City of Santa Barbara

Local Hazard Mitigation Plan Annex to Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan – July 2017

City of Santa Barbara
Annex to Santa Barbara County
2017 Multi-Hazard Mitigation Plan

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SECTION 1 INTRODUCTION

The plan was prepared in 2015-2016 as part of an update to the Santa Barbara City 2011 Hazard Mitigation Plan. The City of Santa Barbara participated in the County wide Mitigation Advisory Committee (MAC), reviewed all portions of the previous hazard mitigation plan pertaining to the City, and incorporated relevant components into this plan. This plan serves as a complete hazard mitigation planning tool for the City of Santa Barbara. It contains updated capability assessment information, a new vulnerability assessment, and an updated/revised mitigation strategy. The methodology and process for developing this annex is explained throughout the following sections.

Across the United States, natural and manmade disasters have led to increasing levels of death, injury, property damage, and interruption of business and government services. The impact on families and individuals can be immense and damages to businesses can result in regional economic consequences. The time, money and effort to respond to and recover from these disasters divert public resources and attention from other important programs and problems. Santa Barbara City, California recognizes the consequences of disasters and the need to reduce the impacts of natural hazards. The elected and appointed officials of the City also know that with careful selection, mitigation actions in the form of projects and programs can become a long-term, cost effective means for reducing the impact of natural hazards.

The Santa Barbara City Hazard Mitigation Plan (the Plan), was prepared and formulated with input and coordination from the Mitigation Advisory Committee (MAC), with support from Santa Barbara County, City Office of Emergency Services and City Departments. The process to develop the Plan included nearly a year of coordination with representatives from each City department. The Plan guides the City of Santa Barbara toward greater disaster preparedness and resistance in harmony with the character and needs of its community.

The City of Santa Barbara is located on the south coast of Santa Barbara County. Due to the Santa Ynez mountain range that blocks colder air from the north, Santa Barbara enjoys mild and pleasant weather. It sits at an elevation of roughly 50 feet above sea level and has a land area of 19 square miles. The city received its name when the California Mission Santa Barbara was founded there in 1786. The mission was known as the Queen of the Missions due to its beauty and the beauty of its surroundings. Attractions in Santa Barbara include the Waterfront, Downtown retail, entertainment and cultural districts, Santa Barbara Museums of Art and Natural History, the Santa Barbara Zoo, and special events such Old Spanish Days – Fiesta Santa Barbara. Santa Barbara is retail, tourism, government, education, and medical center of the County. It is home to the Santa Barbara Regional Airport, which provides commercial services for Ventura, Santa Barbara and San Luis Obispo Counties.

Mitigation is commonly defined as actions taken to reduce or eliminate risks to people and property from hazards and their effects. ***Hazard mitigation*** focuses attention and resources on actions that will reduce or eliminate long term risks to persons or property from natural hazards. The impact of expected yet often unpredictable natural and human-caused events can be reduced through planning. History has demonstrated that it is less expensive to mitigate against disaster damage than to repeatedly repair damage in the aftermath. A mitigation plan states the aspirations and specific courses of action jurisdictions intend to follow to reduce vulnerability and exposure to future hazard events.

It is the City's hope the Plan continues to be used as a tool for all stakeholders to increase public awareness of local hazards and risks, while at the same time providing information about options and resources available to reduce those risks. Informing and instructing the public about potential hazards will help the City protect themselves against the effects of the hazards, and will enable informed decision making on where to live, play and locate homes and businesses.

The emphasis of the Plan is on the assessment and avoidance of identified risks, implementing loss reduction measures for existing exposures and ensuring critical services and facilities survive a disaster. Hazard mitigation strategies and measures avoid losses by limiting new exposures in identified hazard areas, alter the hazard by eliminating or reducing the frequency of occurrence, divert the hazard by redirecting the impact by means of a structure or adapt to the hazard by modifying structures or standards.

Federal legislation has historically provided funding for disaster preparedness, relief, recovery, and mitigation. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest legislation to improve the delivery of mitigation programs through sound and viable planning (Public Law 106-390). The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, DMA 2000 establishes a pre-disaster hazard mitigation program, as well as, outlines requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP).

Section 322 of DMA 2000 specifically addresses mitigation planning at the state and local levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, enhanced mitigation plan prior to a disaster. State, County, and local jurisdictions must have an approved mitigation plan in place prior to receiving post-disaster HMGP funds. These mitigation plans must demonstrate that their proposed projects are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities.

State governments have certain responsibilities for implementing Section 322, including:

- Preparing and submitting a local mitigation plan;
- Reviewing and updating the plan every five years; and
- Monitoring Projects.

DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. This enhanced planning network is intended to enable local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

The Plan has been prepared to meet FEMA and Cal OES requirements thus continuing the County's eligibility for funding and technical assistance from state and federal hazard mitigation programs, such as HMGP, Pre-Disaster Mitigation-Competitive, and Flood Mitigation Assistance programs.

SECTION 2 PLAN PURPOSE AND AUTHORITY

Authority to create this Plan is derived from the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended by the Disaster Mitigation Act of 2000 (DMA

2000). The requirements and procedures for mitigation plans are found in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Part 201 and the associated Interim Final Rule changes of February 26, 2002; October 1, 2002; October 28, 2003; September 13, 2004; October 31, 2007; September 16, 2009; April 25, 2014; December 19, 2014; and October 2, 2015. This federal law and associated rule changes and regulations establishes planning and funding criteria for states and local communities.

- *Enhance Public Awareness and Understanding* – to help residents of the County better understand the natural hazards that threaten safety and welfare; economic vitality; and the operational capability of critical infrastructure;
- *Create a Decision Tool for Management* – to provide information that managers and leaders of local government, business and industry, community associations, and other key institutions and organizations need to take action to address vulnerabilities to future disasters;
- *Promote Compliance with State and Federal Program Requirements* – to ensure that Santa Barbara County and its incorporated cities can take full advantage of state and federal grant programs, policies, and regulations that encourage or mandate that local governments develop comprehensive hazard mitigation plans;
- *Enhance Local Policies for Hazard Mitigation Capability* – to provide the policy basis for mitigation actions that should be promulgated by participating jurisdictions to create a more disaster-resistant future; and
- Provide *Inter-Jurisdictional Coordination of Mitigation-Related Programming* – to ensure that proposals for mitigation initiatives are reviewed and coordinated among the participating jurisdictions within the County.
- Achieve *Regulatory Compliance* – To qualify for certain forms of federal aid for pre- and post-disaster funding, local jurisdictions must comply with the federal DMA 2000 and its implementing regulations (44 CFR Section 201.6). DMA 2000 intends for hazard mitigation plans to remain relevant and current. Therefore, Local plans (including Santa Barbara County's) are updated every five years. This means that the Hazard Mitigation Plan for Santa Barbara County uses a "five-year planning horizon". It is designed to carry the County through the next five years, after which its assumptions, goals, and objectives will be revisited and the Plan resubmitted for approval. Section 7 details specific goals and objectives with regard to implementing mitigation activities over the life of this Plan. In Section 8, Santa Barbara County has outlined a more aggressive approach to ensuring the Plan is implemented, evaluated, monitored and updated.

On the following pages are the resolutions that adopted the 2016 Plan.

RESOLUTION NO. 17-089

A RESOLUTION OF THE COUNCIL OF THE CITY OF SANTA BARBARA ADOPTING THE 2017 CITY OF SANTA BARBARA ANNEX OF THE SANTA BARBARA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, The Federal Disaster Mitigation Act of 2000 (Act), as described in 44 CFR Section 201.6 mandates local governments to submit and maintain a Federal Emergency Management Agency (FEMA) approved local hazard mitigation plan;

WHEREAS, The City of Santa Barbara has participated in a county-wide multi-jurisdictional Hazard Mitigation plan with Santa Barbara County Office of Emergency Management as the Operational Area and lead agency;

WHEREAS, The Multi-Jurisdictional Hazard Mitigation Plan identifies each jurisdiction's risk assessment and mitigation strategies to reduce the impacts of natural, technological, or intentional disasters on the public and local government;

WHEREAS, Identification of hazards in the City assists with response planning, exercise development, public education, and awareness, and other emergency management functions;

WHEREAS, the City's Local Hazard Mitigation Plan will be an Annex to the City's Emergency Operations Plan and a resource for the Safety Element of the City's General Plan in accordance with California Government Code Sections 8685.9 and 65302.6;

WHEREAS, FEMA approved the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan, of which the City's Local Hazard Mitigation Plan is incorporated; and

WHEREAS, The Federal Disaster Mitigation Act of 2000 requires the Plan to be formally adopted by the City Council or governing agency.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Santa Barbara, California, as follows:

1. The City Council approves and adopts the 2017 Local Hazard Mitigation Plan five (5) year update in accordance with the Disaster Mitigation Act of 2000.
2. The City Council adopts the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan.
3. This Resolution is effective upon its adoption.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of August 15, 2017.

_____
Mayor

ATTEST:

_____
City Clerk

RESOLUTION NO. 17-089

STATE OF CALIFORNIA	)	
	)	
COUNTY OF SANTA BARBARA	)	ss.
	)	
CITY OF SANTA BARBARA	)	

I HEREBY CERTIFY that the foregoing resolution was adopted by the Council of the City of Santa Barbara at a meeting held on August 15, 2017, by the following roll call vote:

AYES:	Councilmembers Jason Dominguez, Gregg Hart, Frank Hotchkiss, Cathy Murillo, Randy Rowse, Bendy White; Mayor Helene Schneider
NOES:	None
ABSENT:	None
ABSTENTIONS:	None

IN WITNESS WHEREOF, I have hereto set my hand and affixed the official seal of the City of Santa Barbara on August 16, 2017.

Sarah P. Gorman, CMC
City Clerk Services Manager

I HEREBY APPROVE the foregoing resolution on August 16, 2017.

Helene Schneider
Mayor

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SECTION 3 PLANNING PROCESS

Overview

The planning process implemented for updating the Santa Barbara County *Multi-Jurisdictional Hazard Mitigation Plan* (HMP) utilized two (2) different planning teams. The first team is the Mitigation Advisory Committee (MAC) and the second is the Local Planning team. All eight (8) incorporated cities (City of Buellton, City of Carpinteria, City of Goleta, City of Guadalupe, City of Lompoc, City of Santa Barbara, City of Santa Maria, and City of Solvang) joined the County of Santa Barbara in the preparation of this *Multi-Jurisdictional Hazard Mitigation Plan*. Each of the participating jurisdictions had representation on the MAC and was responsible for the administration of their Local Planning Team.

The planning process followed the concepts and principles outlined in the Comprehensive Preparedness Guide (CPG) 101. Both the MAC and the Local Planning teams focused on these underling philosophies:

- *Focus on the mitigation strategy*
  The mitigation strategy is the plan's primary purpose. All other sections contribute to and inform the mitigation strategy and specific hazard mitigation actions.
- *Process is as important as the plan itself*
  In mitigation planning, as with most other planning efforts, the plan is only as good as the process and people involved in its development. The plan should also serve as the written record, or documentation, of the planning process.
- *This is the community's plan*
  To have value; the plan must represent the current needs and values of the community and be useful for local officials and stakeholders. Develop the mitigation plan in a way that best serves your community's purpose and people.
- *Intent is as important as Compliance*
  Plan reviews will focus on whether the mitigation plan meets the intent of the law and regulation; and ultimately that the plan will make the community safer from hazards.

The planning process for the Santa Barbara County *Multi-jurisdictional Hazard Mitigation Plan (*HMP) incorporated the following steps:

- *Plan Preparation*
  - Form/Validate planning team members
  - Establishing common project goals
  - Setting expectations and timelines
- *Plan Development*
  - Validate and revise the existing conditions/situation within planning area; the *Capabilities Assessment and Hazard Assessment Sections* in the HMP
  - Develop and review the risk to hazards (exposure and vulnerability) within the planning area; the *Vulnerability Assessment Section* in the HMP
  - Review and identify mitigation actions and projects within the planning area; the Mitigation Strategy in the HMP
- *Finalize the Plan*
  - Review and revise the plan
  - Approve the plan

- Adopt and disseminate the plan

Throughout this process, and though other standard practices, opportunities for public involvement was offered and encouraged.

The MAC team was guided through the planning process; and as material was shared and decisions were made, it was the MAC team's responsibility to bring these findings back to their Local Planning Team. Below is a summary of the collaborative planning process of the MAC and Local Planning team.

Mitigation Advisory Committee (MAC)

MAC Members

The Mitigation Advisory Committee (MAC), formed in 2004, is a standing committee that works together throughout the year to discuss and provide input on a variety of activities. The MAC is led by Santa Barbara County Public Works Department and Santa Barbara County Fire, Office of Emergency Services and has representation from all of the local jurisdictions.

The MAC was utilized for the updating of the Santa Barbara County *Multi-Jurisdictional Hazard Mitigation Plan.* To assist with this effort Santa Barbara County Fire, Office of Emergency Services hired a consultant to support and assist each jurisdiction to update their Local Hazard Mitigation Plan; contained as an annex in the Santa Barbara County *Multi-Jurisdictional Hazard Mitigation Plan*. The table below (**Table 0.1**) lists the members of the MAC.

Table 0.1 Members of the Mitigation Advisory Committee 2016

Names	Organization	MAC Member Status
Michael Dyer	Santa Barbara County – Emergency Manager	New Member
Shannon McCrone	Santa Barbara County – Emergency Services Planner	New Member
Robert Troy	Santa Barbara County – Deputy Director Emergency Management	New Member
Tylor Headrick	Santa Barbara County- GIS/Emergency Services Planner	New Member
Steve Oaks	Santa Barbara County Fire – Battalion Chief	New Member
Rob Hazard	Santa Barbara County Fire – Captain	New Member
Rudy Martel	Santa Barbara County Agricultural Commissioner	New Member
Joyce Tromp	Santa Barbara County Flood Control	New Member
Jon Frye	Santa Barbara County Flood	New Member
Tom Fayram	Santa Barbara County Public Works Deputy Director	Returning Member
Matthew Schneider	Santa Barbara County Planning and Development Deputy Director-Long Range Planning	New Member
Marc Bierdzinski	City of Buellton – City Manager/Planning Director	Returning Member
Mimi Audelo	City of Carpinteria – Program Manager	New Member
Claudia Dato	City of Goleta – Senior Project Manager (Public Safety)	Returning Member
Gary Hoving	City of Guadalupe – Public Safety Director	New Member
Kurt Latipow	City of Lompoc – Fire Chief	New Member
Yolanda McGlinchey	City of Santa Barbara – Emergency Services Manager	Returning Member
Roy Dugger	City of Santa Maria – Emergency Preparedness Coordinator	Returning Member
Bridget Elliott	City of Solvang – Associate Engineer	New Member

Names	Organization	MAC Member Status
Jim Caesar	UCSB – Emergency Manager	Returning Member
Lindsey Stanley	Cal OES – Emergency Services Coordinator	New Member
Andrew Petrow	Consultant	New Member

Overview of MAC Meetings

The MAC meetings were arranged and scheduled to follow the planning process steps outlined in Section 3.1. Each meeting was designed to walk the MAC members through sections of the Santa Barbara County *Multi-Jurisdictional Hazard Mitigation Plan* and annexes. In addition to reviewing and validating material, the intent was to also educate MAC members on the planning process and purpose of each section. By taking this step it will help ensure that each MAC member could bring this knowledge back to their Local Planning Teams. The table below (Table 3.2) provides a list and the main purpose of each of the MAC meetings.

Table 0.1 Mitigation Advisory Committee (MAC) Meetings Summary

Date	Purpose
April 2015	**Kick Off (in person)** • Reviewed and discussed the hazards in the Plan; including initial ranking. • Each jurisdiction was asked to review their previous goals and objectives with a local planning team.
December 2015	**MAC Meeting (in person)** • Recap of previous MAC meeting • Goal of the project • Understanding of HMP update requirements • Validation of team members • Proposed Planning Process • Review of Capabilities Assessment Section
January 2016	**MAC Meeting (conference call)** • Recap of previous MAC meeting • Review of Capabilities Assessment Section • Discussion of public outreach efforts • Preparation for next MAC meeting
February 2016	MAC Meeting (in person) • Recap of previous MAC meeting • Review of Hazard Assessment Section • Presentation of Vulnerability Assessment results • Discussion of public outreach efforts • Preparation for next MAC meeting
March 2016	MAC Meeting (conference call) • Recap of previous MAC meeting • Review of Capabilities Assessment and Vulnerability Assessment Sections • Preparation for next MAC meeting
April 2016	MAC Meeting (in person) • Recap of previous MAC meeting

Date	Purpose
	• Initial discussion of mitigation projects and actions
May 2016	MAC Meeting (conference call) • Recap of previous MAC meeting • Discussion of mitigation actions and projects • Discussion of update process • Preparation for next MAC meeting
June 2016	MAC Meeting (in person) • Recap of previous MAC meeting • Discussion of mitigation actions and projects • Discussion of update process

See Appendix 3A for sign-in sheets and presentations, where applicable.

City Local Hazard Mitigation Planning Team

Local Hazard Mitigation Planning Team Planning Process

Although plans are reviewed yearly by the Emergency Managers Task Team; the formally assembled it's Local Hazard Mitigation Planning Team (LHMP) in 2015 to begin the process of revising the City's portion of Local Hazard Mitigation Plan. The LHMP was developed utilizing key personnel from various departments within the City. The LHMP held meetings to review the all Sections of the Hazard Mitigation Plan and determine appropriate mitigation project and engage the public. The LHMP followed the same process as the County and MAC to keep consistency throughout the planning process.

The LHMP planning process was, 1) Plan Preparation by developing a team, establishing goals and setting priorities; 2) Plan Development by revising the existing *Capabilities Assessment and Hazard Assessment Sections* in the HMP, reviewed risks and hazards, reviewed and identified any additional mitigation actions and projects, and 3) Finalized the Plan in conjunction with the County's Multi-Jurisdictional Hazard Mitigation Plan.

As mentioned above, the City of Santa Barbara participated in the Mitigation Advisory Committee (MAC). Information and discussion topics raised at the MAC meetings were brought to the City's LHMP Team for discussion of relevance within the City limits and for this annex. Yolanda McGlinchey, Emergency Services Manager, served as the City's liaison on the MAC and coordinated the collaboration of the Local Hazard Mitigation Planning Team.

Local Hazard Planning Team Members

The following table lists the City of Santa Barbara Local Hazard Mitigation Planning Team members.

Table 0.1 City Planning Committee 2016

Name	Department	Title
Todd Stoney	Police	Captain
Adam Nares	Community Development	GIS Technician

Name	Department	Title
Ann Marx	Fire	Wildland Specialist
Rosemary Dyste	Community Development	Project Planner
Mick Kronman	Waterfront	Operations Manager
John Ewasiuk	Public Works – Engineering	Principal Engineer
Andrew Stuffler	Community Development	Chief Building Officer
Jeff Brent	Public Works – Streets	Maintenance Supervisor
Santos Escobar	Parks & Recreation	Parks Manager
Rick Fulmer	Public Works – Streets	Streets Manager
Tracy Lincoln	Airport	Operations Manager
Rob Badger	Administration –IS	Information Systems Manager
Joe Poire	Fire	Fire Marshal
Liliana Encinas	Fire	Public Education Specialist
Yolanda McGlinchey	Fire/OES	Emergency Services Manager

Overview of Local Planning Team Meeting

The City of Santa Barbara Local Hazard Mitigation Planning Team (LHMP) met regularly during the planning process. The City's Emergency Services Manager served as liaison to the County's Mitigation Advisory Committee (MAC) to discuss updates to this plan and provide comments on review drafts. The table below summarizes the meetings held by the City's LHMP Team.

Table 0.2 County Planning Committee Meetings Summary

Meeting Dates	Summary of Discussions
September 23, 2015	Initial meeting of Planning Team to review current plan and determine who needs to be part of the planning process.

October 20, 2015	Second Planning Team Meeting
	• Mitigation Strategies
	  o Review old projects
	  o Discuss new projects
	• Mapping – Which ones need updating
	• Next steps

December 8, 2015	Third Planning Meeting • Update on Mitigation Strategies • Update by GIS Team • Revisions to Schedule
December 10, 2015	Fourth Planning Meeting – Map Team Only • Progress on Maps • Mapping Questions • What is still needed from County

Meeting Dates	Summary of Discussions
March 1, 2016	Fifth Planning Team Meeting • Introductions • Review of MAC meeting • Discussion of Maps – Next Steps • Hazard Assessment
May 11, 2016	Sixth Planning Team Meeting • Review of 04-28-16 MAC meeting • Review Section Drafts • Maps • Critical Facilities • Vulnerability Assessments • Next Steps
July 26, 2016	Seventh Planning Team Meeting • Review information from July 15, 2015 Public Outreach • Review Sections 1,2,3,4 5, 6, 7 and 8 • Review Maps • Discuss Critical Facilities • Determine media for public outreach and comment

See Appendix 3B for sign-in sheets and presentations, where applicable.

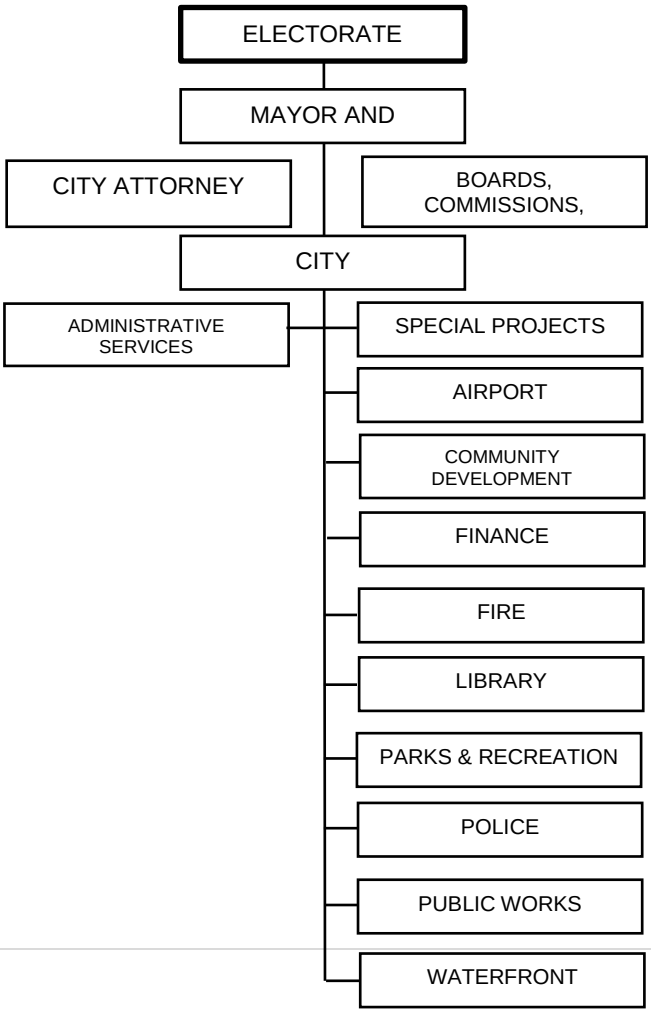
SECTION 4 CAPABILITY ASSESSMENT

The City of Santa Barbara Local Hazard Mitigation Planning Group identified current capabilities available for mitigation projects, activities and planning. This section outlines Santa Barbara's capabilities as it relates to governance; each city department's responsibility; the City of Santa Barbara Emergency Services Organization; an analysis of the City's capabilities and policies as they relate to hazard mitigation, Fiscal Resources, and the City's planning mechanisms.

Governance

The City of Santa Barbara employs a Manager-Council form of governance. Santa Barbara City Council is comprised of one Mayor and six Council Members, all of whom are elected officials each serving a four year term. The City of Santa Barbara's organization is comprised of thirteen departments. These departments are Administrative Services; Airport; City Administrator; City Attorney; Community Development; Finance; Fire; Library; Mayor and Council; Parks and Recreation; Police; Public Works; and Waterfront. In addition, Santa Barbara has 29 Advisory Boards, Commissions, and Committees whose job is to advise the City Council on a wide variety of subjects.

CITY OF SANTA BARBARA ORGANIZATION CHART



Departmental Responsibilities, Plans, and Capabilities

City Administrator's Office

The City Administrator's Office provides leadership, direction, and oversight to City departments to accomplish goals and objectives approved by the City Council, in accordance with the City Charter. The City Administrator manages all departments, provides training and development for all City employees, reviews the performance of all City departments, and assists the Council in prioritizing goals. The City Administrator's Office also provides oversight to City TV on Channel 18.

In response to natural disasters, the City Administrator's Office serves as the primary point of contact to coordinate the entire flow of public information. This is accomplished through the use of media releases, press conferences, website updates, the City TV scroll, public information kiosks and all other social media outlets. The Office works in conjunction with other emergency personnel to coordinate the public release of accurate, timely, and consistent information.

Administrative Services Department

The Administrative Services Department consists of three divisions: City Clerk, Human Resources, and Information Systems. Each division has multiple programs to best define, budget, and administer services. The Department provides important services to over 1,000 city employees and the community.

