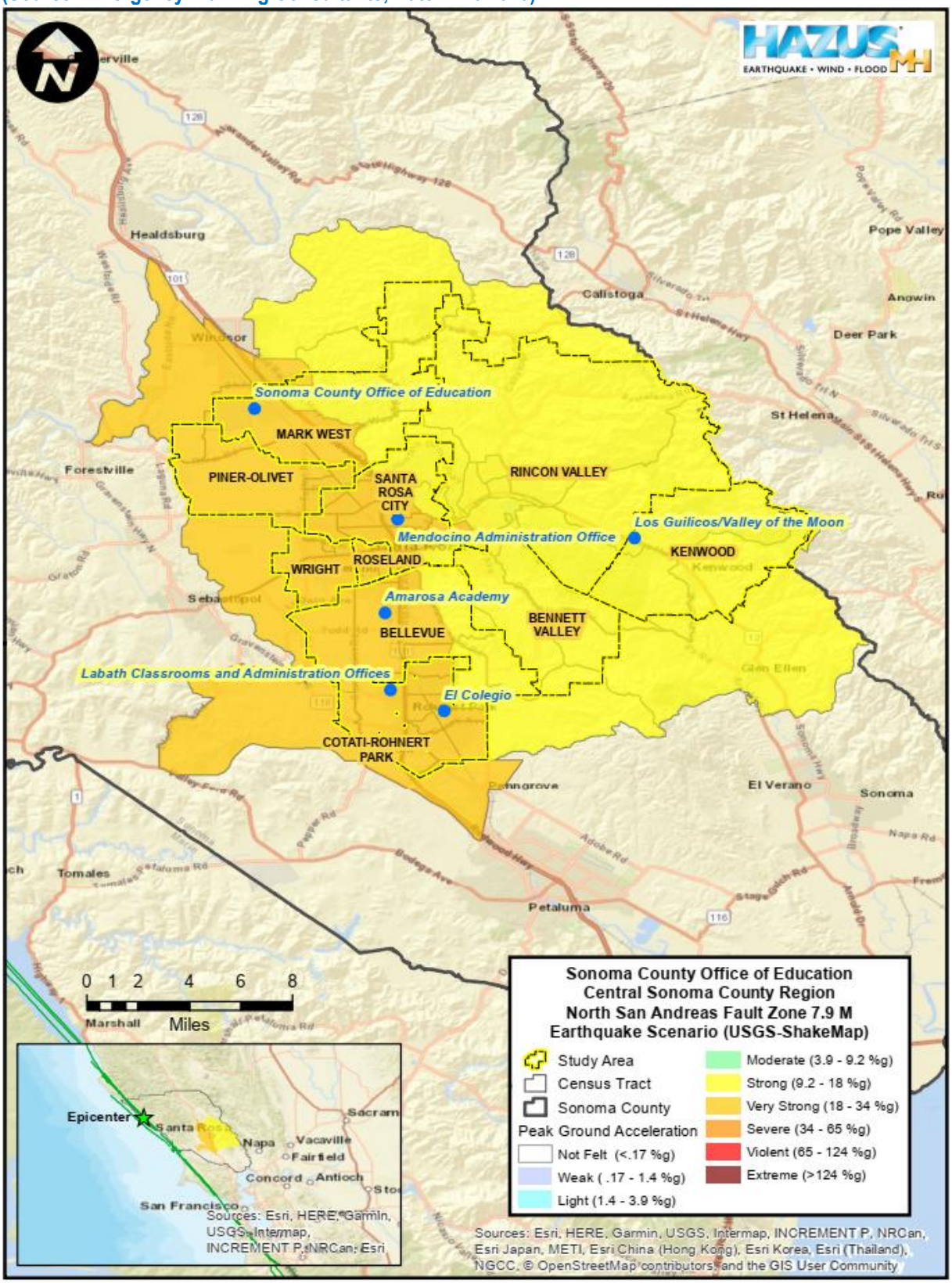
**Map: Shake Intensity Map – San Andreas Fault M7.9 – North Sonoma County Region (Source: Emergency Planning Consultants)**



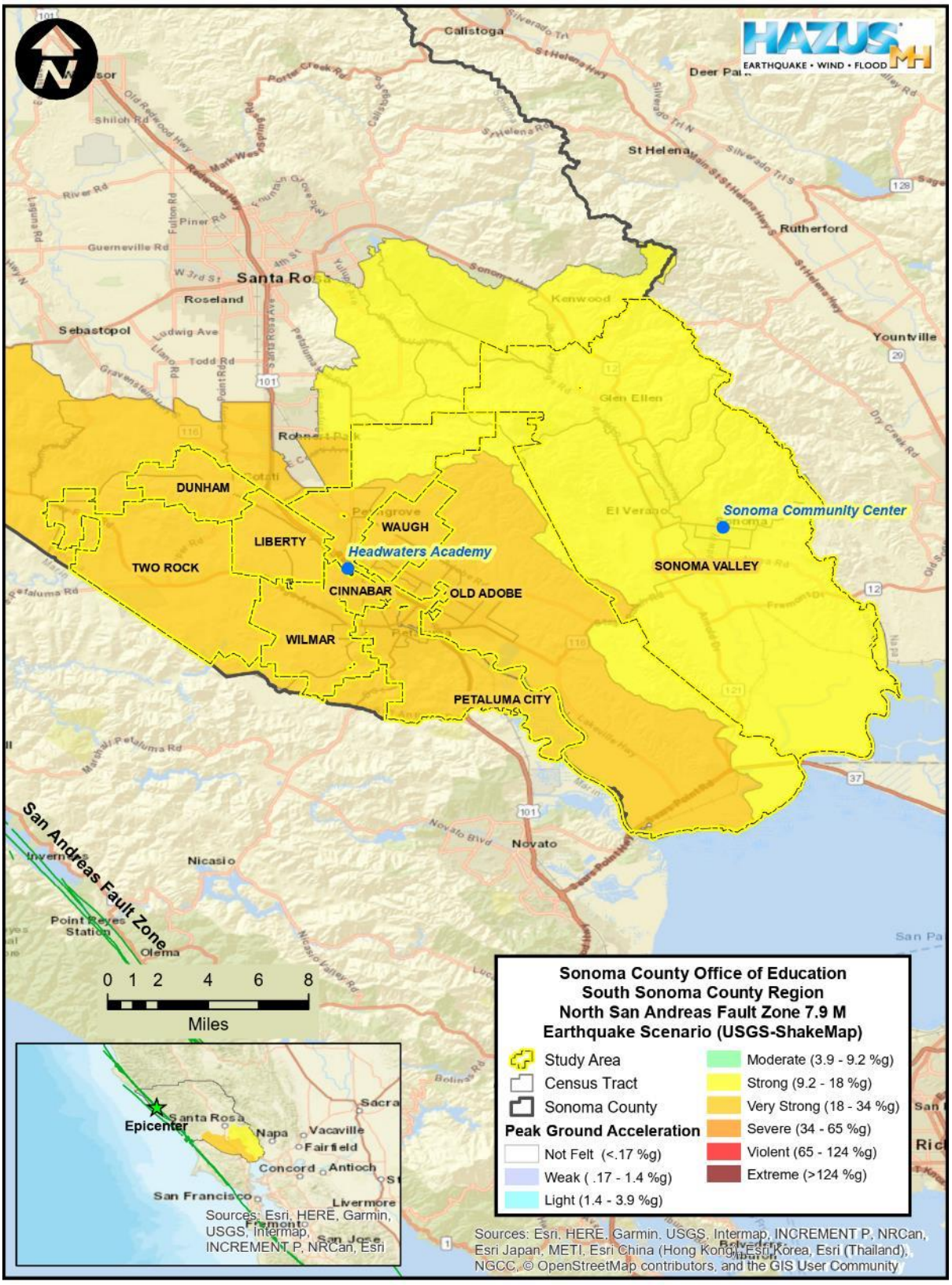
**Map: Shake Intensity Map – San Andreas Fault M7.9 – West Sonoma County Region**
**(Source: Emergency Planning Consultants, Date: 1.26.2020)**



**Map: Shake Intensity Map – San Andreas Fault M7.9 – Central Sonoma County Region**
**(Source: Emergency Planning Consultants, Date: 1.26.2020)**



**Map: Shake Intensity Map – San Andreas Fault M7.9 – South Sonoma County Region**
**(Source: Emergency Planning Consultants, Date: 1.26.2020)**



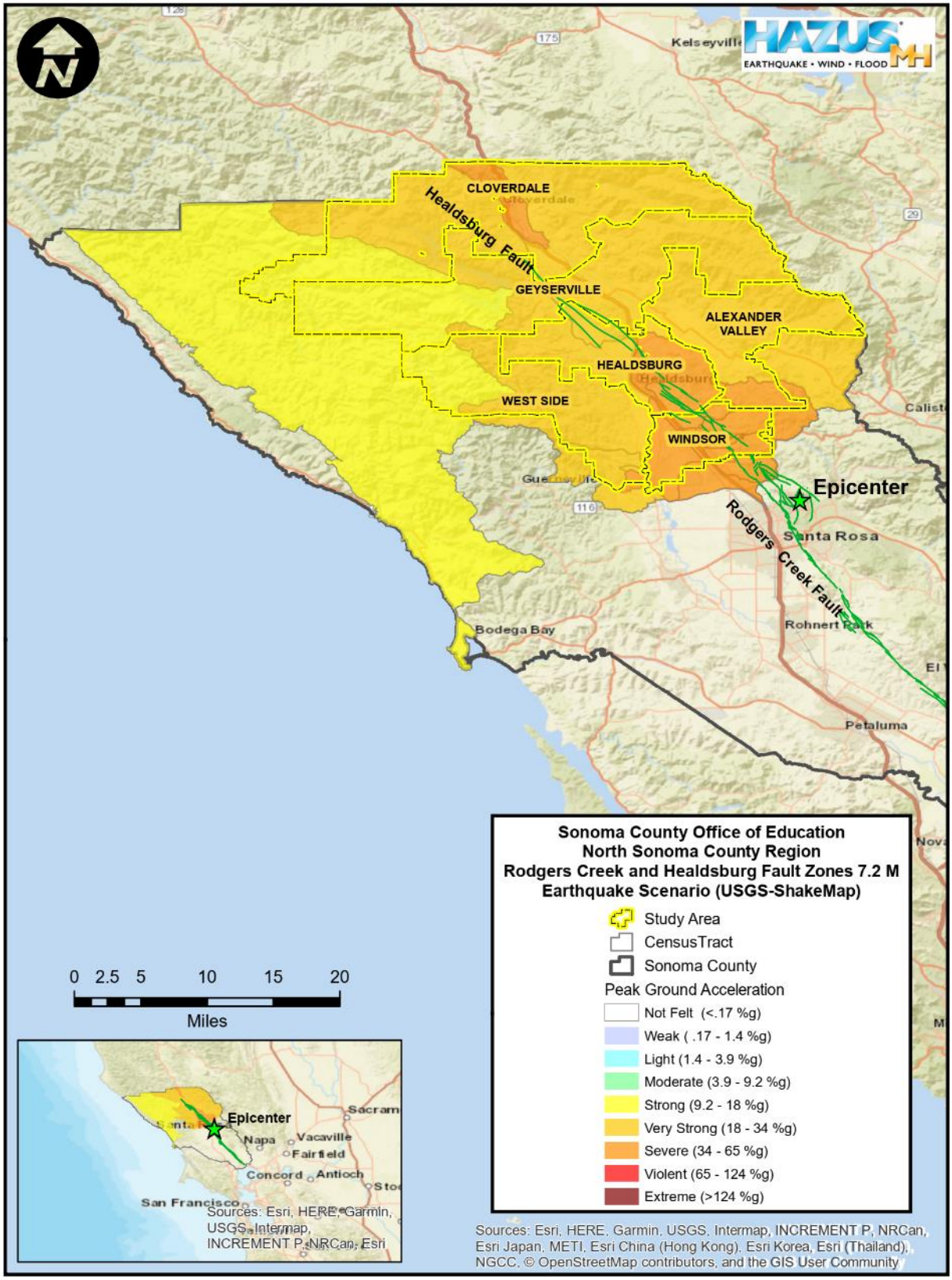
### *Rodgers Creek Fault*

The Rodgers Creek Fault, which lies east of the San Andreas Fault, is the main strand of the North American-Pacific Plate boundary north of San Francisco Bay. USGS estimates there is a 33% chance of a M>=6.7 earthquake on the combined Rodgers Creek-Hayward fault system over the 30-year period 2014-2043. The Rodgers Creek fault is one fault in a series of right-stepping en-echelon faults that include the Hayward fault to the south, and the Healdsburg and Maacama faults to the north.

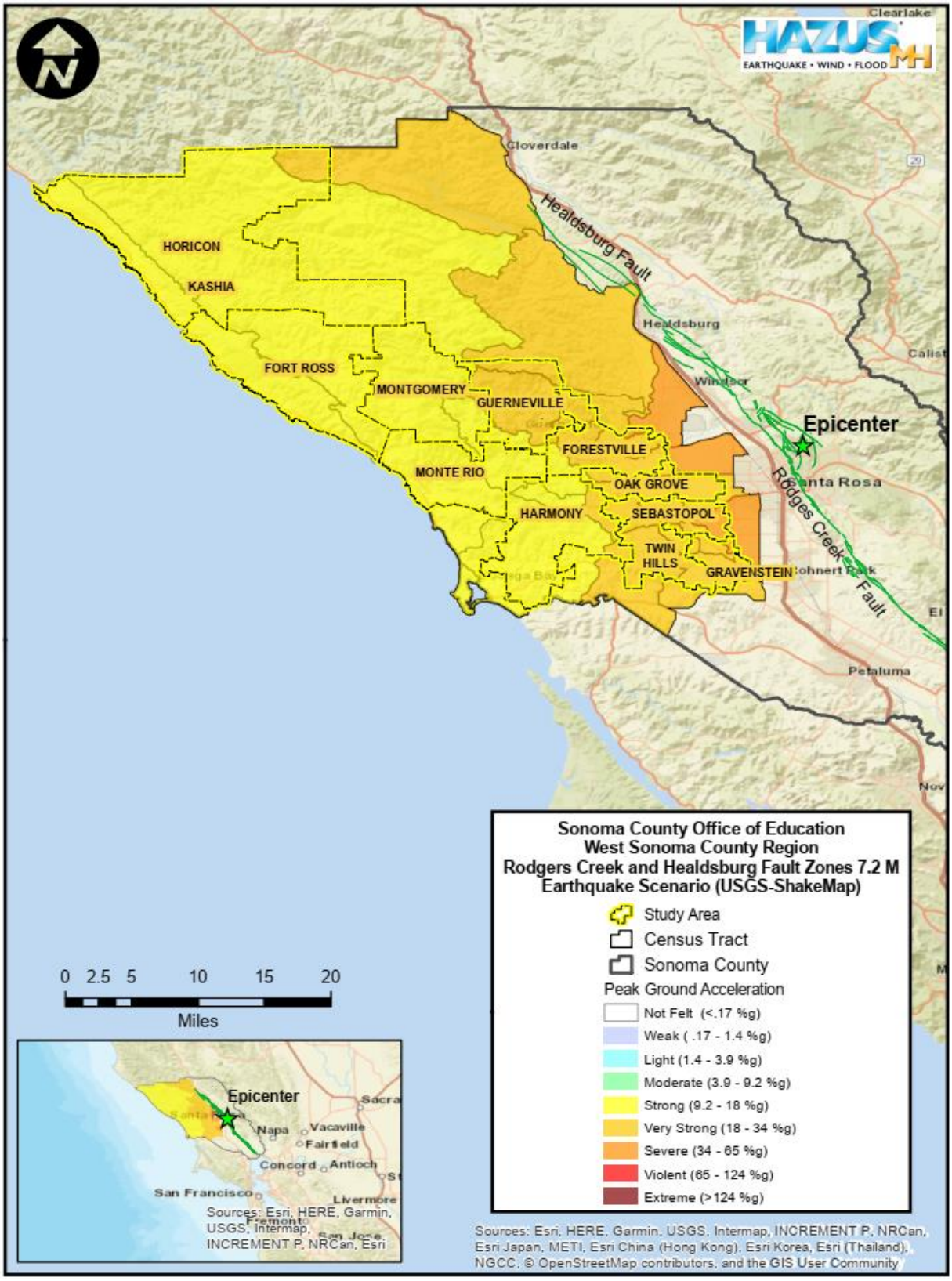
### *Healdsburg Creek Fault*

The Healdsburg Fault is a northward, step-over extension of the Rodgers Creek Fault along the east side of the Cotati Valley north of Santa Rosa. The maximum credible earthquake expected to be generated from the Healdsburg Fault is estimated to be about M7.5.

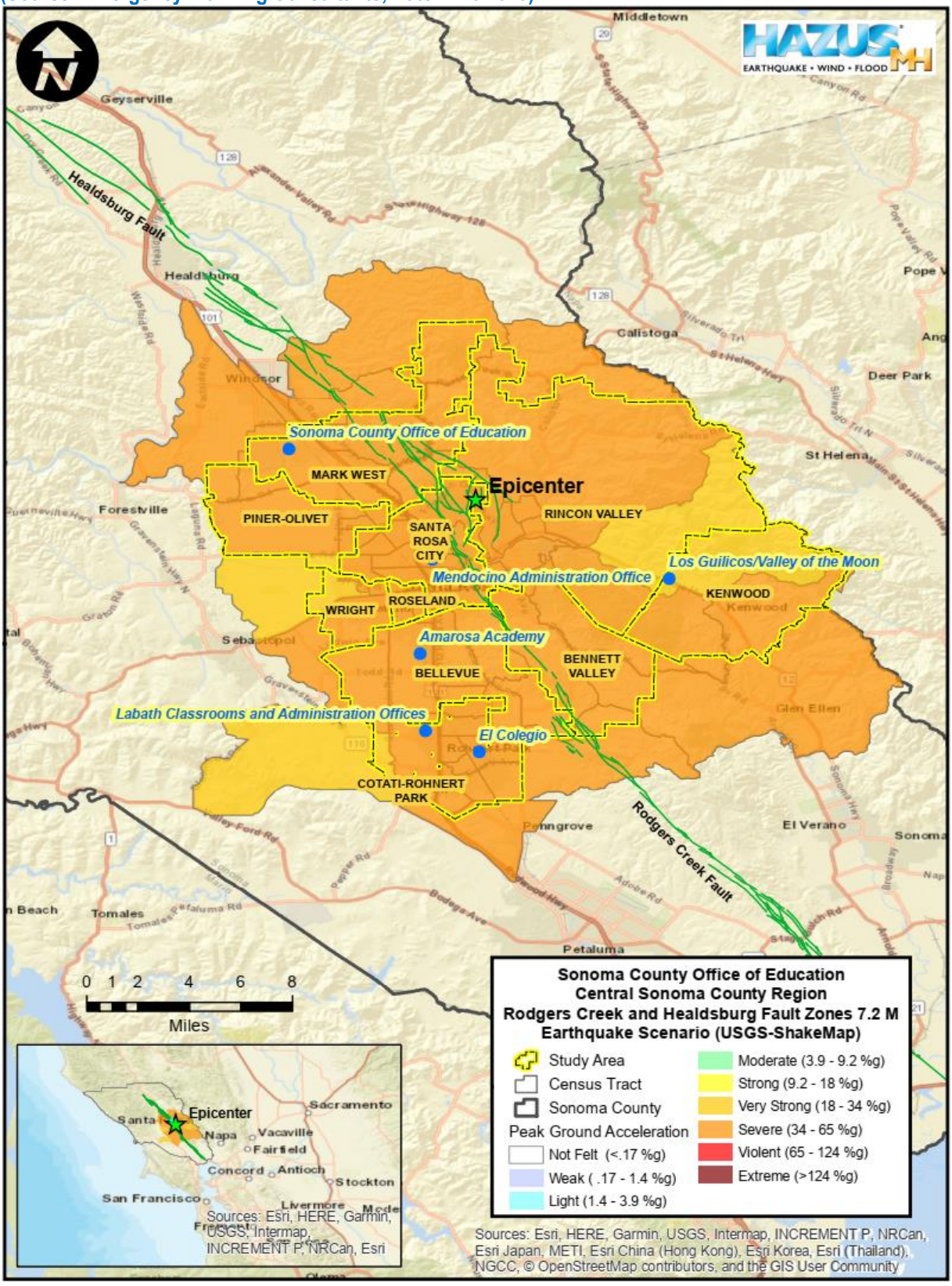
**Map: Shake Intensity Map – Rodgers Creek & Healdsburg Fault Zones M7.2 – North Sonoma County Region (Source: Emergency Planning Consultants, Date: 1.26.2020)**



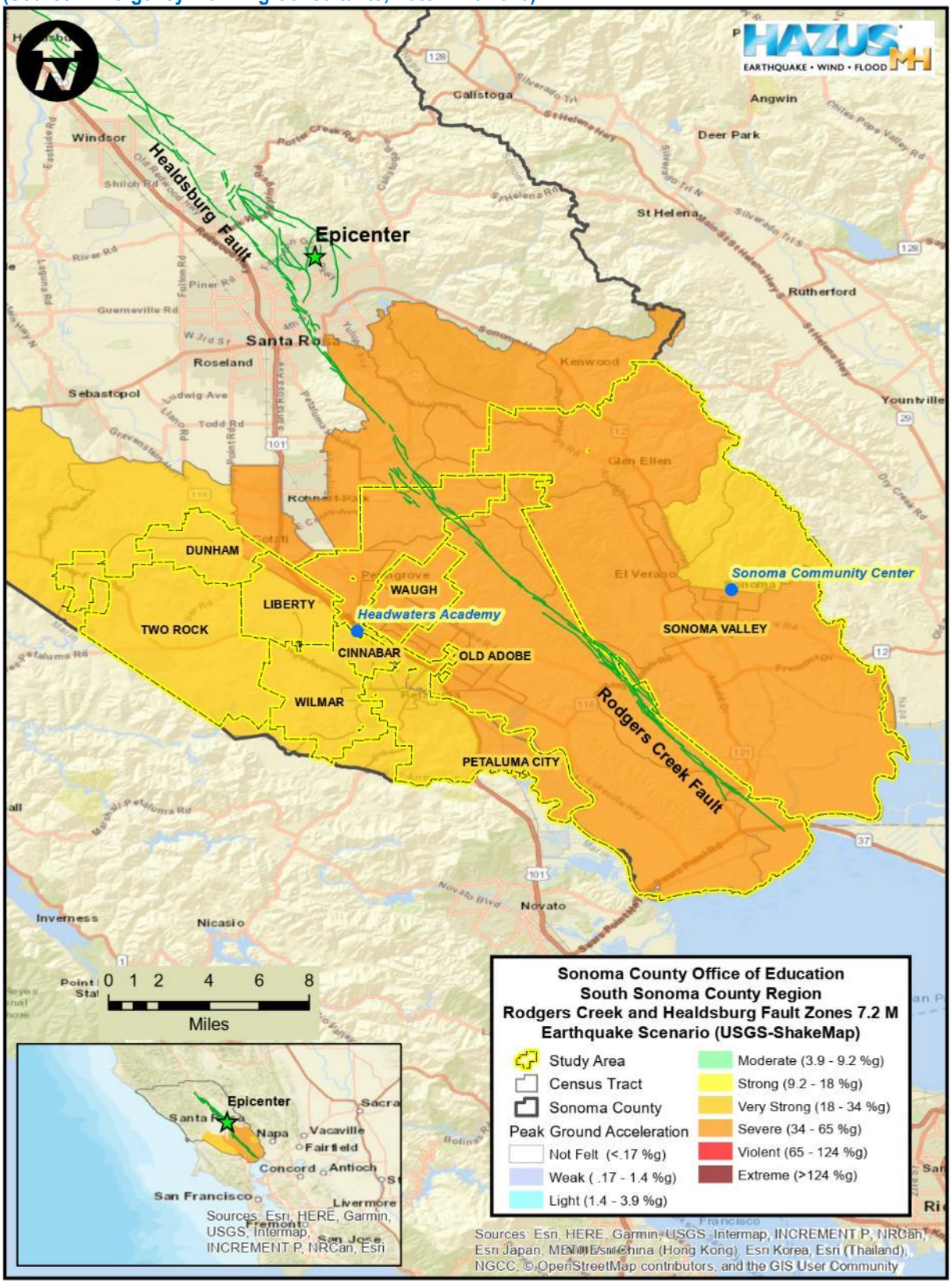
**Map: Shake Intensity Map – Rodgers Creek & Healdsburg Fault Zones M7.2 – West Sonoma County Region (Source: Emergency Planning Consultants, Date: 1.26.2020)**



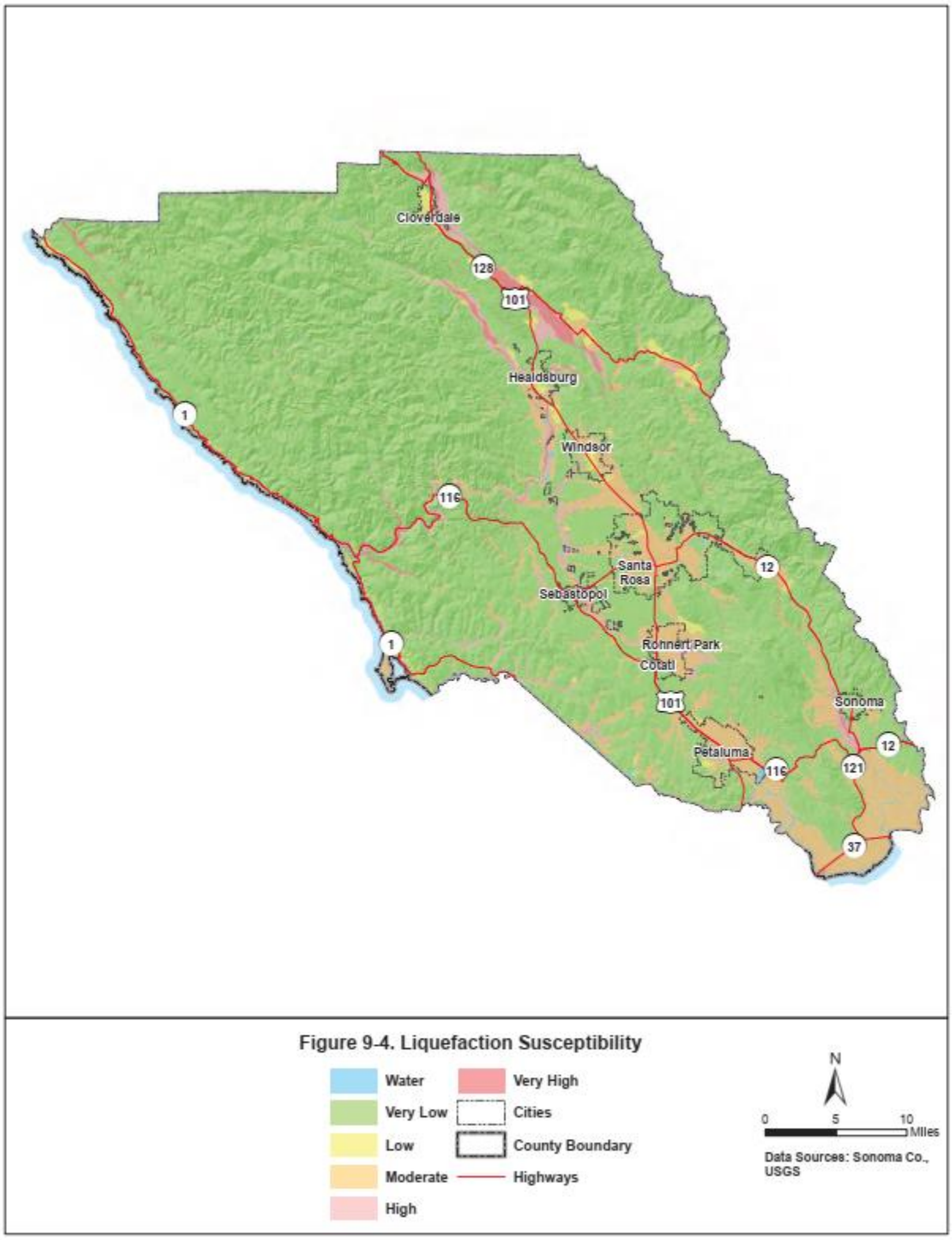
**Map: Shake Intensity Map – Rodgers Creek & Healdsburg Fault Zones M7.2 – Central Sonoma County Region (Source: Emergency Planning Consultants, Date: 1.26.2020)**



**Map: Shake Intensity Map – Rodgers Creek & Healdsburg Fault Zones M7.2 – South Sonoma County Region (Source: Emergency Planning Consultants, Date: 1.26.2020)**



## Map: Liquefaction Susceptibility in Sonoma County
## (Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)



| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3a. |
|---|
| **Q:** Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Impact of Earthquakes in the Project Area** below. |

## Impact of Earthquakes in the Project Area

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to the Project Area. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life,
- ✓ Commercial and residential structural damage,
- ✓ Disruption of and damage to public infrastructure,
- ✓ Secondary health hazards e.g. mold and mildew,
- ✓ Damage to roads/bridges resulting in loss of mobility,
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community,
- ✓ Negative impact on commercial and residential property values, and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

## Issues Relating to Earthquakes

*The following information is drawn from the 2021 Sonoma County Multijurisdictional Hazard Mitigation Plan.*

Important issues associated with an earthquake include the following:

- ✓ A large percentage of the Project Area is prone to liquefaction.
- ✓ Structures on these soils may experience significant structural damage.
- ✓ It is estimated more than a third of the planning area's building stock was built prior to 1975, when seismic provisions became uniformly applied through building code applications. Many structures may need seismic retrofits in order to withstand a moderate earthquake. Residential retrofit programs, such as Earthquake Brace+Bolt, may be able to assist in the costs of these efforts.
- ✓ Due to limitations in current modeling abilities, the risk to critical facilities in the planning area from the earthquake hazard is likely understated. A more thorough review of the age of critical facilities, codes they were built to, and location on liquefiable soils should be conducted.
- ✓ Damage to transportation systems in the planning area after an earthquake has the potential to significantly disrupt response and recovery efforts and lead to isolation of populations.
- ✓ Earthquakes can cause fires in wooden homes and the collapse of essential buildings such as fire stations.
- ✓ Landslides and tsunamis are major secondary hazards that could have a widespread effect on the county.
- ✓ Citizens are expected to be self-sufficient up to two weeks after a major earthquake without government response agencies, utilities, private-sector services, and infrastructure components. Education programs are currently in place to facilitate development of individual, family, neighborhood, and business earthquake preparedness.

It takes individuals, families, and communities working in concert with one another to be prepared for disaster.

- ✓ After a major seismic event, the planning area is likely to experience disruptions in the flow of goods and services resulting from the destruction of major transportation infrastructure across the broader region.
- ✓ A seismic event can damage communication systems, complicating efforts to coordinate response to the event.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b. |
|---|
| **Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Summary of Vulnerability to Earthquakes** below. |

## Summary of Vulnerability to Earthquakes

The following is a summary of vulnerability to earthquakes. All of SCOE-owned properties would be impacted by an earthquake including SCOE's Main Facility, Legal Facility, Overflow Parking Lot, Valley of the Moon, Juniper Shop Facility, CBI, Sonoma Valley – Sassari Elementary, Petaluma City – 4C's McDowell Elementary, and SELPA Properties Lewis Opportunity School, Headwaters Academy, Sonoma Community Center (SE), and SCOE Alternative Education Properties Satellite Office Space, and Amarosa Academy including a total of approximately 325 occupants, 12 buildings, and property/contents valued at $51 million. These estimates are based on 2023.

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses. Sonoma County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region. Fault ruptures themselves contribute very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Many schools use portable buildings and classrooms to expand school footprints. These manufactured buildings are very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings.

According to the SCOE, there are no URM buildings owned by SCOE. The Uniform Building Code (UBC) identifies four seismic zones in the United States. California's Field Act holds public school building construction to a higher standard than all other structures in the built environment. Portable classrooms are exempt from those regulations if the intended use is no longer than six years. Portables used by public schools for non-temporary purposes are required by the Field Act to have extra-strong construction, and to be bolted to a concrete foundation or wooden foundation secured to the ground. They are inspected during both manufacture and installation by the Division of the California State Architect. The SCOE understands that utilization of these buildings is rife throughout the County, particularly in smaller, more rural districts, and that many of these placements have outlived the six-year use mandate. That said, replacing these

structures with permanent buildings is well beyond the current budget allocation that most County schools receive and constitute a formidable financial burden. There are no recorded histories of any seismic related retrofits performed on school facilities within the County. Those historic structures that pre-date CDE building requirements for student and staff safety are no longer used for school functions.

Impacts from earthquakes in the SCOE will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Should ground shaking be intense, SCOE facilities and critical infrastructure could be damaged or destroyed. Of greater risk than the building is the students and staff who occupy those buildings; injury or loss of life could occur during a significant event. In addition to earthquakes causing structural damage, the SCOE has multiple non-structural components that may be damaged during earthquake shaking. Nonstructural components include furnishings and equipment, electrical and mechanical fixtures, and architectural features such as suspended ceilings, partitions, cabinets, and shelves. In general, nonstructural components and building contents become hazards when they slide, break, fall, or tip over during an earthquake. Securing the nonstructural components and building contents improves safety and security of the school facility. The only retrofitting projects that have been undertaken within the County in the last decade have been solar installations that in some instances have required non-structural elements—ground bracings and footing, as example.

# Wildfire Hazards

## Hazard Definition

Wildfire is an uncontrolled fire spreading through vegetative fuels and exposing or possibly consuming structures. They often begin unnoticed and spread quickly. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A wildland/urban interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

### *Wildfire Characteristics*

There are three categories of wildland/urban interface fire: The classic wildland/urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas; the mixed wildland/urban interface is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The occluded wildland/urban interface exists where islands of wildland vegetation occur inside a largely urbanized area. Certain conditions must be present for significant interface fires to occur. The most common conditions include hot, dry and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel topography, weather, drought, and development.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.**

**Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Previous Occurrences of Wildfire in the Project Area** below.

## Previous Occurrences of Wildfire in the Project Area

Wildfires, particularly wildland/urban interface fires, have historically occurred in Sonoma County and the Project Area. CAL FIRE has identified several "historic wildland fire corridors" in Sonoma County, including the Guerneville/Cazadero area which experienced fires in 1923, 1951, and 1978; the Geysers area which has experienced multiple fires, the most recently in 2013; and the 1964 Hanley fire area. Another area with a repetitive fire loss history is Sonoma Valley where the Cavedale fires of 1925 and 1996 caused significant property damage.

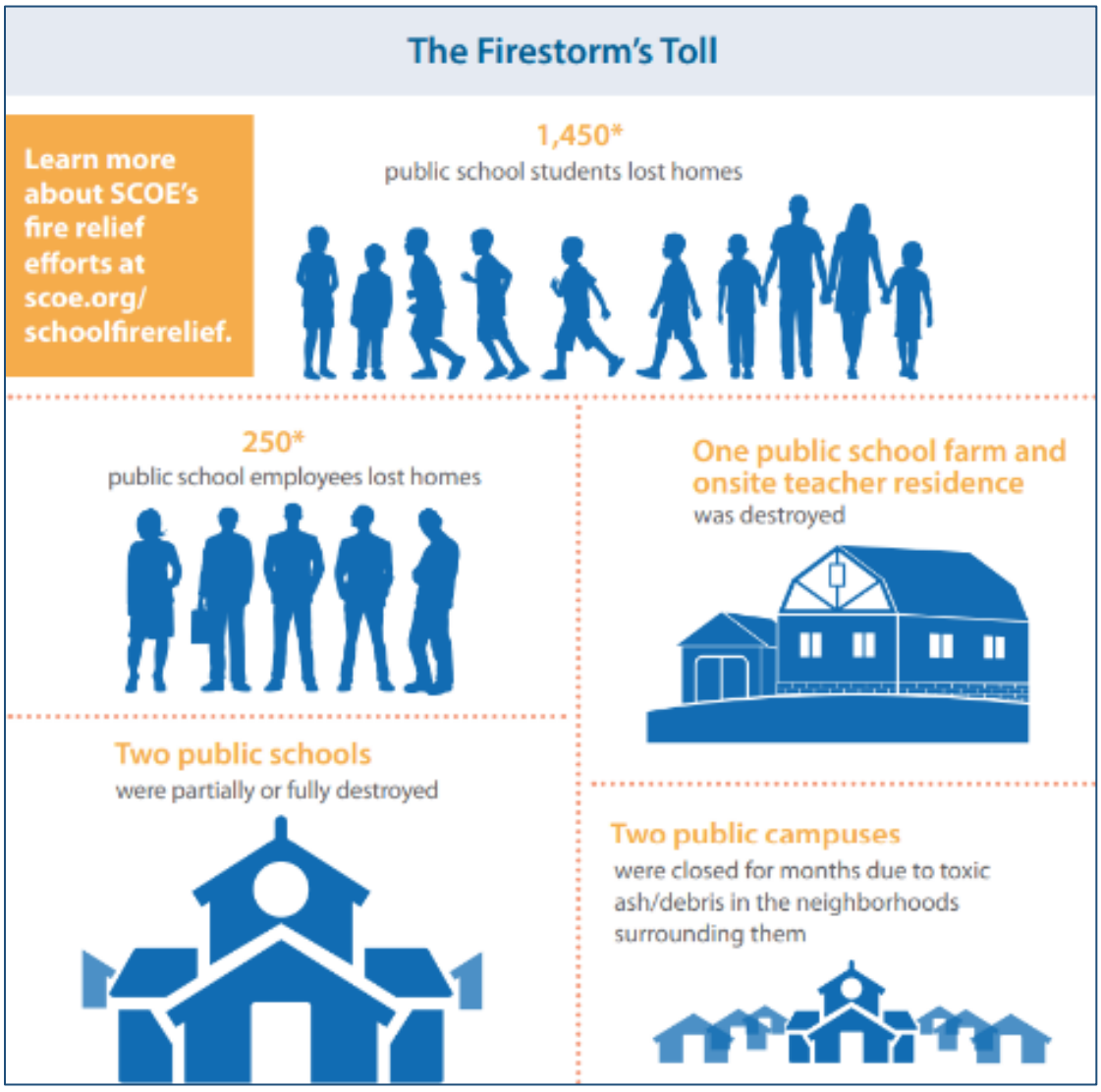
**Table: Historic Wildfires in Sonoma County**
**(Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021 and CALFIRE)**

| Year | Name | Acres Burned | Structures Burned |
|---|---|---|---|
| **1964** | Hanley | 52,700 | 108 |
| **1964** | Nuns Canyon | 10,400 | 27 |
| **1965** | Knight's Valley | 6,000 | 0 |
| **1965** | Pocket Ranch | 4,000 | 0 |
| **1965** | Austin Creek | 7,000 | 0 |
| **1972** | Bradford | 1,760 | 4 |
| **1978** | Creighton Ridge | 11,405 | 64 |
| **1988** | Cloverdale | 1,833 | 100 |
| **1988** | Geysers | 9,000 | 7 |
| **1996** | Porter Creek | 300 | 0 |
| **1996** | Cavedale | 2,100 | 0 |
| **1999** | Geyser Road | 1,300 | 0 |
| **2000** | Berryessa | 5,731 | 15 |
| **2004** | Geysers | 12,000 | 6 |
| **2008** | Pine | 989 | 0 |
| **2013** | McCabe | 3,505 | 0 |
| **2015** | Valley | 76,067 | 1,955 |
| **2017** | Sonoma Complex | 110,700 | 6,997 |
| **2019** | Kincade | 77,758 | 374 |
| **2020** | LNU Lightning Complex (Walbridge and Meyers) | 57,563 | 303 |
| **2020** | Glass | 67,484 | 661 |

## *2017 Wildfires*

On the night of October 8, 2017, a historic wind event led to one of the worst firestorms in Sonoma County history, followed by almost three weeks of fire. In total, the Nuns, Tubbs, and Pocket Fires (together comprising the Sonoma Complex Fire) burned over 110,700 acres in Sonoma and Napa counties. Twenty-four lives were lost as a result of the fires. According to the CA Insurance Commissioner, 6,997 structures were destroyed, resulting in direct losses exceeding $7.8 billion dollars.


The wildfires that swept through Sonoma County took an unprecedented toll on all 40 school districts, 179 public schools, and roughly 70,500 students. The blazes left a great number of students and teachers without homes and reduced several school sites to ashes.



## 2019 Kincade Fire

The 2019 Kincade fire erupted on October 23, 2019, due to a damaged electrical transmission line controlled by PG&E near the community of Pulga. The fire, driven by strong winds, quickly spread in dry vegetation. The fire was fully contained on November 6, 2019, after burning roughly 77,758 acres. The fire threatened over 90,000 structures and caused widespread evacuations throughout Sonoma County, including the communities of Geyserville, Healdsburg, and Windsor. Evacuation orders and air quality concerns forced the closure of 23 districts within the Project Area.

## 2020 LNU Lightning Complex Fire

The LNU Lightning Complex fires were a large complex of wildfires that burned during the 2020 California wildfire season across much of the Wine Country area of Northern California – Lake, Napa, Sonoma, Solano, and Yolo Counties, from August 17 to October 2, 2020. The complex was composed of numerous lightning-sparked fires, most of which were small. However, while they initially started separate from each other, the Hennessey Fire eventually grew to merge with the Gamble, Green, Markley, Spanish, and Morgan Fires, scorching 192,000 acres by itself, for a total burn area of 363,220 acres in the complex. The fire, which burned in the hills surrounding several large cities, such as Fairfield, Napa, and Vacaville, destroyed 1,491 structures and damaged a further 232. In all, six people were killed and another five injured.

| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1a.** |
|---|
| **Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Local Conditions** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b.** |
| **Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Local Conditions** below. |

## Local Conditions

According to the Sonoma County Multijurisdictional Hazard Mitigation Plan (2021), the risk to many parts of the Project Area from wildfire is of significant concern. **See Map: Fire Hazard Severity Zones** for specific locations. The combination of highly flammable fuel, long dry summers and steep slopes creates a significant natural hazard of large wildland fires in many areas of Sonoma County. Wildland fire season in Sonoma County spans the months after the last spring rains have fallen and until the first fall or winter rains occur. The months of August, September and October have the greatest potential for wildland fires as vegetation dries out, humidity levels fall, and offshore winds blow. However, as effects of climate change are being realized, fire season has been lengthened and in drought conditions fires can occur at any time of year.

### *Fuels*

Fuels consist of a variety of vegetation (grass, brush, or trees) available for combustion. The amount and density of fuel directly affects the intensity of the fire and the rate of fire spread. Different fuels have different burn qualities. For example, grasses release little energy, but can sustain extremely high rates of spread. Throughout the Project Area, there is a diverse range of fuels. The southern third of the project area is characterized by grasslands and/or oak woodland. Highly fire-prone nob cone pine and chaparral landscapes can be found in the east, along the Napa and Lake County lines. Redwood forest environments are found across the project area, especially along the north coast and in the lower Russian River drainage. In much of the oak woodlands, fire exclusion is allowing Douglas Fir and other brushy species to colonize the grass lands, changing fuel models, and increasing fire potential.

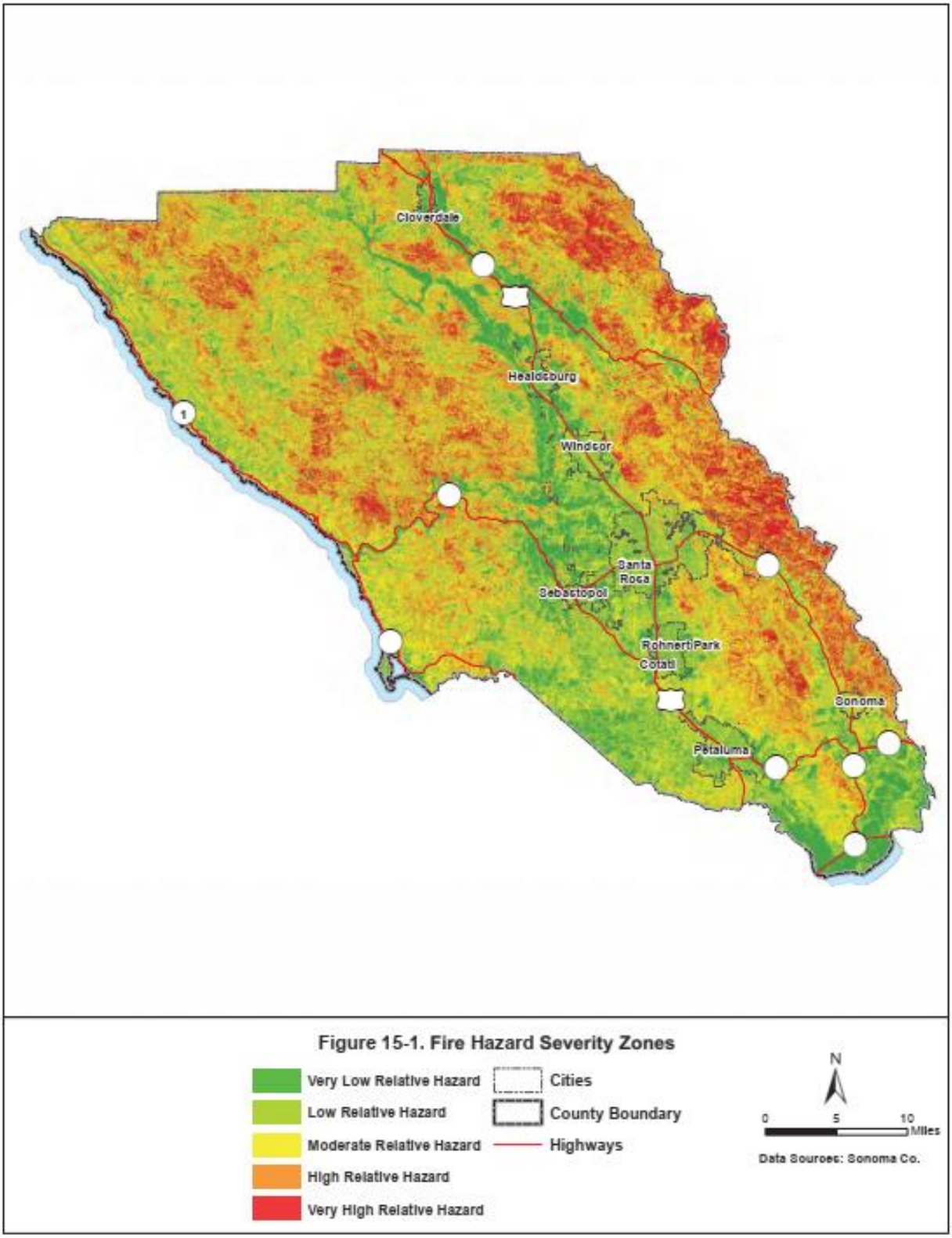
### *Weather*

Strong and dry north-east Diablo winds significantly increase the likelihood and severity of wildland fires across Sonoma County. Except for areas immediately along the coast, during fire season the weather is generally warm and dry during the day, with peak summer day temperatures 80° – 100° F, and relative humidity ranging between 20% and 35%. Gradient winds are generally out of the South/Southwest at 5-10 mph, strengthening to 10-15 mph in the late afternoon and diminishing by dark. Coastal onshore flow, often accompanied by fog, frequently prevails after sunset, allowing for good nighttime relative humidity recovery in the warm inland areas.

### *Risk*

Considering the above factors, CAL FIRE has mapped fire hazard severity levels in Sonoma County as shown in **Map: Fire Hazard Severity Zones**. Over half of Sonoma County has been rated as moderate or high fire hazard risk. Area of Very High Fire Severity Zone (VHFSZ are designated along the mountainous eastern range of Sonoma County. Cloverdale Unified, Geyserville Unified, Alexander Valley, Healdsburg Unified, Rincon Valley, Kenwood, and Sonoma Valley Unified school districts are at considerable risk due to very high fire hazard severity zones.

## Map: Fire Hazard Severity Zones
## (Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)



**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.**

**Q:** Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))
**A:** See **Impact of Wildfire in the Project Area** below.

## Impact of Wildfire in the Project Area

Wildfires and their impact vary by location and severity of any given wildfire event. Based on the risk assessment, it is evident that wildfires will continue to have potentially devastating economic impacts to the Project Area facilities. Impacts that are not quantified, but anticipated in future events include:

- ✓ Injury and loss of life,
- ✓ Commercial and residential structural damage,
- ✓ Disruption of and damage to public infrastructure,
- ✓ Secondary health hazards e.g. mold and mildew,
- ✓ Damage to roads/bridges resulting in loss of mobility,
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community,
- ✓ Negative impact on commercial and residential property values, and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

## Issues Relating to Wildfire

*The following information is drawn from the 2021 Sonoma County Multijurisdictional Hazard Mitigation Plan.*

Wildfire is an inevitable and normal ecological process in the fire-adapted landscape of Sonoma County. Nearly 100 years of aggressive fire suppression has contributed to the high wildfire risk of today. Absent fire for many years, wildland areas became overstocked with highly flammable vegetation. At the same time, expansion of homes into rural WUI areas increased the number of homes in high-risk areas. Typically, residential property owners do not maintain forested lands, exacerbating wildfire potential. On public lands, availability of budget for large-scale wildland fuels maintenance is an ongoing issue. Overcrowded conditions degrade overall forest health and degrade the environmental values provided by forest ecosystems. While in a few areas, recent wildfires burned hot enough to damage wildland ecosystems, in general wildland ecosystems have not sustained irrevocable damage. In many cases fires were beneficial. Large, uncontrolled wildfires can cause significant damage to ecosystem services, however life, home and economic losses to residents and communities must be considered along with environmental consequences.