The City Clerk's Office provides agendas, staff reports, and minutes of City Council meetings; maintains and processes all City Council-approved ordinances, resolutions, deeds, agreements, and contracts; administers municipal elections; recruits and maintains membership records for advisory groups; and provides staff for the City Hall reception area and telephone system.

Human Resources provides a centralized program of personnel administration for over 1,039 regular positions. The division recruits and tests applicants for City positions; establishes job descriptions and compensation levels for over 365 classifications; conducts classification studies; provides staff support to the Civil Service Commission, coordinates disciplinary actions and assists managers on performance issues; administers benefit programs including health insurance, deferred compensation and retirement; in-processes new employees; provides new employee orientation; manages the computerized Financial Management System (FMS) in relationship to job titles, positions, compensation (COLAs, merit increases, status changes, etc.), and employee benefit selections.

Information Systems provides Infrastructure support, Financial and Enterprise Applications, and Centralized GIS. Infrastructure Support provides technical leadership, maintenance and user support for computing and networking services to City staff by operating and maintaining the City's 40+ Local Area Networks; providing maintenance and support to over 750 desktop computers; establishing and maintaining standards for hardware and software; coordinating the City's computer training program; establishing standards and providing oversight of the City's local Intranet and public Website; and performing systems analysis, system integration and system implementation. Financial and Enterprise Applications Support provides financial management systems and related services; maintains enterprise wide applications such as

maintenance management, SQL reporting services, and data exportation to support the analysis and inquiry needs of City staff; provides consulting services to all departments in areas of business problems, implementing solutions. Centralized GIS provides a standards and rules based central database of GIS data; provides tools to update and display GIS data; and provides detailed maps, drawings and other GIS services.

Santa Barbara Airport

The Santa Barbara Airport is one of the region's most important and visible assets. A recent University of California, Santa Barbara Economic Forecast Project study found that the Airport has a $500 million annual impact on the County. Since the 1930s it has been the region's primary air transportation facility. More than 755,000 passengers used the Airport in 2010; making it the busiest airport on the California coast between San Jose and Los Angeles. Consistent with national trends, air travel through the Santa Barbara Airport declined during the recent recession. However, upsizing of aircraft, and additional flights a have increased travel over the past year and airline forecast studies show the passenger volume will grow over the next 10 years.

The Airport is currently preparing a new master plan for development through 2025. The plan will identify Airport facility and capacity needs and prescribe improvements. It is vital that the Airport remain open during natural disaster situations to serve as a transportation point for the ingress and egress of personnel, equipment and supplies during the recovery phase of a disaster. The Airport completed a master drainage plan to address flooding issues, and several of the recommended projects from plan have been completed. The remaining flood control projects are listed in this document as potential projects for funding.

Approximately 400 of the 430 acres of the Goleta Slough Ecological Reserve are within Airport boundaries. As a steward of the slough, the Airport has made significant environmental improvements with plans for further restoration in the future.

In 2008 the Airport completed its airfield safety projects which brought the runway safety areas up to federal standard and reduced the commercial runway flood hazard.

As mitigation for the Airfield Safety Projects, the Airport has spent nearly $9 million to improve or restore 40 acres of wetland habitat in the Goleta Slough. Ten of those acres were completed in 2010 after a 3-year study of bird behavior in tidal wetlands. The results of this study show that the restoration of tidal circulation has improved habitat for wildlife while reducing the risk of wildlife strikes on or near the airfield. This study has national significance as other airports may follow in Santa Barbara's footsteps. Each restoration site is overseen in a 7-year maintenance and monitoring program to ensure success.

City Attorney Department

The City Attorney's Office is responsible for legal representation and advice to the City Council, Boards, Commissions and all City officers and staff. These responsibilities include advising the City Council and Planning Commission, as well as City staff, on thousands of matters each year. The office is also responsible for all City code enforcement and litigation services. The office is staffed by six attorneys and five support and paraprofessional staff.

Community Development Department

The Community Development Department is responsible for planning and zoning, building and safety, and housing and redevelopment for the City of Santa Barbara. The department has three divisions: Administration, Housing & Human Services; Building & Safety; and Planning.

The Housing & Human Service Division is responsible for a number of programs including: Successor Agency to the Redevelopment Agency, Affordable Housing Development, Housing Rehabilitation Loans, Community Development Block Grant (CDBG), Administration & Human Services Grants, Rental Housing Mediation, and Fair Housing Enforcement for the City of Santa Barbara. This division contributes to disaster mitigation through the funding of the housing rehabilitation and community improvement programs as well as capital improvement projects.

The Building & Safety Division is responsible for three programs: Building Inspection and Code Enforcement; Building Counter and Plan Review; and Records, Archives and Clerical Services. One of the primary functions of this division is to ensure all new and remodeled structures as well as additions to existing structures are constructed to current health and safety codes, thus lessening the potential impact of future disasters.

The Planning Division is responsible for four programs: Long Range Planning and Special Studies; Zoning Ordinance Information and Enforcement; Development / Environmental Review; and Design Review and Historical Preservation. This division mitigates natural and man-made hazards through the implementation of the General Plan, Zoning Ordinance, California Environmental Quality Act (CEQA), the Local Coastal Plan, the Subdivision Map Act, and a variety of other California planning statutes.

The primary responsibilities of this division in mitigating disasters is through: 1) the development of General Plan goals and policies, e.g. the Safety Element, 2) the permitting of proposed projects to ensure all development is consistent with hazard risk reduction and community resilience related goals and polices, and 3) the enforcement of existing development to ensure continued compliance with existing goals and policies through the Zoning Ordinance. In addition, all three divisions of the Community Development Department are regularly trained to respond to disasters and assist with the recovery efforts.

Fire Department

The mission of the Fire Department is to serve and protect the community from the perils of fires, medical emergencies, environmental emergencies, and natural disasters. This will be accomplished through education, code enforcement, planning, prevention, emergency response, and disaster recovery. The Fire Department is responsible for managing the following programs, Fire Administration; Fire Prevention; Wildland; Office of Emergency Services; and Fire Operations.

Fire Administration provides leadership, policy direction and administrative support to the entire department. Fire Prevention protects life, property and the environment from the perils of fire, hazardous materials, and other disasters through proactive code enforcement, modern fire prevention methods, fire and arson investigation and progressive public safety education, which provides fire and life safety education to the community to reduce the loss of life and property. Wildland ensures a safer community in the wildland-urban interface by assisting with and enforcing road clearance, defensible space and vegetation management, the Office of Emergency Services coordinates the City's response to disaster, educates residents to prepare

and operates the City Emergency Operations Center, located at Fire Station 1; Fire Operations saves and protects lives, property, and the environment of the Santa Barbara community by preventing the impact of future events through proactive planning, public education, and occupancy fire code inspections.
In 2004, the City adopted the Wildland Fire Plan, a comprehensive approach to mitigating the wildland fire hazard in the wildland- urban interface. The policies and actions developed for the Plan cover a wide range of areas. They include re-designation of the City's high fire hazard area, public education programs, evacuation preplanning, and changes to City codes, fire protection services, biomass utilization, and vegetation management programs on both private and public lands. The plan has recently been designated as the City's Community Wildfire Protection Plan. In an effort to implement elements of that plan the City adopted the Wildland Fire Suppression Assessment District (WFSAD) in 2006. In cooperation with residents of the district, the program has removed hundreds of tons of flammable vegetation, reducing the threat of wildfire and enhancing evacuation routes throughout the district.

The City of Santa Barbara's Manager of the Office of Emergency Services is a non-sworn management position within the Fire Department. The Emergency Services Manager is responsible for the development and maintenance of emergency plans, organization and coordination of emergency programs and training.

Public Library System

The Library System provides information services, reading materials and educational resources to residents of all ages from the Santa Ynez Valley through Carpinteria. The largest components of the department are areas of public service in the Central Library including circulation, reference, and youth services. The system includes seven branches, five of which are owned and funded by the County of Santa Barbara and administered under an agreement with the City. The Goleta Library is owned by the City of Goleta and administered under an agreement with the City. Additional activities include access to the Internet via public computers, an Adult Literacy program, interlibrary loan and borrowing, acquisition of materials, cataloging and processing of materials, and maintenance of the Library's catalog and users database.

Parks and Recreation Department

The City of Santa Barbara Parks and Recreation Department maintains 59 parks totaling nearly 1800 acres. The Parks Division is responsible for all aspects of park, open space, street tree and beach management and during emergencies provides logistical support such as personnel and supply transportation. The Recreation Division provides numerous recreational and cultural opportunities as well as community services. During emergencies the Department manages community buildings and recreation facilities as shelters and staging areas. The Golf Division manages the city's municipal golf course, which is a second staging area for emergency operations. The mission of the Creeks Restoration and Water Quality Improvement Division is to improve creek and ocean water quality and restore natural creek systems with the implementation of storm water and urban runoff pollution reduction, creek restoration and community education programs. The water quality program focuses on creek clean-up, street sweeping and storm water projects. Creek restoration programs improve creek health and water quality. Objectives include reducing erosion by bank stabilization and providing access where feasible. The Creeks Division has prepared Watershed Action Plans for Santa Barbara's three major watersheds and has held community forums for public input into these plans.

Police Department

The mission of the Santa Barbara Police Department, through the philosophy of community oriented policing, is to create a safe community where all people can live in peace without the fear of crime.

This commitment will ensure a professional quality of service and accountability to the citizens of the City of Santa Barbara.

While the primary mission of the Santa Barbara Police Department is law enforcement, the Police Department plays a pivotal role in general public safety as it relates to disaster preparedness. In addition, the Police Department has created some mitigation strategies that is included in their Unusual Occurrence Manual (UOM). The UOM is a guide for how officers will respond during a major incident or disaster.

The City's dispatch center was recently relocated to the Granada Garage facility at 1219 Anacapa Street. The move was due to the substandard condition of the current Police Department. In many emergency situations, police officers are among the first responders, assisting with traffic control, effecting evacuations and monitoring potentially life threatening situations.

Public Works Department

The City's largest department is Public Works. The department's total annual budget of over $93 million represents approximately 31% of the City's total budget and its 299 full time employees is approximately 14% of the City's permanent work force. The Department is responsible for operating the City's El Estero Wastewater Treatment Facility on Yanonali Street and the Cater Water Treatment Facility on San Roque Road. The Department's mission is to provide for the public's needs relative to the City's transportation system, water and wastewater services, refuse collection, construction and maintenance of all City facilities, automotive equipment communications equipment and repair and maintenance of all streets, sidewalks, and street lights throughout the City.

The Public Works Department is divided into five divisions: Administrative Services, Engineering, Facilities Maintenance, Transportation and Water Resource. The Engineering Division is responsible for contract engineering; construction; land development; real property; sewer design; surveying; and water design. The Facilities Maintenance Division is responsible for building maintenance; communications; custodial services; and motor pool. The Transportation Division is responsible for alternative transportation; parking; streets maintenance; transportation operations; and transportation planning. The Water Resources Division is responsible for water and wastewater administration; water supply management; water treatment; water distribution; wastewater collection; wastewater treatment; laboratory and environmental services.

The Department is responsible for the following emergency activities and areas:

- Recovery operations in all types of disasters.
    - Coordinating with Public Utilities companies in the repair of utilities essential to the life, health and welfare of the community.
    - Coordinating and furnishing of transportation to all emergency agencies of the City

and providing maintenance for disaster vehicles and equipment throughout the State of Emergency.

- Assuring of an adequate supply of water for emergency requirements and an adequate supply of potable water for human consumption.
- Assuring that sanitary facilities are operational or that alternate emergency facilities are provided.
- Assisting in and providing for traffic controls (signs, barricades, and signalization) and warning signs.
- Providing personnel to assist in EOC operations (office and field). Setting up and operating the Public Works Department Operating Center.

The Public Works Engineering Division is very involved in hazard mitigation activities. It manages the City's Capital Improvement Program and provides professional engineering services for planning, designing, surveying, inspecting and managing public works improvements. Long-range master planning to support the City's street, water, wastewater, transportation and parking infrastructures is also provided. The Division also provides the Airport, Waterfront, and all General Fund departments with engineering services. Services include in-house design, construction management and inspection of the annual water, sewer replacement and street capital improvement programs, plus contract administration of Airport, Waterfront, and Parks and Recreation capital projects.

Waterfront Department

The mission of the Waterfront Department is to provide the community with a quality Waterfront for recreation and commercial use, along with mooring and landside services for boating. The Waterfront Department manages approximately 252 acres of tidelands and submerged lands encompassing the Harbor and Stearns Wharf. These lands belong to the State and are held in trust by the City of Santa Barbara. The Waterfront Department consists of three Divisions: Business Services, Harbor Operations and Facilities Management.

Harbor Operations oversees the Santa Barbara Harbor Patrol. The mission of the Santa Barbara Harbor Patrol is to enforce laws, educate the public and provide emergency fire, medical and ocean response services to facilitate the safe and orderly use of the Waterfront area. In many instances, Harbor Patrol Officers are the first emergency personnel on scene to a critical incident. The Waterfront Department's Operations Division is also responsible for coordinating the Department's Tsunami response and is researching warning systems and evacuation plans.

The Waterfront Department's Facilities Division is responsible for maintenance of the breakwater, Stearns Wharf City Pier, and all of the marinas, providing clean and safe commercial and recreational facilities for tenants and visitors. They take the lead on the projects in the waterfront, including sediment management plans, structure remodels and marina reconfigurations.

The Business Division's Financial Management Section supports the Waterfront Department by staying within budget and processing revenue and expenditure accurately. The Property Management Section manages waterfront leases to ensure that the public receives quality services and that the Department collects market value rents. The Parking Services Section

provides competitively price parking that is convenient, clean and customer friendly to the community and the City's visitors.

In response to a natural disaster, the Waterfront Department, during a hazardous or disaster event, immediately transforms into an emergency response organization that includes the first responders, maintenance and finance sections. Preparation, mitigation and response plans are contained in the Waterfront's Department's Emergency Response Plan (2009).

A local base of operations called a Disaster Operating Center (DOC) located in the Waterfront Administration Building is established in order to effectively coordinate personnel and resources in order to immediately respond to hot spots as they are identified by the Incident Commander, local agencies and/or the public. The DOC becomes a base of operations and collection center for information, inspection/damage reports, and response strategies as they are developed. In addition, monitoring with the City's Emergency Operations Center (EOC) is coordinated with the Operations Section for public information, dispatch to the law enforcement, and dispatch to maintenance staff for any channel or road closures; as needed. Staff are deployed to mitigate hazards and inspect critical structures, as well as oversee any contracted clean-up or construction crews.

The Waterfront Department has a pre-planned routine for emergency response, to assure FEMA reimbursement by using the correct reporting techniques with pre-assigned teams responsible for inspecting critical facilities and to perform as flexible response units, all the disaster locations identified and numbered and called into the EOC (if opened).

City of Santa Barbara Emergency Services Organization

The City of Santa Barbara's Office of Emergency Services (OES) is a Division of the Fire Department. The purpose of OES is to develop and implement plans for the protection of persons and property within the City of Santa Barbara in the event of a disaster, and to coordinate Emergency Services functions of the City with all other public agencies and affected private persons, corporations and organizations.

The City of Santa Barbara's Emergency Services Organization is managed by the Emergency Services Council (ESC). The City Administrator serves as the Director of Emergency Services and acts as chair of the ESC. Other members of the ESC include: the Police Chief; Fire Chief; Public Works Director; and representatives of departments, service, or divisions designated by the City Administrator. The Emergency Services Manager is responsible for the development and maintenance of emergency plans, organization and coordination of emergency programs and training, and is also a member of the ESC.

The City of Santa Barbara's Emergency Services Organization is comprised of all officers and employees of the City, together with those volunteer forces enrolled to aid the City during a disaster, and all groups, organizations and persons who may by agreement or operation of law, including persons pressed into service under the provisions of Section 9.116.060(3) of the Santa Barbara Municipal Code be charged with duties incident to the protection of life and property in the City during such disaster. This includes, but is not limited to: School Districts; Santa Barbara Community College District; Santa Barbara Metropolitan Transit District; American Red Cross; and the Amateur Radio Emergency Services (ARES).

The City of Santa Barbara revised their Standardized Emergency Management System Emergency Management Plan (SEMS EMP) in January 2013 to ensure the most effective and

economical allocation of resources for the maximum benefit and protection of the civilian population in time of emergency. The EMP was developed in conjunction with the Santa Barbara County Operational Area, as part of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS). The EMP addresses emergency responses associated with natural disasters, technological incidents, and national security. The objective of the plan is to establish an effective organization capable of responding to potential large-scale emergency situations using all appropriate facilities and personnel in the City. The SEMS EMP assigns tasks and specifies policies and procedures for coordination of emergency staff and service elements. The SEMS EMP identifies emergency response actions associated with the large-scale emergencies through standard operation procedures.

The plan states that hazard mitigation is a year round effort and encourages all entities to prepare hazard mitigation plans. The following activities are identified by the plan as potential mitigation activities: improving structures and facilities at risk; identifying hazard-prone areas and developing standards for prohibited or restricted use; recovery and relief from loss; and providing hazard warning.

Fiscal Resources

The fiscal year 2016 adopted budget includes a total operating budget of $293.4 million and a citywide capital program of $105.8 million. The General Fund, which includes traditional local government services, is composed of a $124.3 million operating budget and a $2.7 million capital program.

In addition to the General Fund, the City has a number of other funds used to account for various activities. Special revenue funds, totaling $33.7 million are used to account for revenues legally restricted for a specific purpose. Enterprise funds, totaling $117.6 million are used to account for the activities of the City operating in a manner similar to the private sector, including water, wastewater, airport, golf, downtown parking, and waterfront operations. Finally, internal service funds, totaling $27.2 million are used to account for services provided internally to City departments and programs, such as Information Systems and Risk Management Services.

In 1996, the City Council established minimum reserve levels for all operating funds, including the General Fund. Pursuant to the adopted resolution, the General Fund currently maintains two separate reserves:

- Emergency Reserve – Set at 15% of the adopted operating budget, established to respond to natural disasters, such as floods, earthquakes, etc.
- Economic Contingency Reserve – Set at 10% of the adopted operating budget, established to respond to provide for unique one-time costs and maintenance of City services, and to permit orderly adjustments during periods of reductions.

The following Table shows specific financial and budgetary tools available to the City of Santa Barbara such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, building impact fees for homebuyers or developers for new development; ability to incur debt through general obligations bonds; and the withholding spending in hazard-prone areas.

City of Santa Barbara: Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)
A. Community Development Block Grants (CDBG)	Yes
B. Capital improvements project funding	Yes
C. Limited authority to levy taxes for specific purposes	Yes
D. Fees for services	Yes
E. Impact fee for homebuyers or developers for new developments/homes	Yes
F. Incur debt through general obligation bonds	Yes
G. Incur debt through general obligation bonds	Yes
H. Incur debt through private activity bongs	Yes
I. Withhold spending in hazard-prone areas	Yes
J. Local, state and federal grant funds	Yes

Relevant Plans, Policies, and Ordinances

The City of Santa Barbara has a range of guidance documents and plans for each of its departments. These include a general plan, public works and public utilities plans, capital improvement plans, emergency management plans, Local Coastal Program (LCP), Master Environmental Assessment (MEA), Circulation Element, Mission Creek Project, Conejo Slide Area Program, Airport plans, flood response guidelines, Tsunami Response Guidelines, Watershed Response Guidelines and slough programs. The City uses building codes, fire codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future is through policies laid out in the General Plan, Plan Santa Barbara.

It is important to note that during the Local Hazard Mitigation Plan update planning process these plans, programs, codes and policies were evaluated to determine their effectiveness in risk education and reduction efforts, as well as, its usefulness to implement mitigation measures. Any shortfalls or areas where the plans, programs, codes, and policies could be improved or expanded were identified and captured under annual review, the annual planning process and Mitigation Chapters of this plan. If no mitigation actions were identified, then it can be assumed that the Planning Team determined that no shortfalls or areas for improvement are needed.

The General Plan

The City of Santa Barbara General Plan was first adopted in the 1960's and was last updated in 2011. The 2011 General Plan is comprised of eight reorganized elements, including the seven

state mandated elements, as well as optional elements of Economy and Fiscal Health and Historic Resources.

Santa Barbara is a mature city, and not much vacant land remains for residential or nonresidential development. The remaining vacant land is generally found in areas of steep topography where development potential is constrained. Over 60 percent of the land is in residential use, excluding the residential portion of mixed-use development in the Downtown or other commercial areas. To encourage infill development and due to concern over resources limitations, the General Plan has a Growth Management program to limit nonresidential growth. Conversely, one of the top priorities of the General Plan is to encourage workforce and affordable housing in the City's multi-family and commercial zones. Institutional and public facilities are mainly found all over the City while most of the City's government facilities are found in the historical center of the community. There are approximately 1,086 acres of land dedicated open space and parks (not including beaches).

Zoning Ordinance

Local land use controls also include the Zoning Ordinance, which shapes the form and intensity of residential development. Consistent with the General Plan, the City's Zoning Ordinance allows a range of zones and dwelling unit densities from one unit per acre (single-family) to 27 units per acre (studio units with variable density). These zones also allow mobile home and emergency shelter units.

Zoning ordinance regulations related to hazard mitigation include Development Along Creeks, which provides controls on development adjacent to Mission Creek to prevent undue damage or destruction of development from flood water; a prohibition of residential second units and mobile homes in designated high fire hazard areas; and a slope density regulation that increases the minimum lot area where the average slope from 10 to over 30 percent.

The Environmental Policy and Construction section of the Municipal Code includes regulations and general requirements for hazardous waste generators, seismic safety, flood plain management, erosion and sedimentation control for construction, and construction prohibited in the vicinity of the Conejo Road landslide due to special geologic hazard conditions.

Starting in 2015, the City is updating its Zoning Ordinance to bring it up to date to reflect current uses and practices. The City's goal is that this project will result in a new Zoning Ordinance that is:

- Restructured, simple and user friendly
- Modern and current
- Clear in decision making processes
- More flexible in administering the code
- Aligned with historic interpretations
- Responsive to nonconforming situations.

Floodplain Management

The City of Santa Barbara does not participate in the National Flood Insurance Program (NFIP). The City purchases property insurance on the commercial market that provides coverage for loss related to flood. However, Flood Insurance Rate Maps (FIRMs) were developed through the NFIP and were last updated in September 2005 and have been made available in GIS format as Digital Flood Insurance Rate Maps. These are on file with the Santa Barbara Operational Area Office of Emergency Services, County Flood Control, and the Santa Barbara City Public Library that identify floodplains, along with evacuation routes and locations of public shelters.

Safety Element

The Safety Element is a required component of the City's General Plan and is element most relevant to hazard mitigation and emergency response. The Safety Element was updated in 2013 and includes specific items as prescribed by the California Government Code as well as other relevant safety issues that are considered important. Hazard maps provided in the Safety Element depict the general locations and possible severity of various hazards and are important tools in identifying and reducing the potential effects of hazards and for hazard response planning. The Safety Element provides information to guide the evaluation of hazard-related effects, provides policies to protect the community from hazard-related risk, and supports the implementation of programs intended to enable and expedite the recovery of a community after a disaster occurs.

SECTION 5 HAZARD ASSESSMENT

Overview

The purpose of this section is to review, update and/or validate the identified and profiled hazards in 2016 City Santa Barbara Multi-Hazard Mitigation Plan (HMP). The intent is to confirm the list of hazards facing the city and determine if the current information and material is current and accurate. The importance of this is to ensure that all hazards are being considered and decisions are based on the most up-to-date information. Another purpose of this section is to screen the hazards; providing an understanding of the significance by ranking higher priority hazards in the community.

As part of this effort the City liaisoned with the Mitigation Advisory Committee (MAC) and as well as the City's local planning team. The MAC group assessed information at the county-level, while the City's planning team assessed the information relating our jurisdiction.

As part of process both groups leveraged other planning efforts and documents, including the State of California Multi-Hazard Mitigation Plan, the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element, the City's 2013 Emergency Management Plan, and the Santa Barbara County 2016 HMP; as well as other various City plans.

Local Hazard Mitigation Planning Team Hazard Assessment

Utilizing the information and material from the State of California Multi-Hazard Mitigation Plan, the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element, and the City of Santa Barbara 2011 HMP, the City's 2013 Emergency Management Plan, the Local Hazard Mitigation Planning team, the Santa Barbara County Mitigation Advisory Committee (MAC) reviewed and revised: 1) the list of hazards in the geographic area, 2) the information and material presented for each hazard, and, 3) the prioritization of the hazards. The following sections provide a summary of the work.

Hazard Identification

Based on the review of the Santa Barbara City 2016 HMP and incorporating information from other documents (i.e., the California State Multi-Hazard Mitigation Plan) and local experience and knowledge, the LHMP team identified the following hazards as being relevant to City of Santa Barbara (**Table 5.1**).

Table 0.1 Relevant Hazards in the City of Santa Barbara

List of City Hazards
Earthquake
Wildfire
Landslide and other Earth Movements
Flood
Climate-Related Hazards
Sea Level Rise
Drought and Water Shortage
Severe Weather
Energy Shortage
Oil Spills
Dam Failure
Agricultural Pests
Epidemic/Pandemic/Vector Borne Disease
Hazardous Materials Release
Terrorism
Cyber Threats
Airline Crashes
Train Accidents
Tsunami
Civil Disturbance
Marine Invasive Species

Hazard Screening/Prioritization

The intent of screening hazards is to help prioritize which hazard creates the greatest concern in the community. Because the original process used to rank hazards in the Santa Barbara City 2011

HMP is not being utilized, an alternative approach is being recommended. A summary of the process and the results of the revised hazard ranking for the 2016 HMP update are discussed below:

Ranking Tool Design
The ranking tool prioritizes hazards on two (2) separate factors:

- Probability of the hazard affecting the community
- Potential impacts of the hazard on the community

To further assist with the process, the following definition of "High", "Medium", and "Low" probability and impacts were utilized:

Probability
High- Highly Likely/Likely
Medium- Possible
Low- Unlikely

Impact
High- Catastrophic/Critical: Major loss of function, downtime, and/or evacuations
Medium- Limited: Some loss of function, downtime and/or evacuations
Low- Negligible: Minimal loss of function, downtime and/or evacuations

Based on the revised list of hazards and utilizing the alternative approach, the LHMP team screened the hazards. The results of the assessment are in **Table 5.2**. The shading of the matrix boxes indicate the priority level: red = tier 1; green = tier 2; and gray = tier 3.

Table 0.2 Hazard Screening and Ranking

Rank	High Impact	Medium Impact	Low Impact
High Probability		• Drought/Water Shortage • Energy Shortage • Flooding • Landslide/Other Earth Movements • Oil Spill • Sea Level Rise/Coastal Flooding • Severe Weather • Wildfire	• Agricultural Pests/Disease • Train Accident
Medium Probability	• Earthquake	• HazMat Release • Terrorism	• Commercial/Military Aircraft Crash • Cyber Threat
Low Probability	• Dam Failure	• Civil Disturbance • Marine Invasive Species • Natural Gas Pipeline/Shortage • Tsunami	

Hazard Profiles

The following sections represents work done by the MAC and confirmed by the LHMP team. The information provided below is relevant to the City of Santa Barbara. In other words, if the LHMP team considered a particular hazard not a threat it was not included in the HMP. The following material is intended to be an overview of the hazards; more information may be found in the State of California Multi-Hazard Mitigation Plan, the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element, City's 2013 Emergency Management Plan and other documents.

5.1.1 Earthquake

5.1.1.1 Description of Hazard

An earthquake is caused by a release of strain, within or along the edge of the Earth's tectonic plates, which produces ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. The severity of the motion increases with the amount of energy released, decreases with distance from the causative fault or epicenter, and is amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally, total destruction. The scale currently used in the United States is the Modified Mercalli Intensity (MMI) Scale. It was developed in 1931 by the American seismologists Harry Wood and Frank Neumann. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

Most people are familiar with the Richter scale, a method of rating earthquakes based on strength using an indirect measure of released energy (**Table 5.3**). The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released. An earthquake registering 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering 5.0.

Table 0.3 Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	Slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage over larger areas.
8 or greater	Can cause serious damage in areas several hundred kilometers across.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years return period. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

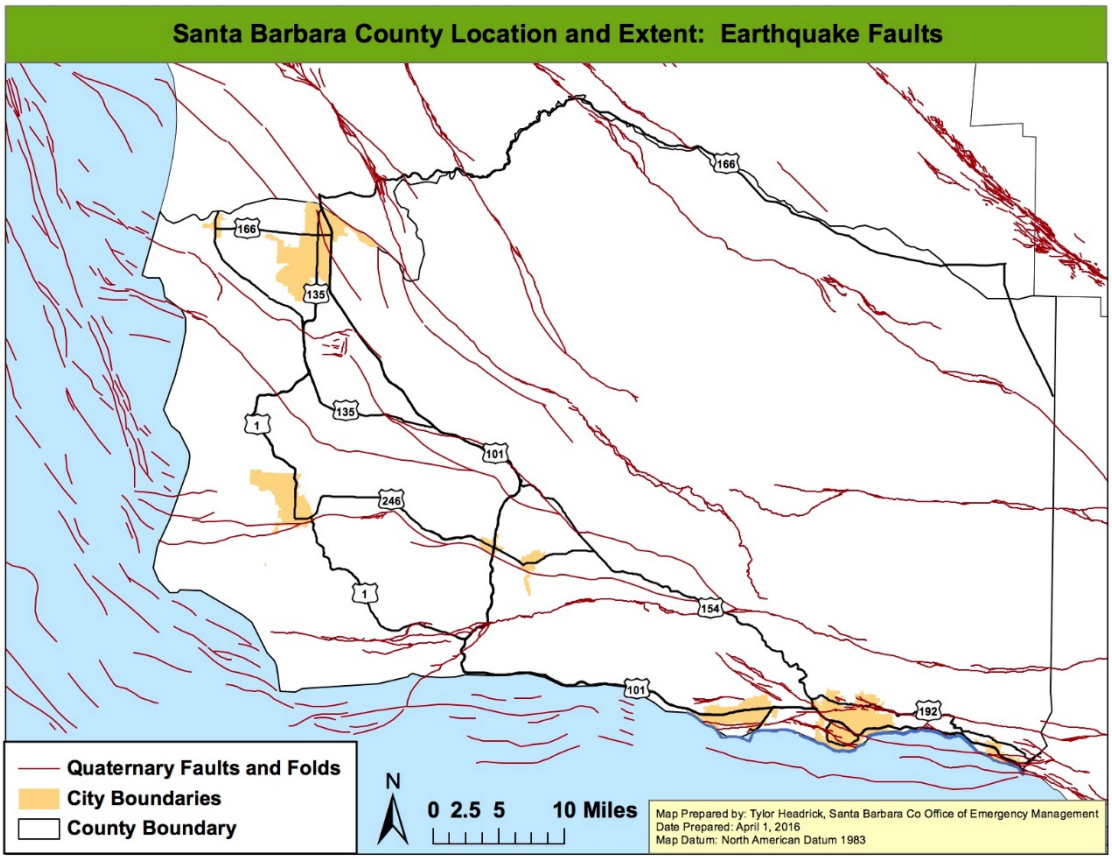
Liquefaction is the phenomenon that occurs when ground shaking causes loose, saturated soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength. Lateral spreads develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength results when the soil supporting structures liquefies and causes structures to settle, resulting in damage and in some cases, collapse.

5.1.1.2 Location and Extent of Hazard in Santa Barbara

As previously mentioned, Santa Barbara County, including the City of Santa Barbara, is located in a high seismic activity zone. The County is located in the Transverse Range geologic province. Movement of continental plates manifest primarily along the San Andreas Fault system. The San Andreas fault is situated 7 miles northeast of Santa Barbara County; active faults in the San Andreas Fault system that fall within Santa Barbara County include the Nacimiento, Ozena, Suey, and Little Pine faults. Other active faults in the region include the Big Pine, Mesa, Santa Ynez, Graveyard-Turkey Trap, More Ranch, Pacifico, Santa Ynez, and Santa Rose Island faults. The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element provides descriptions of all faults in Santa Barbara County, including historically active, active, potentially active and inactive, as well as their location and fault length. A map of faults in the Santa Barbara County region is located below (**Figure 5.1**).

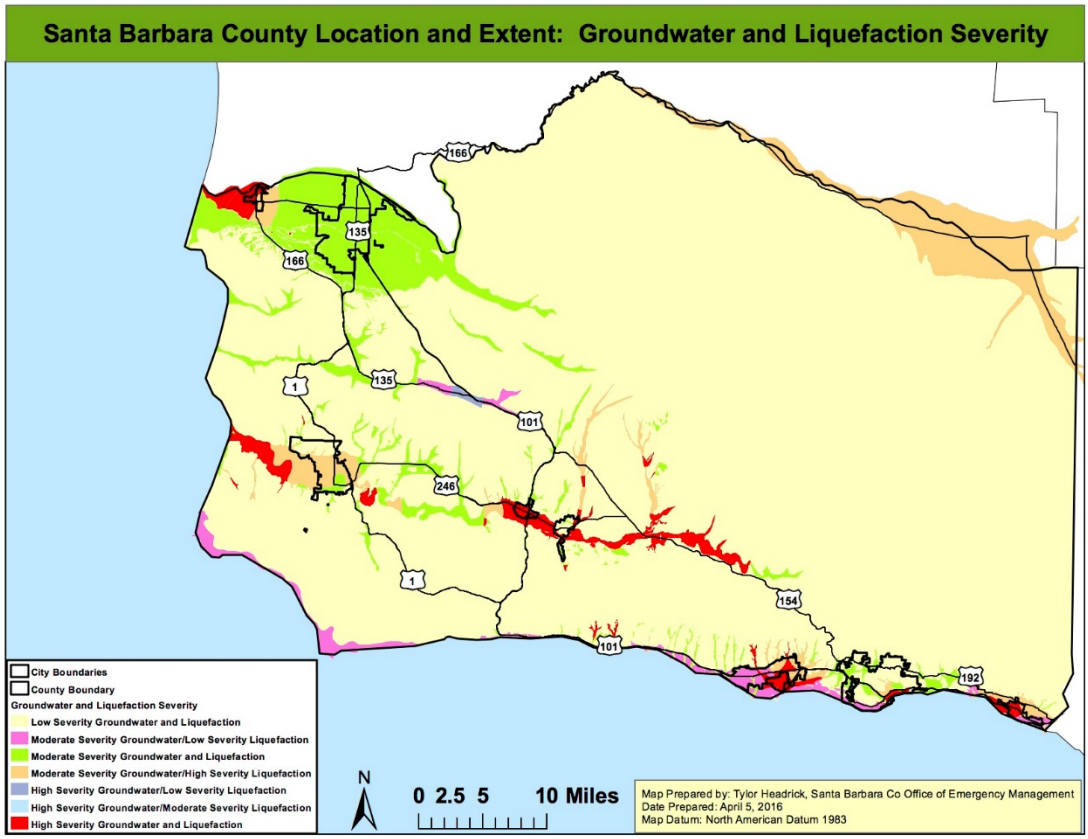
The City has areas of liquefaction that would cause severe damage in the downtown and lower eastside areas.

Figure 0.1 Earthquake Faults in Santa Barbara County



After earthquakes, some regions may be prone to liquefaction. On level ground, liquefaction results in water rising to the ground surface. On sloping ground, liquefaction will usually result in slope failure such as occurred at the Sheffield Dam in the 1925 Santa Barbara earthquake. Liquefaction risk is considered high if there were soft soils (Types D or E) present. The National Earthquake Hazards Reduction Program (NEHRP) rates soils from hard to soft, and gives the soils ratings from Type A through Type E, with the hardest soils being Type A, and the softest soils rated at Type E. The majority of the soils in Santa Barbara County are types A-C, with some areas having type D. There have been no Type E soils identified. (NOTE: A further discussion of soils can be found in the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element, along with maps of the expansive soils and collapsible soils problems ranking.) Liquefaction risk is also determined by depth to groundwater. Most of the low coastal plan and valley bottoms are underlain by alluvium and given a moderate rating with respect to liquefaction potential. Based on this information and work conducted as part of the Santa Barbara County Comprehensive Plan a map was generated indicating groundwater and liquefaction severity (**Figure 5.2**).

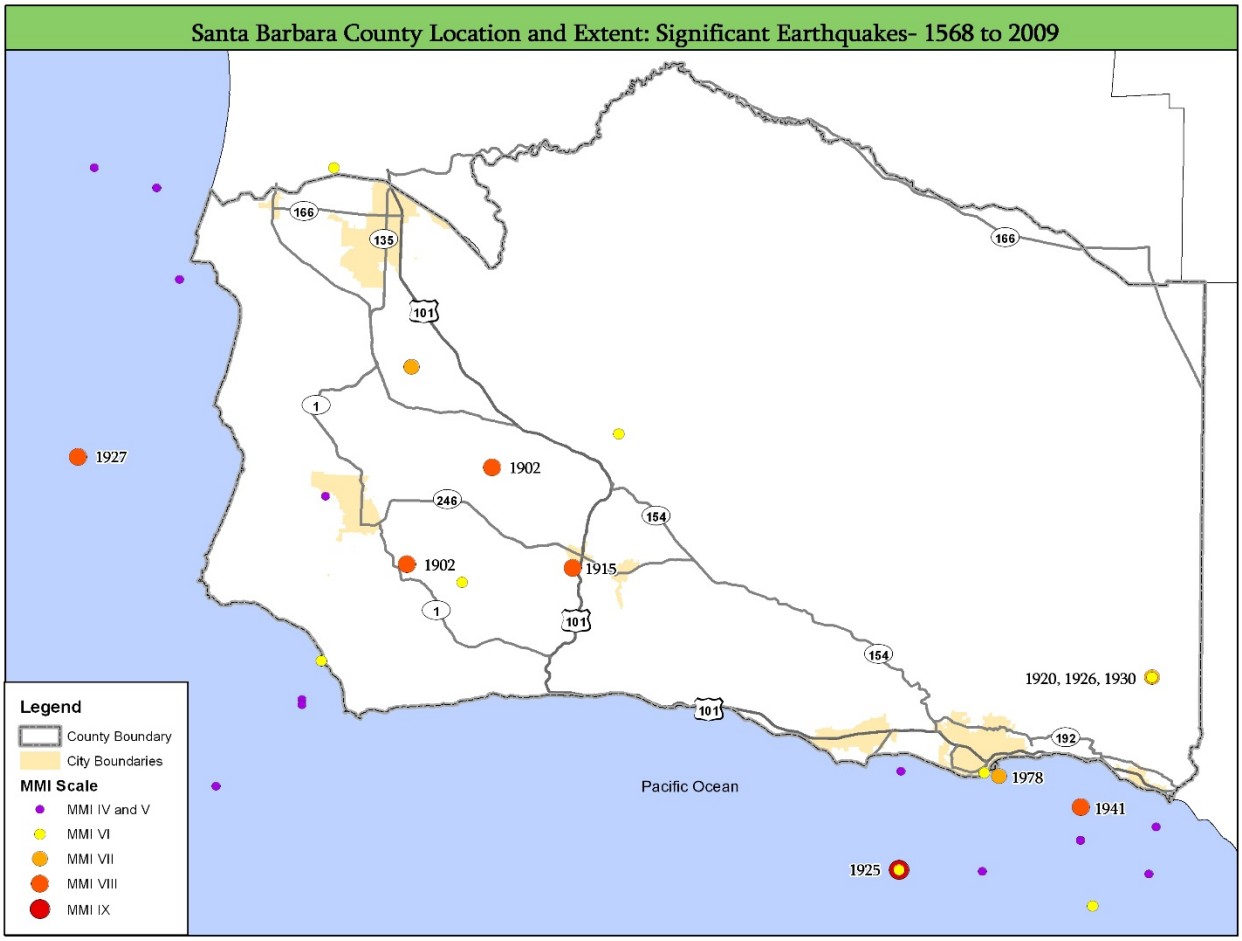
Figure 0.2 Groundwater and Liquefaction Severity



5.114 *History of Hazard in City of Santa Barbara*

City of Santa Barbara is located in a high seismic activity zone and as such has a long history of earthquakes. Although most seismic activity in California occurs along the San Andreas Fault system, most historic seismic events in the City of Santa Barbara region have been centered offshore on an east-west trending fault between Santa Barbara and the Channel Islands. The below map (**Figure 5.3**) displays historical epicenters of earthquakes located in the Santa Barbara County from 1568 to 2009. The dates of the more significant earthquake events are provided adjacent to the epicenters.

Figure 0.3 Significant Earthquakes 1568 to 2009



While more extensive discussion of previous earthquakes in Santa Barbara County is available in the Seismic and Safety Element of the Santa Barbara County Comprehensive Plan, the following information provides an overview of the more recent, significant events:

In June of 1925, the City experienced this destructive earthquake that caused property damage estimated at $8 million and killed 13 people. Most of the damage occurred at Santa Barbara and nearby towns along the coast, but the earthquake caused moderate damage at many points north of the Santa Ynez Mountains, in the Santa Ynez and Santa Maria River valleys. North of Santa Barbara, the earth dam of the Sheffield Reservoir was destroyed, but the water released caused little damage.

In Santa Barbara, few buildings on State Street escaped damage. Because parts of the main business district and the area near the seashore were built on land fill, many of the structures there were demolished, and others were so shattered that they had to be razed. In general, however, buildings of reinforced concrete were damaged little, except where workmanship was poor; frame buildings covered with stucco, sheathing, or lath also withstood the shock

well. Loss to the sewage system was heavy only in areas of land fill, but the disposal plant was destroyed above the surface of the ground.

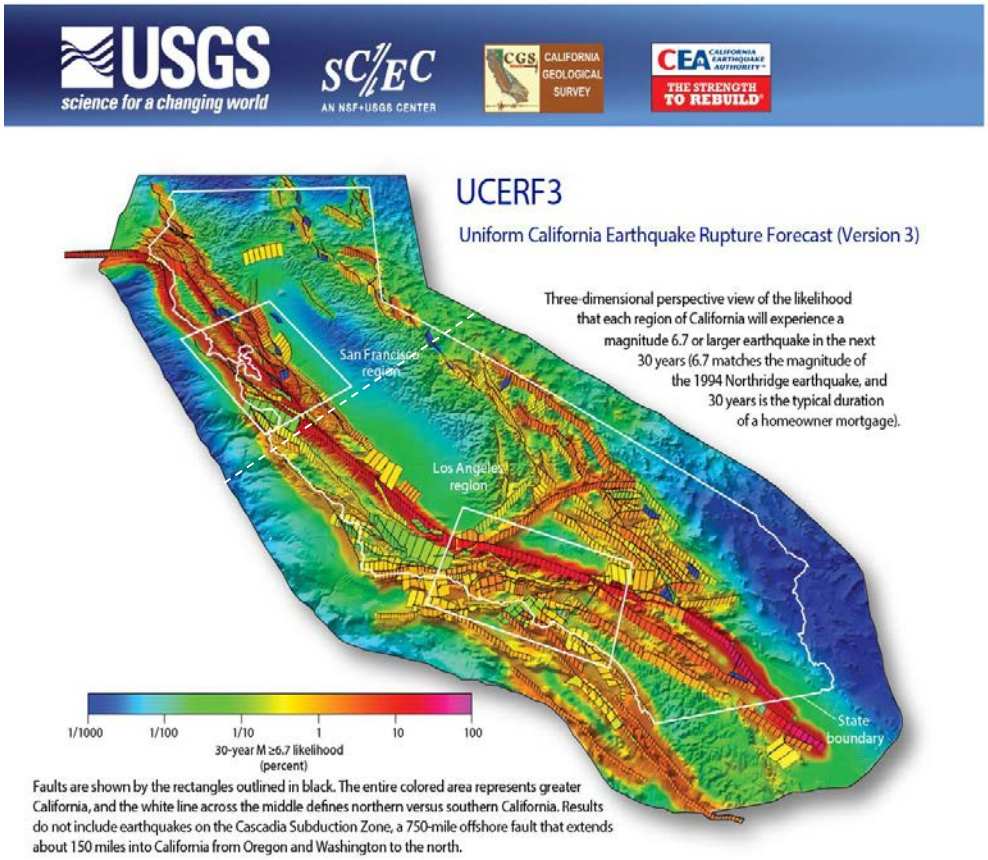
In March of 1978, and continuing sporadically through July of 1978, a swarm of small earthquakes, called micro-earthquakes occurred underneath the northeastern end of the Santa Barbara Channel. Toward the end of the micro-earthquake swarm, in July and early August of 1978, an unusually large amount of oil and tar was reported on local beaches in Santa Barbara. A common occurrence for the Santa Barbara area, the oil from these natural seeps was considered only a minor nuisance. On August 13, 1978, an earthquake occurred just to the southwest of the City of Santa Barbara, about 5 miles beneath the Santa Barbara Channel. There was minimal damage in the City. There were sixty-five people were treated for injuries at local hospitals. No deaths were reported.

On December 22, 2003 at 11:15 a.m. a magnitude 6.5 earthquake struck the central California coast. The event, known as the San Simeon Earthquake, was located 11 kilometers northeast of San Simeon, and 39 kilometers west/northwest of Paso Robles. Although the San Simeon Earthquake was felt in parts of the City there was no damage.

5.1.1.4 Probability of Occurrence

The United States Geological Survey (USGS) and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3 (UCERF3; 2015), have estimated the chances of having large earthquakes throughout California over the next 30 years (**Figure 5.4**).

Figure 0.4 Rates for Earthquake of Magnitude 6.7 or Larger in the Next 30 years (USGS, 2015)



Statewide, the rate of earthquakes around Magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99% likelihood in the next 30 years); in southern California, the rate is one per 12 years (93% likelihood in the next 30 years). Southern California's rates are given in **Table 5.4**.

Table 5.4 Southern California Region Earthquake Likelihoods (UCERF3, 2015)

Magnitude (greater than or equal to)	Average Repeat Time (years)	30-year likelihood of one or more events
5	0.24	100%
6	2.3	100%
6.7	12	93%
7	25	75%
7.5	87	36%
8	522	7%

5.1.1.5 *Climate Change Considerations*

To date, no credible evidence has been provided that links climate to earthquakes; however, climate and weather does play a significant role in the response and recovery from earthquakes. Effects from climate change could create cascading complications and impacts.

5.1.2 Wildfire

5.1.2.4 *Description of Hazard*

Wildfires can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. A WUI fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the wildland-urban interface is defined as "*…the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.*"

The WUI fire can be subdivided into three categories (NWUIFPP, 1998): 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. Generally, many of the areas at risk within the Santa Barbara County fall into the classic wildland-urban interface category.

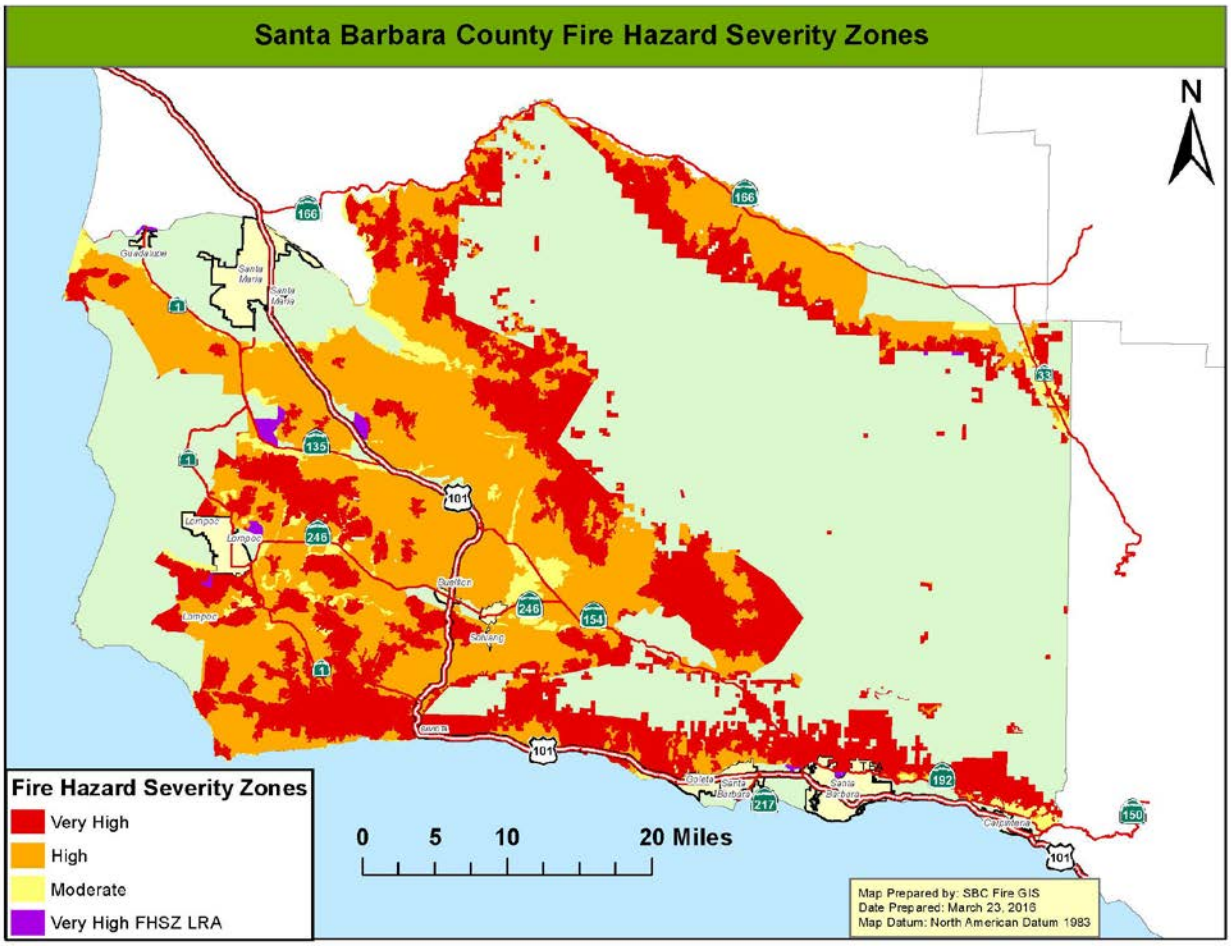
Certain conditions must be present for a wildfire hazard to occur; a large source of fuel must be present, the weather must be conducive (generally hot, dry, and windy), and fire suppression sources must not be able to easily suppress and control the fire. The cause of a majority of wildfires is human-induced or lightning; however, once burning, wildfire behavior is based on three primary factors: fuel, topography, and weather. Fuel will affect the potential size and behavior of a wildfire depending on the amount present, its burning qualities (e.g. level of moisture), and its horizontal and vertical continuity. Topography affects the movement of air, and thus the fire, over the ground surface. The terrain can also change the speed at which the fire travels, and the ability of firefighters to reach and extinguish the fire. Weather as manifested in temperature, humidity and wind (both short and long term) affect the probability, severity, and duration of wildfires.