Research shows that home loss in wildland fires is primarily driven by two equally important factors:

1 - The vulnerabilities of buildings that make them prone to ignition—Embers cause 80 percent of wildland fire home ignitions. The following elements are most vulnerable to embers but can be retrofitted on existing homes to reduce risk of ignition:

- ✓ Non-Class A roofs
- ✓ Roof edges and soffits
- ✓ Combustible plants and materials within 5 feet of house walls
- ✓ Non-WUI approved venting products that allow for ember entry into structures
- ✓ Wooden attachments, such as fences and decks

- ✓ Non-WUI rated windows
- ✓ Siding

2 - The vegetative fuels within 100 feet of structures (the area referred to as defensible space)—Good defensible space, wherein vegetation has been reduced to reduce fire intensity and spread, is critical to reduce ignition.

Most of the homes in Sonoma County's WUI areas were constructed before 2008, when the WUI Building Code went into effect. This code requires ignition-resistant building materials in WUI areas. Structures built before it took effect and those without adequate vegetation management are at higher risk from wildland fire ignition.

Outside of the home and the 100-foot defensible space zone, surrounding wildland fuels can play a role in home destruction, as fire and embers can spread from nearby wildland areas into communities. It is in this area that vegetation management can come into play. This refers to actions taken to alter natural vegetation or plant communities that abut communities, usually on the scale of 10s to 1,000s of acres. Vegetation management can include prescribed fire, prescribed grazing, timber harvest techniques, invasive plant removal, or mechanical treatment to remove fine fuels, dense stands of fire-prone species, shrubs, and dead and dying vegetation. Fuels are reduced in order to create "community calming zones" or restore ecosystems to less flammable conditions. Strategically placed calming zones can reduce near-community fire intensity and spread, provide safe anchors that firefighters can use to stop forward progress of the fire, and supplement and support near-home mitigation strategies. Roadside fuels treatment can support emergency ingress and egress, increasing community and firefighter safety.

Although the patterns of land use, natural plant communities, topography, weather, soils, and geology vary across the landscapes of Sonoma County, notable patterns are discernible. An approach is needed for deploying existing techniques at the scale of whole communities. Such an approach would be informed by the principles of landscape ecology. It would view the natural lands where fires tend to originate and the built infrastructure of human communities that abut the natural landscapes as a coupled system. Mitigating large-scale loss of life and property can be achieved using relatively well-established techniques of home hardening, defensible space and vegetation management at the scale of whole communities and the natural landscapes that surround them.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))
**A:** See **Summary of Vulnerability to Wildfires** below.

## Summary of Vulnerability to Wildfires

The following is a summary of vulnerability to wildfires for SCOE-owned properties. Valley of the Moon which serves as a nursery/child care and special needs facility. It is the only property vulnerable to direct impacts from wildfire including a total of approximately 15 occupants, 1 building, and property/contents valued at $7.5 million. These estimates are based on 2023 data.

The wildfire hazard is one of the highest priority hazards in the County and is the hazard with the greatest potential for catastrophic loss. High fuel loads throughout the County, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the Wildland Urban Interface (WUI) areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County, especially in these interface areas, the risk and vulnerability to wildfires will likely increase. Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the SCOE. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the SCOE by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the SCOE; smoke and air pollution from wildfires can be a severe health hazard.

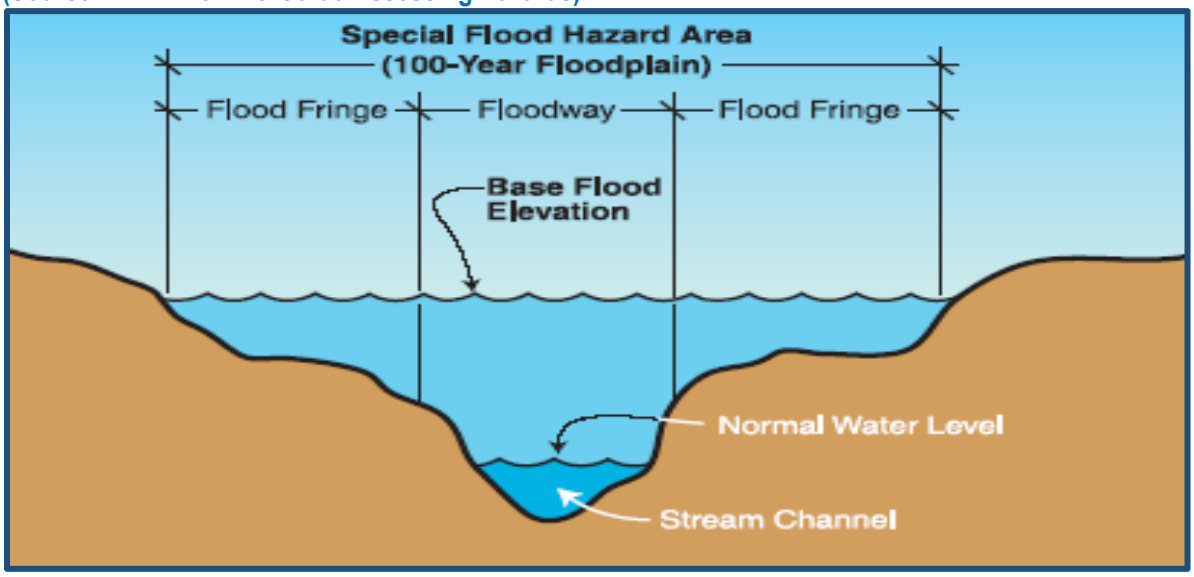
Although the physical damage and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate Public Safety Power Shutoffs (PSPSs) which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

# Flood Hazards

## Hazard Definition

A floodplain is a land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess flood water. The floodplain is made up of two sections: the floodway and the flood fringe. The 100-year flooding event is the flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood. Schematic: Floodplain and Floodway shows the relationship of the floodplain and the floodway.

**Figure: Floodplain and Floodway**
**(Source: FEMA How-To-Guide Assessing Hazards)**




### *Types of Flooding*

Two types of flooding primarily affect the region: slow-rise or flash flooding. Slow-rise floods may be preceded by a warning period of hours or days. Evacuation and sandbagging for slow-rise floods have often effectively lessened flood related damage. Conversely, flash floods are most difficult to prepare for, due to extremely limited, if any, advance warning and preparation time.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.**

**Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Previous Occurrences of Flooding in the Project Area** below.

## Previous Occurrences of Flooding in the Project Area

According to Sonoma County, floods are the most frequent natural hazard impacting the region, causing the greatest property losses and account for the highest number of local, Gubernatorial, and Presidential disasters. The Sonoma county Operational Area Emergency Operations Center (EOC) has been activated ten times due to flood related local emergencies since 1995.

In February 2019, the region experienced days of heavy rains and flooding along the Russian River causing mandatory evacuations of thousands of residents. The river crested at over 45 feet, the highest recorded level since 1995. Damage to Sonoma County roads was estimated at over $23 million. Guerneville School was closed due to the flooding and damages were estimated between $300 and $700 thousand dollars.

Additional flooding events that have impacted the region surrounding the Project Area are below:

**Table: Historical Flooding Events – Sonoma County**
**(Source: FEMA and Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)**

| Date | Loss Estimates | Description |
|---|---|---|
| **January 1995** | $21 million | • Over 50 roads closed<br>• 15,000 residents without power<br>• Total displaced persons exceeded 2,000, of which 456 flood victims were evacuated by air<br>• 13 medical cases were treated, and 2 flood-related fatalities occurred |
| **March 1995** | $13.3 million | • Over 100 roads closed<br>• 45,000 residents without power<br>• At least 3,000 residents displaced<br>• Up to 30 containers of possible toxic materials identified in the flood zone |
| **December 1997** | $31 million | • Up to 200 roads were closed or damaged temporarily<br>• 463 homes damaged |

| Date | Loss Estimates | Description |
|---|---|---|
| | | • 12,000 residents without power<br>• Over 1,200 victims evacuated their residences and 2 storm-related deaths occurred<br>• Sewage and treatment plants overflowed |
| **February 1998** | $28 million | • 200 roads were listed as flooded or closed<br>• 6,400 residents without power<br>• 250+ homes were inundated<br>• 1,200 residents voluntarily evacuated<br>• 4 storm-related deaths |
| **December 2005** | $104 million | • Over 100 roads closed due to flooding and landslides<br>• Approximately 50,000 county residents without power<br>• 2106 properties inundated, 67 declared uninhabitable<br>• Unknown number of self-evacuations<br>• Laguna Wastewater Treatment Plant flooded with partially treated sewage spill into the Laguna |
| **December 2014** | $1.1 million | • 48 businesses and single-family dwellings damaged along Foss Creek |
| **January 2017** | $162.3 million | • Severe winter storms, flooding, and mudslides |
| **February 2017** | $537.1 million | • Severe winter storms, flooding, mudslides |
| **February 2019** | $56 million | • Guerneville significantly impacted<br>• $23 million in road damage<br>• 1,900 homes damaged and 578 businesses |

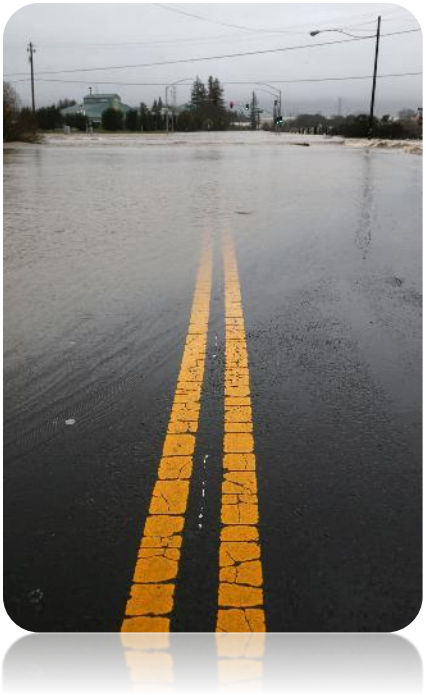
**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.**

**Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
**A:** See **Local Conditions** below.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))
**A:** See **Local Conditions** below.

## Local Conditions



Flooding is a significant hazard within the Project Area due to high intensity rainstorms.

According to the NOAA, Sonoma County's Mediterranean climate is characterized by a summer dry season followed by a winter rainy season, generally extending from November to April. Precipitation in the Russian River is distinctly seasonal, 93 percent occurs during November through March. The bulk of the precipitation occurs during moderate storms of over several days. Rainfall varies throughout the county from 20 to 70 inches annually in the north central and the southeastern sections of the County.

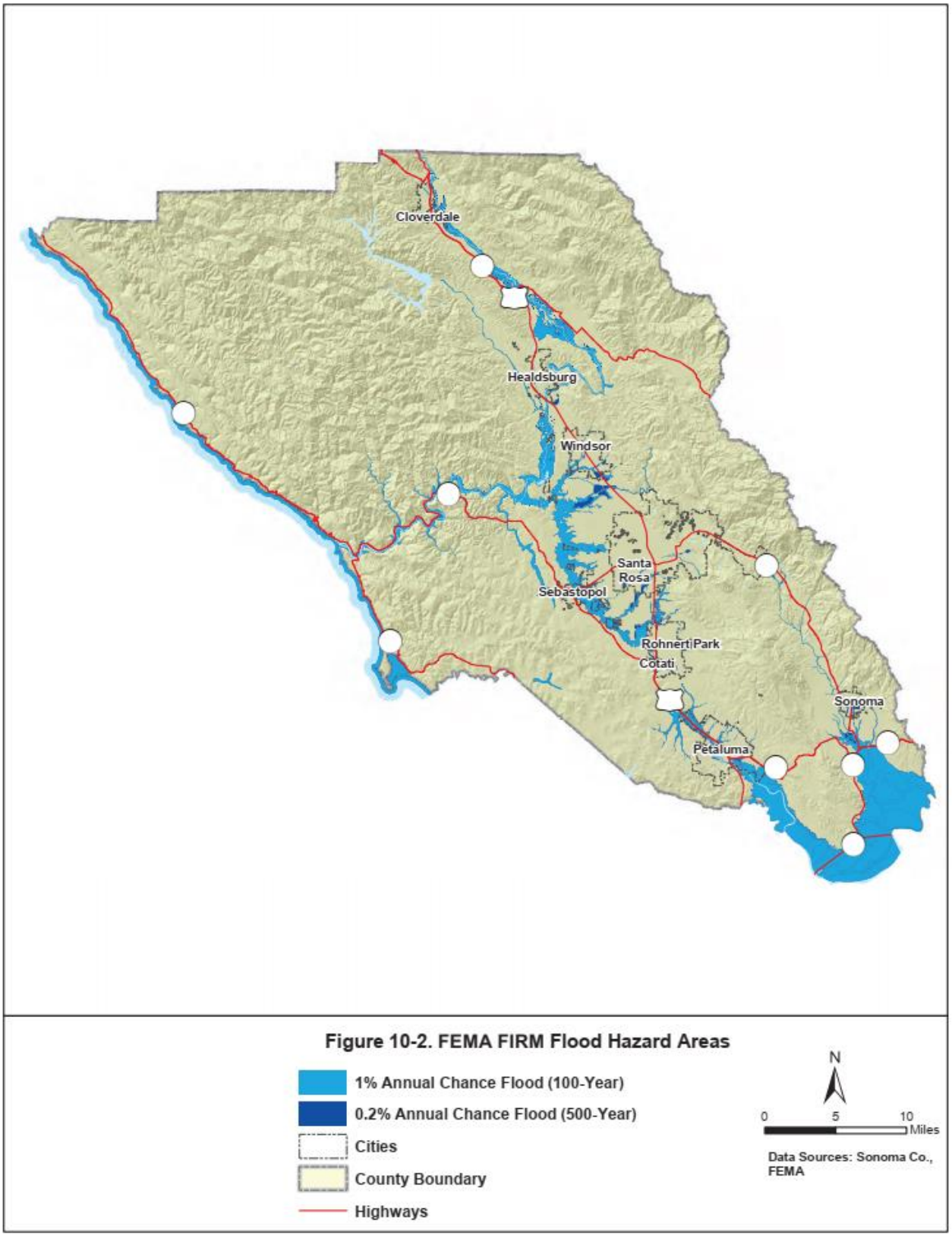
The Federal Emergency Management Agency (FEMA) has identified 100 year flood zones in **Map: FEMA FIRM Flood Hazard Areas**.

According to Sonoma County Multijurisdictional Hazard Mitigation Plan (2021), damaging floods occur most frequently along the Russian River, Petaluma River, and Sonoma Creek; and the tributaries in these watersheds. Floods in Sonoma typically occur during the winter months, develop within 24 to 48 hours after a storm event, and recede within three days after the end of the storm. In the southwest segment of the Russian River, aka Lower Russian River, floods are characterized by high velocity and significant depth of flow due to the relatively narrow floodplain. The frequency of flooding in this portion of the river causes repetitive flood losses to occur in the residential and commercial districts of Mirabel Park, Duncans Mills, Monte Rio, Rio Nido and Guerneville.

The intensity, distribution and duration of rainfall are the most important factors in determining the magnitude of floods. If a storm event extends many hours or days, flooding can be enhanced as soils become saturated, reservoirs full and runoff from the upland and upstream areas accumulates downstream.

Within the Project Area, schools and properties located along the Russian River are at greatest risk of flooding events given the proximity to 100-year flood zones.

## Map: FEMA FIRM Flood Hazard Areas
## (Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)



| Q&A \| ELEMENT C. MITIGATION STRATEGY \| C2 |
|---|
| **Q:** Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))<br>**A:** See **NFIP Participation** below. |

### *National Flood Insurance Program*

The Project Area is fully contained within Sonoma County. The County participates in the National Flood Insurance Program (NFIP). Created by Congress in 1968, the NFIP makes flood insurance available in communities that enact minimum floodplain management rules consistent with the Code of Federal Regulations §60.3. However, special districts are prohibited from participating in NFIP.

## Definitions of FEMA Flood Zone Designations

Flood zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Maps as shown in the maps above. Each zone reflects the severity or type of flooding in the area.

### *Moderate to Low Risk Areas*

In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones:

| ZONE | DESCRIPTION |
|---|---|
| B and X (shaded) | Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile. |
| C and X (unshaded) | Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood. |

### *High Risk Areas*

In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

| ZONE | DESCRIPTION |
|---|---|
| A | Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones. |
| AE | The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones. |

| ZONE | DESCRIPTION |
|---|---|
| A1-30 | These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format). |
| AH | Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones. |
| AO | River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones. |
| AR | Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations. |
| A99 | Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones. |

## *Undetermined Risk Areas*

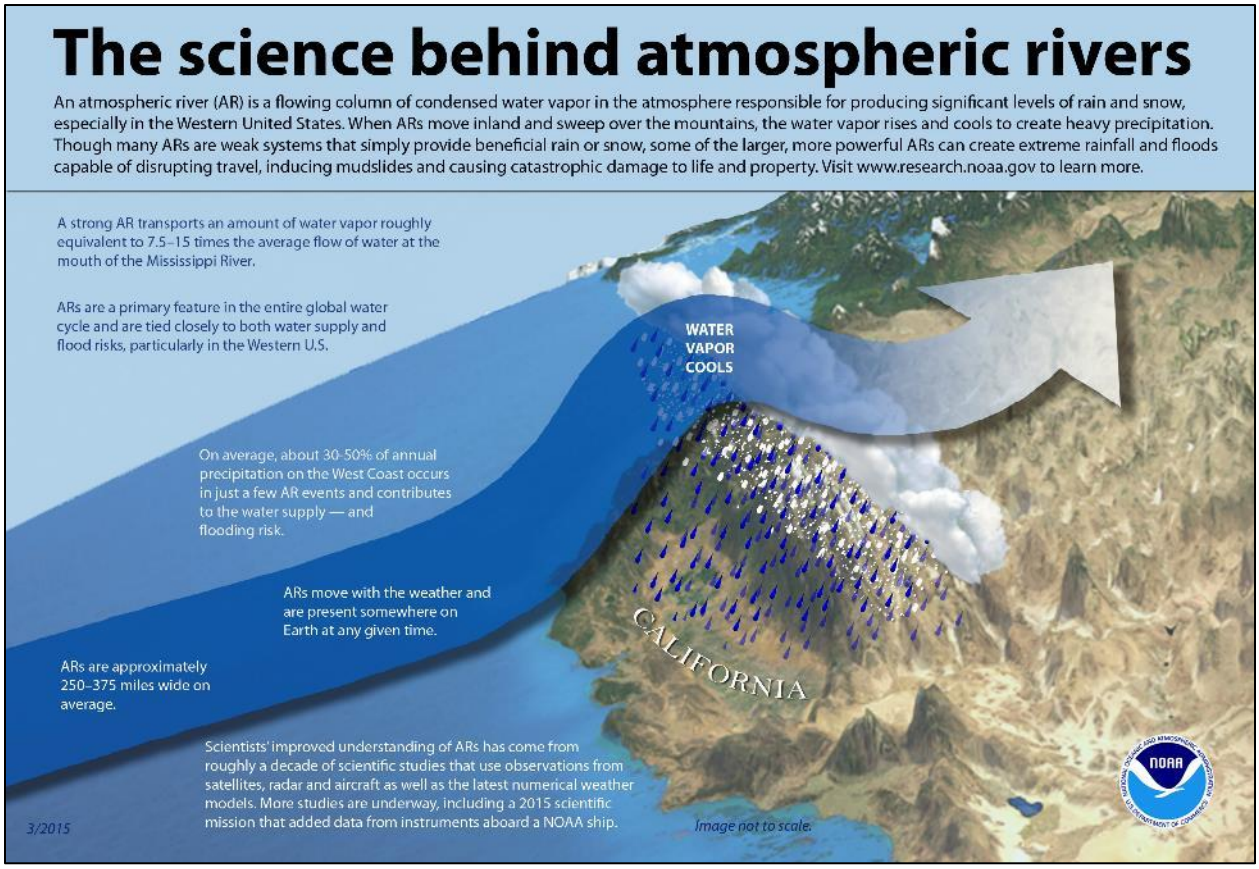
| ZONE | DESCRIPTION |
|---|---|
| D | Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk. |

## *Atmospheric Rivers*

According to the National Oceanic and Atmospheric Administration (NOAA), atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow.

Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides, and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that can bring moisture from the tropics near Hawaii over to the U.S. West Coast.

**Graphic: Atmospheric Rivers**
**(Source: National Oceanic and Atmospheric Administration)**




While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from December 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by December 22, the first full day of winter.

NOAA research (e.g., NOAA Hydrometeorological Testbed and Cal Water) uses satellite, radar, aircraft and other observations, as well as major numerical weather model improvements, to better understand atmospheric rivers and their importance to both weather and climate.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3a. |
|---|
| **Q:** Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Impact of Flooding in the Project Area** below. |

## Impact of Flooding in the Project Area

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the region during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially devastating economic impacts to the Project Area facilities. Impacts that are not quantified, but anticipated in future events include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

## Issues Relating to Flooding

*The following information is drawn from the 2021 Sonoma County Multijurisdictional Hazard Mitigation Plan.*

- ✓ Structures in the planning area built before any regulations existed on floodplain development may be particularly vulnerable to the flood hazard.
- ✓ The accuracy of the existing flood hazard mapping produced by FEMA in reflecting the true flood risk within the planning area is questionable, especially along the Russian River.
- ✓ The extent of the flood-protection currently provided by flood control facilities (dams, dikes and levees) is not known due to the lack of an established national policy on flood protection standards.
- ✓ Older levees are subject to failure or do not meet current building practices for flood protection.
- ✓ The risk associated with the flood hazard overlaps the risk associated with other hazards such as earthquake, landslide, and severe weather. This provides an opportunity to seek mitigation alternatives with multiple objectives that can reduce risk for multiple hazards.
- ✓ There is no area-wide degree of consistency in land-use and floodplain management practices.
- ✓ Climate change may cause more extensive flood problems due to possible sea level rise and more severe weather patterns. The 0.2 percent-annual-chance floodplain inundation area may become a higher probability risk. Coastal flood hazard ratings may also need to be reviewed.
- ✓ More information is needed on flood risk to support the concept of risk-based analysis of capital projects.

- ✓ There needs to be a sustained effort to gather historical damage data, such as high-water marks on structures and damage reports, to measure the cost-effectiveness of future mitigation projects.
- ✓ Ongoing flood hazard mitigation will require funding from multiple sources.
- ✓ Coordinated hazard mitigation efforts among jurisdictions affected by flood hazards in the county are recommended.
- ✓ Floodplain residents should continue to be educated about flood preparedness and the resources available during and after floods.
- ✓ The concept of residual risk should be considered in the design of future capital flood control projects and should be communicated with residents living in the floodplain.
- ✓ The promotion of flood insurance as a means of protecting private property owners from the economic impacts of frequent flood events should continue.
- ✓ The economy affects a jurisdiction's ability to manage its floodplains. Budget cuts and personnel losses can strain resources needed to support floodplain management.
- ✓ Sonoma County is the State of California largest "repetitive loss" community. Challenges in the acquisition of repetitive loss data from FEMA have made it difficult to acquire data necessary to study the repetitive flood loss problem in depth.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**A:** See **Summary of Vulnerability to Flooding** below.

## Summary of Vulnerability to Flooding

The following is a summary of vulnerability to flooding for SCOE-owned properties. Headwaters Academy in Petaluma and Sonoma Community Center (SE) are the properties vulnerable to direct impacts from flooding including a total of approximately 25 occupants, 2 buildings, and property/contents valued at $8.6 million. These estimates are based on 2023 data.

Floods have been a part of the County's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soil. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of schools. The SCOE may be required to close or be placed on a delayed start schedule. Roads that transport students and staff can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwater, causing injuries or deaths.

Equally troubling are urban or localized flooding events. Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the SCOE, as well as damage to SCOE facilities and property. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways, and other critical

infrastructure. Floodwater can break utility lines and interrupt services. Standing water can cause damage to roads used to transport staff and students and can also damage school foundations.