5.1.2.5 *Location and Extent of Hazard in Santa Barbara*

The climate, topography, and vegetation in Santa Barbara County is conducive to wildfires. California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (CDF-FRAP) were mandated to map areas of significant fire hazards based on fuels (vegetation), terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, define the application of various mitigation strategies to reduce risk associated with

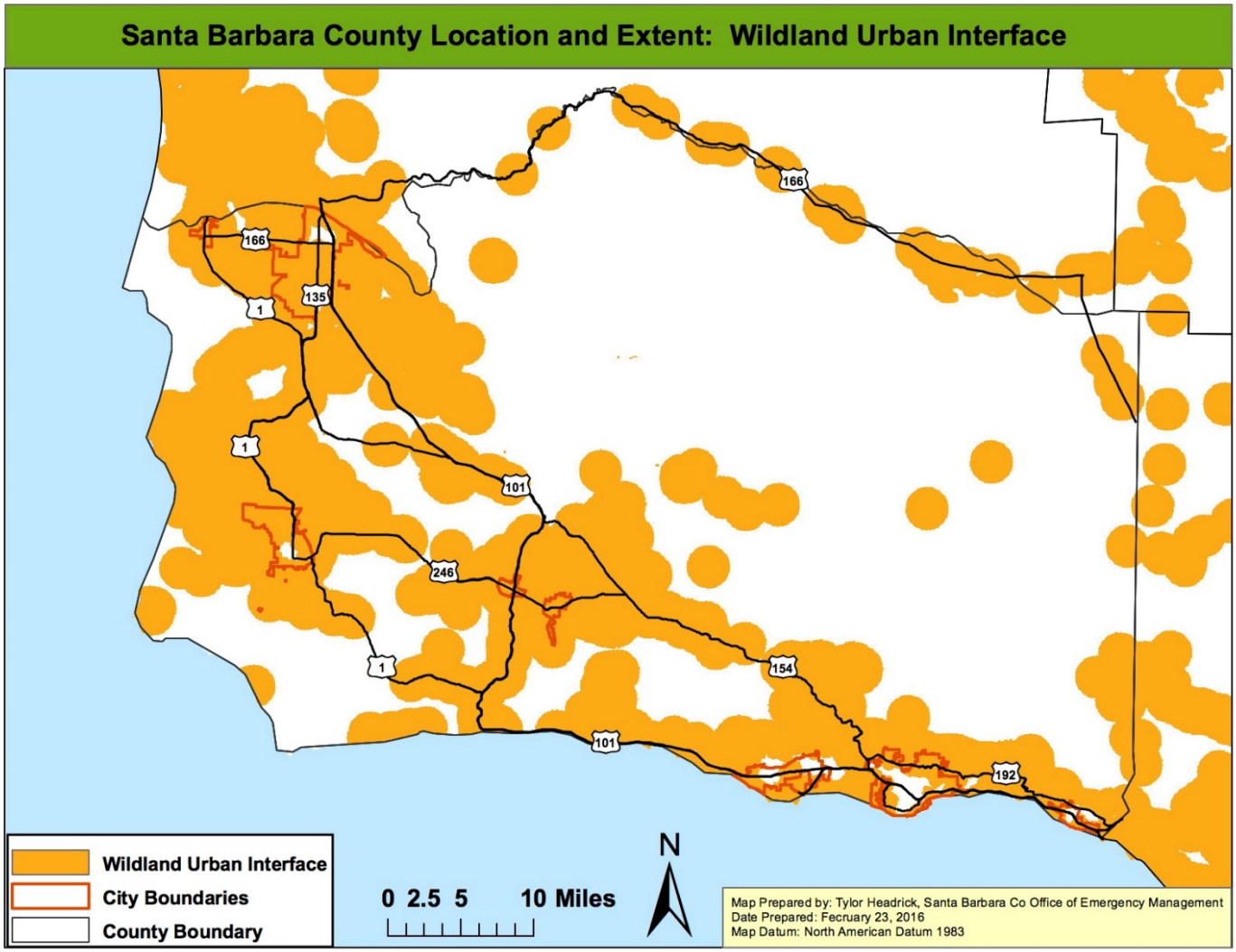
wildland fires. The most current mapping efforts by CDF-FRAP were conducted in 2007. The map below shows the Fire Hazard Severity Zones located in Santa Barbara County (**Figure 5.5**).

Figure 5.5 Fire Hazard Severity Zones



CDF-FRAP developed data that displays the relative risk to areas of significant population density from wildfire. This data is created by intersecting residential housing unit density with proximate fire threat, to give a relative measure of potential loss of structures and threats to public safety from wildfire. The map (**Figure 5.6**) was generated using this data but shows only the wildland-urban interface (WUI) in Santa Barbara County. The WUI map depicts areas where potential fuels treatments will be prioritized to reduce wildland fire threats.

Figure 5.6 Wildland-Urban Interface (WUI)



Fire representative on the LHMP team acknowledged that the WUI data shown in Figure 5.6 was developed on a statewide basis and does not consider the placement of local neighborhoods within the geography. Santa Barbara City Fire has created data at a more local level to convey communities at risk. Due to the threat, the City developed a 'Ready, Set, Go' guide for residents within the high fire area.

A list containing the federally regulated (communities which adjoin federal lands) communities at risk are within the Santa Barbara County's Hazard Mitigation Plan, which includes the City of Santa Barbara

The figure (**Figure 5.7**) below provides an overview of the location of the Communities at Risk.

Figure 0.7 Communities at Risk

5.1.2.6 History of Hazard in Santa Barbara

Because Santa Barbara County and the City are prone to wildfires. Because there are many areas in which the County and City intersect there is a long history of wildfires in the County that have affected the City (see shaded incidents). **Table 5.5** lists the major wildfires in Santa Barbara County from 1922-2015.

Table 0.5 Major Wildfires in Santa Barbara County

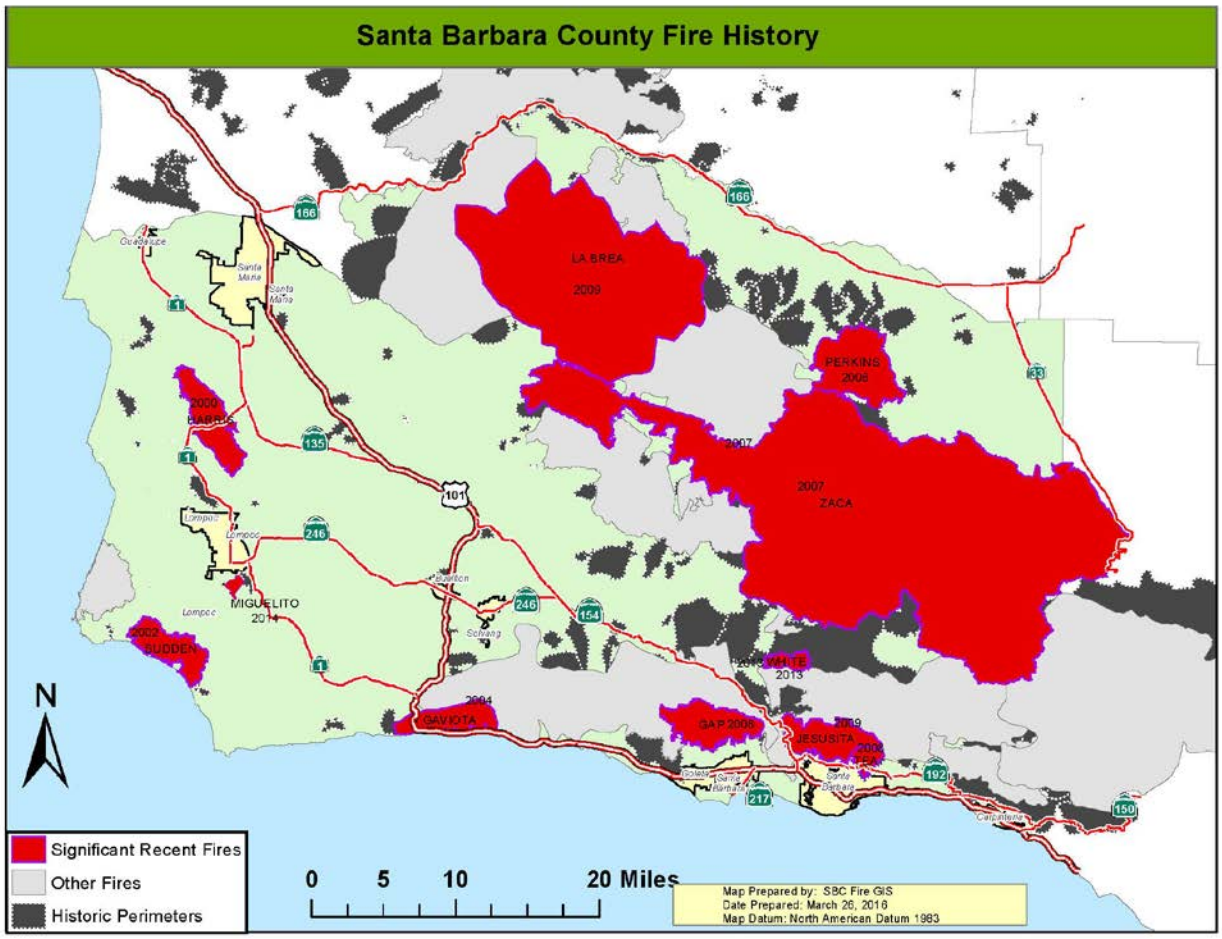
Year	Fire Name	Acres Burned
1922	Kellye Ranch	59,600
1923	Oso Canyon	70,000
1928	Aliso Canyon	42,880
1933	Indian Canyon	30,800
1950	San Marcos	9,500
1953	Big Dalton	73,450
1955	Refugio	84,770
1964*	Coyote	67,000
1966	Wellman	93,600

1971	Romero	14,538
1977*	Sycamore Canyon	805
1977	Hondo Canyon	8,087
1979	Spanish Ranch	1,190
1979	Eagle Canyon	3,765
1990*	Paint	4,424
1993	Marre	43,864
1994	Oak Hill	2,130
1997	Santa Rosa	3,074
1999	Spanish Ranch	22,296
1999	Camuesa	180
2000	Harris	8,684
2002	Sudden	7,500
2004	Gaviota	7,197
2006	Perkins	14,923
2007	Zaca	240,807
2008	Gap	9,443
2008*	Tea	1,940
2009*	Jesusita	8,733
2009	La Brea	89,489
2010	Bear Creek	1,252
2011	Figueroa	698
2013	White	1,984
2015	Miguelito	632

***Fires effecting the City of Santa Barbara**

The CDF-FRAP compiles fire perimeters of wildfires and has established an on-going fire perimeter data capture process. The map below (**Figure 5.8**) shows historic, significant wildfire perimeters in Santa Barbara County. Fire perimeters provide a reasonable view of the spatial distribution of past large fires.

Figure 5.8 Santa Barbara County Fire History



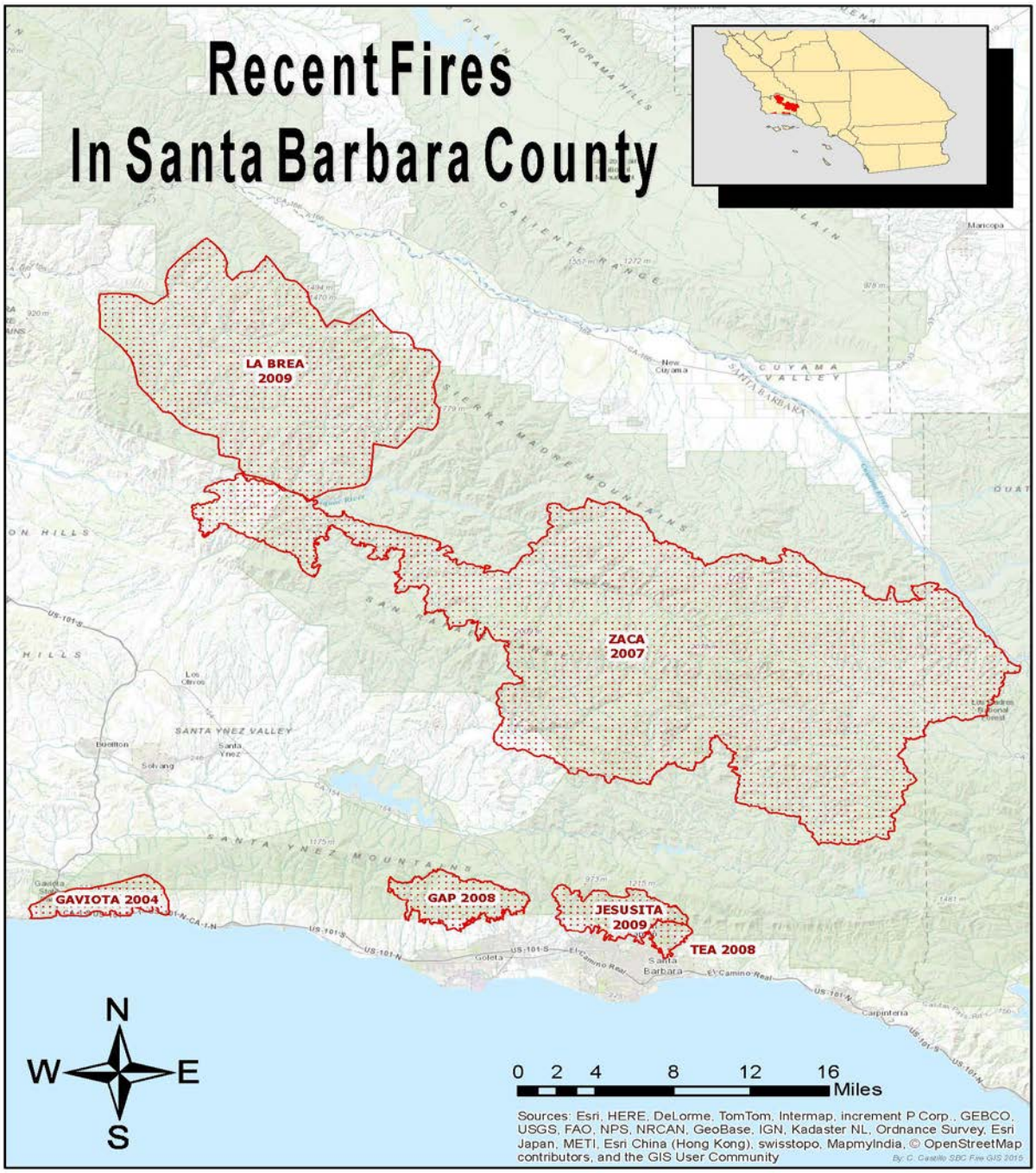
Over the last ten years, Santa Barbara County has experienced seven (7) major fires. Three of these fires; Gap, Tea, and Jesusita; directly threatened the heavily populated Santa Barbara Front Country and areas of the City of Santa Barbara. Two of these fires, Tea and Jesusita, destroyed close to three hundred structures and burned a total 16 ½ square miles. Combined, the La Brea Fire and the Zaca Fire burned a total of 518 square miles, predominately in backcountry areas of the County. Although these two fires did not directly threaten urban areas, the smoke and ash produced created air quality issues for hundreds of miles. Recently the Miguelito and the Mesa fires threatened the Lompoc area (2015). While more extensive discussion of previous wildfires in Santa Barbara County is available, the following information provides an overview and the location (**Figure 5.9**) of the more recent, significant events:

- The Zaca Wildfire burned 240,207 acres, making the Zaca Fire one of the largest wildfires in California history. The total cost of suppression was over $119 million.
- The Gap Wildfire charred 9,443 acres of forest in the Los Padres National Forest. The fire was located in the Santa Ynez Mountains north of the community of Goleta.
- The Jesusita Fire burned over 8,700 acres in the hills above the City of Santa Barbara. This wildfire was driven by a combination of a large dead fuel bed and sundowner winds gusting over 60 miles per hour. The damage, as a result of this fire, was significant, with

80 homes destroyed and another 15 homes badly damaged. No deaths were reported, but at least 30 firefighters were injured battling the fire.

- The La Brea Wildfire burned over 89,000 acres in the Los Padres National Forest in the County of Santa Barbara. The fire was fueled by very hot temperatures, low relative humidity and significant heavy fuels.

Figure 5.9 Recent Fires in Santa Barbara County

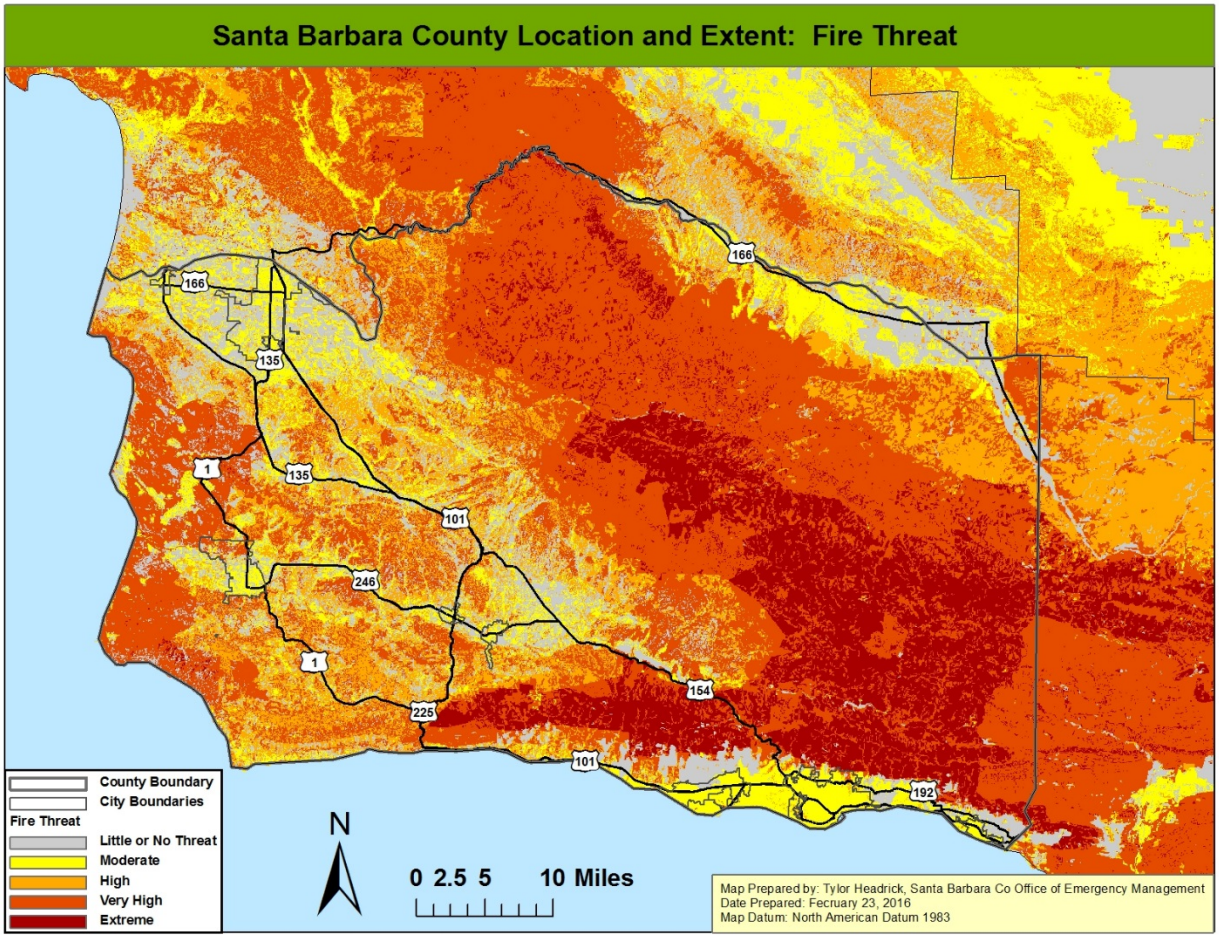


5.1.2.7 *Probability of Occurrence*

Vegetation and topography were the significant elements in the identification of the fire threat zones. A substantial amount of the vegetation in Santa Barbara is commonly called chaparral, it is a dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will eventually age and die; however, they will not be replaced by new growth until a fire rejuvenates the area. Chamise, manzanita and ceanothus are all examples of chaparral which are quite common in Santa Barbara County.

Santa Barbara County was subject to 29 major wildfires over 88 years, resulting in a 33% chance of occurrence in any given year. In addition, the map below (**Figure 5.10**) shows the threat of fire to Santa Barbara County. Fire threat is a combination of two (2) factors: 1) fire frequency or the likelihood of a given area burning, and 2) potential fire behavior. These two factors are combined to create four (4) threat classes ranging from moderate to extreme.

Figure 5.10 Fire Threat



5.1.2.8 *Climate Change Considerations*

Climate change plays a significant role in wildfire hazards. The changing conditions from wet to dry can create more fuel; the increased possibility of high winds increase risk and present a challenge, and drought conditions could hinder ability to contain fires. Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include air quality and

health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslide and flooding.

5.1.3 Landslide and other Earth Movements

5.1.3.4 Description of Hazard

Landslides can be defined as the movement of a mass of rock, debris, or earth down an incline. Types of landslides include: rock falls, rock slides, deep slope failures, shallow debris flows, and mud flows.

- Slope failure occurs when there is erosion of slopes by surface-water runoff. The intensity of slope wash is dependent on the discharge and velocity of surface runoff and on the resistance of surface materials to erosion.
- Mudflows are defined as flows or rivers of liquid mud down a hillside on the surface of normally dry land. They occur when water saturates the ground, usually following long and heavy rain falls, or rapid snow melt. Mud forms and flows down slope if there is no ground cover such as brush or trees to hold the soil in place.
- Debris Flow is defined when water begins to wash material from a slope or when water sheets off of a newly burned stretch of land. Chaparral land is especially susceptible to debris flows after a fire. The flow will pick up speed and debris as it descends the slope. As the system gradually picks up speed it takes on the characteristics of a basic river system, carrying everything in its path along with it.

The most common cause of a landslide is an increase in the down slope gravitational stress applied to slope materials, also known as over-steepening. Over-steepening can be caused by natural processes or by man-made activities. Undercutting of a valley wall by stream erosion or of a sea cliff by wave erosion are ways in which over-steeping may occur naturally.

5.1.3.5 Location and Extent of Hazard in Santa Barbara

The location and extent of landslides are extremely difficult to predict consistently for a planning area the size of Santa Barbara County. Landslides and landslide prone sedimentary formations are present throughout the coastal plain of western Santa Barbara County (**Figure 5.11**). Landslides also occur in the granitic mountains of East Santa Barbara County, although they are less prevalent. Many of these landslides are thought to have occurred under much wetter climatic conditions than at present. Recent landslides are those with fresh or sharp geomorphic expressions suggestive of active (ongoing) movement or movement within the past several decades. Reactivations of existing landslides can be triggered by disturbances such as heavy rainfall, seismic shaking and/or grading. Many recent landslides are thought to be reactivations of ancient landslides.

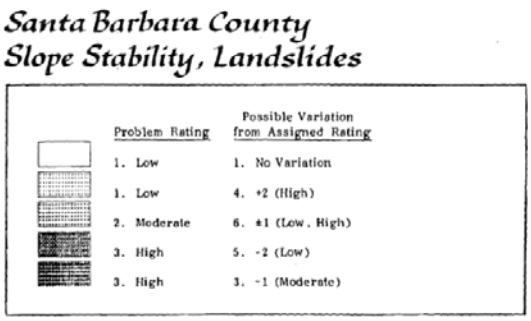
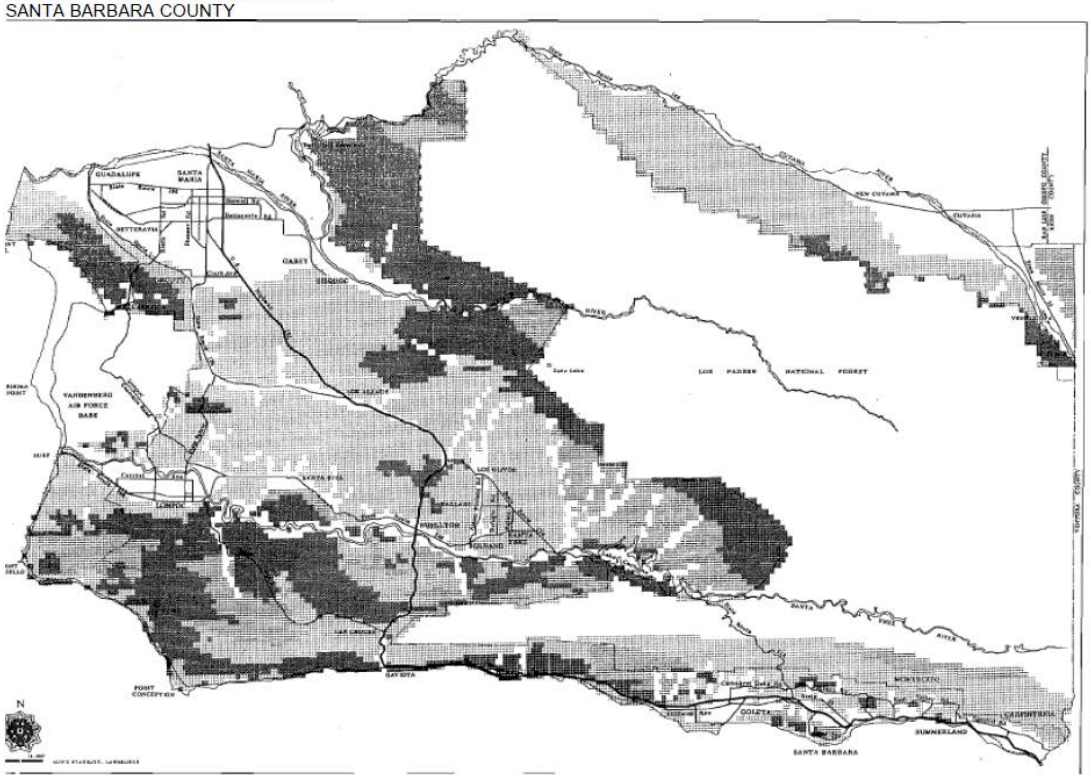


Figure 0.11 Slope Stability, Landslides

SLOPE STABILITY, LANDSLIDES
SANTA BARBARA COUNTY



The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element lists the areas in Santa Barbara County, that include a small portion of the City, where there is fairly severe land sliding and associated geologic formations. The areas are as follows:

- Foothills in the Summerland area
- Foothills of the South Coast – from Santa Barbara west to Gaviota Pass
- Hope Ranch area – west of Lavigia Hill to Goleta
- Sea cliffs along the coast from Santa Barbara to Gaviota, particularly those with out-of-slope dips
- Solvang area south of the Santa Ynez River in the vicinity of, and east of Alisal Ranch
- Areas east and northeast of Los Olivos near the Los Padres National Forest boundary
- Lompoc area south of Santa Ynez River
- Mountains south of Guadalupe and east of Point Sal
- Sycamore Canyon Road area between Alameda Padre Serra and Stanwood Drive; although in the county had a big effect on the City in regards to fire response and mutual aid in that area.

5.1.3.6 History of Hazard in Santa Barbara

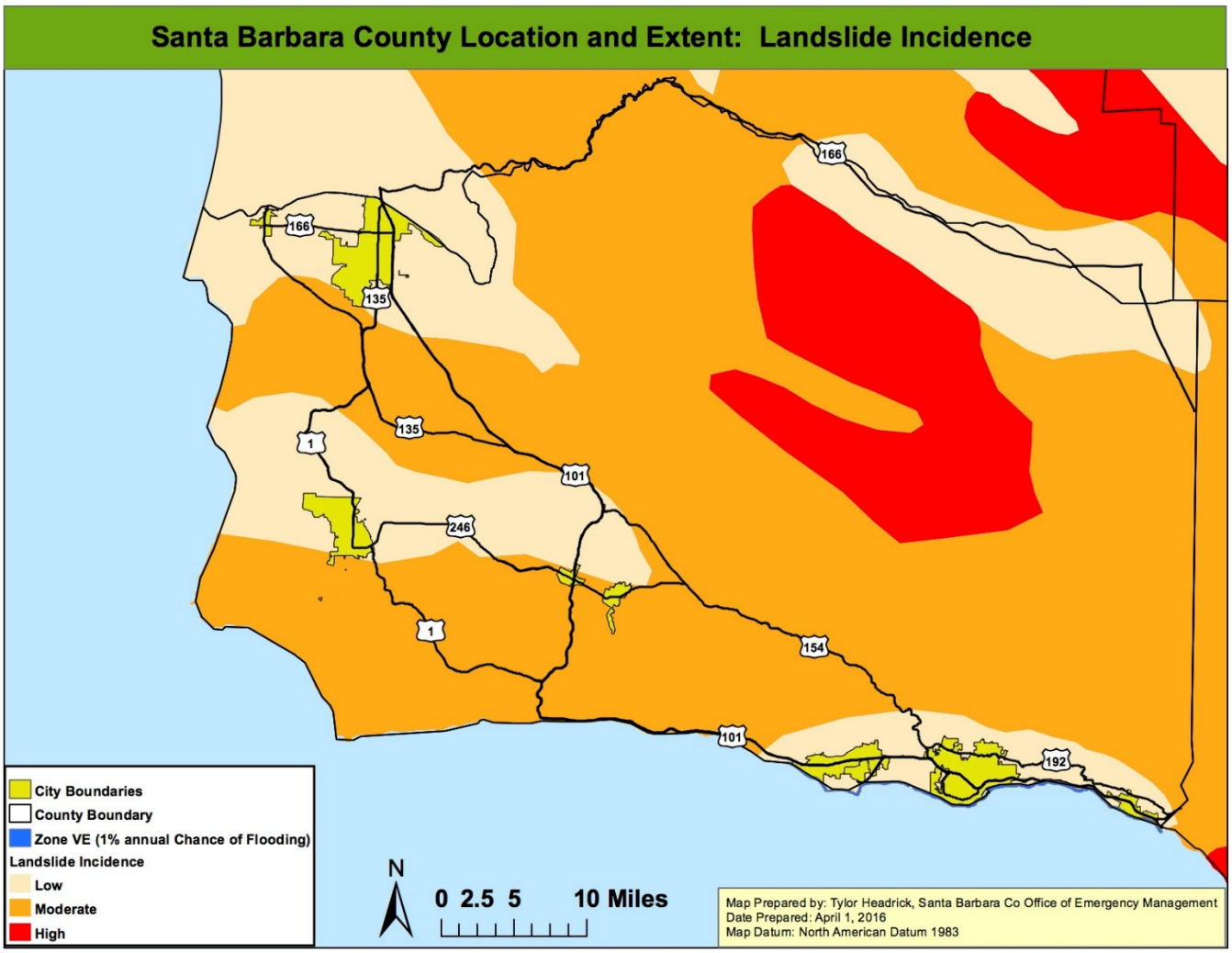
As previously mention, Santa Barbara County is prone to landslides; however the City has not experience any significant slides. However, some slides within the county has affected a few transportation corridors and hampered first responders

5.1.3.7 Probability of Occurrence

Figure 5.13 shows the general locations of high and moderate landslide risk in Santa Barbara County These areas are considered to have a higher probability of landslide occurrence than the low landslide risk areas in Santa Barbara County.

In order for landslides to occur, the correct geological conditions, which include unstable or weak soil or rock, and topographical conditions, such as steep slopes, are necessary. Heavy rain often triggers these hazards, as the water adds extra weight that the soil cannot bear. Over irrigating has the same affect. Earthquakes can also affect soil stability, causing enough weakening to favor gravitational forces.

Figure 0.13 Landslide Incidence



5.1.3.8 Climate Change Consideration

Climate change can increase the frequency and/or intensity of landslides. Changes in precipitation, specifically the increased frequency of intense precipitation, can result in a water content the ground cannot tolerate, and may cause landslides. These landslides may happen more frequently due to the increased number of heavy rainfall events. Also, the increased heavy precipitation events may cause instability in areas where landslides we not as likely before. Therefore, resulting landslides may be larger or more widespread.

5.1.4 Flood

5.1.4.4 Description of Hazard

A flood is a general and temporary condition of partial or complete inundation on land that is normally dry. Several factors determine the severity of floods, including rainfall intensity and duration, antecedent moisture conditions, surface permeability, and geographic characteristics of the watershed such as shape and slope. Other causes can include a ruptured dam or levee, rapid ice or snow melting in the mountains, under-engineered infrastructure, or even a poorly placed beaver dam can overwhelm a river or channel and send water spreading over adjacent land or floodplains.

A large amount of rainfall in a short time can result in flash flood conditions, as can a dam failure or other sudden spill. The National Weather Service's definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

Another form of flooding occurs when coastal storms produce large ocean waves that sweep across coastlines making landfall. Storm surges inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater. The County historically has been vulnerable to storm surge inundation associated with tropical storms and El Nino.

5.1.4.5 Location and Extent of Hazard in Santa Barbara

The geographical location, climate, and topography of Santa Barbara City and County make it prone to flooding. In regions such as Santa Barbara, without extended periods of below-freezing temperatures, floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells. Additionally, due to the Mediterranean climate and the variability of rainfall, stream flow throughout the County is highly variable and directly impacted from rainfall with little snowmelt or base flow from headwaters. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years.

The drainages in the City of Santa Barbara are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. Runoff from high intensity, short duration storm events can cause inundation of over bank areas, debris including sediment, rock, downed trees in the water that can plug culverts and bridges, erosion and sloughing of banks, and loss of channel capacity due to sedimentation.

Another contributing factor to flooding is the City's location along the Pacific Ocean. With its six (6) miles of coastline, the City is susceptible to storm surge events following storms off the coast. Additionally, portions of the City's subject to flooding due to flash flooding, urban flooding, watershed channel overflow, and downstream flooding.

5.1.4.6 History of Hazard in Santa Barbara

Flooding has been a major problem in the City of Santa Barbara. The City has several watershed areas that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to watershed channel flooding and flash flood events.

Between 1862 and the 2014, Santa Barbara City and County experienced 19 significant floods. Eight of these floods received Presidential Disaster Declarations. **Table 5.6** lists these floods, as well as information concerning the nature of the flooding and the extent of the damages. Shaded events occurred in the City of Santa Barbara.

Table 0.6 Historical Records of Large Floods in Santa Barbara County

Date	Damages	Source of Estimate	Comments
1862	Not available	1993 Precipitation Report	Largest discharges ever in California
1907	Significant damage to structures, crops	1993 Precipitation Report	4 straight days of rain, entire Lompoc Valley engulfed
1914	Twelve houses and six bridges lost	County of Santa Barbara Sanitation and Flood Control	Destroyed 2 dams, 22 deaths
1952	50+ homes inundated, large-scale evacuations	EIR, 1993 Precipitation Report	Propagated the formation of the Flood Control District
1964	Millions of dollars	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	Relatively light rain fell on recently burned areas. 20' walls of water, mud, boulders, and trees
1969	$4.5 million	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	Highest flows in 2900 years on Santa Ynez River, 16" of rain in 24 hours at Juncal Dam
1971	Federal Disaster Declaration	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	High flows and flooding along Romero Canyon Creek, Garrapata Creek, and Toro Canyon Creek
1978	Millions of dollars, Presidential Disaster Declaration	1993 Precipitation Report and Hydrology Methods	Inundation of agricultural areas and mudslides.
1980	Presidential Disaster Declaration	n/a	Severe flooding, mudslides, and high tides throughout County
1982-1983	2 Presidential Disaster Declarations	n/a	Parts of southern California received over 200% of normal rainfall
1993	$1.4 million in disaster recovery funds received from FEMA	1993 Precipitation Report and Hydrology Methods	180%-209% of normal rainfall, with highest-ever intensity for the County recorded at Buellton Fire Station: $1^1/_4$ inches in 15 minutes.
January 1995	$50 million, Presidential Disaster Declaration	1995 Floods	Flooding on most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria
March 1995	$30 million, Presidential Disaster Declaration	1995 Floods	Major flooding in Goleta, Santa Barbara, and Montecito, many of the same structures flooded in January were flooded again

Date	Damages	Source of Estimate	Comments
1998	$15 million, Presidential Disaster Declaration	1998 Flood Report	21.36" of rainfall that month in Santa Barbara, many areas at 600% of normal February rainfall
February 2005	$2 million	NCDC	In Santa Barbara county, flash flooding and mudslides closed down Highway 101 at Bates Road.
January 26, 2011	Total Individual Assistance: $1,909,557 Total Public Assistance: $75,414,223 Countywide per capita impact: Santa Barbara County- $9.43, Presidential Disaster Declaration	FEMA	Severe winter storms, flooding, and debris and mudflows occurred from December 17, 2010 to January 4, 2011. The counties affected include: Inyo, Kern, Kings, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Tulare.
March 2011	$1.7 Million	County Insurance Claims	A severe winter storm occurred in March 2011 that included flooding, debris and mudflows flows throughout Santa Barbara County
March 1, 2014	$500k	Television Reports	A strong winter storm caused significant damage to coastal properties on the south coast of Santa Barbara County. Coastal Damage; Goleta Pier partially closed
December 12, 2014	<$100k	County Flood Control District	A brief but intense rainfall, portions of which covered a limited area that exceeded a 200-year return period, caused damage county-wide, mostly in the form of downed trees, bank erosion and sediment and debris deposition.

While there is extensive detailed documentation of historical flood events in Santa Barbara County, the following section provides a summary of the more recent significant flood events:

1992 Flood- The 1992 – 1993 rainy season was one of the wettest recorded in Santa Barbara County, areas of the County received 180% to 209% normal rainfall. One of the County's highest short-duration rainfall intensities was recorded during 1993; 1-¼-inches fell in fifteen minutes at the Buellton Fire Station. Following a 25-year storm event that occurred in late March, Santa Barbara was declared a federal disaster area with 12 creeks substantially damaged along with several detention basins and residences. Santa Barbara County received approximately $1.4 million in disaster recovery funds from FEMA. (1993 Precipitation Report and Hydrology Methods) (Presidential Disaster Declaration)

1995 Flood- The floods of 1995 brought widespread flooding to Santa Barbara County. The most severe flooding occurred on the South Coast while the rest of the County was largely

spared from serious damages. On the South Coast, the 1995 Flood was more severe and wide spread than either the 1969 or 1967 floods. Flooding occurred on most major streams from Goleta to Montecito. Estimated public and private damages were around $100 million and the area was declared a federal disaster area. (1995 Floods)

January 1995- Flooding occurred on most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria. Approximately 510 structures were reported flooded and/or damaged along the South Coast, with a total cost resulting from public and private damages of approximately $50,000,000. All modes of transportation in and out of the South Coast were cut off for several hours; some modes of transportation were not restored for several days. (1995 Floods) (Presidential Disaster Declaration)

March 1995- During the March 10th 1995 storm, major flooding occurred again in the areas of Goleta, Santa Barbara, and Montecito. More than 300 structures were reported flooded and/or damaged; many of the same structures flooded or damaged during the January 1995 storm event. Approximately 30 million dollars of public and private property were damaged during the storm. There was also one death due to this storm in the Sycamore Canyon area of the City. Once again, all modes of transportation in and out of the South Coast were cut off for several hours. (1995 Floods) (Presidential Disaster Declaration)

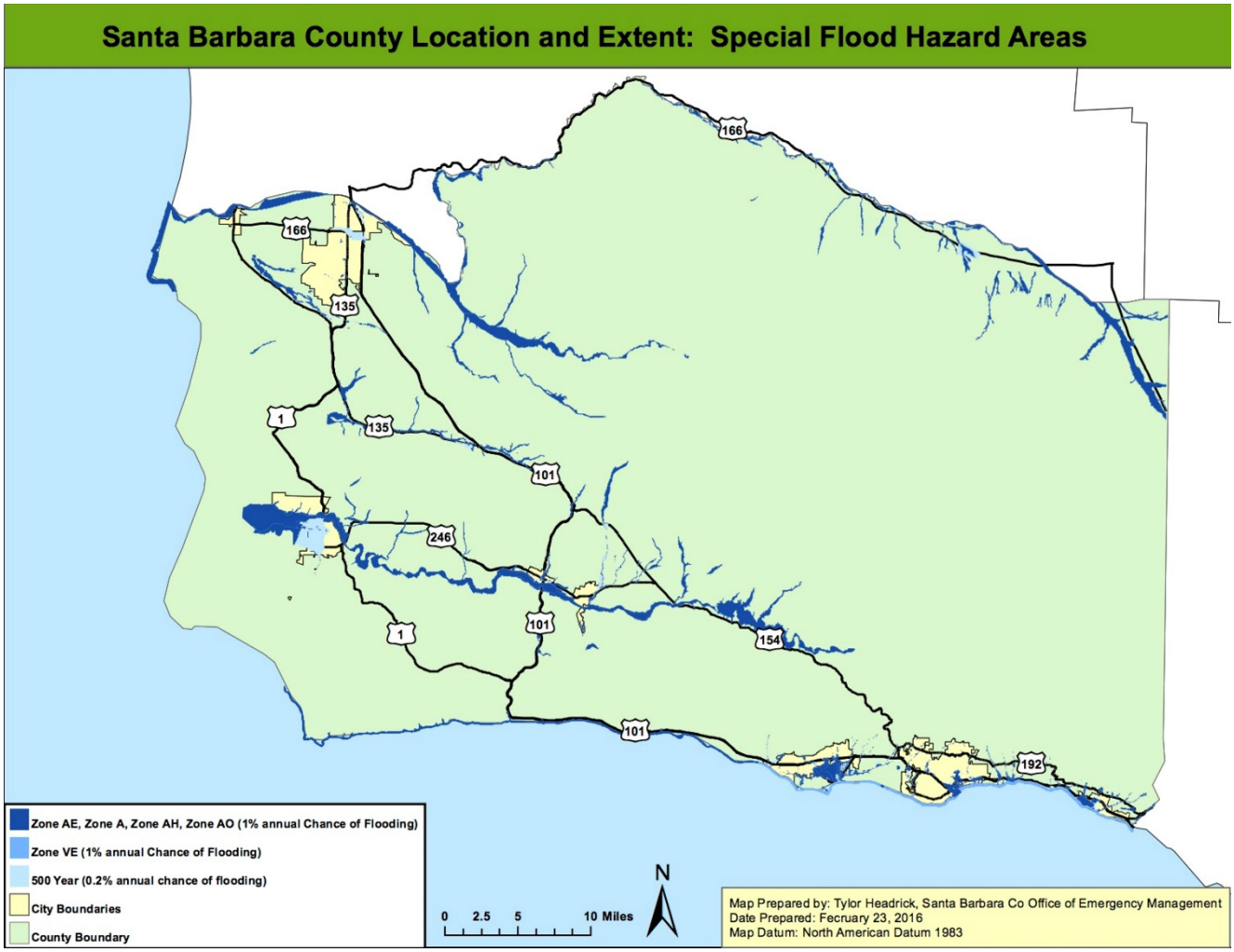
1998 Flood– February 1998 brought several record-breaking rainfalls with 50-year storm event intensities. The City of Santa Barbara recorded its wettest month in history, 21.36-inches of rainfall. By the end of the month, many areas in the County had received 600% of normal February rainfall. Flood related damages within Santa Barbara occurred during three major storm periods: February 1-4, February 6-9, and February 22-24. The cost to repair extensive flood damage to public and private property was estimated at $15 million. Just like in 1995, transportation throughout the County was disrupted through closures of roads, the Santa Barbara Airport, and train service. Flood damage was spread throughout the County and the County was declared a Federal Disaster Area on February 9. (Presidential Disaster Declaration)

Although the February storms had higher annual rainfalls, flooding in 1998 was considered less severe than other historical events due to flood control improvements, such as Cachuma Reservoir, and channel and debris dam maintenance performed by the County. (1998 Flood Report)

5.1.4.7 Probability of Occurrence

The probability of flooding in Santa Barbara County, which includes the City of Santa Barbara, is shown in **Figure 5.14**. The map shows the location of the special flood hazard zones in Santa Barbara County. The flood hazard zones depicted on the map are derived from FEMA's Flood Insurance Rate Maps (FIRM) and indicate the probability of flooding happening over a given period of time. Flood zones are geographic areas that defined varying levels of flood risk. Each zone reflects the severity or type of flooding in the area. The FIRM boundaries are developed by FEMA to convey flood risk.

Figure 5.14 Special Flood Hazard Area



Within the coastal special flood hazard area, there are two primary flood zones: Zone VE and Zone AE. Zone VE, also known as the Coastal High Hazard Area, has a wave component that is greater than three feet in height. Coastal Zone AE has a wave component of 0-3 feet in height.

The Federal Emergency Management Agency is conducting a coastal flood study for Santa Barbara County as part of the California Coastal Analysis and Mapping Project. Results from this Open Pacific Coast Study will produce flood and wave data for the National Flood Insurance Program, Flood Insurance Study reports, and regulatory Flood Insurance Rate Map panels. [1]

This coastal study will result in floodplain mapping that is anticipated to become effective in 2018. Current indications are that the resulting base flood elevations will be several feet higher than the current flood mapping.

[1] Source: FEMA; Santa Barbara, California Open Pacific Coast Study, California Coastal Analysis and Mapping Project, April 2016

The following below describes the different flood hazard zones and their associated probabilities.

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

Zone AE and A1-A30

Zones AE and A1-A30 are the flood insurance rate zones that correspond to the 100-year floodplains that are determined in the FIS by detailed methods. In most instances, BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding with a constant water-surface elevation (usually areas of ponding) where average depths are between 1 and 3 feet. The BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. The depth should be averaged along the cross section and then along the direction of flow to determine the extent of the zone. Average flood depths derived from the detailed hydraulic analyses are shown within this zone. In addition, alluvial fan flood hazards are shown as Zone AO on the FIRM. Mandatory flood insurance purchase requirements apply.

Zone AR

Zone AR is the flood insurance rate zone used to depict areas protected from flood hazards by flood control structures, such as a levee, that are being restored. FEMA will consider using the Zone AR designation for a community if the flood protection system has been deemed restorable by a Federal agency in consultation with a local project sponsor; a minimum level of flood protection is still provided to the community by the system; and restoration of the flood protection system is scheduled to begin within a designated time period and in accordance with a progress plan negotiated between the community and FEMA. Mandatory purchase requirements for flood insurance will apply in Zone AR, but the rate will not exceed the rate for unnumbered A zones if the structure is built in compliance with Zone AR floodplain management regulations.

For floodplain management in Zone AR areas, elevation is not required for improvements to existing structures. However, for new construction, the structure must be elevated (or floodproofed for non-residential structures) such that the lowest floor, including basement, is a maximum of 3 feet above the highest adjacent existing grade if the depth of the base flood elevation (BFE) does not exceed 5 feet at the proposed development site. For infill sites, rehabilitation of existing structures, or redevelopment of previously developed areas, there is a 3 foot elevation requirement regardless of the depth of the BFE at the project site.

The Zone AR designation will be removed and the restored flood control system shown as providing protection from the 1% annual chance flood on the NFIP map upon completion of the restoration project and submittal of all the necessary data to FEMA.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplains that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No BFEs or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

Zone D

The Zone D designation on NFIP maps is used for areas where there are possible but undetermined flood hazards. In areas designated as Zone D, no analysis of flood hazards has been conducted. Mandatory flood insurance purchase requirements do not apply, but coverage is available. The flood insurance rates for properties in Zone D are commensurate with the uncertainty of the flood risk

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no BFEs are shown within this zone. Mandatory flood insurance purchase requirements apply.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zones B, C, and X

Zones B, C, and X are the flood insurance rate zones that correspond to areas outside the 100-year floodplains, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-year flood by levees. No BFEs or depths are shown within this zone.

5.1.4.8 Climate Change Consideration

Climate change is both a present threat and a slow-onset disaster. It acts as an amplifier of existing hazards. Extreme weather events have become more frequent over the past 40 to 50 years and this trend is projected to continue. Rising sea levels, changes in rainfall distribution and intensity are

expected to have a significant impact on coastal communities, including portions of Santa Barbara County. This section presents a discussion of how climate change might impact the frequency, intensity and distribution of flood hazards.

5.1.5 Climate-related Hazards

This section assesses hazards that are related to climate and weather. NASA defines weather as the way the atmosphere is behaving, mainly with respect to its effects upon life and human activities. The difference between weather and climate is that weather consists of the short-term (minutes to months) changes in the atmosphere. Most people think of weather in terms of temperature, humidity, precipitation, cloudiness, brightness, visibility, wind, and atmospheric pressure, as in high and low pressure. In most places, weather can change from minute-to-minute, hour-to-hour, day-to-day, and season-to season. Climate, however, is the average of weather over time and space. Fifty-eight long-term changes in the climate, especially those driven by the accumulation of anthropogenic greenhouse gases in the atmosphere, are expected to change short-term weather patterns and thus change weather-related impacts, both short- and long-term. Most prominently, climate change is warming the average global temperatures, which will result in more frequent and intense extreme events related to changes in temperature and precipitation, such as heat waves, flooding.