# Landslide Hazards

## Hazard Definition

A landslide is defined as the movement of a mass of rock, debris, or earth movement down a slope. Landslides are a type of "mass wasting" which denotes any down slope movement of soil and rock under the direct influence of gravity. The term "landslide" encompasses events such as rock falls, topples, slides, spreads, and flows. Landslides are initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, disturbance and change of a slope by human-caused construction activities, or any combination of these factors. Landslides also occur underwater, causing tidal waves and damage to coastal areas. These landslides are called submarine landslides.

### *Landslide Characteristics*

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year. The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually. As a seismically active region, California has a significant number of locations impacted by landslides. Some landslides result in private property damage, other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life.

Landslides can be broken down into two categories: 1) rapidly moving (generally known as debris flows), and; 2) slow moving. Rapidly moving landslides or debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides, are at increased risk of serious injury. Slow moving landslides can cause significant property damage but are less likely to result in serious human injuries.

The primary effects of mudslides/landslides include abrupt depression and lateral displacement of hillside surfaces over distances of up to several hundreds of feet, disruption of surface drainage, blockage of flood control channels and roadways, displacement or destruction of improvements such as roadways, buildings, and water wells.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.**

**Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Previous Occurrences of Landslides in the Project Area** below.

## Previous Occurrences of Landslides in the Project Area

According to Sonoma County Multijurisdictional Hazard Mitigation Plan (2021), the winters of 1982, 1983, 1986, 1998, and 2006 produced significant landslides in Sonoma County.

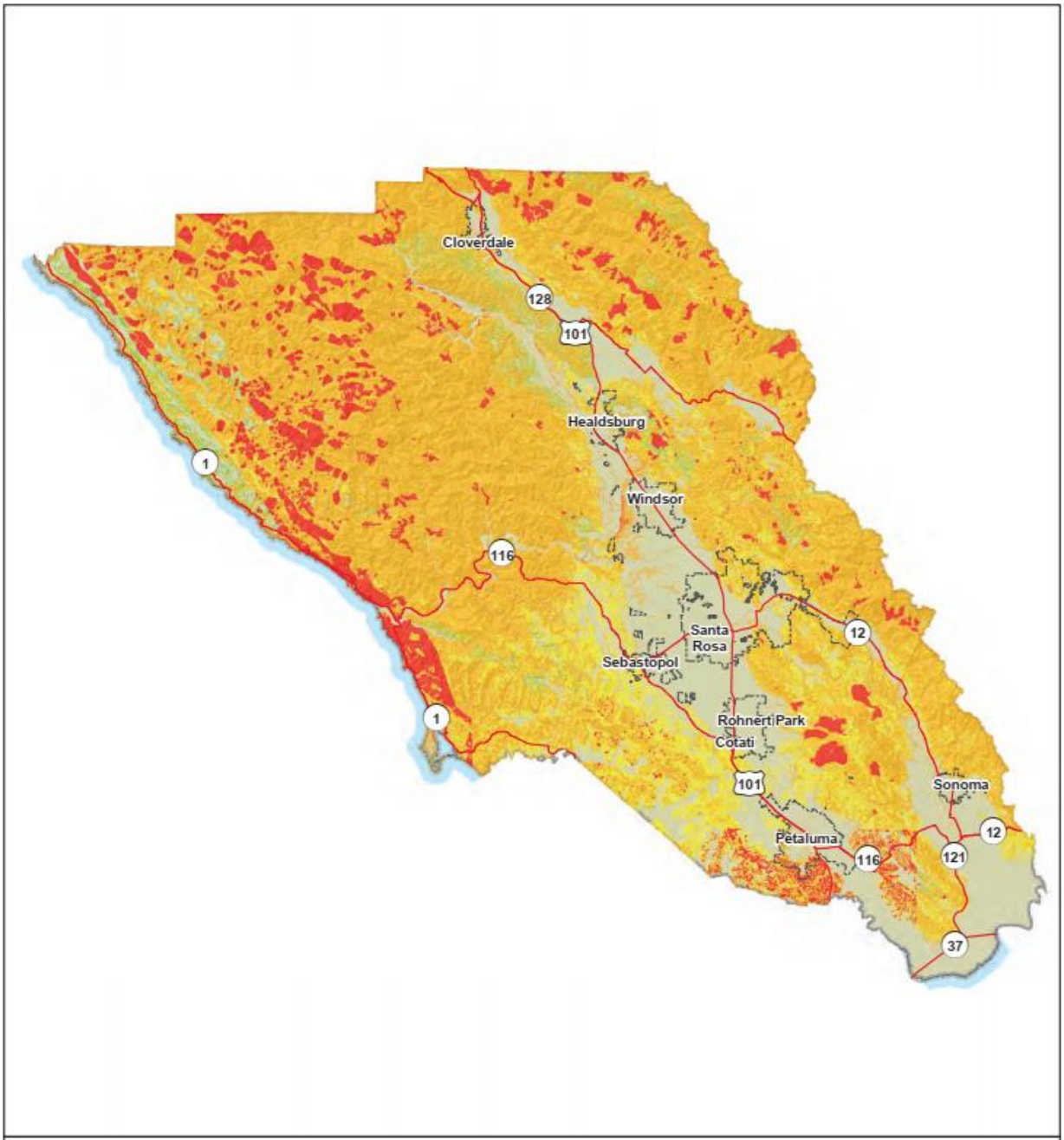
The most recent and most destructive mass movements in Sonoma County occurred in April 2006. Persistent heavy rainfall caused a massive number of landslides across the Sonoma and Marin County valleys area during the first half of April. About $20 million of damage was done to agriculture, with over $9 million spent on road repair damage in Sonoma County alone. Over $5 million worth of damage was done to single family dwellings in Sonoma - with lesser (but still substantial) amounts of damage experienced to businesses and public buildings. In Marin County the hardest hit areas were Mill Valley, Fairfax, and San Rafael. In Mill Valley, a man was killed after he was buried in a mudslide in his backyard.

The most extreme case occurred during the El Nino Winter Storms in January 1998. Landslides caused an estimated $21 million in damage at seven major locations as shown on **Map: Susceptibility to Deep-Seated Landslides**. The three most heavily damaged communities were: (1) Rio Nido, (2) Hidden Acres, and (3) Gold Ridge.

Specifically, in Rio Nido, two large debris flow failures traveled approximately 1,500 feet down a narrow ravine causing the destruction of three homes and damaging four others in Upper Canyon Three. The road and all underground and above-ground utilities were destroyed. The threat of further slippage of the main slide and resulting debris-flow activity forced the evacuation of 140 homes downslope from the slide. Residents were evacuated until the stability of the slides could be determined. Geologic studies were performed, and movement of the slides monitored for years. Evacuation zones maps were periodically revised, and residents gradually permitted to return to some areas.

Other damaging slides occurred in the communities of Monte Rio, Gold Ridge, Hidden Acres, Blucher Valley, Fitch Mountain, and the coastal community of Gleason's Beach.

## Map: Susceptibility to Deep-Seated Landslides
## (Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)



| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1a. |
|---|
| **Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Local Conditions** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b.** |
| **Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Local Conditions** below. |

## Local Conditions

Landslides are a significant tertiary hazard prevalent throughout the region, however they pose a relatively small danger to the Project Area for several reasons. Landslides tend to be localized and only a small portion, less than 10 percent of the high landslide hazard area has been urbanized.

The landslide hazard map below indicates areas of high and low landslide potential based on slope and earth materials; however, the risk of landslide would increase if these areas are subject to either strong earthquake shaking or ground saturation. Landslide risks increase significantly when rainfall saturates soil on steep slopes, triggering mud or debris flows.

In the Project Area, historic landslides are the best indicator of where landslides may occur in the future, unless the conditions that contributed to the prior landslide have been mitigated. Current Sonoma County codes prohibits construction of new structures on known landslide areas. However, existing developments with history of damaging landslides, remain at risk from future events.


### *Project Area Schools*

There are public schools and three public school office buildings in areas that are potentially at risk of landslides. Site specific investigations have not been conducted on individual buildings and actual risk is not known. See **Table: Critical Facilities Vulnerable to Hazards** for specific sites affected.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3a. |
|---|
| **Q:** Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Impacts of Landslides in the Project Area** below. |

## Impacts of Landslides in the Project Area

Based on the risk assessment, it is evident that landslides will continue to have potentially devastating economic impacts to the Project Area facilities. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life,
- ✓ Commercial and residential structural damage,
- ✓ Disruption of and damage to public infrastructure,
- ✓ Secondary health hazards e.g., mold and mildew,
- ✓ Damage to roads/bridges resulting in loss of mobility,
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community,
- ✓ Negative impact on commercial and residential property values, and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

## Issues Relating to Landslides

*The following information is drawn from the 2021 Sonoma County Multijurisdictional Hazard Mitigation Plan.*

Important issues associated with landslides in the planning area include the following:

- ✓ An accurate picture of where landslides occurred during previous storms is vital in making intelligent land use planning and mitigation decisions.
- ✓ Landslides may result in isolation of neighborhoods and communities, due to the fact that large portions of the transportation infrastructure are in areas of high and moderate slope instability. Isolation may result in food shortages, loss of power, and severely reduced economic productivity.
- ✓ There are critical facilities in areas of unstable slopes that could result in interruption to utility services, particularly water and power. This creates a need for mitigation and for continuity of operations planning to develop procedures for providing services without access to essential facilities.
- ✓ Landslides may result in loss of water quality to the environment and for drinking purposes, due to increased sediment delivery into surface waterways.
- ✓ There are existing homes in landslide hazard areas throughout the planning area. The degree of vulnerability of these structures depends on the codes and standards the structures were constructed to. Information to this level of detail is not currently available.
- ✓ The impact of climate change on landslides is uncertain. If climate change impacts the timing and intensity of rain event, then the frequency of landslide events may increase.
- ✓ The risk associated with the landslide hazard overlaps the risk associated with other hazards such as earthquake, flood, and wildfire. This provides an opportunity to seek mitigation alternatives with multiple objectives that can reduce risk for multiple hazards.

- ✓ California's Disclosures in Real Property Transactions law requires disclosure if a property is in a landslide hazard area. Such disclosure is dependent upon knowledge by the seller or the seller's real estate agent or the posting of a landslide hazard map at the offices of the County recorder, County assessor, and County planning agency and a notice identifying the location of the map and any changes to it.
- ✓ Future development could lead to more homes in landslide risk areas.
- ✓ Mapping and assessment of landslide hazards are constantly evolving. As new data and science become available, assessments of landslide risk should be reevaluated.
- ✓ Coastal bluff erosion is particularly susceptible to ocean wave height and the direction of wave approach. El Niño conditions often result in substantial increases of coastal bluff retreat. Roads and residential developments are most exposed to these hazards.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**A:** See **Summary of Vulnerability to Landslides** below.

## Summary of Vulnerability to Landslides

None of the SCOE properties are vulnerable to the impacts of landslides, however four participating districts including Fort Ross, Guerneville, Healdsburg, and Montgomery are vulnerable to landslides.

Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, failures associated with quarries, and open-pit mines, as well as within post-fire areas. Landslides may be triggered by both natural- and human-caused activity. In the vulnerable participating districts, landslides could cause damage to schools, as well as cause transportation issues that may affect one or more sites in the participating districts. This would affect both facilities and enrolled students. Utilities may be impacted, which could cut power or water to the participating district facilities. In some instances, injuries and deaths of students and staff could occur.

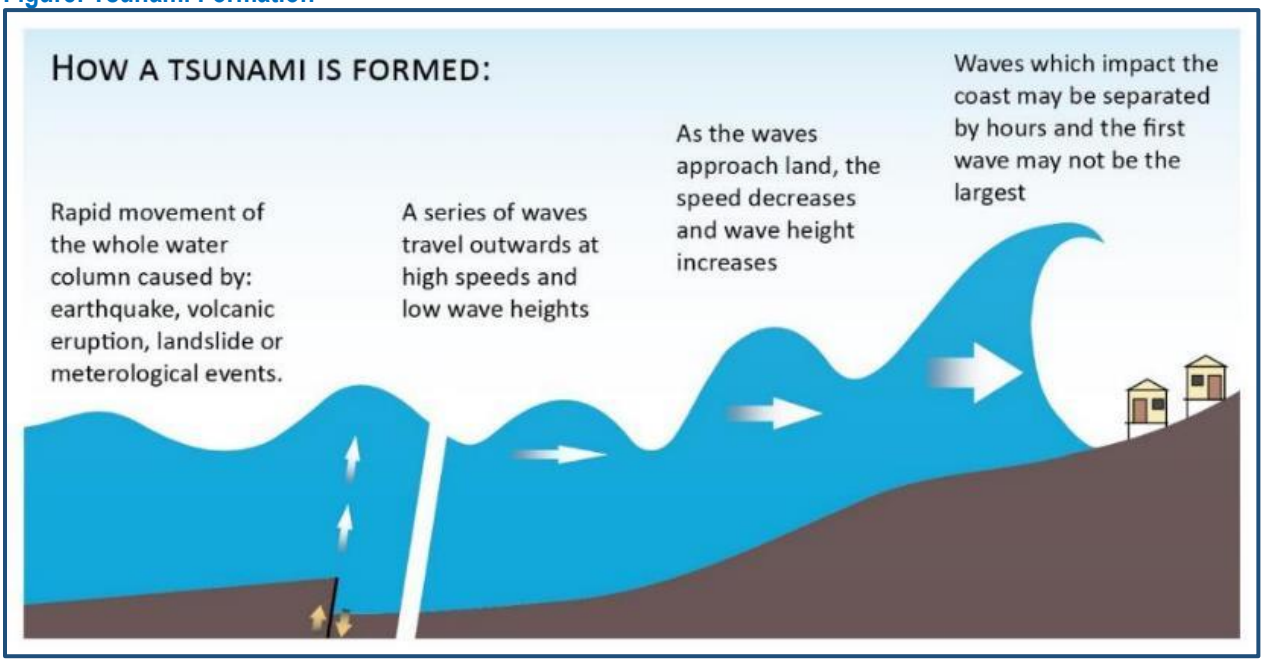
# Tsunami Hazards

## Hazard Definition

The phenomenon we call “tsunami” (soo-NAH-mee) is a series of traveling ocean waves of extremely long length generated primarily by earthquakes occurring below or near the ocean floor. Underwater volcanic eruptions and landslides can also generate tsunamis. In the deep ocean, the tsunami waves move with a speed exceeding 500 miles per hour, and a wave height of only a few inches. Tsunami waves are distinguished from ordinary ocean waves by their great length between wave crests, often exceeding 60 miles or more in the deep ocean, and by the time between these crests, ranging from 10 minutes to an hour.

As they reach the shallow waters of the coast, the waves slow down and the water can pile up into a wall of destruction up to 30 feet or more in height. The effect can be amplified where a bay, harbor or lagoon funnels the wave as it moves inland. Large tsunamis have been known to rise over 100 feet. Even a tsunami 1-3 feet high can inflict destructive damage and cause many deaths and injuries.

**Figure: Tsunami Formation**



## *Earthquakes and Tsunamis*


An earthquake can be caused by volcanic activity, but most are generated by movements along fault zones associated with the plate boundaries. Most strong earthquakes, representing 80% of the total energy released worldwide by earthquakes, occur in subduction zones where an oceanic plate slides under a continental plate or another younger oceanic plate.

Not all earthquakes generate tsunamis. To generate a tsunami, the fault where the earthquake occurs must be underneath or near the ocean and cause vertical movement of the sea floor over a large area, hundreds or thousands of square miles. "By far, the most destructive tsunamis are generated from large, shallow earthquakes with an epicenter or fault line near or on the ocean floor." The amount of vertical and horizontal motion of the sea floor, the area over which it occurs, the simultaneous occurrence of slumping of underwater sediments due to the shaking, and the efficiency with which energy is transferred from the earth's crust to the ocean water are all part of the tsunami generation mechanism. The sudden vertical displacements over such large areas disturb the ocean's surface, displace water, and generate destructive tsunami waves.

| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B2a.** |
|---|
| **Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i)) |
| **A:** See **Previous Occurrences of Tsunami in the Project Area** below. |

## Previous Occurrences of Tsunamis in the Project Area

Fortunately, the Project Area has never been impacted by a major tsunami event. The most recent tsunami warning occurred in March 2011. A magnitude 9.0 earthquake off the coast of Japan triggered a tsunami warning along the coast of Sonoma County. Although tsunami waves were only predicted to be an additional 2 feet, all Sonoma County coasts were closed, and coastal residents alerted. The tsunami warning did not cause any interruption to the Project Area.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1a. |
|---|
| **Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Local Conditions** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b.** |
| **Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Local Conditions** below. |

## Local Conditions

The County of Sonoma was officially recognized as a Tsunami Ready community in March 2016 by National Weather Service representatives. This designation recognizes voluntary community programs that promote collaborative tsunami hazard preparedness efforts. In order to become a Tsunami Ready community, the County developed a local Tsunami Response Plan, mapped inundation areas along the coast, identified evacuation routes, established refuge areas, installed over 160 tsunami signs in the hazard zones, provided education to the public, deployed and maintained redundant and reliable means to disseminate tsunami warnings and participated in readiness exercises.

Sonoma County's rugged cliffs and generally elevated coastline reduces its exposure and vulnerability to tsunamis. Areas with the greatest exposure to potential damage by a tsunami are the coastal communities along the southern Sonoma County coast from Jenner to Bodega Bay. Tsunami inundation maps for the Sonoma Coast area near Jenner, Bodega Bay, and the San Pablo Bay were released in 2009 and form the basis for the County's Tsunami Response Plan.

As indicated on the following map, areas of tsunami danger within Sonoma are limited to those with coastal exposure, namely in Archer Rock, Duncans Mills, Bodega Head, Valley Ford, Petaluma River, Sears Point, Cuttings Wharf, Petaluma Point, Mare Island, and Novato. Although there are multiple communities within tsunami inundation areas, SCOE facilities do not have coastal exposure and therefore are not anticipated to be directly affected by tsunamis. However, the Planning Team recognizes that the indirect impacts could be significant given the need for their facilities to be involved in host shelters and sharing of resources.

## Map: Tsunami Inundation Zones
## (Source: Sonoma County Multijurisdictional Hazard Mitigation Plan 2021)

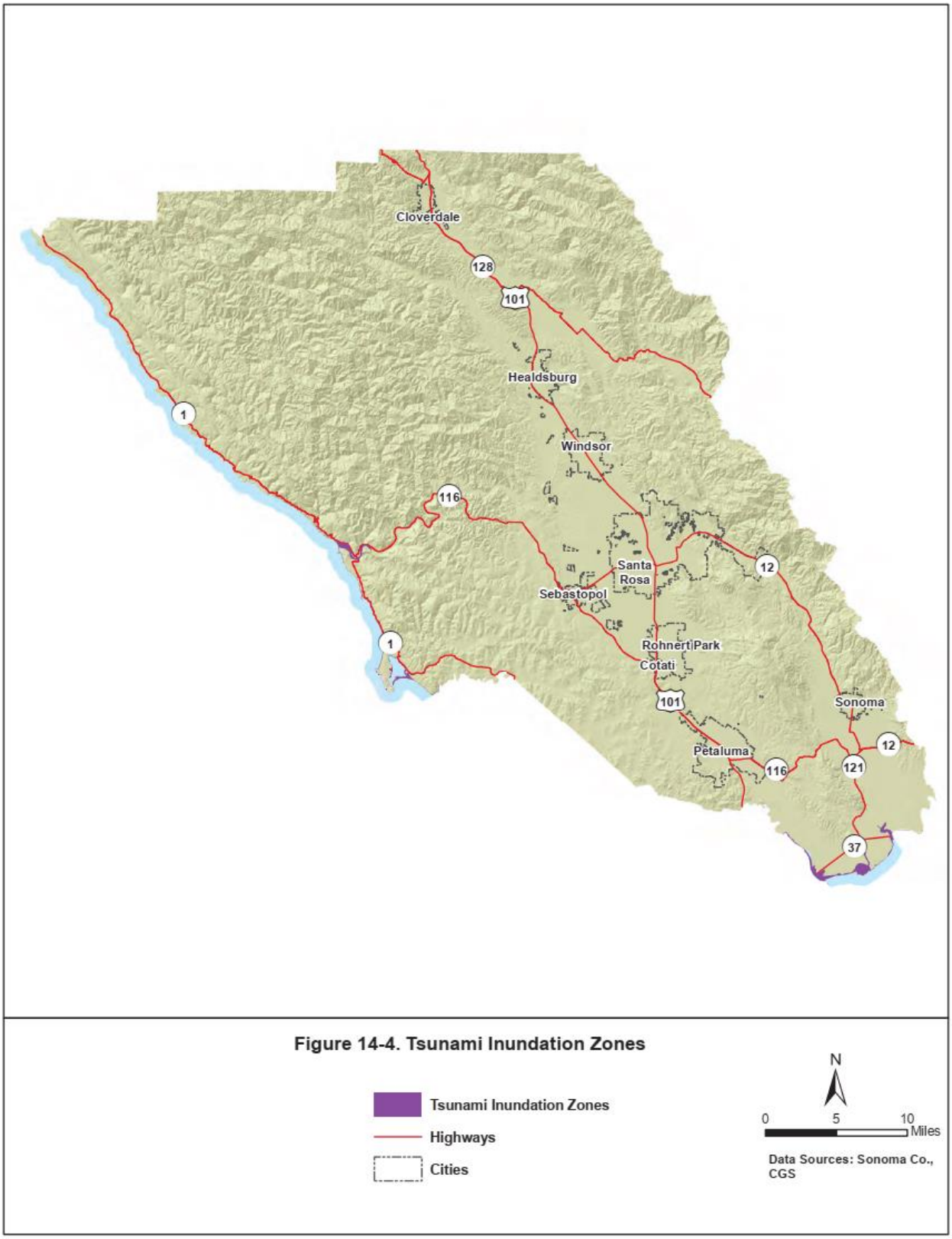



**Figure 14-4. Tsunami Inundation Zones**

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.**

**Q:** Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))
**A:** See **Impact of Tsunamis in the Project Area** below.

## Impact of Tsunamis in the Project Area

Based on the risk assessment, it is evident that tsunamis will continue to threaten the coastline of the Project Area. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life,
- ✓ Commercial and residential structural damage,
- ✓ Disruption of and damage to public infrastructure,
- ✓ Secondary health hazards e.g., mold and mildew,
- ✓ Damage to roads/bridges resulting in loss of mobility,
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community,
- ✓ Negative impact on commercial and residential property values, and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

## Issues Relating to Tsunamis

*The following information is drawn from the 2021 Sonoma County Multijurisdictional Hazard Mitigation Plan.*

Although there are no SCOE or District facilities threatened by tsunami. For the sake of awareness, the following information is offered for the overall County:

Important issues associated with a tsunami in the Project Area include the following:

- ✓ Many structures may not be designed to resist tsunami forces.
- ✓ Present building codes and guidelines do not adequately address the impacts of tsunamis on structures. It is anticipated that future updates to the California Building Code (and Field Act) will include amendments that address these issues.
- ✓ As tsunami warning technologies evolve, the tsunami warning capability within the Project Area will need to be enhanced to provide the highest degree of warning to planning partners with tsunami risk exposure.
- ✓ With the future impacts from climate change, the issue of sea level rise may become an important consideration as probable tsunami inundation areas are identified through future studies.
- ✓ Special attention will be focused on vulnerable communities and tourists in the tsunami zone and on hazard mitigation through public education and outreach.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))
**A:** See **Summary of Vulnerability to Tsunamis** below.

## Summary of Vulnerability to Tsunamis

None of the SCOE or District facilities or associated infrastructure are vulnerable to tsunami. However, it is certainly possible that any of the SCOE facilities could be indirectly impacted or be designated as possible shelters for community members in need of a temporary facility.

A tsunami is a series of great waves that are created by undersea disturbances, such as earthquakes or volcanic eruptions. As opposed to typical waves that crash at the shoreline, tsunamis bring a continuously flowing “wall of water” that has the potential to cause devastating damage in coastal areas immediately along the shore. Areas at greatest risk are less than 50 feet above sea level and within 1 mile of the shoreline. Most deaths that occur during a tsunami result from drowning. Associated risks include flooding, polluted water supplies, and damaged gas lines.

# Utility Related Hazards

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.**

**Q:** Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Previous Occurrences of Utility Related Hazards in the Project Area** below.