In the State Hazard Mitigation Plan, climate change is treated as a condition that will change and potentially exacerbate the impact of other hazards rather than being treated as a distinct hazard with unique impacts. For example, extreme heat and heat waves is an existing hazard that will be exacerbated by climate change. Impacts of climate change on the frequency, timing, and magnitude of flooding varies with the geography throughout the state. Areas that experience early run off from snow melt coupled with intensified rain or coastal areas experiencing sea level rise may be more greatly impacted by flooding. Hazards that have the potential to be affected by climate change are grouped in this subsection.

The following section are the relevant climate-related hazards in Santa Barbara.

5.1.5.4 Sea Level Rise and Erosion

5.1.5.4.1 Description of Hazard

Sea level rise (SLR) is defined as the rising of the level of the sea as a result of the so-called greenhouse effect or global warming. SLR can occur through one or more of three (3) processes that include eustasy, isostasy, or thermal expansion. Erosion is a natural process which alters existing geomorphic features. Erosion can occur due to a number of factors, including winter storms, tidal action, wind-generated high surf, wave action, and rising sea levels.

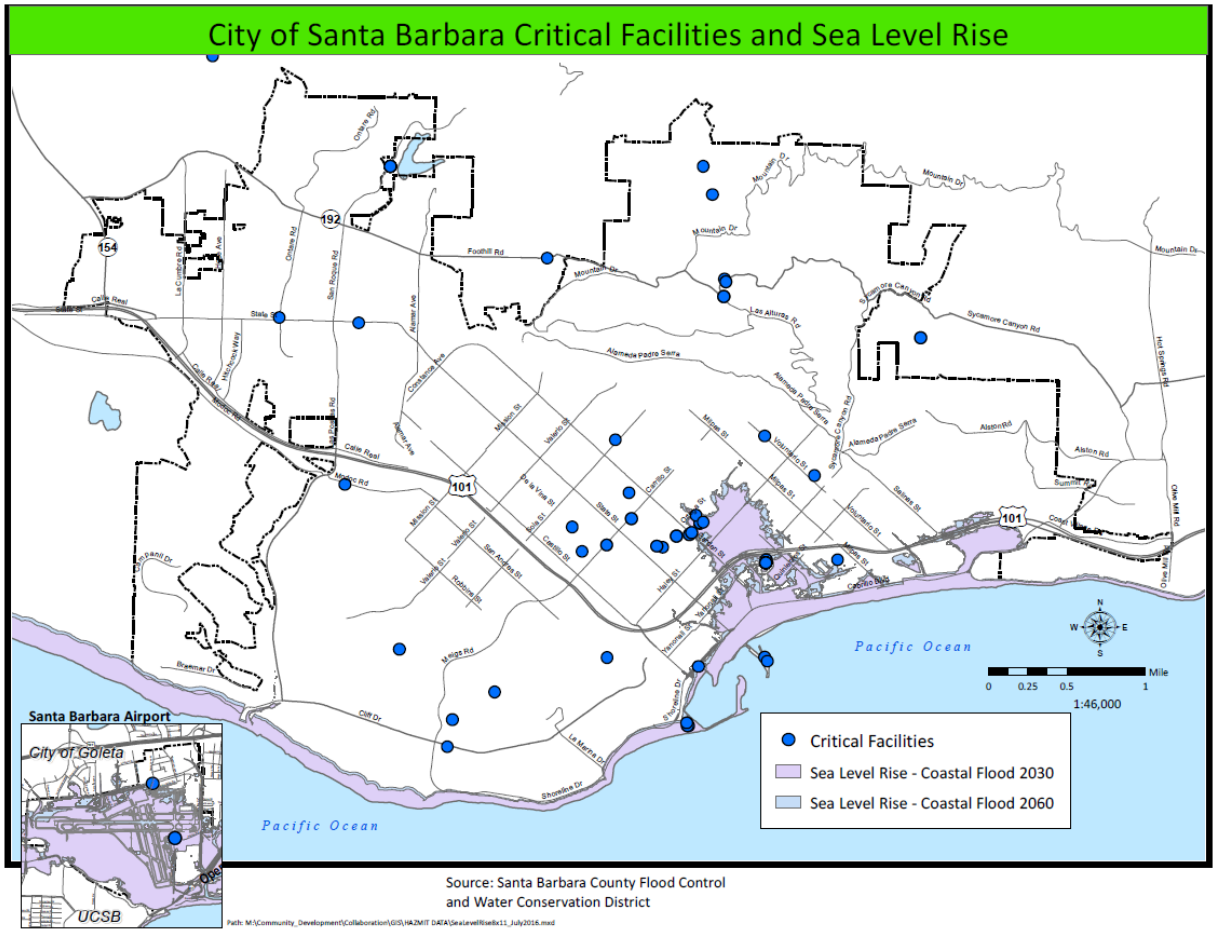
In 2014, the City received a grant from the CCC to update the LUP, not including the Airport. The primary goals are to update and clarify LUP text, policies, and maps and to amend a targeted portion of the IP to include climate change adaption actions. The draft LUP update and targeted IP amendment are scheduled to be completed in spring 2016, followed by Planning Commission and City Council adoption and Coastal Commission certification.

One of the grant tasks was to conduct a sea level rise vulnerability assessment for the City. This task was fulfilled by a team of University of California Santa Barbara Bren School Master degree candidates. The City of Santa Barbara Sea Level Rise Vulnerability Assessment (March 2015) is

being used to inform policy development and the development of practical short term measures for the targeted IP amendment.

5.1.5.4.2 Location and Extent of Hazard in Santa Barbara

The impacts from SLR and erosion in Santa Barbara City will be felt along its six (6) mile long coastline. SLR coupled with increased frequency, severity, and duration of high tide and storm events related to climate change will result in more frequent and severe extreme events along the coast. These events could expose the coast to severe flooding and erosion, damage to coastal structures and real estate, and salinity intrusion into delta areas and coastal aquifers (Projecting Future Sea Level, A Report from the California Climate Change Center, 2006).

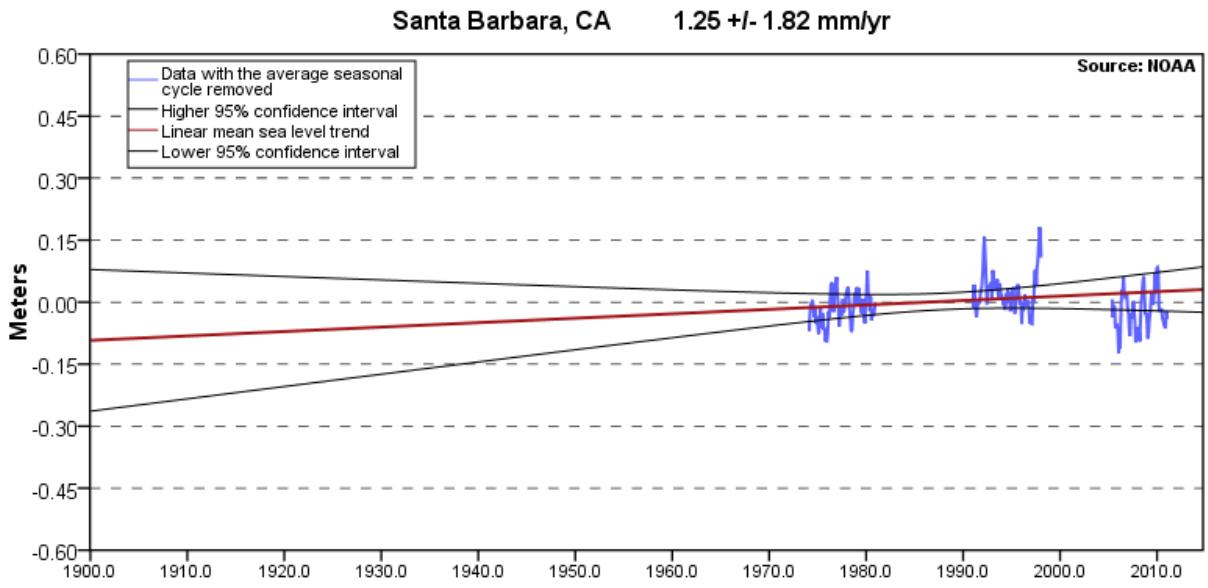


5.1.5.4.3 History of Hazard in Santa Barbara

Typically, the highest sea level readings along California's coastline occur during periods of heavy rain that coincide with high tides, causing coastal flooding, coastal bluff erosion, and landslides such as were experienced during the 1998 El Nino storms. Sea levels are already rising along the Santa Barbara County and City coastlines as is evident in long term tidal gauge records from

Station 9411340 since 1973, where the rate of rise has been approximately 0.41 feet per century[2] (**Figure 5.15**).

Figure 0.15 Mean Sea Level Trend in Santa Barbara



5.1.5.4.4 Probability of Occurrence

As discussed above, the potential impacts of global warming and climate change include increased opportunities for severe weather that may result in sea level rise and erosion. Santa Barbara County's land mass includes more than 110 miles of coastline, which includes six (6) miles in the City of Santa Barbara, with varying geologic features including steep coastal bluffs, beaches, wetlands, bays, and deltas. It also supports varying levels of development and land use, including recreational, agricultural, industrial, commercial, and residential.

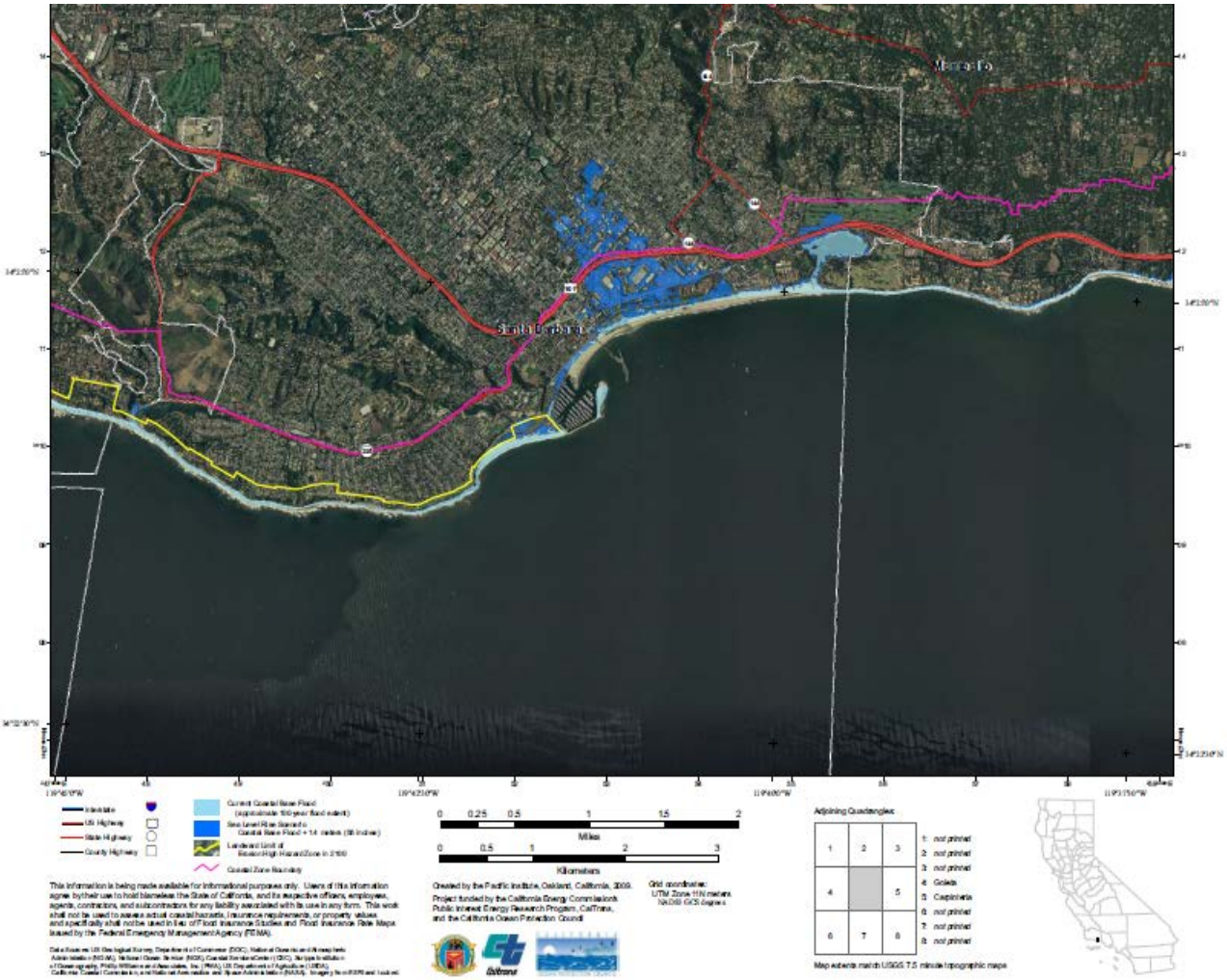
A growing consensus of scientists believes that sea level rise will continue and the rate of rise will increase. The Intergovernmental Panel on Climate Change (IPCC) suggests that global SLR on the order of 0.2 m (0.66 ft.) and 0.6 m (1.97 ft.) is possible by 2100 with other scientists indicating this rise could be over 1 meter (3.28 ft.). [3] **Figure 5.16** depicts areas (dark blue along and near the Santa Barbara County coastline that may be vulnerable to sea level rise in a 1.4 meter sea level rise scenario. [4] From the figure, it is apparent that a considerable number of buildings and infrastructure may be impacted.

[2] NOAA: http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9411340; retrieved April 6, 2011.

[3] M. Vermeer and S. Rahmstorf. 2009. Global sea level linked to global temperature. Proceedings of the National Academy of Sciences, USA.

[4] M. Heberger, H. Cookley, P. Herrera, The Pacific Institute, May 2009. The Impacts of Sea-Level Rise on The California Coast.

Figure 0.16 Sea Level Rise Santa Barbara Quadrangle



5.1.5.4.5 Climate Change Considerations

This entire section is dedicated to climate change hazards, and as such, is focused on climate change's effects on the community. However, it is important to highlight climate change's potential direct impact.

As mentioned above, SLR can be caused by three (3) different processes. Two (2) of which, melting of ice sheets and/or thermal expansion of water, are a result of climate change and/or global warming.

Erosion can be increased by climate change in two (2) ways. First, sea level rise, over time, will cause more rapid erosion of more inland areas than in previous years. This will be chronic erosion, however it will reach new, more inland areas, in the future due to higher average sea levels. Secondly, while the topic of increased frequency of storms is up in debate, if more severe or frequent storms do occur, it will increase coastal erosion events. More frequent storms will impact how frequently acute coastal erosion events occur, while more intense events will cause the erosion to extend further inland than before.

5.1.5.5 Drought and Water Shortages

5.1.5.5.1 Description of Hazard

Drought and water shortages are a gradual phenomenon and generally are not signified by one or two dry years. California's and Santa Barbara's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) generally mitigates the effects of short-term dry periods for most water users. However, drought conditions are present when a region receives below-average precipitation, resulting in prolonged shortages in its water supply, whether atmospheric, surface, or ground water. A drought can last for months or years, or may be declared after as few as 15 days.

5.1.5.5.2 Location and Extent of Hazard in Santa Barbara

The entire county is subject to drought conditions and water shortages.

5.1.5.5.3 History of Hazard in Santa Barbara

Santa Barbara County has had three (3) State and/or Federally declared drought disasters since 1950; in 1990, 1991, and 2001. The State of California and Santa Barbara are currently in a drought. The average rainfall in downtown Santa Barbara City is 18.25 inches; however, since 2016, Santa Barbara has experienced significantly less than normal rainfall. The effects of the drought are most visible when looking at the current capacity and maximum storage of the two main water reservoirs in the county, Lake Cachuma and Twitchell. On February 16, 2016, Cachuma was reported to be at 14.9% capacity, and Twitchell was at 0.2% capacity.

5.1.5.5.4 Probability of Occurrence

In any given year, Santa Barbara County, which includes the City of Santa Barbara, can be subject to drought conditions and water shortages. For this reason, the City is currently in the process of building a desalination plant which should be operational in the fall of 2016. Click here for updated information on the progress of the plant.

5.1.5.5.5 Climate Change Considerations

This entire section is dedicated to climate change hazards, and as such, is focused on climate change's effects on the community. However, it is important to highlight climate change's potential direct impact.

Climate change has the potential to make drought events more common in the West, including California. Extreme heat creates conditions more conducive for evaporation of moisture from the ground, thereby increasing the possibility of drought. A warming planet could lead to earlier melting of winter snow packs, leaving lower stream flows and drier conditions in the late spring and summer. Snow packs are important in terms of providing water storage and ensuring adequate supply in the summer, when water is most needed. Changing precipitation distribution and intensity have the potential to cause more of the precipitation that does fall to run-off rather than

be stored. The result of these processes is an increased potential for more frequent and more severe periods of drought.

5.1.5.6 Severe Weather and Storms

5.1.5.6.1 Extreme Heat

5.1.5.6.1.1 Description of Hazard

Extreme Heat is a function of heat and relative humidity. A Heat Index describes how hot the heat-humidity combination makes the air feel. As relative humidity increases, the air seems warmer than it actually is because the body is less able to cool itself via evaporation of perspiration. As the Heat Index rises, so do health risks such as heat exhaustion, sunstroke, and heatstroke. Some Heat Index Program Alert procedures are implemented when the high temperature is expected to exceed 105° to 110° (depending on local climate) for at least two consecutive days.

5.1.5.6.1.2 Location and Extent of Hazard in Santa Barbara

The entire county, which includes the City of Santa Barbara, is subject to extreme heat conditions, particularly inland areas.

5.1.5.6.1.3 History of Hazard in Santa Barbara

Santa Barbara County and City has experienced several extreme heat events in the past; however, they are not well documented. One documented event occurred in September 1856 where a U.S. Coast Guard vessel recorded a record temperature of 135 degrees Fahrenheit during a sundowner event on the Santa Barbara coast.

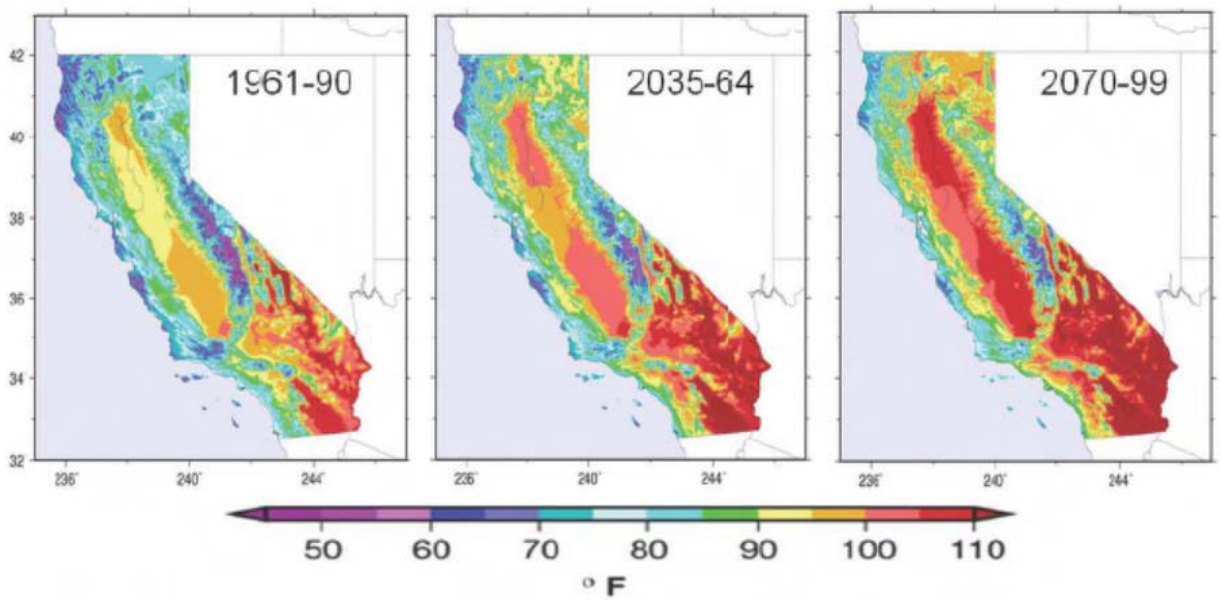
5.1.5.6.1.4 Probability of Occurrence

In any given year, Santa Barbara can be subject to extreme heat conditions.

5.1.5.6.1.5 Climate Change Considerations

As temperatures rise due to climate change, Californians will face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. By mid-century, extreme heat events in urban centers could cause two to three times more heat-related deaths than occur today. By 2100, hotter temperatures are expected throughout the state, with an increase of 3 to 5.5°F under the lower emissions scenario and 8 to 10.5°F under the higher emissions scenario (**Figure 5.17**).

Figure 5.17 Comparison between Historic and Projected Temperature



5.1.6 Energy Shortage and Resiliency

5.1.6.4 Description of Hazard

Energy shortages (or disruptions) are considered a form of lifeline system failure. Disruptions can be the consequence of another hazard, or can be a primary hazard, absent of an outside trigger. A failure could involve one, or a combination of the potable water system, power system, natural gas system, wastewater system, communication system, or transportation system. Most power blackouts are not human caused. They are the result of situations involving unintended events, such as an overwhelming need for power due to weather conditions, equipment failure, or accidents. They may also fail due to natural hazards such as earthquakes, floods, and landslides. These outages can last anywhere from a few minutes to several weeks.

Santa Barbara County has two service providers. Pacific Gas and Electric (PG&E) provides electricity in the northern part of the County, with termination of services north of the Gaviota area. Southern California Edison (SCE) provides power to the Southern parts of the County, with termination of services in Gaviota. The two systems are not connected. Thus, is there is a major interruption of service in the Santa Barbara area, then all serviced could be denied in either direction.

Both power companies are well aware of the restrictions on their systems and are making planned systematic changes to address the shortcomings. SCE has temporarily deployed several portable generators in the Goleta Valley to mitigate any problems that may occur during the El Nino rain season.

The City of Santa Barbara is served by the Southern California Edison Company. There are two lines that serve the southern portion of the County that includes the City.

5.1.6.5 Location and Extent of Hazard in Santa Barbara

The entire county, which includes the City of Santa Barbara, is subject to energy shortages.

5.1.6.6 History of Hazard in Santa Barbara

Energy disruptions on a small scale have occurred on a regular basis in Santa Barbara City; especially during strong wind / storm events.

5.1.6.7 Probability of Occurrence

In any given year, Santa Barbara City can be subject to energy shortages. A large disruption due to a power failure or rotating brown out a highly likely during strong storm events or during times of extreme heat.

5.1.6.8 Climate Change Considerations

With increased changes in weather and climate, the demands on energy will shift too. This shift in demand could have significant impacts on energy supply and demand.

5.1.7 Oil Spills

5.1.7.4 Description of Hazard

An oil spill is a release of liquid petroleum hydrocarbon into the environment due to human activity or technological error that results in pollution of land, water, and air. Oil releases also occur naturally through oil seeps either on land or under water. Marine oil spills, whether accidental or intentional, can result from the release of crude oil from offshore oil platforms, drilling rigs, wells, pipelines, tank trucks, and marine tank vessels (tankers). Refined petroleum products such as gasoline, diesel, and heavier fuels such as bunker fuel used by cargo ships are also sources of potential oil spill releases. Depending on the origin, size, and duration of the release, an oil spill can have serious impacts on air and water quality, public health, plant and animal habitat, and biological resources. Clean up and recovery is time and cost consuming, and dependent on weather conditions such as wind and rain. Tidal and Current conditions may also make the spill more dynamic.

5.1.7.5 Location and Extent of Hazard in Santa Barbara

This hazard can occur in any part of Santa Barbara City where existing oil & gas operations are located, including off shore where there are several platforms and undersea pipelines.

5.1.7.6 History of Hazard in Santa Barbara

Santa Barbara City has experienced the following large oil spills

- January 28, 1969 Platform A - 80,000 to 100,000 barrels
- May 19, 2015 Plains All American Pipeline at Refugio - 3,400 barrels

5.1.7.7 Probability of Occurrence

In any given year, Santa Barbara City could be subject to oil spills offshore.

5.1.7.8 Climate Change Considerations

With increased changes in weather, climate, and economics, the demands for oil & gas production may shift. This shift in demand could increase production, distribution, and transportation of oil products; thus increasing the potential oil spill occurrences.

5.1.8 Dam Failure

5.1.8.4 Description of Hazard

Dams fail due to old age, poor design, structural damage, improper siting, landslides flowing into a reservoir, or terrorist actions. Structural damage is often a result of a flood, erosion, or earthquake. A catastrophic dam failure could inundate the area downstream. The force of the water is large enough to carry boulders, trees, automobiles, and even houses along a destructive path downstream. The potential for casualties, environmental damage, and economic loss is great. Damage to electric generating facilities and transmission lines could impact life support systems in communities outside the immediate hazard area.

5.1.8.5 History of Hazard in Santa Barbara

The State of California and the federal government have a rigorous Dam Safety Program. This is a proactive program that ensure proper planning in the event of failure but also sets standards for dam design and maintenance. Because of this, many potential issues have been addressed and/or resolved. Prior to the implementation of this program Santa Barbara did experience a dam related incident.

Built in 1917, the Sheffield Dam only survived for eight years, failing catastrophically during an earthquake in 1925 in the City of Santa Barbara. It was built on sandy soil which liquefied during the event. The center 300-feet of the 720-feet long dam broke off and was carried away on the liquefied soil, spilling 30 million gallons of water. Damage estimates are unavailable.

5.1.8.6 Location and Extent of Hazard in Santa Barbara

There are two (2) dams in the City; of these one is owned and operated by the City of Santa Barbara; Gibraltar Dam. These dams range in purpose from water supply to flood control. Dam failure inundation zones mapped by the State of California indicate areas that would be inundated should a dam fail catastrophically. The inundation mapping is considered confidential by the State of California.

Gibraltar Dam and reservoir are located on the Santa Ynez River in Santa Barbara County, about 9 miles north of the City and upstream from Lake Cachuma. The City owns and operates the dam and reservoir pursuant to a Notice of Appropriation posted on October 11, 1904. Stored water is diverted through Mission Tunnel to the Cater Water Treatment Plant. The dam is a constant radius, concrete arch dam constructed in 1920 with an original capacity of 14,500 AF; it was raised to current elevation in 1949 and strengthened in 1991.Gibraltar Reservoir is the source of about one-third of the City of Santa Barbara's water supply. Loss of storage capacity due to siltation has been an issue since the dam was constructed. To monitor changes in capacity, and pursuant to the requirements of the Upper Santa Ynez River Operations Agreement, the City commissions a bathymetric survey of Gibraltar Reservoir at approximately three year intervals.

The other dam and reservoir in the City is Lauro Dam, which is owned and operated by the Bureau of Reclamation. Lauro Dam and Reservoir are located on Diablo Creek near Santa Barbara. The dam is an earth fill structure with a crest length of 540 feet and a height of 137 feet. The reservoir has a capacity of 640 acre-feet.

(**Figure 5.18**).
Figure 5.19 displays the dam failure inundation areas along with the location of major dams in the County.

Figure 0.18 Dam Locations

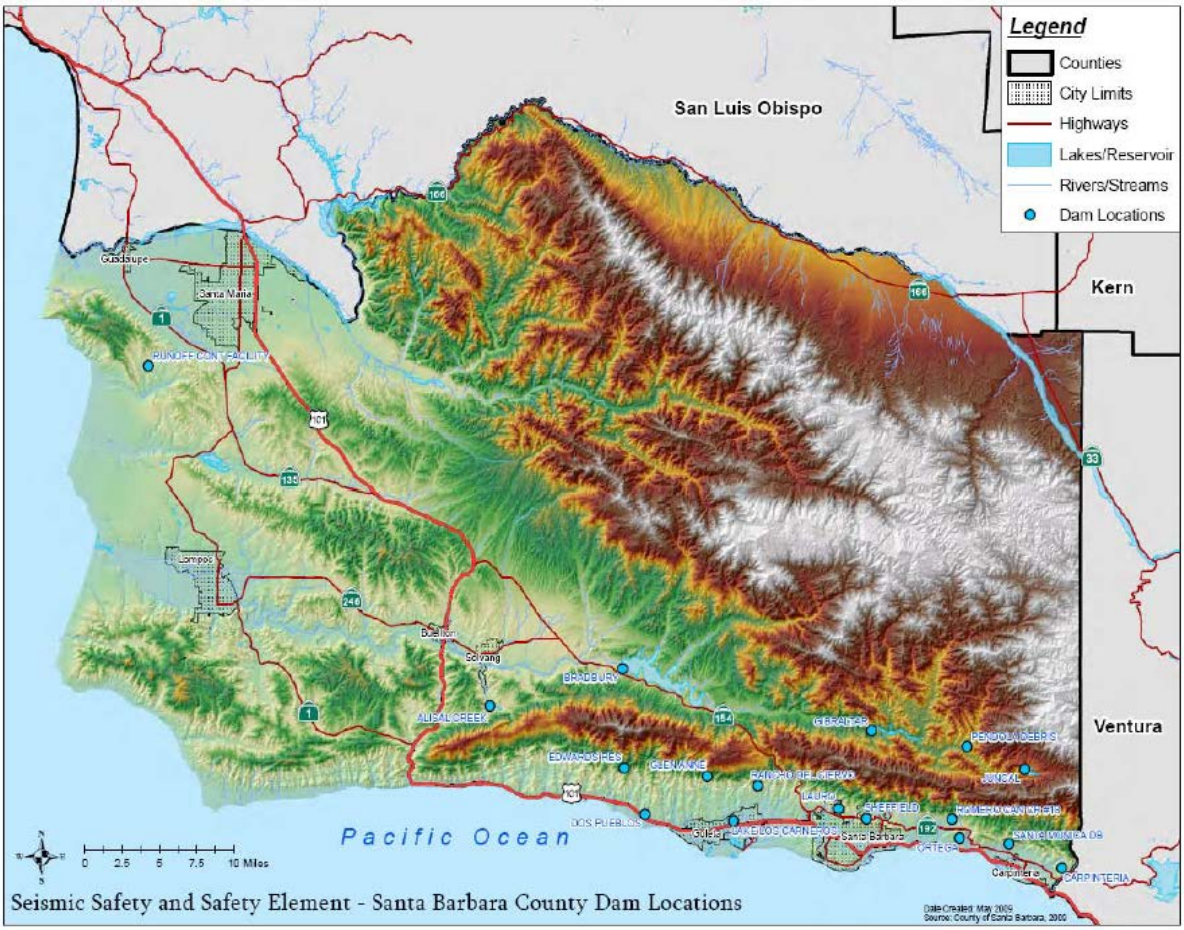


Figure 0.19 Dam Inundation Zones

NEED MAP

5.1.8.7 Probability of Occurrence

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides and excessive rainfall and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand.

However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

5.1.8.8 Climate Change Considerations

Increased rainfall from changing climate conditions could present a risk to dams in Santa Barbara County if volume of runoff is greater than the dam's capacity. This could cause the County to release stored water into the downstream water courses in order to ensure the integrity of the dam.

5.1.9 Agricultural Pests

5.1.9.4 Description of Hazard

Agricultural pests and disease infestation occur when an undesirable organism inhabits an area in a manner that causes serious harm to agriculture crops, livestock or poultry, and wild land vegetation or animals. Countless insects and diseases live on, in, and around plants and animals in all environments. Most are harmless, while some can cause significant damage and loss. Under some conditions, insects and diseases that have been relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks than they would be under normal conditions.

5.1.9.5 History of Hazard in Santa Barbara

The City of Santa Barbara does not have any historical record regarding agricultural pests that have caused any type of incident

5.1.9.6 Location and Extent of Hazard in Santa Barbara

The County's agricultural emergency events does effect the city except in regard to loss revenue.

Figure 5.20 shows land that, under the Williamson Act, has been zoned as agricultural, open space, or recreational. These lands are susceptible to agricultural pests and diseases. **Figure 5.21** portrays crop land. These areas are also susceptible to agricultural pests and diseases.

Figure 0.20 Agricultural Preserves, 2010

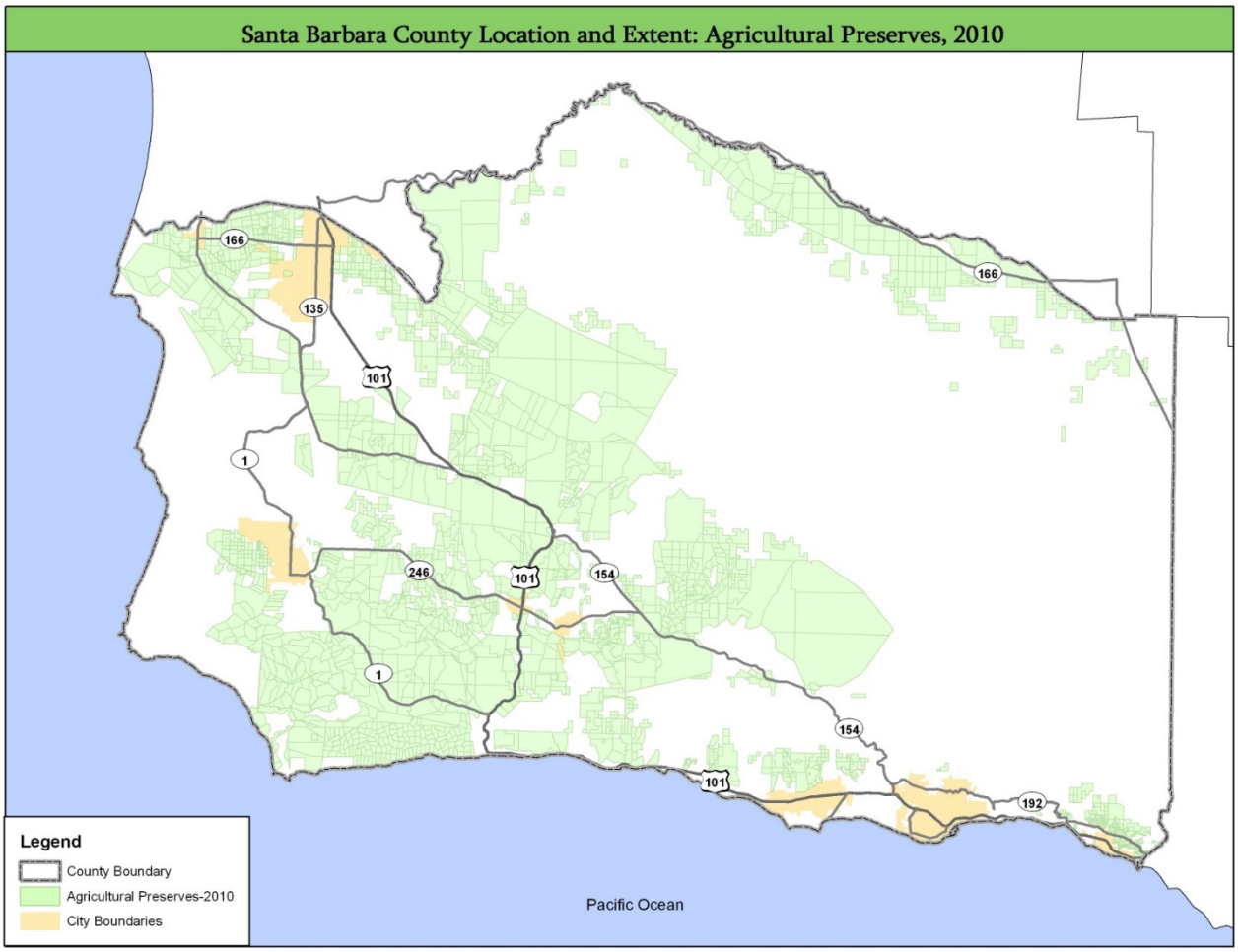
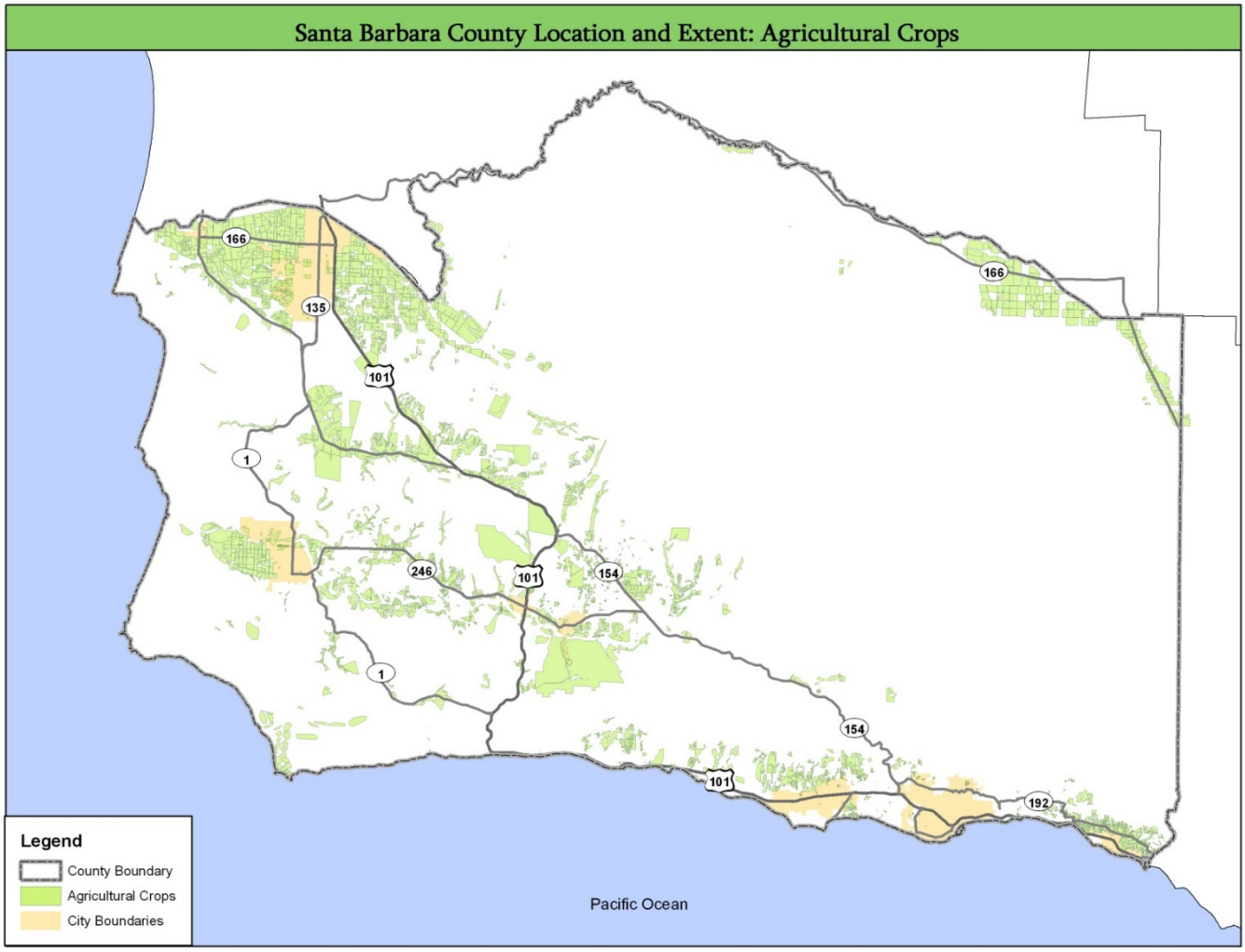


Figure 0.21 Agricultural Crops



5.1.9.7 Probability of Occurrence

Due to its interaction with the global economy, its mild Mediterranean climate, and its diversified agricultural and native landscape, Santa Barbara County currently experiences and will continue to experience periodic losses due to agricultural pests and diseases. The probability in the City of Santa Barbara is low; but the City would feel loss as it does interact with the County in regards to economics.

5.1.9.8 Climate Change Consideration

California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. For example, the pink bollworm, a common pest of cotton crops, is currently a problem only in southern desert valleys because it cannot survive winter frosts elsewhere in the state. However, if winter temperatures rise 3 to 4.5°F, the pink bollworm's range would likely expand northward, which could lead to substantial economic and ecological consequences for the state.

Temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the lifecycles of many insects, suggesting that pest problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed (California Climate Change Center 2006).

5.1.10 Epidemic/Pandemic/Vector Borne Disease

5.1.10.4 Description of Hazard

Infectious disease emergencies are circumstances caused by biological agents, including organisms such as bacteria, viruses or toxins, with the potential for significant illness or death in the population.

Infectious disease emergencies may be caused by:

- Naturally occurring diseases spread person to person (e.g., measles, mumps, meningococcal disease, tuberculosis)
- Foodborne (e.g.: salmonella, E.coli, botulinum toxin, etc.)
- Vectors such as a mosquito that spread disease (e.g.: West Nile virus, dengue, Zika, malaria).
- Newly emerging infectious diseases (e.g.: Ebola, Zika, SARS, MERS, avian influenza).
- Intentionally caused spread of disease or toxins known as bioterrorism. Past bioterrorism events include the contamination of restaurant food with E.coli in Oregon (1984) and the release of Sarin gas in the Tokyo subway (1995).

The impact of infectious disease emergencies on the local community and its critical infrastructure will depends on:

- The type of biological agent and availability of treatment for victims
- The availability of prophylaxis for responders and the public
- The scale of exposure and ongoing exposure
- The mode of transmission and whether transmission can be interrupted
- Whether the event is affecting staffing for critical infrastructure within and outside of the county such as transportation, law enforcement, health care, and the medical and food supply chains.

Outbreaks, Epidemics, and Pandemics

An **outbreak** is when there are more cases than would be normally expected, often suddenly, of an infectious disease in a community or facility.
An **epidemic** is when there are more cases than would be normally expected of an infectious disease, often suddenly, in a population of a large geographic area.
A **pandemic** refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. Examples include pandemic influenza and Severe Acute Respiratory Syndrome or “SARS”.

Outbreaks, epidemics, or pandemics can occur when a new virus emerges to which the population has little immunity. The 20th century saw three such pandemics, the most notable of which was the 1918 Spanish influenza pandemic that was responsible for 20 million deaths throughout the world. Secondary impacts include significant economic disruption to a community’s infrastructure

due to loss of employee work time, essential services and products, and costs of treating or preventing spread of the disease.

Public health measures are used to control outbreaks, epidemics, or pandemics of infectious diseases, and are especially important for diseases with high morbidity or mortality and limited medical prophylaxis and/or rapid treatment.

Measures to control disease include:

- Legal measure such as isolation and quarantine of persons or products, and legal closure of food establishments.
- Control of contaminated food or water through recall of product or, for water, "Do Not Use", "Do Not Drink" or "Boil Water" orders issued by state or local health departments.

Vector control to eliminate vectors such as mosquitos that carry the disease from person to person. The Vector Borne Disease Section of the California Department of Public Health identifies the following types of diseases:

• *Africanized Honeybees*	• *Bed Bugs*	• *Body Lice*
• *Cat Scratch Disease*	• *Conenose Bugs*	• *Hantavirus Cardiopulmonary Syndrome*
• *Head lice*	• *Lyme Disease*	• *Mosquitoes*
• *Murine Typhus*	• *Plague*	• *Ticks*
• *West Nile Virus*	• *Red Imported Fire Ants*	• *Scabies*
• *Swimmer's Itch*	• *Tularemia*	• *Zike Virus*

5.1.10.5 Location and Extent of Hazard in Santa Barbara

An infectious disease hazard can occur throughout the entire County, which would include the City of Santa Barbara.

5.1.10.6 History of Hazard in Santa Barbara

1. Foodborne outbreaks occur every year in Santa Barbara County, which includes the City, commonly the result of Norovirus, and have sickened up to 100 individuals at a single facility.
2. 2009 H1N1 "Swine Flu" pandemic required rationing and prioritization of influenza vaccine. Public was given 27,000 vaccinations at large and small scale clinics. One hundred thirty-two thousand (132,000) doses of vaccine were distributed Countywide through response partners. The Santa Barbara Public Health Department Operations Center was activated for more than three months.

5.1.10.7 Probability of Occurrence

Disease outbreaks and flu epidemics occur on an ongoing basis. Occasionally these outbreaks require the initiation of the Santa Barbara County Public Health Department Infectious Disease Response Plan but have required little to no support from the City Emergency Operations Center.

There is a continued threat from a novel influenza virus or other emerging epidemic or pandemic disease that would require a disaster response at the EOC level. The disease could affect the city infrastructure, and the ability of the EOC and other city departments to respond due to disease related loss of staff.

5.1.10.8 Climate Change Consideration

- While many vector born and zoonotic diseases (VBZD), such as malaria, yellow fever, dengue, and murine typhus, are rarely seen in the United States, we are directly susceptible to VBZD that are found in warmer climates and vulnerable due to global trade and travel.
- Many VBZD are climate sensitive and ecological shifts associated with climate change are expected to impact the distribution and incidences of these diseases.
- Changes in temperature and precipitation directly affect vector born disease transmission through pathogen-host interaction, and indirectly through ecosystem changes and species composition.
- As temperatures increases vectors can spread into new areas that were previously too cold. For example, two mosquito vectors that carry malaria are now found at the U.S.-Mexico border.

5.1.11 Hazardous Materials Release

5.1.11.4 Description of Hazard

Hazardous Waste/Materials are widely used or created at facilities such as hospitals, wastewater treatments plants, universities and industrial/manufacturing warehouses. Several household products such as cleaning supplies and paint are also considered hazardous materials. Hazardous materials include:

- Explosives;
- Flammable, non-flammable, and poisonous gases;
- Flammable liquids;
- Flammable, spontaneously combustible, and dangerous when wet solids;
- Oxidizers and organic peroxides;
- Poisons and infectious substances;
- Radioactive materials; and
- Corrosive materials.

Both mobile and external hazardous materials releases can spread and affect a wide area, through the release of plumes of chemical, biological, or radiological elements or leaks or spills. Conversely, internal releases are more likely to be confined to the structure the material is store in.

Chemical may be corrosive or otherwise damaging over time. A hazardous materials release could also result in fire or explosion. Contamination may be carried out of the immediate area of the incident by people, vehicles, wind, and water. Weather conditions can increase the size and intensity of the Hazardous Materials Release. Typography, such as hills and canyons, can increase the size of the release or make it more difficult to contain.

5.1.11.5 Location and Extent of Hazard in Santa Barbara

The locations and identity of facilities that store hazardous materials are reported to local and federal governments. Many facilities have their own hazardous materials guides and response plans, including transportation companies who transport hazardous materials.

The release of hazardous materials into the environment can cause a multitude of problems. Although these incidents can happen almost anywhere, certain areas of the City are at higher risk, such as near roadways that are frequently used to transport hazardous materials and locations with industrial facilities that use, store, and/or dispose of such materials. Areas crossed by railways, waterways, airways, and pipelines also have increased potential for mishaps.

5.1.11.6 History of Hazard in Santa Barbara

In 1984, there was a chemical release from a chemical disposal truck on Hwy 101 in Santa Barbara City. The truck held a mixture of chemicals that were to be delivered to the Casmalia Chemical Dump (currently closed) in Santa Barbara County. The chemical release not only caused a cloud, but it released some of the liquid into the Mission Creek watershed area. This caused the evacuation of over 200 residents in the Westside areas of the city. The incident closed the Highway 101 north and south, which cause surface street gridlock for several hours.

5.1.11.7 Probability of Occurrence

The release of hazardous materials can occur throughout the entire county. Incidences can occur during production, storage, transportation, use or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long lasting health effects, and damage to buildings, the environment, homes, and other property.

5.1.11.8 Climate Change Consideration

As mentioned above, weather can play a significant factor in hazardous material releases. While there is little evidence to link climate change increase occurrences of hazardous material releases, it could impact the response and recovery efforts.

5.1.12 Terrorism

5.1.12.4 Description of Hazard

The term terrorism refers to intentional, criminal malicious acts. There is no single, universally accepted definition of terrorism, and it can be interpreted in many ways. Terrorism is defined in the Code of Federal Regulations as "*...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.*" (28 CFR, Section 0.85). For the purposes of this plan, terrorism refers to the use of weapons of mass destruction, including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and cyber terrorism. Conventional Attacks/Active Shooter incident is initiated by humans. It can be a well-planned coordinated attack with multiple suspects, or the result of a lone individual on a rampage.

5.1.12.5 Location and Extent of Hazard in Santa Barbara

Terrorism can occur throughout the entire city but due to its intended purpose would most likely happened in more populous urban areas where more devastation (and fear) will ensue.

5.1.12.6 History of Hazard in Santa Barbara

There has been no recorded history of terrorism in the City of Santa Barbara.

5.1.12.7 Probability of Occurrence

All City businesses and facilities are perceived as a soft target resulting in increased property crimes by criminals who live outside the City. Climate Change Consideration

While there is little evidence to link climate change increase occurrences of terrorism, depending on the type of attack, it could impact the response and recovery efforts.

5.1.13 Cyber Threats

5.1.13.4 Description of Hazard

A cyber security threat is a circumstance or event that has or indicates the potential to exploit vulnerabilities and to adversely impact organizational operations, organizational assets (including information and information systems), individuals, other organizations, or society. Critical infrastructure, such as utilities and telecommunications, are also potential targets. Examples of cyber threats include malware, phishing, denial of service attacks, ransomware, and state-sponsored hacking.

5.1.13.5 Location and Extent of Hazard in Santa Barbara

This hazard can happen anywhere within the County or City but will generally be targeted towards larger corporations or government.

5.1.13.6 History of Hazard in Santa Barbara

While there have been several smaller cyber threats and hacking, none have reached a level of significance.

5.1.13.7 Probability of Occurrence

Cyber threats are on the rise globally, national, and locally. The probability of occurrence of cyber threats is rapidly increasing, especially with increased reliance on the Internet and cloud-based computing.