## Previous Occurrences of Utility Related Hazards in the Project Area

### *Power Failure/Stoppages*

Pacific Gas and Electric (PG&E) provides utility service to the Project Area. There have been brief power failures and deliberate outages as recent as October 2019 with impacts to 87,000 homes and businesses. If severe weather threatens a portion of the electric system, it may be necessary for PG&E to turn off electricity in the interest of public safety. Known as the Public Safety Power Shutoff program (PSPS), it was most recently activated during the Kincade Wildfire. *Note: any utility service-related wildfires are discussed in the Wildfire Hazards Section.*

### *Drought/Water Shortages*

The majority of impacts relating to drought to the Project Area result from distribution shortages that are regulated by utility providers. See **Local Conditions – Chart: 5-Year Drought History** below for historical information regarding drought in the Project Area.

### *Natural Gas Pipelines*

There have been no pipeline incidents posting a significant threat to the Project Area.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.**

**Q:** Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Local Conditions** below.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**A:** See **Local Conditions** below.

## Local Conditions

### *Power Failure and Stoppages*

Power failure is defined as any interruption or loss of electrical service caused by disruption of power transmission caused by accident, sabotage, natural hazards, or equipment failure (also

referred to as a loss of power or power outage). A significant power failure is defined as any incident of a long duration, which would require the involvement of the local and/or State emergency management organizations to coordinate provision of food, water, heating, cooling, and shelter. Power failures in the planning area are usually localized and are usually the result of a natural hazard event involving high winds or storms. Electricity throughout the project area is provided by Pacific Gas and Electric (PG&E).

The massive 2011 Southern California electricity outage brought to light many critical issues surrounding the state's power generation and distribution system, including its dependency on out-of-state resources. Although California has implemented effective energy conservation programs, the state continues to experience both population growth and weather cycles that contribute to a heavy demand for power.

Hydro-generation provides approximately 25% of California's electric power, with the balance coming from fossil fuels, nuclear, and green sources. As experienced in 2000 and 2001, blackouts can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption.

The effects of an energy shortage would affect all occupants of the project area. Perhaps most at risk would be medically challenged individuals with health care equipment reliant on electricity (e.g., oxygen), businesses, emergency service locations, and vulnerable population centers (e.g., schools).

In 2018, the California Public Utilities Commission (CPUC) directed California's three largest energy companies to coordinate to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may now be shut off for reasons of public safety. This new protocol is referred to as Public Safety Power Shutoff (PSPS).

### *Drought/Water Shortages*

It's impossible to separate drought from water supply shortages. Drought is defined as a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal". It is also related to the timing (e.g., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness of the rains (e.g., rainfall intensity, number of rainfall events).

Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Human beings often exacerbate the impact of drought. Recent droughts in both developing and developed countries and the resulting economic and environmental impacts and personal hardships have underscored the vulnerability of all societies to this natural hazard.

One dry year does not normally constitute a drought in California but serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure — its

reservoirs, groundwater basins, and inter-regional conveyance facilities — mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multiyear period. There is no universal definition of when a drought begins or ends. Impacts of drought are typically felt first by those most reliant on annual rainfall -- ranchers engaged in dry land grazing, rural residents relying on wells in low-yield rock formations, or small water systems lacking a reliable source. Criteria used to identify statewide drought conditions do not address these localized impacts. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

There are four different ways that drought can be defined:

- **Meteorological** - a measure of departure of precipitation from normal. Due to climatic differences, what is considered a drought in one location may not be a drought in another location.
- **Agricultural** - refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.
- **Hydrological** - occurs when surface and subsurface water supplies are below normal.
- **Socioeconomic** - refers to the situation that occurs when physical water shortage begins to affect people.

The U.S. Drought Monitor (USDM) is a map that is updated weekly to show the location and intensity of drought across the country. The USDM uses a five-category system (USDM, 2021):

• D0—Abnormally Dry
  - Short-term dryness slowing planting, growth of crops
  - Some lingering water deficits
  - Pastures or crops not fully recovered

• D1—Moderate Drought
  - Some damage to crops, pastures

- Some water shortages developing
- Voluntary water-use restrictions requested

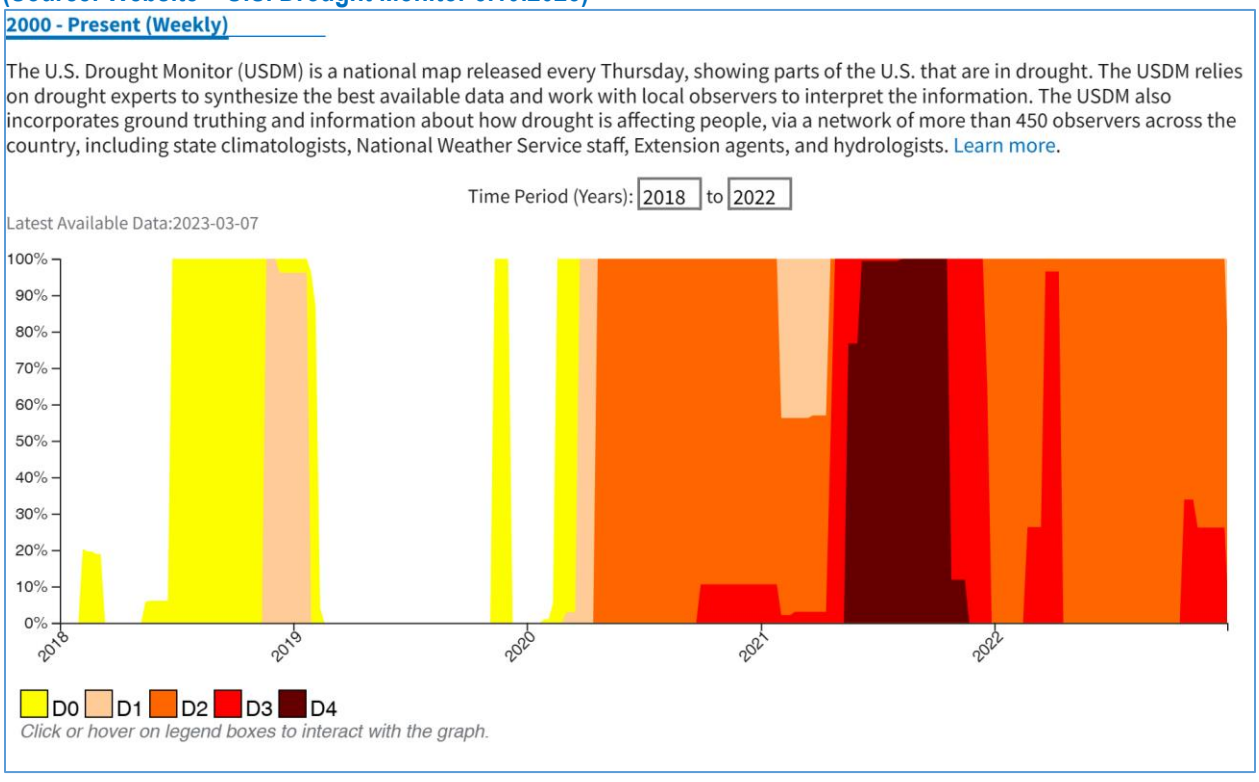
• D2—Severe Drought
- Crop or pasture loss likely
- Water shortages common
- Water restrictions imposed

• D3—Extreme Drought
- Major crop/pasture losses
- Widespread water shortages or restrictions

• D4—Exceptional Drought
- Exceptional and widespread crop/pasture losses
- Shortages of water creating water emergencies

The USDM categories show experts' assessments of conditions related to drought. These experts check variables including temperature, soil moisture, stream flow, water levels in reservoirs and lakes, snow cover, and meltwater runoff. They also check whether areas are showing drought impacts such as water shortages and business interruptions. Associated statistics show what proportion of various geographic areas are in each category of dryness or drought, and how many people are affected. U.S. Drought Monitor data go back to 2000.

**Chart: 5-Year Drought History - Sonoma County, California**
**(Source: Website – U.S. Drought Monitor 3.10.2023)**



**U.S. Drought Monitor – Sonoma County, California**
**(Source: Website – U.S. Drought Monitor 12.15.2022)**

U.S. Drought Monitor

Current Map | Maps | Data | Summary | About | Conditions & Outlooks | En Español | NADM

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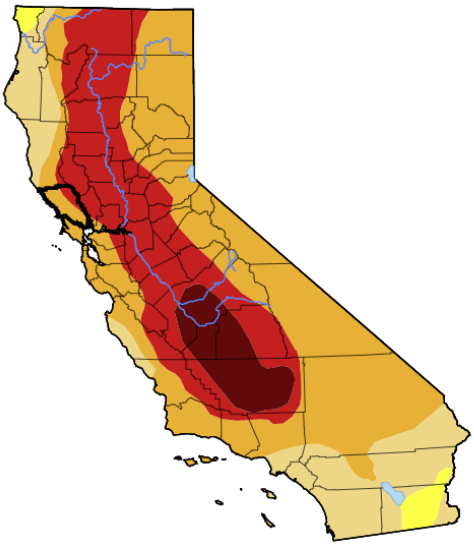
## Sonoma County, CA



**Map released: Thurs. December 15, 2022**

Data valid: December 13, 2022 at 7 a.m. EST

**Intensity**

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

**Authors**

United States and Puerto Rico Author(s):
Curtis Riganti, National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):
Denise Gutzmer, National Drought Mitigation Center

| Week | Date | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 | DSCI |
|---|---|---|---|---|---|---|---|---|
| Current | 2022-12-13 | 0.00 | 100.00 | 100.00 | 100.00 | 26.16 | 0.00 | 326 |
| Last Week | 2022-12-06 | 0.00 | 100.00 | 100.00 | 100.00 | 26.16 | 0.00 | 326 |
| 3 Months Ago | 2022-09-13 | 0.00 | 100.00 | 100.00 | 100.00 | 0.00 | 0.00 | 300 |
| Start of Calendar Year | 2021-12-28 | 0.00 | 100.00 | 100.00 | 100.00 | 0.00 | 0.00 | 300 |
| Start of Water Year | 2022-09-27 | 0.00 | 100.00 | 100.00 | 100.00 | 0.00 | 0.00 | 300 |
| One Year Ago | 2021-12-14 | 0.00 | 100.00 | 100.00 | 100.00 | 100.00 | 0.00 | 400 |

Additionally, the long-term effects of climate change on regional water resources are unknown, but global water resources are already stressed without climate change. Current stresses on water resources include:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban water infrastructure

With a warmer climate, droughts could become more frequent, more severe, and longer lasting. The drought of the late 1980s showed what the impacts might be if climate change leads to a change in the frequency and intensity of droughts across the United States. From 1987 to 1989, losses from drought in the United States totaled $39 billion (OTA, 1993). More frequent extreme events such as droughts and floods could end up being more cause for concern than the long-term change in temperature and precipitation averages.

## *Natural Gas Pipelines*

There are several major natural gas pipelines that traverse the planning area as shown on **Map: California Natural Gas Utility Service Area**. While pipelines are often thought of as presenting risks to communities, natural hazards can impact the integrity of pipelines. According to the U.S. Department of Transportation, although natural hazards are cited as the cause in fewer than ten percent (10%) of pipeline incidents, the failure of a large-diameter, high-pressure natural gas or hazardous liquid transmission pipeline during an earthquake can significantly complicate a communities' ability to respond and recover from the event. Natural gas is supplied to the planning area by Pacific Gas & Electric (PG&E).

On September 9, 2010, a 30-inch steel natural gas transmission pipeline owned and operated by PG&E ruptured and exploded in the City of San Bruno residential neighborhood. The blast and ensuing inferno resulted in 8 confirmed deaths, 66 reported injuries, 34 destroyed structures, and 8 damaged structures. Cal OES has identified preliminary damage estimates at $15.4 million, including $2.5 million for debris removal, $10.2 million for protective measures, $2.1 million for roads and bridges, and $0.6 million for utilities and other facilities. Investigations into the cause of the explosion are under way by the National Safety Transportation Board (NSTB), the California Public Utilities Commission (CPUC), and PG&E. Although it will not be confirmed until official investigations are completed, initial speculation points to the weakening of the 60-year-old pipeline due to corrosion. The day after the explosion, the CPUC asked PG&E to provide a list of its top 100 high-priority projects to upgrade or replace portions of the pipeline for reasons of public safety, as well as information on the status of listed projects. The list was published on September 21, 2010. Although targeted for repair several years ago, the San Bruno pipeline was not on the list.

Virtually all natural gas, which accounts for about 28 percent of energy consumed annually, is transported by transmission pipelines. Although California is a leader in exploring and implementing alternative energy sources such as wind and solar, the expansion of traditional energy sources, such as natural gas, continues. There are natural gas transmission pipelines within the Project Area, as well as adjoining communities.

Map: California Natural Gas Utility Service Area (Source: California Energy Commission, Date: 2020)

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3a. |
|---|
| **Q:** Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Impact of Utility Related Hazards in the Project Area** below. |

## Impacts of Utility Related Hazards in the Project Area

Based on the risk assessment, it is evident that Utility-Related hazards will continue to have potentially devastating impacts to certain portions of the Project Area.

Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life,
- ✓ Commercial and residential structural damage,
- ✓ Disruption of and damage to public infrastructure,
- ✓ Significant economic impact,
- ✓ Negative impact on commercial and residential property values, and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

## Issues Relating to Utility Related Hazards

Important issues associated with utility related events include the following:

- ✓ A large percentage of the Project Area could be impacted all at the same time which would significantly impact emergency services capabilities.
- ✓ In the event of a power outage, it may be necessary for the utility provider to assist certain properties with reactivation.
- ✓ In the event of an outage of natural gas or propane, the utility provider may be required to assist customers with reactivation.
- ✓ Transportation systems in the planning area after an outage has the potential to significantly disrupt response and recovery efforts and lead to isolation of populations.
- ✓ Results loss of heating and air conditioning systems can impact comfort and safety levels for building occupants.
- ✓ Infrastructure-related computer systems are vulnerable to power outages.
- ✓ Schools and other educational facilities would be expected to be self-sufficient during outages and may be compromised as to decreased services from government response agencies, utilities, private-sector services, and infrastructure components.
- ✓ Lack of refrigeration would impact storage of onsite medicines, food, and other supplies.
- ✓ The flow of goods and services could result due to impacts to major transportation infrastructure across the broader region.
- ✓ A power outage can compromise or damage communication systems, complicating efforts to coordinate response to the event.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b. |
|---|
| **Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Summary of Vulnerability to Utility Related** below. |

## Summary of Vulnerability to Utility Related

The following is a summary of vulnerability to utility related events. All of SCOE-owned properties would be impacted by a utility related event including SCOE's Main Facility, Legal Facility, Overflow Parking Lot, Valley of the Moon, Juniper Shop Facility, CBI, Sonoma Valley – Sassari Elementary, Petaluma City – 4C's McDowell Elementary, and SELPA Properties Lewis Opportunity School, Headwaters Academy, Sonoma Community Center (SE), and SCOE Alternative Education Properties Satellite Office Space, and Amarosa Academy including a total of approximately 325 occupants, 12 buildings, and property/contents valued at $51 million. These estimates are based on 2023.

Public Safety Power Shutoff (PSPS) can be initiated by PG&E for a range of reasons including wildfire, high wind, severe weather, flooding, and earthquake. The power shutoffs are initiated in large areas within the County so property may not even be impacted by the initial event but still impacted by the power shutoff.

Drought is a much slower moving hazard. Severe reductions and shutoffs can take place following a broken water main or during major repairs. It is possible that water agencies could resort to restrictions rather than just fines.

# Epidemic/Pandemic/Vector-Borne Disease Hazards

## Hazard Definition

According to the California State Hazard Mitigation Plan (2018), the California Department of Public Health has identified epidemics, pandemics, and vector-borne diseases as specific hazards that would have a significant impact throughout the State.

According to the Centers for Disease Control (CDC), an epidemic refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population area. A pandemic refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors – living organisms that can transmit infectious pathogens between humans, or from animals to humans.

### Seasonal Influenza

Seasonal influenza, also known as the flu, is a disease that attacks the respiratory system (nose, throat, and lungs) in humans. Seasonal influenza occurs every year. In the U.S., the influenza season typically occurs from October through May, peaking in January or February with yearly epidemics of varying severity. Although mild cases may be similar to a viral "cold," influenza is typically much more severe. Influenza usually comes on suddenly; may include fever, headache, tiredness (which may be extreme), dry cough, sore throat, nasal congestion, and body aches; and can result in complications such as pneumonia. Persons aged 65 and older, those with chronic health conditions, pregnant women, and young children are at the highest risk for serious complications, including death.

### *Pandemic Influenza*

Pandemic influenza occurs when a new influenza virus, for which there is little or no human immunity, emerges and spreads on a worldwide scale, infecting a large proportion of the human population. The 20th century saw three such pandemics. The most notable pandemic was the 1918 Spanish influenza pandemic that was responsible for 20 million to 40 million deaths throughout the world. There have been two pandemics in the 21st century; H1N1 in 2009, and the most recent COVID-19 outbreak in 2019. As demonstrated historically and currently, pandemic influenza has the potential to cause serious illness and death among people of all age groups and have a major impact on society. These societal impacts include significant economic

disruption that can occur due to death, loss of employee work time, and costs of treating or preventing the spread of influenza.

| Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B1a. |
|---|
| Q: Does the plan include a general description of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))<br>**A:** See **Local Conditions** below. |
| **Q&A \| ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT \| B3b.** |
| Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))<br>**A:** See **Local Conditions** below. |

## Local Conditions

### *H1N1 Influenza*

In 2009 a pandemic of H1N1 influenza, popularly referred to as the swine flu, resulted in many hospitalizations and deaths. Pandemic H1N1 influenza is spread in the same way as seasonal influenza, from person to person through coughing or sneezing by infected people. In April 2009, two kids living more than 100 miles apart in Southern California came down with the flu. By mid-April, their illnesses had been diagnosed as being caused by a new strain of H1N1 influenza. Persons infected with H1N1 experienced fever and mild respiratory symptoms, such as coughing, runny nose, and congestion. In some cases, symptoms were severe and included diarrhea, chills, and vomiting, and in rare cases respiratory failure occurred. The H1N1 virus caused relatively few deaths in humans. In the United States, for example, it caused fewer deaths (between 8,870 and 18,300) than seasonal influenza, which, based on data for the years 2014–2019, causes an average of about 40,000 deaths each year. The H1N1 virus was most lethal in individuals affected by chronic disease or other underlying health conditions.

### *COVID-19*

As of 2020, the CDC is responding to a pandemic of respiratory disease spreading from person to person caused by a novel (new) coronavirus. The disease has been named "Coronavirus Disease 2019" (abbreviated "COVID-19"). Coronaviruses are a large family of viruses that are common in people and many different species of animals, including camels, cattle, cats, and bats. Rarely, animal coronaviruses can infect people and then spread between people such as with Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).

According to the CDC, many of the patients at the epicenter of the outbreak in Wuhan, Hubei Province, China had some link to a large seafood and live animal market, suggesting animal-to-person spread. Later, a growing number of patients reportedly did not have exposure to animal markets, indicating person-to-person spread. Person-to-person spread was subsequently reported outside Hubei and in countries outside China, including in the United States. Most international destinations now have ongoing community spread with the virus that causes COVID-19, as does the United States.

On March 4, 2020, Governor Newsom proclaimed a state of emergency for California in response to the COVID-19 outbreak. On March 19, 2020, Governor Newsom issued an executive order

directing all residents immediately to heed current State public health directives to stay home, except as needed to maintain continuity of operations of essential critical infrastructure sectors.


According to the 2021 Sonoma County Multijurisdictional Hazard Mitigation Plan, in March 2020, Sonoma County was included in the FEMA Major Disaster Declaration for the COVID-19 coronavirus pandemic. As of January 2021, about 23,000 people, or 4.57 percent of the Sonoma County population, had contracted the coronavirus and 234 people, 1.01 percent of the population, had died from it (Sonoma County Emergency 2021). As of January 2021, over 18,000 people in Sonoma County had received the COVID-19 vaccine (Sonoma County Emergency 2021).

## *Avian Influenza*

Avian Influenza, commonly referred to as “Bird Flu,” remains a looming pandemic threat. Avian Influenza primarily spreads from birds to birds and rarely to humans. Public health experts continue to be alert to the possibility that an avian virus may mutate or change so that it can be passed from birds to humans, potentially causing a pandemic in humans. Some strains of the Avian Influenza could arise from Asia or other continents where people have very close contact with infected birds. This disease could have spread from poultry farmers or visitors to live poultry markets who had been in very close contact with infected birds and contracted fatal strains of Avian Influenza. Thus far, Avian Influenza viruses have not mutated and have not demonstrated easy transmission from person to person. However, if Avian Influenza viruses were to mutate into a highly virulent form and become easily transmissible from person to person, the public health community would be very concerned about the potential for an influenza pandemic. Such a pandemic could disrupt all aspects of society and severely affect the economy.

## *Vector-Borne Diseases*

Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors. Every year there are more than 700,000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis and onchocerciasis. Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many of these vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it into a new host, after the pathogen has replicated. Often, once a vector becomes infectious, they can transmit the pathogen for the rest of their life during each subsequent bite/blood meal.

## *Mosquito-Borne Viruses*

Mosquito-borne viruses belong to a group of viruses commonly referred to as arboviruses (for arthropod-borne). Although 12 mosquito-borne viruses are known to occur in California, only West Nile virus (WNV), western equine encephalomyelitis virus (WEE), and St. Louis encephalitis virus (SLE) are significant causes of human disease. WNV continues to seriously affect the health of humans, horses, and wild birds throughout the state. Since 2003, there have been over 6,000 WNV human cases with 248 deaths, and over 1,200 equine cases.

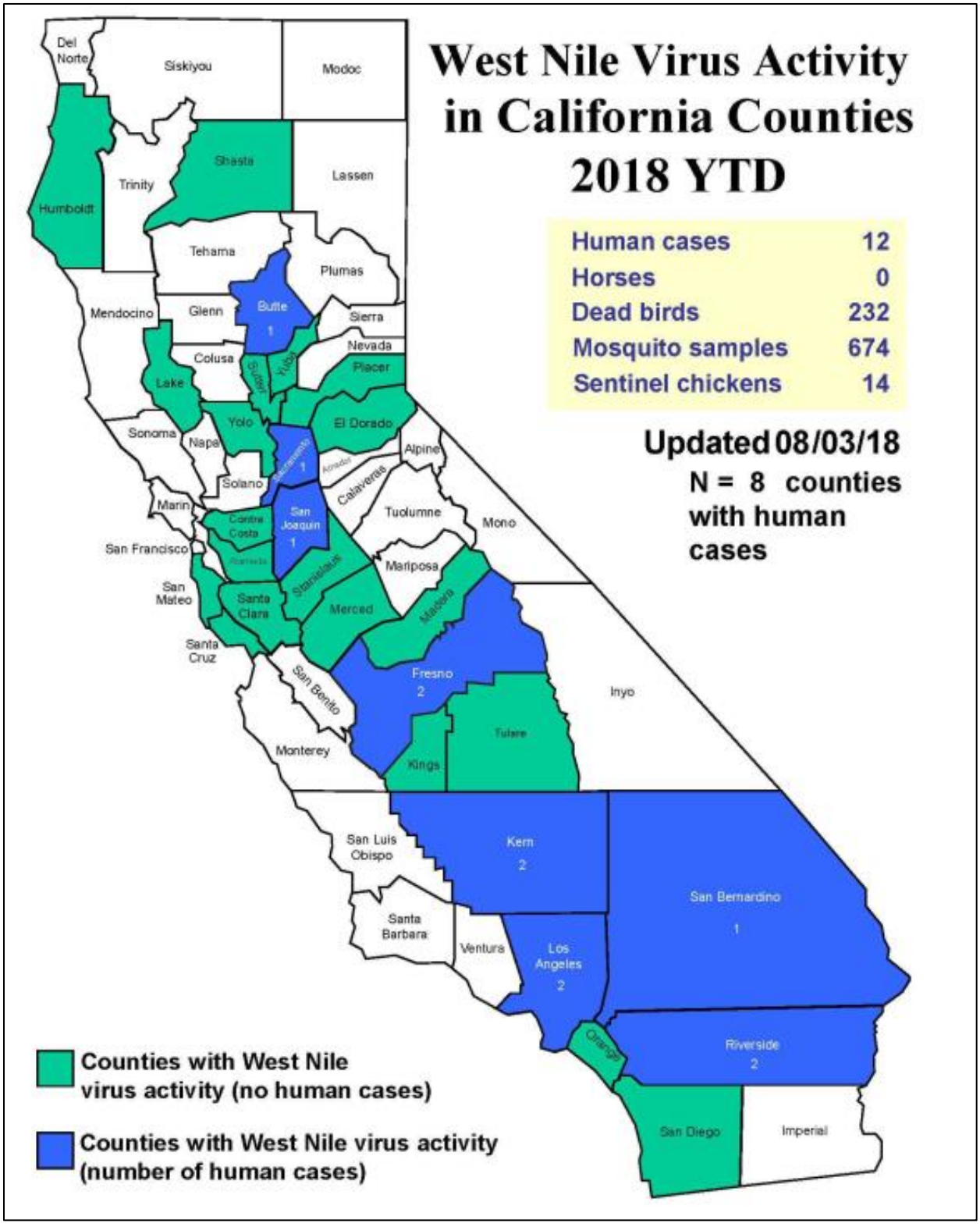
WNV first appeared in the United States in 1999 in New York and rapidly spread across the country to California in subsequent years. California has historically maintained a comprehensive mosquito-borne disease surveillance and control program including the Mosquito-borne Virus Surveillance and Response Plan, which is updated annually in consultation with local vector control agencies.

Climate change will likely affect vector-borne disease transmission patterns. Changes in temperature and precipitation can influence seasonality, distribution, and prevalence of vector-borne diseases. A changing climate may also create conditions favorable for the establishment of invasive mosquito vectors in California.

For most Californians, WNV poses the greatest mosquito-borne disease threat. Above-normal temperatures are among the most consistent factors associated with WNV outbreaks. Mild winters are associated with increased WNV transmission due, in part, to less mosquito and resident bird mortality. Warmer winter and spring seasons may also allow for transmission to start earlier. Such conditions also allow more time for virus amplification in bird-mosquito cycles, increasing the potential for mosquitoes to transmit WNV to people.

The effects of increased temperature are primarily through acceleration of physiological processes within mosquitoes, resulting in faster larval development and shorter generation times, more frequent mosquito biting, and shortening of the incubation period time required for infected mosquitoes to transmit WNV. During periods of drought, especially in urban areas, mosquitoes tend to thrive more due to changes in stormwater management practices. Mosquitoes in urban areas can reach higher abundance due to stagnation of water in underground stormwater systems that would otherwise be flushed by rainfall. Runoff from landscape irrigation systems mixed with organic matter can also create ideal mosquito habitat. Drought conditions may also force birds to increase their utilization of suburban areas where water is more available, bringing these WNV hosts into contact with urban vectors.

**Map: West Nile Virus Activity in California Counties**
**(Source: California State Hazard Mitigation Plan - 2018)**

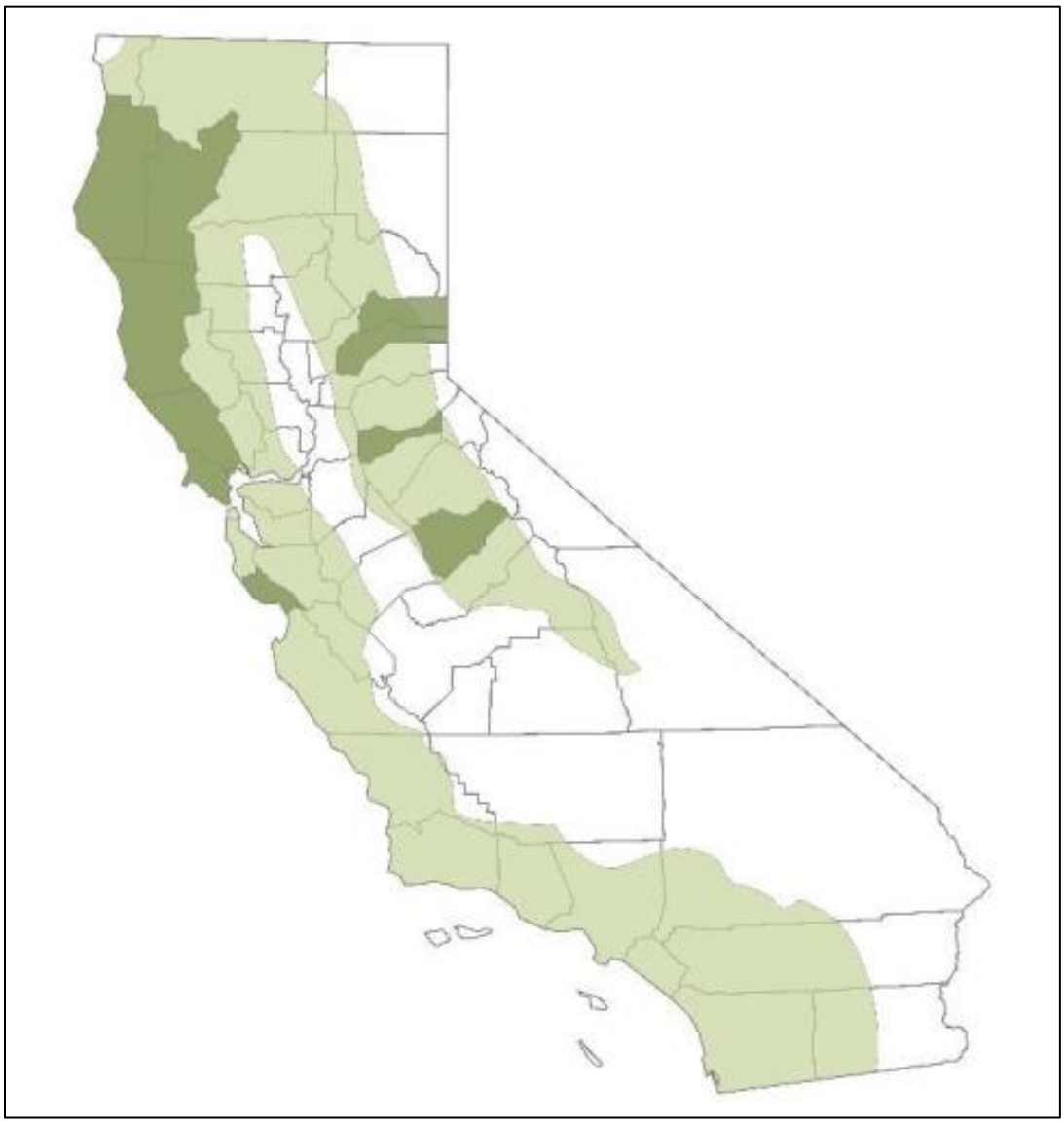


## *Lyme Disease*

Lyme disease is caused by a spirochete (a corkscrew-shaped bacteria) called Borrelia burgdorferi and is transmitted by the Western black-legged tick. Lyme disease was first described in North America in the 1970s in Lyme, Connecticut, the town for which it was then named. Though the tick has been reported from 56 of the 58 counties in California, the highest incidence of disease occurs in the northwest coastal counties and northern Sierra Nevada counties with western-facing slopes. Ticks prefer cool, moist areas and can be found in wild grasses and low vegetation in both urban and rural areas.

The map below shows Western black-legged tick and Lyme disease incidence in California. The Western black-legged tick is commonly found in all green areas shown on the map; dark green areas on the map show where reported Lyme disease cases most often had exposure.

**Map: Tick and Lyme Disease Incidence in California**
**(Source: California State Hazard Mitigation Plan - 2018)**



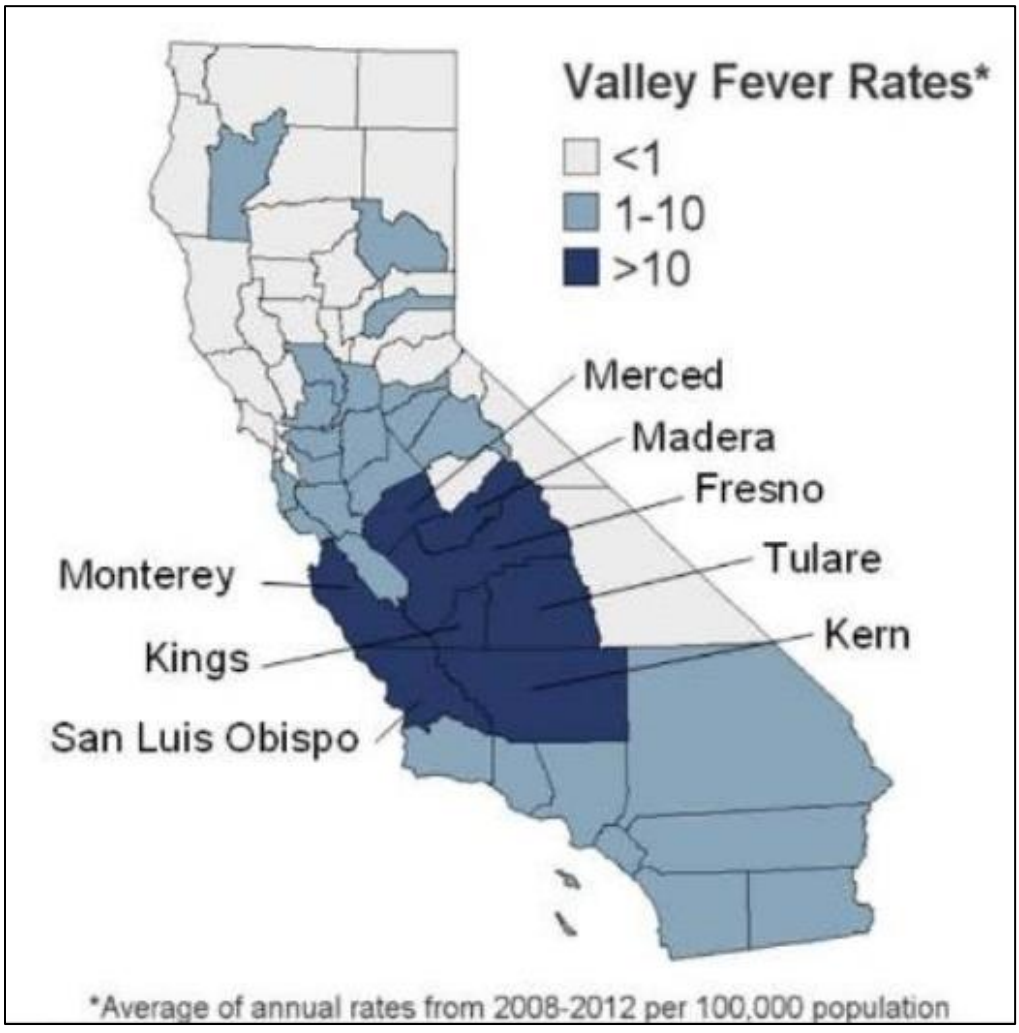
## *Valley Fever*

Valley Fever is caused by Coccidioides, a fungus that lives in the soil in the southwestern United States and parts of Mexico, Central America, and South America. Inhaling the airborne fungal spores can cause an infection called coccidioidomycosis, which is also known as "cocci" or "Valley Fever."

Most people who are exposed to the fungus do not get sick, but some people develop flu-like symptoms that may last for weeks to months. In a very small proportion of people who get Valley Fever, the infection can spread from the lungs to other parts of the body and cause more severe conditions, such as meningitis or even death. Valley Fever cannot spread from person to person.

Most cases of Valley Fever in the U.S. occur in people who live in or have traveled to the southwestern United States, especially Arizona and California. The map below shows the areas where the fungus that causes Valley Fever is thought to be endemic, or native and common in the environment. The full extent of the current endemic areas is unknown and is a subject for further study

**Map: Valley Fever Average Annual Rates by California County**
**(Source: California State Hazard Mitigation Plan - 2018)**



**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.**

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

**A:** See **Previous Occurrences of Epidemic/Pandemic/Vector-Borne Diseases in the Project Area** below.

## Previous Occurrences of Epidemic/Pandemic/Vector-Borne Diseases in the Project Area

The most recent outbreak to affect SCOE is the current COVID-19 pandemic. On March 14, 2020, SCOE recommended that all Sonoma County school districts temporarily close and suspend classes. Following the school closures, SCOE transitioned to distance learning for all students on March 25th. During this time, SCOE and school districts across the county rapidly adapted to the emergency by providing remote learning, “grab-and-go" meal distribution, pop-up childcare for emergency/medical providers and telecommuting.

On June 12, 2020, SCOE, in collaboration with the Sonoma County Department of Health Services and a committee of regional superintendents, released a document of guiding principles and planning considerations that schools and districts should consider when making plans for opening the 2020-2021 school year. Each district will be responsible for creating its own reopening plan.

The guidance is intended to help school districts plan for the next school year, with the acknowledgment that COVID-19 presents an ever-changing set of challenges. As the COVID-19 situation evolves, and as additional guidance from the State and Sonoma County Department of Health Services is issued during the summer, local school districts will adjust as needed.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.**

Q: Is there a description of each hazard’s impacts on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

**A:** See **Impact of Epidemic/Pandemic/Vector-Borne Diseases in the Project Area** below.

## Impact of Epidemic/Pandemic/Vector-Borne Diseases in the Project Area

Based on the risk assessment, it is evident that Epidemic/Pandemic/Vector-Borne Diseases will continue to have potentially devastating economic impacts to SCOE. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Disruption of public infrastructure
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to citizens as facilities, businesses, and public areas could be closed
- ✓ Significant decrease in convenience of shopping
- ✓ Business operations may be closed or limited to essential and critical needs only

## Issues Relating to Epidemic /Pandemic/ Vector-Borne Diseases

Important issues associated with Epidemic / Pandemic / Vector-Borne include the following:

- ✓ A large percentage of the Project Area could be impacted all at the same time which would significantly impact emergency services capabilities.
- ✓ In the event separation or isolation of the populations becomes necessary, schools will be significantly impacted and delivery methods re-examined.
- ✓ Depending on the severity of the situation, it may be necessary to have remote access to computer and control systems.
- ✓ As seen during COVID-19, schools need to be prepared to distance and/or isolate students and staff. The actual disease or outbreak will dictate public health protocols.
- ✓ Transportation systems may be altered or discontinued which will compromise the abilities of staff and parents to be on time.
- ✓ HVAC systems may need to shut down or filters changed more frequently.
- ✓ If an outbreak occurs in a school, the facility may be directed to shelter in place until onsite medical resources can be provided and occupants released for advanced or home care.

**Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.**

**Q:** Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

**A:** See **Summary of Vulnerability to Epidemic / Pandemic / Vector-Borne Diseases** below.

## Summary of Vulnerability to Epidemic / Pandemic / Vector-Borne Diseases

The following is a summary of vulnerability to epidemic / pandemic / vector-borne diseases. All of SCOE's properties could be impacted by any of these events including SCOE's Main Facility, Legal Facility, Overflow Parking Lot, Valley of the Moon, Juniper Shop Facility, CBI, Sonoma Valley – Sassari Elementary, Petaluma City – 4C's McDowell Elementary, and SELPA Properties Lewis Opportunity School, Headwaters Academy, Sonoma Community Center (SE), and SCOE Alternative Education Properties Satellite Office Space, and Amarosa Academy including a total of approximately 325 occupants, 12 buildings, and property/contents valued at $51 million. These estimates are based on 2023.

As with COVID-19, it's very possible that future events will also involve entire regions. As such, social distancing and business closures can curtail SCOE's capability to provide services to the districts. Larger events could also include problems with supply chain, and delivery of utility-related services including water and electricity.

Students, parents, and staff can be directly and indirectly involved. Public transportation could be minimized or eliminated. As discussed above in "Issues", many onsite capacities could be impacted including use of HVAC systems requiring filter replacements. Also, large demands could be placed on custodial services.

# PART III: MITIGATION STRATEGIES

## Mitigation Strategies

### Overview of Mitigation Strategy

As the cost of damage from disasters continues to increase nationwide, SCOE recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from natural hazards by identifying resources, information and strategies for risk reduction, while helping to guide and coordinate mitigation activities at SCOE facilities.

The plan provides a set of action items to reduce risk from hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the Project Area
2. Identify and prioritize future mitigation projects
3. Assist in meeting the requirements of federal assistance programs

The Mitigation Plan is integrated with other plans including the jurisdictional Emergency Operations Plans.

### Mitigation Measure Categories

Following is FEMA's list of mitigation categories. The activities identified by the Planning Team are consistent with the six broad categories of mitigation actions outlined in FEMA publication 386-3 *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*.

- ✓ **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- ✓ **Property Protection:** Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- ✓ **Public Education and Awareness:** Actions to inform and educate citizens, property owners, and elected officials about hazards and potential ways to mitigate them.

  Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- ✓ **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses preserve or restore the functions of natural systems. Examples include sediment and

erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- ✓ **Emergency Services:** Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- ✓ **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.

| Q&A \| ELEMENT C. MITIGATION STRATEGY \| C3 |
|---|
| **Q:** Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))<br>**A:** See **Goals** below. |
| **Q&A \| ELEMENT D. MITIGATION STRATEGY \| D3** |
| **Q:** Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))<br>**A:** See **Mitigation Actions Matrix** below. |

## Goals

The Executive Planning Team established goals based on the risk assessment that represent a long-term vision for hazard reduction and enhanced mitigation capabilities. Each goal is supported by mitigation action items. The Executive Planning Team developed these action items through its knowledge of the local area, risk assessment, review of past efforts, identification of mitigation activities, and qualitative analysis.

The five mitigation goals and descriptions are listed below.

### *Protect Life and Property*

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural, human-caused, and technological hazards. Improve hazard assessment information to make recommendations for avoiding new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.

### *Increase Public Awareness*

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards. Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

### *Protect Natural Systems*

Support management and land use planning practices with hazard mitigation to protect life. Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.

### *Promote Partnerships and Implementation*

Strengthen communication and coordinate participation with public agencies, riders, non-profit organizations, business, and industry to support implementation. Encourage leadership within SCOE and public organizations to prioritize and implement local and regional hazard mitigation activities.

## *Enhance Emergency Services*

Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure. Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry. Coordinate and integrate hazard mitigation activities where appropriate, with emergency operations plans and procedures.

**Q&A | ELEMENT C. MITIGATION STRATEGY | C5a.**

**Q:** Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

**A:** See **Benefit/Cost Ratings** and **Priority Rating** below.

## *Benefit/Cost Ratings*

The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Building Resilient Infrastructure and Communities (BRIC) grant programs. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

**Cost ratings** were defined as follows:

**High:** Existing jurisdictional funding will not cover the cost of the action item so outside sources of revenue would be required.

**Medium:** The action item could be funded through existing jurisdictional funding but would require budget modifications.

**Low**: The action item could be funded under existing departmental funding.

**Benefit ratings** were defined as follows:

**High**: The action item will provide short-term and long-term impacts on the reduction of risk exposure to life and property.

**Medium**: The action item will have long-term impacts on the reduction of risk exposure to life and property.

**Low**: The action item will have only short-term impacts on the reduction of risk exposure to life and property.

| Q&A \| ELEMENT D. MITIGATION STRATEGY \| D3 |
|---|
| **Q:** Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3)) |
| **A:** See **Mitigation Actions Priority Rating** below. |

## *Mitigation Actions Priority Rating*

The Planning Team utilized the following Priority Rating method. Designations of "High", "Medium", and "Low" priority have been assigned to all of the action item using the following criteria:

Does the Action:
- ☐ solve the problem?
- ☐ address Vulnerability Assessment?
- ☐ reduce the exposure or vulnerability to the highest priority hazard?
- ☐ address multiple hazards?
- ☐ benefits equal or exceed costs?
- ☐ implement a goal, policy, or project identified in the General Plan or Capital Improvement Plan?

Can the Action:
- ☐ be implemented with existing funds?
- ☐ be implemented by existing state or federal grant programs?
- ☐ be completed within the 5-year life cycle of the LHMP?
- ☐ be implemented with currently available technologies?

Will the Action:
- ☐ be accepted by the community?
- ☐ be supported by community leaders?
- ☐ adversely impact segments of the population or neighborhoods?
- ☐ require a change in local ordinances or zoning laws?
- ☐ positive or neutral impact on the environment?
- ☐ comply with all local, state and federal environmental laws and regulations?

Is there:
- ☐ sufficient staffing to undertake the project?
- ☐ existing authority to undertake the project?

As mitigation action items were updated or written the Planning Team, representatives were provided worksheets for each of their assigned action items. Answers to the criteria above determined the priority according to the following scale.

- 1-6 = Low priority
- 7-12 = Medium priority
- 13-18 = High priority

| Q&A \| ELEMENT C. MITIGATION STRATEGY \| C1b. |
|---|
| **Q:** Does the plan document each jurisdiction's ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C4a.** |
| **Q:** Does the plan identify and analyze a comprehensive range (different alternatives) of specific mitigation actions and projects to reduce the impacts from hazards? (Requirement §201.6(c)(3)(ii))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C4b.** |
| **Q:** Does the plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction? (Requirement §201.6(c)(3)(ii))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C4c.** |
| **Q:** Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C5a.** |
| **Q:** Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C5b.** |
| **Q:** Does the plan identify the position, office, department, or agency responsible for implementing and administering the action/project, potential funding sources and expected timeframes for completion? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT D. MITIGATION STRATEGY \| D1** |
| **Q:** Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT D. MITIGATION STRATEGY \| D2** |
| **Q:** Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT D. MITIGATION STRATEGY \| D3** |
| **Q:** Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))<br>**A:** See **Mitigation Actions Matrix** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C6c.** |
| **Q:** The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. (Requirement §201.6(c)(4)(ii))<br>**A:** See **Mitigation Actions Matrix** below. |

## Mitigation Actions Matrix

Following is **Table: Mitigation Actions Matrix** which identifies the existing and future mitigation activities developed by the Planning Team. *(Note: Funding Source and Planning Mechanism acronyms are FMP-Facilities Maintenance Plan, HMGP-Hazard Mitigation Grant Program, PDM-Pre Disaster Mitigation Grant, BRIC-Building Resilient Infrastructure and Communities)*

| ***Sonoma County Office of Education*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mitigation Action Item** | **Coordinating Agency** | **Timeline** | **Goal**: Protect Life and Property | **Goal**: Public Awareness | **Goal**: Natural Systems | **Goal**: Emergency Services | **Goal:** Partnerships and Implementation | **Buildings & Infrastructure:** Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y) | **Funding Source and Planning Mechanism:** GF- General Fund, FMP, HMGP, PDM, BRIC | **Benefit:** L-Low, M-Medium, H-High | **Cost:** L-Low, M-Medium, H-High | **Priority:** L-Low, M-Medium, H-High |
| **MULTI-HAZARD ACTION ITEMS** | | | | | | | | | | | | |
| MH-1 Annually update the Facilities Inspection Tool (FIT). | Facilities | Ongoing | X | X | X | X | X | Y | GF | H | L | H |
| MH-2 Provide annual briefing to the campus Emergency Response Team and Leadership on the results of the Facilities Inspection Tool. A "heads up" on vulnerabilities will help them to assess damages more efficiently. | Facilities | Ongoing | X | X | X | X | X | Y | GF | H | L | H |
| **EARTHQUAKE ACTION ITEMS** | | | | | | | | | | | | |
| EQ-1 Conduct seismic inventory of facilities and inspect integrity of non-structural devices. | Facilities | 1-5 years | X | X | X | X | X | Y | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EQ-2 Based on the results of the seismic inventory, retrofit or rebuild as necessary. | Facilities | 1-5 years | X | X | X | X | X | Y | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |
| **EPIDEMIC/PANDEMIC/VECTOR-BORNE DISEASES ACTION ITEMS** | | | | | | | | | | | | |
| EPV-1 Upgrade HVAC units in order to be compliant with present-day energy standards. | Facilities | 1-5 years | X | X | X | X | X | Y | GF | H | M | H |
| EPV-2 Install automatization devices/openers to decrease surface contact (doors, fountains, etc.). | Facilities | 1-5 years | X | X | X | X | X | Y | GF | H | M | H |
| **FLOODING ACTION ITEMS** | | | | | | | | | | | | |
| FLD-1 Trim vulnerable trees on campus before large storms. | Facilities | Ongoing | X | X | X | X | X | Y | GF | H | L | H |
| FLD-2 Clean out and/or expand storm drain capacity as necessary. | Facilities | 1 year | X | X | X | X | X | Y | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |
| **TSUNAMI ACTION ITEMS** | | | | | | | | | | | | |
| TSU-1 Encourage wildfire mitigation measures (i.e., tree breaks) in tsunami-prone areas to reduce impacts of fires that may occur after a tsunami impacts the coastline or river. | Facilities | Ongoing | X | X | X | X | X | | GF, FMP, HMGP, PDM, BRIC | H | M-H | H |
| TSU-2 Locate new infrastructure and critical facilities outside of the tsunami hazard area. | Facilities | 1-5 years | X | X | X | X | X | Y | GF, FMP, HMGP, PDM, BRIC | H | M-H | H |
| **UTILITY-RELATED ACTION ITEMS** | | | | | | | | | | | | |
| UT-1 Research and/or purchase generators suitable for the campus. | Facilities | 1 year | X | X | X | X | X | Y | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |
| UT-2 Research and/or purchase water filtration for the campus. | Facilities | 1 year | X | X | X | X | X | Y | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |
| **WILDFIRE ACTION ITEMS** | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WF-1 Implement defensible space practices. | Facilities | 1 year | X | X | X | X | X | | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |
| WF-2 Research and/or purchase a fire monitoring system. | Facilities | 1 year | X | X | X | X | X | Y | FMP, HMGP, PDM, BRIC, GF | H | M-H | H |

# Plan Maintenance

The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the Project Area jurisdictions will integrate public participation throughout the plan maintenance process.

## *Local Mitigation Officer*

Each of the participating jurisdictions will be responsible for maintaining their Mitigation Actions Matrix – a key to plan implementation. Each participating jurisdiction will have its own Local Mitigation Officer (same individual as assigned to the MJHMP Executive Planning Team). The review and update to the Mitigation Actions Matrices will take place in advance of the semi-annual Plan Maintenance Meeting of the MJHMP Executive Planning Team.

In addition to those efforts of individual jurisdictions, the overall MJHMP will be maintained by the MJHMP Executive Planning Team. The Team will be led by the Executive Planning Team Chair Greg Medici who also serve as SCOE's Local Mitigation Officer. Under the direction of the Chair, the Planning Team will take responsibility for overall plan maintenance and implementation. The Chair will facilitate the MJHMP Planning Team meetings and will assign tasks such as updating and presenting the Plan to the members of the Team. Plan implementation and evaluation will be a shared responsibility among all of the Team members. The various Local Mitigation Officers will coordinate with their leadership to ensure funding for 5-year updates to Plan as required by FEMA.

The Team will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The Local Mitigation Officers will be authorized to make changes in assignments to the current Planning Team.

The MJHMP Planning Team will meet no less than semi-annually during a standing meeting. Meeting dates will be scheduled once the final Planning Team has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan. The Local Mitigation Officers or designee will be responsible for contacting the Planning Team members and organizing the annual meeting which will take place annually during the month of the Plan's approval.

## Method and Scheduling of Plan Implementation

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|
| **Monitoring** | XX | XX | XX | XX | XX |
| **Evaluating** | | | | | |
| Internal Planning Team Evaluation | X | X | X | X | X |
| Cal OES and FEMA Evaluation | | | | | X |
| **Updating** | | | | | X |

# Monitoring and Implementing the Plan

## *Plan Adoption*

Each of the participating jurisdiction's Boards of Education will be responsible for adopting the Mitigation Plan. These governing bodies have the authority to promote sound public policy regarding hazards. Once the plan has been adopted, the MJHMP Planning Team Chair will be responsible for submitting it to the State Hazard Mitigation Officer at California Office of Emergency Services (Cal OES). Cal OES will then submit the plan to the Federal Emergency Management Agency (FEMA) for review and approval. This review will address the requirements set forth in 44 C.F.R. Section 201.6 (Local Mitigation Plans). Upon acceptance by FEMA, the MJHMP participating jurisdictions will gain eligibility for Hazard Mitigation Grant Program funds.

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A6a.** |
|---|
| **Q:** Does the plan identify how, when, and by whom the plan will be **monitored** (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))<br>**A:** See **Monitoring the Plan** below. |

## *Monitoring the Plan*

The Local Mitigation Officers will hold semi-annual meetings to gather status updates on their mitigation action items. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan. See the **Semi-Annual Implementation Report** discussed below which will be a valuable tool for the Planning Team to measure the success of the Hazard Mitigation Plan. The focus of the annual meeting will be on the progress and changes to the Mitigation Action Items.

| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C6a.** |
|---|
| **Q:** Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated? (Requirement §201.6(c)(4)(ii))<br>**A:** See **Implementation through Existing Program** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C6b.** |
| **Q:** Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms? (Requirement §201.6(c)(4)(ii))<br>**A:** See **Implementation through Existing Programs** below. |
| **Q&A \| ELEMENT C. MITIGATION STRATEGY \| C6c.** |
| **Q:** The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. (Requirement §201.6(c)(4)(ii))<br>**A:** See **Implementation through Existing Programs** below. |

## *Implementation through Existing Programs*

The Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The Local Mitigation

Officers will implement recommended mitigation action items through existing programs and procedures.

Each of the project area jurisdictions is responsible for adhering to the State of California's "Field Act" under the direction of the State's Department of Education.

Some of the goals and action items in the MJHMP will be achieved through activities recommended in the policy, capital, and fiscal documents. Within each of the Plan's 39 participants, each will have an internal team including department representatives tasked with mitigation action items. The internal team will meet on a bi-annual basis. Upon bi-annual review, the internal team will work with the departments to identify areas that the MJHMP action items are consistent with the strategic and budget documents to ensure the MJHMP goals and action items are implemented in a timely fashion.

Upon FEMA approval, the MJHMP Executive Planning Team will begin the process of incorporating risk information and mitigation action items into existing planning mechanisms. The bi-annual meetings of the Executive Planning Team will provide an opportunity for Team members to report back on the progress made on the integration of mitigation planning elements into the planning documents and procedures of the various jurisdictions.

Specifically, the Team will utilize the following section from the MJHMP to integrate with other policy, capital, and fiscal documents within their jurisdiction:

- ✓ Risk Assessment (Base Plan), Project Area Profile (Base Plan), Planning Process (Base Plan) – Emergency Operations Plan, Facilities Maintenance Plans, FIT Reports, Comprehensive School Safety Plans, etc.
- ✓ Mitigation Actions Matrix – Capital Projects, Grants, Bonds

## *Semi-Annual Implementation Report*

The Semi-Annual Implementation Matrix is the same as the Mitigation Actions Matrix but with a column added to track the annual status of each Action Item. Upon approval and adoption of the Plan, the entire Semi-Annual Implementation Report will be added to the Appendix of the Plan. Following is a view of the Semi-Annual Implementation Matrix:

Insert here during finalization of the MJHMP

An equal part of the monitoring process is the need to maintain a strategic planning process which needs to include funding and organizational support. In that light, at least one year in advance of the FEMA-mandated 5-year submission of an update, the MJHMP Planning Team Chair will convene the Team to discuss funding and timing of the update planning process. On the fifth year of the planning cycles, the Planning Team will broaden its scope to include discussions and research on all of the sections within the Plan with particular attention given to goal achievement and public participation. If the Planning Team intends to seek federal grant funding, the application should be submitted well in advance of the plan's expiration date to allow for the full grant application process.

## *Economic Analysis of Mitigation Projects*


FEMA's approach to identifying the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.
Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the Planning Team will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Planning Team will use other approaches to understand the costs and benefits of each action item and develop a prioritized list.

The “benefit”, “cost”, and overall “priority” of each mitigation action item was included in the Mitigation Actions Matrix located in Part III: Mitigation Strategies. A more technical assessment will be required in the event grant funding is pursued through the Hazard Mitigation Grant Program. FEMA Benefit-Cost Analysis Guidelines are discussed below.

## *FEMA Benefit-Cost Analysis Guidelines*

The Stafford Act authorizes the President to establish a program to provide technical and financial assistance to state and local governments to assist in the implementation of hazard mitigation measures that are cost effective and designed to substantially reduce injuries, loss of life, hardship, or the risk of future damage and destruction of property. To evaluate proposed hazard mitigation projects prior to funding FEMA requires a Benefit-Cost Analysis (BCA) to validate cost effectiveness. BCA is the method by which the future benefits of a mitigation project are estimated and compared to its cost. The end result is a benefit-cost ratio (BCR), which is derived from a project’s total net benefits divided by its total project cost. The BCR is a numerical expression of the cost effectiveness of a project. A project is considered to be cost effective when the BCR is 1.0 or greater, indicating the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training to support the effort and assist with estimating the expected future benefits over the useful life of a retrofit project. It is imperative to conduct a BCA early in the project development process to ensure the likelihood of meeting the cost-effective eligibility requirement in the Stafford Act.

The BCA program consists of guidelines, methodologies and software modules for a range of major natural hazards including:

- ✓ Flood (Riverine, Coastal Zone A, Coastal Zone V)
- ✓ Hurricane Wind
- ✓ Hurricane Safe Room
- ✓ Damage-Frequency Assessment
- ✓ Tornado Safe Room
- ✓ Earthquake
- ✓ Wildfire

The BCA program provides up to date program data, up to date default and standard values, user manuals and training. Overall, the program makes it easier for users and evaluators to conduct and review BCAs and to address multiple buildings and hazards in a single BCA module run.

## Evaluating and Updating the Plan

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A6b.** |
|---|
| **Q:** Does the plan identify how, when, and by whom the plan will be **evaluated** (assessing the effectiveness of the plan at achieving stated purpose and goals) over time? (Requirement §201.6(c)(4)(i))<br>**A:** See **Evaluation** below. |

### *Evaluation*

At the conclusion of the Semi-Annual Implementation Meeting, the MJHMP Planning Team Chair will lead a discussion with the Planning Team on the success (or failure) of the Hazard Mitigation Plan to meet the plan goals. The results of that discussion will be added to the Evaluation portion of the Semi-Annual Implementation Report and inclusion in the 5-year update to the Plan. Efforts will be made immediately by the Planning Team to address any failed plan goals.

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A6c.** |
|---|
| **Q:** Does the plan identify how, when, and by whom the plan will be **updated** during the 5-year cycle? (Requirement §201.6(c)(4)(i))<br>**A:** See **Formal Update Process** below. |

### *Formal Update Process*

As identified above, the Mitigation Action Items will be monitored for status on a semi-annual basis as well as an evaluation of the Plan's goals. The MJHMP Planning Team Chair or designee will be responsible for contacting the Planning Team members and organizing the annual meeting which will take place annually during the month of the Plan's approval. Planning Team members will also be responsible for participating in the formal update to the Plan every fifth year of the planning cycle.

The Planning Team will begin the update process with a review the goals and mitigation action items to determine their relevance to changing situations within the Project Area as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Planning Team will also review the Plan's **Risk Assessment**

portion of the Plan to determine if this information should be updated or modified, given any new available data. The **coordinating organizations** responsible for the various action items will report on the status of their projects, including the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised. Amending will be made to the Mitigation Actions Matrix and other sections in the Plan as deemed necessary by the Planning Team.

| **Q&A \| ELEMENT A: PLANNING PROCESS \| A5** |
|---|
| **Q:** Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))<br>**A:** See **Continued Public Involvement** below. |

## *Continued Public Involvement*

Each of the participating jurisdictions is dedicated to involving the public directly in the continual review and updates to the Multi-Jurisdictional Hazard Mitigation Plan. Copies of the plan will be made available at each of the District Offices and on each of their websites. The existence and location of these copies will be publicized through customary mediums for each of the jurisdictions. These postings will also contain an email address and phone number where people can direct their comments and concerns. At the discretion of the MJHMP Planning Team Chair, a public meeting may be held after the Semi-Annual Implementation Meeting. The meeting would provide the public a forum in which interested individuals and/or agencies could express their concerns, opinions, or ideas about the plan.

The MJHMP Planning Team Chair will be responsible for using a range of resources to publicize any public meetings and always free to maintain public involvement through the public access channel, web page, and newspapers.

# Annexes

The “Base Plan” was prepared for the Sonoma County Office of Education. The Base Plan contains all of the background information and hazard research for the entire project area.

Annexes were prepared for each of the 38 districts within the project area. The Annexes include agency-specific information including participation in the planning process, a location map and description of the agency, and a hazard profile, ranking, and map. Additionally, the Annexes contain information regarding agency-specific protocols for integrating the MJHMP with other plans and processes.

# Attachments

## FEMA Letter of Approval

# Board of Education Adoption Resolutions

# Sample Staff Report to Board of Education

# Invitation to Executive Team Kick-Off Meeting

On Wednesday, March 4, 2020, 02:32:04 PM PST, Bonnie Tanner <btanner@scoe.org> wrote:

We are starting to plan for the first of 3 planning sessions with the districts for the SCOE Hazard Mitigation Plan development. The hazard mitigation planning process entails identifying natural hazards posing the greatest threat to properties owned by the Districts. Hazard mitigation is defined as actions taken to minimize or eliminate threats associated with hazards. The planning process will include hazard identification and capturing existing and future mitigation actions. The resulting plan will make SCOE and all of the districts eligible for federal and state grants. The project has been divided into 4 "areas". Each of those Area Planning Teams will meet for 2-hours on 3 occasions. The purpose of the first meeting will be to discuss the overall project, timeline, review of concepts and issues relating to hazard mitigation and to discuss opportunities for community outreach. We will also review the initial hazard research conducted to date by the consultant.

Below is a list of how the districts are divided into areas as well as the schedule of the upcoming meetings. Your district will need to attend the specified meeting that coordinates with the area you have been assigned. Your attendance is required at each meeting. Please mark your calendar for all future meetings (reminders will be sent out).

Intended participants are as follows: Point of Contact (required), Superintendent, CBO, Facilities Director, and any additional district or site staff you feel is appropriate for this project. This could include site personnel for individual schools. Those that attend will be asked to weigh in on their ideas of mitigation projects needed for the district.

**Areas:**
**North:** Cloverdale, Geyserville, Healdsburg, West Side, Alexander Valley, Windsor
**West:** Horicon, Kashia, Montgomery, Guerneville, Monte Rio, Harmony, Twin Hills, Sebastopol, Gravenstein, WSCUHSD, Fort Ross, Forestville, Oak Grove
**Central:** SRCS, Piner-Olivet, Mark West, Bellevue, Wright, Roseland, Cotati-RP, Bennett Valley, Rincon Valley, Kenwood, SCOE
**South:** Petaluma, Sonoma Valley, Old Adobe, Cinnabar, Two Rock, Liberty, Dunham, Waugh, Wilmar, SCOE

**1st Area Planning Team:**
**March 23rd**
9:00-11:00 am West Area
1:00-3:00 pm North Area
**March 24th**
9:00-11:00 am, South Area
1:00-3:00 pm Central Area
**2nd Area Planning Team:**
**April 27th**
9:00-11:00 am West Area
1:00-3:00 pm North Area
**April 28th**
9:00-11:00 am, South Area
1:00-3:00 pm Central Area
**3rd Area Planning Team:**
**May 18th**
9:00-11:00 am West Area
1:00-3:00 pm North Area
**May 19th**
9:00-11:00 am, South Area
1:00-3:00 pm Central Area

Please use the link below to let us know how many people to expect from your district. Please let me know if you have any questions.

**RSVP** **Due by March 13th**

Bonnie Tanner
Department Administrative Specialist
Business Services
707-524-2628

# Executive Team Kick-Off Meeting Sign-In Sheets

Sonoma County Office of Education | Hazard Mitigation Kick-Off Meeting | February 11, 2020

| Initials | District | Last Name | First Name | Title/Position | Will you be the official Point of | Email Address |
|---|---|---|---|---|---|---|
| | Bennett Valley | Field | Sue | Superintendent | Yes | sue.field@bvusd.org |
| | Cloverdale Unified School | Scaramella | Rick | Director Of MOT | Yes | scaramellar@cusd.org |
| | Cotati-Rohnert Park Unified School District | Savage | Josh | Executive Director of Facilities, Maintenance and Operations | Yes | josh_savage@crpusd.org |
| | Forestville | Semik | Renee | Superintendent | Yes | rsemik@forestvilleusd.org |
| | Fort Ross | Markatos | John | Supt | Yes | fresd@mcn.org |
| | Geyserville | Bertolucci | Deborah | Superintendent | Yes | dbert@gusd.com |
| | Geyserville | Menicucci | Christina | Manager of Business Services | No | cmenicucci@gusd.com |
| | Guerneville | Pedersen | Dana | Superintendent | Yes | dpedersen@guernevilleschool.org |
| | Harmony | Morgan | Matthew | Superintendent-Principal | Yes | mmorgan@harmonyusd.org |
| | Healdsburg Unified School District | Smith | Robert | Maintenance and Operations Supervisor | Yes | rsmith@husd.com |
| | Kashia | Pomplin | Patti | CBO | Yes | ppomplin@kashiaesd.org |
| | Mark West | Calloway | Ronald | Suprintendent | No | rcalloway@mwusd.org |
| | Mark West | Cuculich | Regina | Assoc. Supt of Business | No | rcuculich@mwusd.org |
| | Monte Rio | Myers | Nathan | Superintendent | Yes | nmyers@monteriousd.org |
| | Montgomery School District | Parmeter | Taryn | District Secretary | Yes | office@mescaz.org |
| | Oak Grove | Stringfellow | Amber | Superintendent | Yes | astringfellow@ogusd.org |
| | Old Adobe | Williams | Lynda | CBO | Yes | lwilliams@oldadobe.org |
| | Petaluma City Schools | Thomas | Chris | Chief Business Officia | Yes | cthomas@petk12.org |
| | Piner-Olivet USD | Koha | Felicia | Chief Business Officia | Yes | fkoha@pousd.org |
| | RESIG | Davis | Will | Director of Environmental Services | No | wdavs@resig.org |
| | RESIG | Fields | Steven | Risk Manager | No | sfields@resig.org |

Sonoma County Office of Education | Hazard Mitigation Kick-Off Meeting | February 11, 2020

| Initials | District | Last Name | First Name | Title/Position | Will you be the official Point of | Email Address |
|---|---|---|---|---|---|---|
| | Rincon Valley Union School District | Hebel | Daniel | M&O Supervisor | Yes | dhebel@rvusd.org |
| | Roseland | Jones-Kerr | Amy | Superintendent | Yes | ajones-kerr@roselandsd.org |
| | Santa Rosa City Schools | Edson | Rick | Deputy Superintendent | Yes | redson@srcs.k12.ca.us |
| | SCOE | Silva | Mark | Director of Facilities | Yes | msilva@scoe.org |
| | Sebastopol | Irving | Linda | Superintendent | No | lirving@sebusd.org |
| | Sebastopol Union Schools | Ono | Brent | Fac. Sup | Yes | bono@sebusd.org |
| | Sonoma Valley | Sandoval | David | Manager of Maintenance and Operations | Yes | dsandoval@sonomaschools.org |
| | Twin Hills | Bickford | Barbara | Superintendent | Yes | bbickford@twinhillsusd.org |
| | Two Rock | Hurley | TJ | Chief Business Officer | No | thurley@trusd.org |
| | Waugh | Gardner | Mike | Superintendent | Yes | mgardner@waughsd.org |
| | Wight | Jereb | Bill | Director of Maintenance | Yes | bjereb@wrightesd.org |
| | Wight | Schaible | Adam | Superintendent | No | aschaible@wrightesd.org |
| | Cinnabar | Judy | Angel | CBO | Yes | ajudy@cinnabar.org |
| | RESIG | Dekker | Christine | Loss Prev. | | cdekker@resig.org |
| | WRIGHT | JEREB | BILL | DIRECTOR | Yes | bjereb@wrightesd.org |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Initials | District | Last Name | First Name | Title/Position | Will you be the official Point of | Email Address |
|---|---|---|---|---|---|---|
| MR | Alexander Valley | Reno | Matt | Supt./Principal | Yes | mreno@alexandervalleyusd.org |
| RF | Bellevue | Farrell | Roger | Director of Maintenance & Operations | Yes | rfarrell@busd.org |
| DH | Dunham | Hoffman | Daniel | Superintendent | Yes | Dhoffman@dunhamsd.k12.ca.us |
| WH | Gravenstein USD | Holden | Wanda | CBO | Yes | wholden@grav.k12.ca.us |
| | Horicon | McFarland | Jeff | Superintendent/ Principal | Yes | jmcfarland@horiconsd.org |
| BB | Kenwood | Bales | Bob | Superintendent/Principal | Yes | bbpetaluma@gmail.com |
| CR | Liberty | Rafanelli | Christopher | Superintendent | Yes | crafanelli@libertysd.org |
| MS | Mark West | Smith | Michael | Dir of M&O | Yes | msmith@mwusd.org |
| BM | Two Rock | MacClain | Betha | Superintendent | Yes | bmacclain@trusd.org |
| KM | West Side | Menlove | Kris | Superintendent-Prindpal | Yes | kmenlove@westsideusd.org |
| | West Sonoma County UHS District | Bruneman | Jennie | Director of Facilities | Yes | jbruneman.do@wscuhsd.k12.ca.us |
| CC | Windsor Unified | Canelake | Chris | Director of Human Resources | Yes | ccanelake@wusd.org |
| | Wilmar | Garvey | Sheryle | Supt/Principal | Yes | sgarvey@wilmarusd.org |
| | Erin Tarkanian | Tarkanian | Erin | Loss Prevention | | etarkanian@presg.org |

# Planning Team Agendas

## Executive Planning Team

### Agenda: Executive Planning Team Meeting #1

**Agenda**

**SCOE Executive Planning Team Kick-Off Meeting**

**February 11 or 12, 2020**

1. **Introductions**
    a. **Consultants**
    b. **Executive Planning Team**

2. **FEMA Independent Study Course 318 – Hazard Mitigation**

3. **Discuss Planning Process**
    a. **Executive Planning Team**
    b. **Area Planning Teams**
    c. **Site-Specific Planning Team**

4. **Community Outreach Alternatives**

5. **Adoption and Approval Process**

## Area Planning Team

### Agenda: Area Planning Team Meeting

**Agenda**

**Area Planning Team Meeting**

**April 27 or 28, 2020**

1. **Introductions**
2. **Summary of Hazard Analysis**
3. **Examples of Hazard Mitigation**
4. **Federal Requirements Regarding Hazard Mitigation Planning**
5. **Developing a Hazard Mitigation Strategy**
    a. **Document Existing and Future Hazard Mitigation Activities (including review of items identified in first draft plan).**
        i. **Action Item**

ii. **Goals Achieved**
iii. **Coordinating Agency**
iv. **Timeline**
v. **Funding and Planning Mechanisms**
vi. **Benefit, Cost, and Priority**

Entity Planning Team

**Agenda: Entity Planning Team Meeting**

**Agenda**

**Entity Planning Team Meeting**

**May 2020**

1. **Developing a Hazard Mitigation Strategy**
    a. **Document Existing and Future Hazard Mitigation Activities (including review of items identified in first draft plan).**
        1. **Action Item**
        2. **Goals Achieved**
        3. **Coordinating Agency**
        4. **Timeline**
        5. **Funding and Planning Mechanisms**
        6. **Benefit, Cost, and Priority**

## Secondary Stakeholders Involvement

The Third Draft Plan was distributed to the general public and external agencies on August 21, 2021. Following the review by Cal OES, a Fourth Draft Plan was distributed on January 30, 2023.

| Date Invited to Provide Input or Input Gathered | Agency Represented, Name, Position Title | Information Received | How Information was Incorporated into Plan |
|---|---|---|---|
| **External Agencies** | | | |
| August 21, 2021 | Department of Emergency Management, Christopher Godley, Director | None | N/A |
| August 21, 2021 | PRMD, Administration, Regina De Le Cruz, Deputy Director | None | N/A |
| August 21, 2021 | PRMD, Natural Resources, Lisa Hulette, Department Program Manager | None | N/A |
| August 21, 2021 | PRMD, Engineering and Construction, Nathan Quarles, Deputy Director | None | N/A |
| August 21, 2021 | PRMD, Fire Prevention & Hazardous Materials, Steve Mosiurchak, Fire Warden / Fire Marshall | None | N/A |
| August 21, 2021 | Emergency Operations Center, Jeff DuVall, Deputy Director | None | N/A |
| August 21, 2021 | City of Petaluma, Peggy Flynn, City Manager | None | N/A |
| August 21, 2021 | City of Santa Rosa, Clare Hartman, Acting Assistant City Manager | None | N/A |
| August 21, 2021 | City of Sonoma, Garrett Toy, City Manager | None | N/A |
| August 21, 2021 | City of Windsor, Kem MacNab, Town Manager | None | N/A |
| August 21, 2021 | City of Cloverdale, David Kelley, City Manager | None | N/A |
| August 21, 2021 | City of Rohnert Park, Darrin Jenkins, City Manager | None | N/A |
| August 21, 2021 | City of Cotati, Damien O'Bid, City Manager | None | N/A |

| | | | |
|---|---|---|---|
| August 21, 2021 | City of Sebastopol, Larry McLaughlin, City Manager | None | N/A |
| August 21, 2021 | City of Healdsburg, Jeff Kay, City Manager | None | N/A |
| August 21, 2021 | County Administrator's Office, Sheryl Bratton, County Administrator | None | N/A |
| **General Public** | | | |
| August 21, 2021 | Jennifer Palladini | "I appreciate the plan's recognition of the role that climate change plays in amplifying hazardous risks to our schools. I would like the plan to recognize the importance of coordinated local action to reduce carbon emissions within Sonoma County in order to do our part to reduce future hazards predicted to continue to increase with climate change. An important part of mitigation, of reducing the severity of these hazards, is confronting the growing emissions that amplify these hazards." | Added multi-hazard mitigation action item. |
| August 21, 2021 | Anonymous | Several comments regarding the Calculated Priority Risk Index. | Comment added to the introduction to the Calculated Priority Risk Index in the Risk Assessment clarifying the scale is used to compare maximum credible events (e.g., local declaration declared) |
| August 21, 2021 | Eric Hoffman | Correction to change Santa Ana winds to Diablo winds. | Correction to Wildfire Hazard Section. |
| August 21, 2021 | Eric Hoffman | Recommended addition of Local Responsibility Area maps of high fire hazard locations within incorporated cities. | Defensible Space maps added for Cloverdale and Santa Rosa. |
| August 21, 2021 | Bill Jensen | Recommended better clarification on wildfires vs public safety power shutoff events. | Clarification added to Utility-Related Events Hazard Section. |

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| August 21, 2021 | Hannah Lee | Wants to volunteer to help with implementing mitigation actions. Has written LHMPs and have HMGP grants I'm currently on at work. Also, the need for seismic assessment/inventory of facilities was common among districts. Would this occur individually by each district or could there be a countywide grant application for this work? It seems like it would be eligible for HMGP planning funding if it is part of the risk assessment for a 2026 update. I think multi-jurisdictional updates are eligible for $250k. If the cost of a countywide assessment is much more than that of older buildings could be grouped and prioritized for the 2026 update. | No changes made to content of plan document. This community outreach comment will memorialize the offer of assistance. |
| August 21, 2021 | Robin Haines | I appreciate the work that has gone into this document. As a volunteer at The Petaluma Wildlife Museum at Petaluma High School I do have concerns about power outages and our live animal collection in the event of a long-term power outage. We are not linked to the high solar grid and have been waiting two years for the generator we were told we would get. Our reptiles will develop significant health issues without proper heat and lighting. | Shared with Petaluma High School for inclusion in the mitigation action items. |
| August 21, 2021 | Jen Sturdy | FIRST COMMENT: From the risk mitigation section, "EPV-1 Upgrade HVAC units in order to be compliant with present-day energy standards." This is helpful, but can you confirm if this includes a filtration system for air purification in the event of wildfire and toxic air pollution? It is a much more likely scenario that we have wildfire smoke affecting the area and kids may remain in school, but a concern is air quality - what is the mitigation strategy? | This level of specificity will be based on the "present-day energy standards" in place when the mitigation action item is carried out. |

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| August 21, 2021 | Jen Sturdy | SECOND COMMENT: In the risk mitigation plan, how is 'extreme heat' not included as a risk with corresponding risk mitigation? As we look at increasing temperatures during the school year (April, May, June, August, September, October) and drier winters, how might this impact schools and ability for children to stay safely in school? There seem to be a variety of issues to consider here - anywhere between solar energy options and smart grid options (to stay powered through rolling blackouts or other power outages - some districts list this, many list generators - are generators really the only/best option here for sustainability?), considering cool roofing and cool pavement options, ensuring trees/shade and safe play areas, reconsidering extent of impermeable vs. permeable surfaces, etc. Please consider including 'extreme heat' as a likely probable risk factor for our County and risk mitigation strategies. | The Utility Related Hazard-Specific Section identifies issues relating to extreme heat and impacts to utility services. There are several mitigation action items in the Base Plan and Annexes mitigating against extreme heat – they are listed in the Multi-Hazard section of the Mitigation Actions Matrices. |
| | | THIRD COMMENT: As we think about risk factors and risk mitigation - much of this seems to dovetail with great work being done in city/school infrastructure resiliency and what schools can do on a large scale to directly mitigate forces driving climate change - points in addition to those listed above: creating green space, rain gardens, what about electric school buses? (If Stockton can do it, can't Sonoma County - https://www.greencarcongress.com/2021/05/20210506-stockton.html) how is school food waste managed/composted? etc.. | Excellent point. During the Implementation phase of this project, the Planning Team will be reminded to look over the comments received. |

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| August 21, 2021 | Jen Sturdy | FOURTH COMMENT: Funding may be a limitation for why we see only a certain list of mitigation efforts - is this the case? If so, again how is this work viewed through the larger lens of climate resiliency and green infrastructure to identify government and private funding options? This report is excellent and thoughtful, but it does seem that it needs to be placed in a larger picture so that we aren't limiting our risk assessment and mitigation around a certain set of available funds. | Funding source is identified and the "cost" ranking for each mitigation action item is not based on a dollar amount but rather the level of difficulty to acquire the funds. Please see the Mitigation Strategies section for information on the ranking and prioritizing process. |
| August 21, 2021 | Anonymous | Have worked for Gravenstein since 2003. When I started working there, we had around 250 students. I feel that the school has grown too big. These safety concerns are a bit unnerving. I look forward to hearing what the plan is going forward. At the moment, I feel completely unprepared for an emergency that would require everyone to leave campus all at once. | These excellent points should be considered as the District updates its Emergency Response Plan and District's Strategic Plan. |
| August 21, 2021 | Dan Northern | He finds it interesting and disappointing that the plan does not address active shooters, structural fires on campus and threatening the campus and hazardous materials releases from nearby roadways or industry. | HMPs are tied to natural hazards. |
| August 21, 2021 | Dan Northern | He finds it interesting that the WSCUHSD only has 12 items listed for 3 campuses, 1500 students, and over 70 acres of facilities and grounds. Further oversite of the District's hazard mitigation issues seems necessary. | Such observations should be shared during the decision-making process at the District level. |

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| August 21, 2021 | Andy Kiehl | This is an extremely high level review. Good job on identifying hazards. The mitigation activities are lacking across all areas. The report fails to indicate, based on risk level, the highest level priorities across the county and within district. All of the dangers and mitigation plans are treated with similar import and priority. Earthquake safety is paramount to the community as shown by the risk assessment. Many of these schools were constructed a half century ago. The only reason local earthquakes have not had a higher death toll is because people were at home as stated in the report. This is a key area to look into investment for the districts (instead of replacing sidewalks that were functionally great and not a safety hazard, instead of putting a new reader board outside all schools…) that no one is willing to step up to write into the report. Risk should also include funding into the calculation of risk. | Clarification: the risks are "ranked" using the Calculated Priority Risk Index. |
| August 21, 2021 | David Rose | For the section on the Gravenstein Union School District, I think it is very important for the committee to be aware of an additional hazard for the students at our elementary school, Gravenstein Elementary. Our school, with an enrollment of 495, is located at the end of Twig Avenue, meaning there is only one way in and out. As a result, we have significant traffic issues. On normal days, this is an inconvenience. If we were to have an emergency on this campus that would require an evacuation, it would take a minimum of 3 hours for all families to get to campus to pick up their student(s). If the emergency involved an immediate threat to safety, that timeline would put many students at risk, and would greatly inhibit access to the campus by law enforcement or emergency services personnel. I think it is very important for this situation to be noted in the plan and included in any mitigation efforts. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |

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| August 21, 2021 | Sam Cole | Gravenstein Elementary School is located at the end of Twig Avenue. There is no other road in or out of the school. This causes significant traffic which could be extremely dangerous in an evacuation scenario, as it would take hours for all students to be able to be picked up. The traffic, when at its worst, would almost certainly block road and school access for emergency vehicles needing to reach the school. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |
| August 21, 2021 | Anonymous | I am concerned about access to the Gravenstein Union School District in the event of an emergency. There is only one street in and out of the school so there is a serious traffic issue if emergency vehicles need to get to the school in a timely matter during any hazardous or emergency situation. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |
| August 21, 2021 | Katie Anderson | There was no mention of improving access to the Gravenstein Elementary School site and creating evacuation routes. This is a significant concern for a school of 550 people and one ingress/egress. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |

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| August 21, 2021 | Erin Hillmer | In the section on Gravenstein School District in Sebastopol (page 138) there is no mention of dealing with the issue of the school being at the end of a one way street. On normal days, this is inconvenient and mildly dangerous. In case of emergency or need to evacuate, it would be very dangerous and nearly impossible to navigate. There are nearly 500 students enrolled and evacuation would take hours with the current traffic limitations. There is also an issue if emergency vehicles or police need to get to campus, as the road is completely blocked with cars coming/going. If there was an imminent threat, the staff and nearly 500 enrolled students would be in danger, with only one way in/out. I urge the committee to add this to the Gravenstein School plans. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |
| August 21, 2021 | Gail Carnahan | I second our Superintendent's comments: "I think it is important for the committee to be aware of another potential hazard for the Gravenstein Elementary School District in Sebastopol. Gravenstein Elementary School is located at the end of Twig Avenue and has an enrollment of 495 students. The school is located where Twig Avenue ends, which means there is only one way in and out. On a normal day, this causes some significant traffic and is inconvenient. On a day where there is a threat to student and staff safety and an evacuation is necessary, it would take a minimum of three hours in order for all families to be able to get to campus to take their child(ren) to safety. If the threat to the campus was imminent, many students and staff would be at risk. Additionally, if law enforcement or public safety vehicles were needed on campus, the traffic would severely limit access and would significantly delay the arrival of safety services to the campus. I think it is very important for the committee to consider addressing this situation with mitigation plans." | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |

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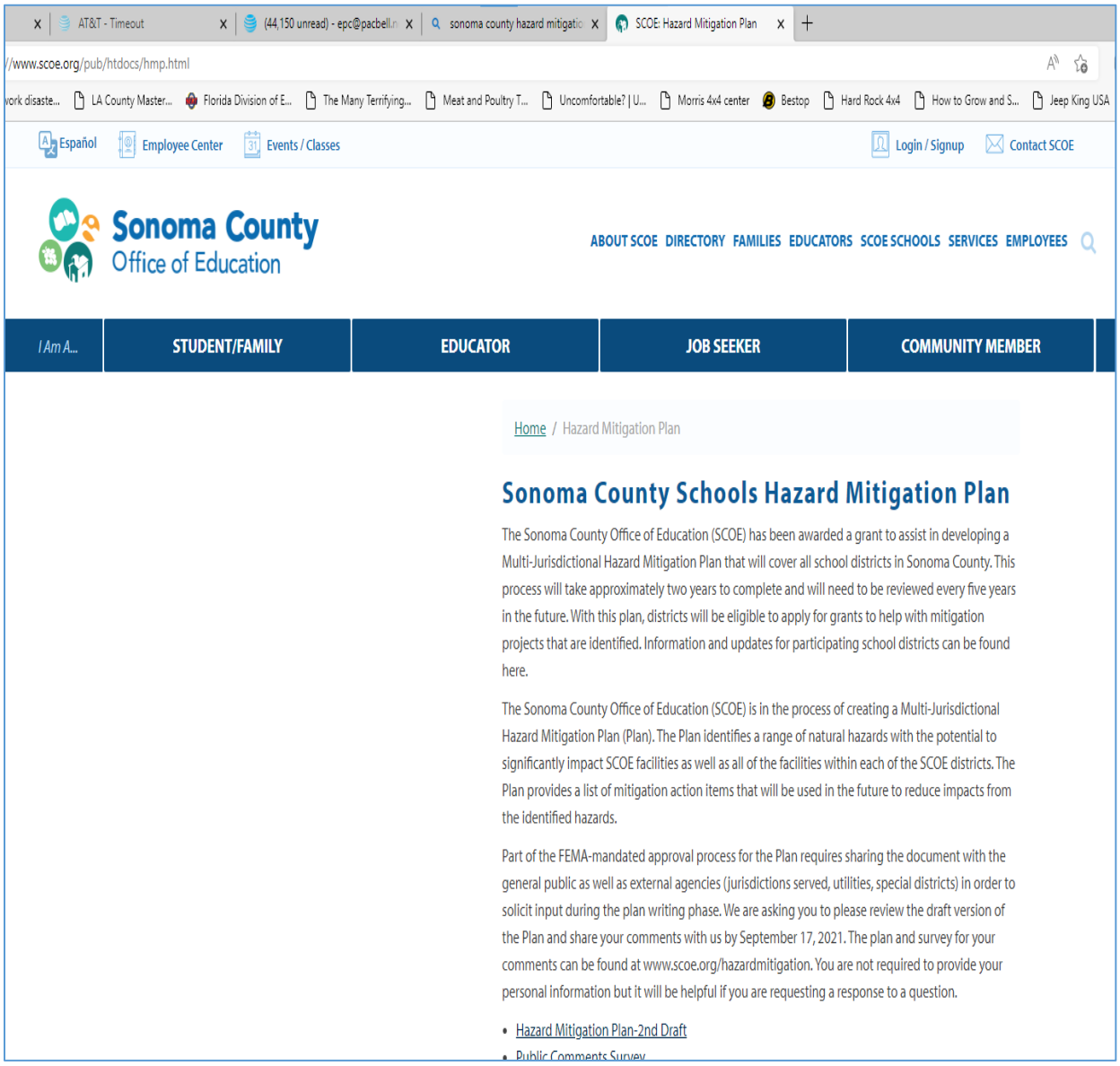
| August 21, 2021 | Amber Ray Hernandez | My children attend Gravenstein Elementary School in the Gravenstein Union School District. Our school is at the end of Twig Ave which is a dead end street. There are almost 500 students at our school. Administration does their best to move traffic in/out as efficiently as possible but I fear if there was ever an emergency and mass evacuation were necessary the school population will be at serious risk. Our school informs us it could take up to three hours to evacuate everyone. That is extremely concerning. Possible evacuation is not the only potential hazard here. If there were an emergency where rescue vehicles had to make it to the school during pick up or drop off time, traffic is complete gridlock and may delay help getting to campus. I feel this is a very serious risk and plead with this committee to consider mitigation plans for our school. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |
| August 21, 2021 | Kim Hawkins | There appears to be no action plan for a huge potential disaster at Gravenstein Elementary should it ever be necessary to evacuate due to a fast-moving wildfire. It´s hard to believe they ever got permits to build such a large school (nearly 500 enrolled now) with only one way in and out over the long stretch of Twig Avenue and only one lane in each direction! It may require some government action including acquiring property through eminent domain to provide at least one alternate route of escape. It´s above my paygrade to figure out how to create another road to the 116 or perhaps an access road connecting further north on Lone Pine, but options need to be explored. | These important points should be shared with the District's Hazard Mitigation Planning Team as well as the Board of Trustees during the decision-making process. |
| January 30, 2023 | Rima Meechan, Superintendent/Principal, West Side Union School District | Updated names of Board members | Incorporated changes. |

## Website Posting




## Invitations to the General Public

The members of the general public (staff, parents, community) were invited by each of the participating entities using the same letter produced by SCOE. Districts were provided with guidance on the need to distribute the information to their "public" using whatever means they preferred (social media, newsletter, etc.) and to forward proof of distribution to SCOE. This solicitation took place during the plan writing process and yielded input from several stakeholders (See **Stakeholder Involvement** below). The information included background of the project and access to the website posting of the Second Draft Plan. Also, announcements were made during the SCOE Board of Education meetings. Following is the emailed invitation, a screen shot of the

posting on the SCOE website, and a sample web posting from one of the participating districts. Following the Cal OES review, the Fourth Draft was distributed on January 30, 2023 to the public.

August 31, 2021

Subject: 2021 Multi-Jurisdictional Hazard Mitigation Plan

Hello,

The Sonoma County Office of Education (SCOE) is in the process of creating a Multi-Jurisdictional Hazard Mitigation Plan (Plan). The Plan identifies a range of natural hazards with the potential to significantly impact SCOE facilities as well as all of the facilities within each of the SCOE districts. The Plan provides a list of mitigation action items that will be used in the future to reduce impacts from the identified hazards.

Part of the FEMA-mandated approval process for the Plan requires sharing the document with the general public as well as external agencies (jurisdictions served, utilities, special districts) in order to solicit input during the plan writing phase.

We are asking you to please review the draft version of the Plan and share your comments with us by September 17, 2021. The plan and survey for your comments can be found at www.scoe.org/hazardmitigation. You are not required to provide your personal information but it will be helpful, if you are requesting a response to a question.

Thank you in advance for your time and assistance with this project. We look forward to receiving your comments.

Bonnie Brown
Administrative Operations Specialist
Business Services
Sonoma County Office of Education

707-524-2628
bbrown@scoe.org

January 30, 2023

Subject: 2023 Multi-Jurisdictional Hazard Mitigation Plan

Hello,

The Sonoma County Office of Education (SCOE) has been in the process of creating a Multi-Jurisdictional Hazard Mitigation Plan (Plan) since 2020. The Plan identifies a range of natural hazards with the potential to significantly impact SCOE facilities as well as all of the facilities within each of the SCOE districts. The Plan provides a list of mitigation action items that will be used in the future to reduce impacts from the identified hazards.

Part of the FEMA-mandated approval process for the Plan requires sharing the document with the general public as well as external agencies (jurisdictions served, utilities, special districts) in order to solicit input during the plan writing phase.

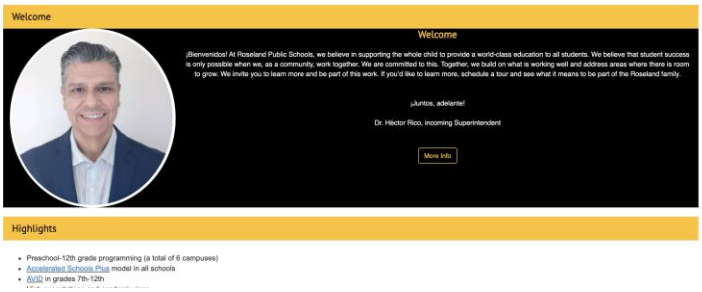
We are asking you to please review the draft version of the Plan and share your comments with us by February 16, 2023. The plan and survey for your comments can be found at www.scoe.org/hazardmitigation. You are not required to provide your personal information but it will be helpful if you are requesting a response to a question.

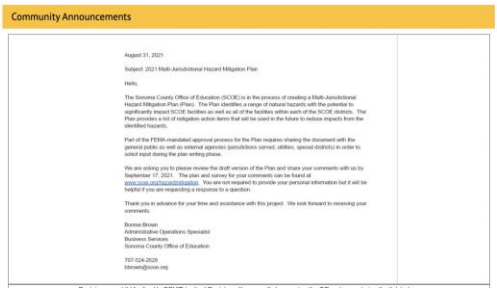
Thank you in advance for your time and assistance with this project. We look forward to receiving your comments.

Bonnie Brown
Administrative Operations Specialist
Business Services
Sonoma County Office of Education

707-524-2628
bbrown@scoe.org

In addition to the invitations sent by SCOE shown above, following is a sample website invitation sent from one of the participating districts – Roseland Public Schools:

Here is a sample of a district forwarding the SCOE email soliciting input on the Hazard Mitigation Plan. The sample is from Wright Elementary School District:

Sonoma County Office of Education

Bonnie Brown <bbrown@scoe.org>

**2021 Multi-Jurisdictional Hazard Mitigation Plan**

1 message

**Kristin Enbysk** <kenbysk@wrightesd.org> Tue, Sep 14, 2021 at 3:05 PM
Reply-To: Kristin Enbysk <kenbysk@wrightesd.org>
To: WRIGHT ELEMENTARY SCHOOL DISTRICT Recipients <recipients@wrightesd.parentlink.net>

Subject: 2021 Multi-Jurisdictional Hazard Mitigation Plan

Hello,

The Sonoma County Office of Education (SCOE) is in the process of creating a Multi-Jurisdictional Hazard Mitigation Plan (Plan). The Plan identifies a range of natural hazards with the potential to significantly impact SCOE facilities as well as all of the facilities within each of the SCOE districts. The Plan provides a list of mitigation action items that will be used in the future to reduce impacts from the identified hazards.

Part of the FEMA-mandated approval process for the Plan requires sharing the document with the general public as well as external agencies (jurisdictions served, utilities, special districts) in order to solicit input during the plan writing phase.

We are asking you to please review the draft version of the Plan and share your comments with us by September 17, 2021. The plan and survey for your comments can be found at www.scoe.org/hazardmitigation. You are not required to provide your personal information but it will be helpful if you are requesting a response to a question.

Thank you in advance for your time and assistance with this project. We look forward to receiving your comments.

Bonnie Brown

Administrative Operations Specialist

Business Services

Sonoma County Office of Education

707-524-2628

bbrown@scoe.org

# Invitations to the External Agencies

External agencies listed above were invited by SCOE via email and provided with an electronic link to the SCOE website. Following is the email distributed along with both invitations to contribute to the planning process:

August 31, 2021

Subject: 2021 Multi-Jurisdictional Hazard Mitigation Plan

Dear Public Agency Official,

The Sonoma County Office of Education (SCOE) is in the process of creating a Multi-Jurisdictional Hazard Mitigation Plan (Plan). The Plan identifies a range of natural hazards with the potential to significantly impact SCOE facilities as well as all the facilities within each of the SCOE districts. The Plan provides a list of mitigation action items that will be used in the future to reduce impacts from the identified hazards.

Part of the FEMA-mandated approval process for the Plan requires sharing the document with the general public as well as external agencies (jurisdictions served, utilities, special districts) in order to solicit input during the plan writing phase. If you are not the correct person to receive this email please forward onto the more appropriate department, and if possible please use the link below to indicate that you did receive this email and who you forwarded it to.

We are asking you to please review the draft version of the **Plan** and share **your comments** with us by September 17, 2021. If you are not able to provide your comments by this date, we will move forward with the understanding that you do not have any concerns and you are comfortable with the Plan as it is written. FEMA requires that we record the agency you represent, your name and your job title. Please include this information with your response.

Thank you in advance for your time and assistance with this project. We look forward to receiving your comments.

Copy of Hazard Mitigation Plan

Survey for Comments

Bonnie Brown
Administrative Operations Specialist
Business Services
Sonoma County Office of Education

707-524-2628
bbrown@scoe.org

January 30, 2023

Subject: 2023 Multi-Jurisdictional Hazard Mitigation Plan

Hello,

The Sonoma County Office of Education (SCOE) has been in the process of creating a Multi-Jurisdictional Hazard Mitigation Plan (Plan) since 2020. The Plan identifies a range of natural hazards with the potential to significantly impact SCOE facilities as well as all of the facilities within each of the SCOE districts. The Plan provides a list of mitigation action items that will be used in the future to reduce impacts from the identified hazards.

Part of the FEMA-mandated approval process for the Plan requires sharing the document with the general public as well as external agencies (jurisdictions served, utilities, special districts) in order to solicit input during the plan writing phase.

We are asking you to please review the draft version of the Plan and share your comments with us by February 16, 2023. The plan and survey for your comments can be found at www.scoe.org/hazardmitigation. You are not required to provide your personal information but it will be helpful if you are requesting a response to a question.

Thank you in advance for your time and assistance with this project. We look forward to receiving your comments.

Bonnie Brown
Administrative Operations Specialist
Business Services
Sonoma County Office of Education

707-524-2628
bbrown@scoe.org

# HAZUS – Study Areas

**SCOE HAZUS Study Areas**

**North**
School Districts: Cloverdale Unified School District, Geyserville Unified School District, Healdsburg Unified School District, West Side Union School District, Alexander Valley Union School District, Windsor Unified School District
SCOE Facilities: None

**West**
School Districts: Horicon School District, Kashia School District, Montgomery Elementary School District, Guerneville School District, Monte Rio Union School District, Harmony Union School District, Twin Hills Union School District, Sebastopol Union School District, Gravenstein Union School District, West Sonoma County High School District, Fort Ross Elementary School District, Forestville Union School District, Oak Grove Union School District
SCOE Facilities: None

**Central**
School Districts: Santa Rosa City Schools (includes Santa Rosa Elementary School District, Santa Rosa City High School District), Piner-Olivet Union School District, Mark West Union School District, Bellevue Union School District, Wright School District, Roseland School District, Cotati-Rohnert Park Unified School District, Bennett Valley Union School District, Rincon Valley Union School District, Kenwood School District
SCOE Facilities: Sonoma County Office of Education 5340 Skylane Boulevard, Santa Rosa; Amarosa Academy, 3261 Dutton Ave., Santa Rosa; Los Guilicos/Valley of the Moon , 542 Eliza Way, Santa Rosa; Mendocino Administration Office, 1006 Mendocino Ave, Santa Rosa; LaBath Classrooms and Administration Offices, 5860 LaBath Avenue, Rohnert Park; El Colegio,1059 Camino Colegio, Rohnert Park

**South**
School Districts: Petaluma City Elementary School District, Petaluma Joint Union High School District, Sonoma Valley Unified School District, Old Adobe Union School District, Cinnabar School District, Two Rock Union School District, Liberty School District, Dunham School District, Waugh School District, Wilmar Union School District
SCOE Facilities: Sonoma Community Center 276 E. Napa Street, Sonoma; Headwaters Academy, 1355 Industrial Avenue, Petaluma

# HAZUS Reports (available under separate cover)