5.1.13.8 Climate Change Consideration

While there is little evidence to link climate change to increase in occurrences of cyber threats, the target could be related to persons/groups with issues with individuals or companies they perceive to have effect on the climate (i.e., greenhouse gas producers).

5.1.14 Aircraft Crashes

5.1.14.4 Description of Hazard

Airline crashes are defined as any accident of private, commercial, or military aircraft on land or over sea. Airline crashes, like other transportation accidents, are less likely to lead to a state or federal disaster declaration, than other hazards previously and afore mentioned.

5.1.14.5 Location and Extent of Hazard in Santa Barbara

In addition to being within the flight pattern of many airports providing regional flights (i.e., Los Angeles International, San Francisco International, Oakland, San Jose International, Burbank Airport, John Wayne Airport, Long Beach Airport, Ontario International Airport), Santa Barbara has one (1) general aviation airport

The Santa Barbara Airport (SBA) is located near Goleta, west of Santa Barbara. On any given day, an average of 2,100 passengers arrive and depart from the airport. Santa Barbara is the busiest airport on the California coast, between Los Angeles and San Jose; serving more than 700,000 passengers annually. Five passenger airlines and one cargo carrier operate approximately 40 daily flight departures at the airport.

5.1.14.6 History of Hazard in Santa Barbara

Currently in the City of Santa Barbara there has not been a record of a large aircraft incident.

5.1.14.7 Probability of Occurrence

With the amount of general aviation operations, private flights, and its position between Los Angeles/San Diego and the Bay Area, there is a notable possibility of Santa Barbara City experiencing an airline crash.

5.1.14.8 Climate Change Consideration

There is no none linkage between climate change and airline crashes. Although bad weather does play a factor in some airline crashes, current technology does a good job of forecasting potential conditions.

5.1.15 Train Accidents

5.1.15.4 Description of Hazard

Train accidents are defined as any accidents involving public or private trains carrying passengers or cargo along the rail corridor. Train accidents, like other transportation accidents, are less likely to lead to a state or federal disaster declaration, than other hazards previously and afore mentioned.

5.1.15.5 Location and Extent of Hazard in Santa Barbara

Trains running through Santa Barbara City, and in close proximity to U.S. Highway 101, carry both commuters and commodities. Such commodities include hazardous materials, fuel (including oil), agriculture, meats, and non-consumables. A hazardous materials incident on the rails or roadway has the potential to shut down both rail and highway transportation routes where the two are within close proximity to another.

5.1.15.6 History of Hazard in Santa Barbara

In 1991 the Seacliff Incident, in neighboring Ventura County, occurred when a train released 440 gallons of aqueous hydrazine. The accident required the evacuation of the nearby Seacliff Community along with the shutting down of Highway 101, and took 5 days to cleanup. The City has not experienced this type of incident; but there is a history of many fatalities on the tracks running through Santa Barbara.

5.1.15.7 Probability of Occurrence

Train accidents are generally localized and the incidents result in limited impacts at the community level. However, if there are volatile or flammable substances on the train and the train is in a highly populated or densely forested area, death, injuries, and damage to homes, infrastructure, and the environment, including forest fires can occur.

5.1.15.8 Climate Change Consideration

There is no none linkage between climate change and train accidents; however, because of rail road track proximity along the Pacific Ocean, sea level rise could impact service. It is expected that conditions would be gradual in nature and would not create unforeseen problems or complications.

5.1.16 Tsunami

5.1.16.4 Description of Hazard

A tsunami is a series of long waves generated in the ocean by a sudden displacement of a large volume of water. Underwater earthquakes, landslides, volcanic eruptions, meteoric impacts, or onshore slope failures cause this displacement. Tsunami waves travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed diminishes, its wavelength decreases, and its height increases. Depending on the type of event that creates the tsunami, as well the remoteness of the event, the tsunami could reach land within a few minutes or after several hours. Low-lying areas could experience severe inland inundation of water and deposition of debris more than 3,000 feet inland.

5.1.16.5 Location and Extent of Hazard in Santa Barbara

The City of Santa Barbara is located on or near several offshore geological faults, the more prominent faults being the Mesa Fault, the Santa Ynez Fault in the mountains, and the Santa Rosa Fault. There are other unnamed faults in the offshore area of the Channel Islands. These faults have been active in the past and can subject the entire area to seismic action at any time.

5.1.16.6 History of Hazard in Santa Barbara

The relative threat for local tsunamis in Santa Barbara can be considered low due to low recurrence frequencies. Large, locally-generated tsunamis are estimated to occur once every 100 years. Thirteen possible tsunamis have been observed or recorded from local earthquakes between 1812 and 1988. These tsunami events were poorly documented and some are very questionable. There is no doubt that earthquakes occurring along submarine faults off Santa Barbara could generate large destructive local tsunamis (http://www.drgeorgepc.com/Tsunami1812SantaBarbara.html). Internet research provides some documentation that two tsunamis were generated from two major earthquakes in the Santa Barbara City region in December of 1812. The size of these tsunamis may never be known with certainty, but there are unconfirmed estimates of 30-35 feet waves in Santa Barbara City. The estimates are found in various literature and based on anecdotal history only.

Major faults of the San Andreas zone, although capable of strong earthquakes, cannot generate any significant tsunamis. Only earthquakes in the Transverse Ranges, specifically the seaward extensions in the Santa Barbara Channel and offshore area from Point Arguello, can generate local tsunamis of any significance. The reason for this may be that earthquakes occurring in these regions result in a significant vertical displacement of the crust along these faults. Such tectonic displacements are necessary for tsunami generation.

Two separate events, occurring in 1877 and 1896, are listed in NOAA's online database as having heights of 1.8 and 2.5 feet waves. However, tsunami heights from historical records are estimated and should not be regarded as exact. Other recorded tsunamis affecting Santa Barbara during the 20th century are in the 0.1 – 1.0 foot range.

On February 27, 2010, a magnitude 8.8 earthquake occurred along the central coast of Chile and produced a tsunami. For the coast of Southern California, it was one of the largest tsunami episodes since 1964. In general, tsunami waves between 2 and 4 feet were reported. Tsunami waves of around 3 feet were reported by tide gauges across the Santa Barbara Channel. At Santa Barbara Pier, significant beach erosion was reported along with displacement of buoys. The tsunami surge lasted in excess of 20 hours. The most significant damage occurred along the coasts of Ventura and southern Santa Barbara counties. Numerous reports of dock damage were reported along with beach erosion.

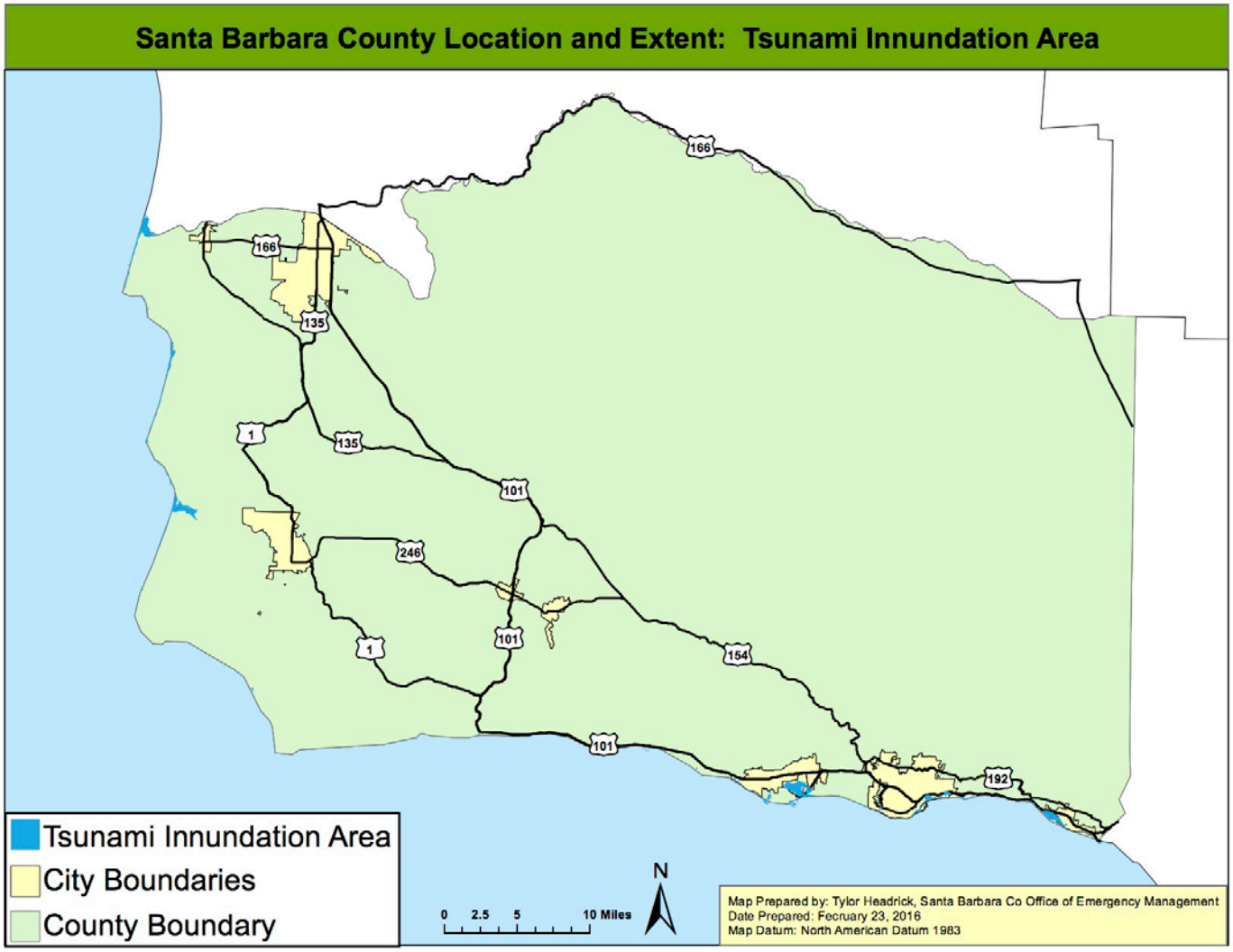
On March 11, 2011, a magnitude 9.0 earthquake occurred off the Pacific coast of Tohoku, Japan. This earthquake devastated many communities in Japan and caused tsunami effects across the ocean in Santa Barbara City. The only significant impact to Santa Barbara City was to the dredging contractor for the City of Santa Barbara harbor. The City harbor operations documented approximately $1,500 of damages (Public Assistance).

5.1.16.7 Probability of Occurrence

The University of Southern California (USC) Tsunami Research Group has modeled areas in Santa Barbara County, which include the City, which could potentially be inundated in the event of a tsunami. This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. The data was mapped by Cal OES for the purpose of Tsunami Evacuation Planning. Extreme tsunami inundation areas were mapped and used to profile maximum potential exposure. The figure below (**Figure 5.24**) shows tsunami run up limits for Santa Barbara County. The tsunami inundation map helps to assist cities and counties in

identifying their tsunami hazard areas. The inundation line represents the maximum considered tsunami run up from a number of extreme, yet realistic, tsunami sources.

Figure 0.25 Tsunami Inundation Area



Based on the tsunami inundation map above, several areas along the coast of Santa Barbara have the potential to be inundated by a tsunami. However, since the probability of an earthquake occurring is rare, the probability of a tsunami is also rare.

5.1.16.8 Climate Change Consideration

Tsunamis are created by earthquakes or other earth movements, to date, no relationship has been made between climate change and the occurrences of earthquakes or other earth movements.

5.1.17 Civil Disturbance

5.1.17.4 Description of Hazards

Civil Disturbance is a term generally used to describe disorderly conduct or a breakdown of orderly society by a large group of people. Civil Disturbance can range from a form protest against major socio-political problems to riots.

5.1.17.5 Location and Extent of Hazard in Santa Barbara

Civil Disturbance can occur in any part of Santa Barbara City; however, it will generally be located within larger metropolitan areas.

5.1.17.6 History of Hazard in Santa Barbara

There is no data in the City of Santa Barbara regarding civil disturbances.

5.1.17.7 Probability of Occurrence

There are no studies that predict the probability of civil disturbance occurrences.

5.1.17.8 Climate Change Consideration

While there is no direct linkage between climate change and civil disturbances, there could be indirect linkages. As climate change impacts are either felt or perceived to be felt it could ignite passions within people to demonstrate against possible causes or enablers.

5.1.18 Marine Invasive Species

5.1.18.4 Description of Hazard

The introduction of non-indigenous species (NIS) into coastal marine and estuarine waters can cause significant and enduring economic, human health, and environmental impacts. In coastal environments, commercial shipping is the most important vector for species introductions. Commercial ships transport organisms through two primary mechanisms (vectors): ballast water and vessel biofouling. Ballast water is taken on and released by a vessel during cargo loading and discharging operations to maintain the vessel's trim and stability. Biofouling organisms are aquatic species attached to or associated with submerged or wetted hard surfaces. Ships transfer organisms to California waters from throughout the world. The transfer of ballast water from "source" to "destination" ports results in the movement of many organisms from one region to the next. Additionally, as vessels move from port to port, biofouling communities are transported along with their "host" structure. Once introduced, invasive species are likely to become a permanent part of an ecosystem and may flourish, creating environmental imbalances, presenting risks to human health, and causing significant economic problems. Examples include the zebra and quagga mussel infestations in the Colorado River Aqueduct System and California waterways, and the propagation of aquatic weeds, such as water hyacinth, in the California Delta.

5.1.18.5 Location and Extent of Hazard in Santa Barbara

All water bodies that are subject to recreational/commercial vessels and/or hydraulically connected to potential sources of infestation.

5.1.18.6 History of Hazard in Santa Barbara

In 2015, the start of crab-fishing was delayed for several month's due to a massive coastal algae bloom fueled by El Nino. The potentially fatal toxin delayed crab-fisheries to begin their trade, which caused several businesses to suffer economic loss.

5.1.18.7 Probability of Occurrence

There is always a potential for threat of indigenous species occurrence that is subject to many factors in the Santa Barbara City's coastal channel.

5.1.18.8 Climate Change Consideration

With the climate change water temperature can rise and fall; causing disruption to the ecosystem of the ocean. This can cause many instances of invasive marine life to cause ecological and economic devastation throughout the City's coastal channel.

SECTION 6 VULNERABILITY ASSESSMENT

6.1 Overview

The purpose of this section is to estimate the potential vulnerability (impacts) of hazards within the county and city on the built environment (residential, non-residential, critical facilities, etc.) and population. To accomplish this, three (3) different approaches will be used: 1) application of scientific loss estimation models; 2) analysis of exposure of critical facilities to hazards; and 3) a qualitative estimate of the impacts to hazards. It is important to note that the first two approaches can only be applied to hazards that have an exposure area (footprint). For those hazards where an exposure layer does not exist, a brief qualitative assessment of the potential vulnerability will be presented. This will be done for hazards that are within the city.

6.1.1 Scientific Loss Estimation Models

The scientific loss estimation modeling efforts will include the utilization of the Federal Emergency Management Agency (FEMA) Hazus-MH 3.0 model. Hazus-MH is a nationally applicable standardized methodology that estimates potential losses from earthquakes, hurricane winds and floods. Hazus-MH uses state-of-the-art Geographic Information Systems (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of earthquakes, hurricane winds and floods on populations. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing mitigation plans and policies, emergency preparedness and response and recovery planning. This modeling will be done for Earthquake and Flood hazards only.

Hazus standard configuration allows for "out-of-the-box" regional or community-wide loss assessment using default ("Level 1) building inventory databases, aggregated to the census tract (earthquake) or census block (flood) level. A summary of Hazus default building inventory data for Santa Barbara County, and the unincorporated areas of the County, are given in **Table 6-1** (by general occupancy) and **Table 6-2** (by general building type). The distribution of buildings across the various construction classes given in Table 2 is estimated using Hazus default relationships (e.g., x percent of offices may be built of concrete frame, y% of offices may be built of reinforced masonry, etc.). The actual distribution of building across these construction types may be different. For example, the California Seismic Safety Commission (CSSC) published results of unreinforced masonry building surveys (CSSC, 2006), which indicate that the 23 URM buildings in Unincorporated Santa Barbara County have been retrofitted (vs. 185 URM buildings predicted by the default database).

Table 6-1: Hazus-MH 3.0 Default Building Inventory Data for Santa Barbara County by General Occupancy

Jurisdiction	General Occupancy	Building Replacement Value ($1,000)	Contents Replacement Value ($1,000)	Building Square Footage (1,000 Sq. Ft.)	Building Count
	Residential	$34,724,716	$17,364,871	231,312	116,304

Jurisdiction	General Occupancy	Building Replacement Value ($1,000)	Contents Replacement Value ($1,000)	Building Square Footage (1,000 Sq. Ft.)	Building Count
Santa Barbara County	Commercial	$6,387,442	$6,837,941	38,617	7,325
	Industrial	$1,307,134	$1,815,947	9,609	1,934
	Other	$1,805,563	$1,905,059	11,455	1,810
	TOTAL	**$44,224,855**	**$27,923,818**	**290,993**	**127,373**
City of Santa Barbara	Residential	$8,533,634	$4,267,361	54,637	24,775
	Commercial	$2,361,823	$2,512,267	14,116	2,320
	Industrial	$291,582	$392,884	2,169	580
	Other	$449,423	$479,574	2,582	452
	TOTAL	**$11,636,462**	**$7,652,086**	**73,503**	**28,127**
	%	**33.8%**	**31.9%**	**33.1%**	**35.2%**

Table 6-2: Hazus-MH 3.0 Default Building Inventory Data for Santa Barbara County by General Building Type

Jurisdiction	General Building Type	Building Replacement Value ($1,000)	Building Replacement Value (%)	Estimated Building Count	% of Building Count
Santa Barbara County	Concrete	$2,492,739	5.6%	2,396	2%
	Manufactured Housing	$415,023	0.9%	7,669	6%
	Precast Concrete	$1,556,413	3.5%	2,005	2%
	Reinforced Masonry	$3,088,459	7.0%	3,858	3%
	Steel	$2,461,502	5.6%	2,614	2%
	Unreinforced Masonry	$614,394	1.4%	727	1%
	Wood Frame (Other)	$1,733,790	3.9%	2,001	2%
	Wood Frame (Single-family)	$31,862,522	72.0%	106,108	83%
	TOTAL	**$44,224,842**		**127,378**	
City of Santa Barbara	Concrete	$796,670	6.8%	755	3%
	Manufactured Housing	$29,950	0.3%	492	2%
	Precast Concrete	$481,237	4.1%	613	2%
	Reinforced Masonry	$987,969	8.5%	1,108	4%
	Steel	$723,963	6.2%	796	3%

Jurisdiction	General Building Type	Building Replacement Value ($1,000)	Building Replacement Value (%)	Estimated Building Count	% of Building Count
	Unreinforced Masonry	$212,342	1.8%	232	1%
	Wood Frame (Other)	$659,422	5.7%	637	2%
	Wood Frame (Single-family)	$7,744,911	66.6%	23,489	84%
	TOTAL	**$11,636,464**		**28,122**	
	%	**33.8%**		**35.2%**	

Table 6-3 provides a summary of the Hazus-MH essential facilities default data (police stations and public schools) for anta Barbara County, and the unincorporated County Areas. The Hazus-MH essential facilities default data for fire station was augmented to account for a significant number of missing facilities for Santa Barbara County. Table 6-3 also indicates the construction type and design level assumed by Hazus-MH for these facilities; all are assumed to be wood frame of either High or Moderate code design level. A more accurate risk assessment could be conducted if additional facility information was collected, such as structural system, number of stories, year of construction/seismic code used for design, building square footage, building replacement value, and content replacement value. It should be noted that the Hazus-MH default database represents each school campus with a single building record of an assumed construction type. In reality, most public schools are multi-building campuses, built over a period of years (i.e., buildings may be designed to different seismic codes). To improve the risk assessment for public schools, information on each individual building would need to be collected.

Notes:
1) Totals may not match due to rounding
2) The distribution of buildings across the various construction classes is estimated using Hazus' default relationships. The actual distribution may be different. For example, the California Seismic Safety Commission published results of unreinforced masonry building surveys (2006), which indicated that there are 263 URM buildings in Santa Barbara (100% retrofitted) vs. 232 predicted by the default database.

Table 6-3: Hazus-MH 3.0 Default Essential Facilities Data for Santa Barbara County

Essential Facility Type	HAZUS-MH Default Structural Class and Design Level	Santa Barbara County	City of Santa Barbara
Fire Stations*	W1 (Wood Frame ≤ 5,000Sq.Ft.), Moderate Code Design Level	41	8
Police Stations	W1 (Wood Frame ≤ 5,000Sq.Ft.), Moderate Code Design Level	16	1

Public Schools	W1 (Wood Frame ≤ 5,000Sq.Ft.), High Code Design Level	123	13

* For the current assessment, the default fire station data has been revised to include missing stations.

The lifeline inventory within HAZUS-MH is divided between transportation and utility lifeline systems. There are seven transportation systems that include highways, railways, light rail, buses, ports, ferries and airports; and six utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power, and communications. The lifeline inventory data are provided in **Tables 6-4** and **Table 6-5**.

Table 6-4: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	*Bridges*	*360*	***407.90***
	Segments	*270*	***3,299.40***
	Tunnels	*1*	***1.70***
		Subtotal	**3,709.10**
Railway	*Bridges*	*6*	***0.60***
	Facilities	*5*	***13.30***
	Segments	*157*	***263.90***
	Tunnels	*0*	***0.00***
		Subtotal	**277.80**
Light Rail	*Bridges*	*0*	***0.00***
	Facilities	*0*	***0.00***
	Segments	*0*	***0.00***
	Tunnels	*0*	***0.00***
		Subtotal	**0.00**
Bus	*Facilities*	*5*	***6.40***
		Subtotal	**6.40**
Ferry	*Facilities*	*3*	***4.00***
		Subtotal	**4.00**
Port	*Facilities*	*0*	***0.00***
		Subtotal	**0.00**
Airport	*Facilities*	*5*	***53.30***
	Runways	*8*	***303.70***
		Subtotal	**357.00**
		TOTAL	**4,354.30**

Table 6-5: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	*Distribution Lines*	*NA*	***323.20***
	Facilities	*0*	***0.00***
	Pipelines	*0*	***0.00***
		Subtotal	**323.20**
Waste Water	*Distribution Lines*	*NA*	***193.90***
	Facilities	*8*	***628.70***
	Pipelines	*0*	***0.00***
		Subtotal	**822.60**
Natural Gas	*Distribution Lines*	*NA*	***129.30***
	Facilities	*0*	***0.00***
	Pipelines	*0*	***0.00***
		Subtotal	**129.30**
Oil Systems	*Facilities*	*2*	***0.20***
	Pipelines	*0*	***0.00***
		Subtotal	**0.20**
Electrical Power	*Facilities*	*4*	***519.20***
		Subtotal	**519.20**
Communication	*Facilities*	*42*	***5.00***
		Subtotal	**5.00**
		TOTAL	**1,799.50**

6.1.2 Analysis of Exposure of Critical Facilities to Hazards

The City's Local Hazard Mitigation Planning Team (LHMP) reviewed its list of critical facilities and generated a summary of the facilities by major categories: Law, Fire, Public Works, Health and Human Services, Administrative, Communications, and Other (**Table 6-6**). This list of critical facilities presents the buildings and structures that are the City's primary concern for ensuring resiliency; they include City owned or operated facilities. Information for City owned or operated facilities (building replacement cost) were reviewed and updated as needed. However, available

information for the privately owned or operated facilities will be a Mitigation Project for the LHMP Team.

Using Geographic Information Systems (GIS) software, each critical facilities was geolocated on maps to illustrate the geographic location of each facility. Based on each facility's geolocation, GIS software was then used to identify facilities within the hazard exposure area (footprint). The results were a map and a table summarizing the total number of exposed critical facilities by the major categories; and a total of the building replacement cost and building content costs for county owned or operated facilities. This approach was done for Wildfire, Dam Failure, Tsunami, Landslides/Earth Movements, and Climate-related (some).

Table 6-6 Critical Facilities in Santa Barbara County

Category of Facility	Total Structures	Total Worth	
Law	1	$8,339,233	
Fire	8	$6,291,348	
Public Works	8	$93,105,465	
Airport	3	55,245,587	
Administrative	1	$14,562,625	
Waterfront (does not include marina)	2	$548,754	
Total Value	**32**	**$460,213,034**	

6.1.3 Qualitative Estimate of Impacts

The approach used to complete this effort involves utilizing readily available data (i.e., Census) to extrapolate and estimate potential vulnerability. In some cases, the estimation will build upon historic events but it may also include projecting worst case potentials. The MAC and the LHMP Team summarized the remaining hazards which the City is vulnerable and assessed the amount and type of damage that could be expected. This approach was done for Droughts/Water Shortage, Energy Shortage, , Hazardous Material Release, Terrorism, Aircraft Crashes, Civil Disturbance, Climate-related (some) Oil Spill, Epidemic/Pandemic, Radiological Incident, Cyber Threat, Train Accident, , and Marine Invasive Species.

6.2 Scientific Loss Estimation Analysis

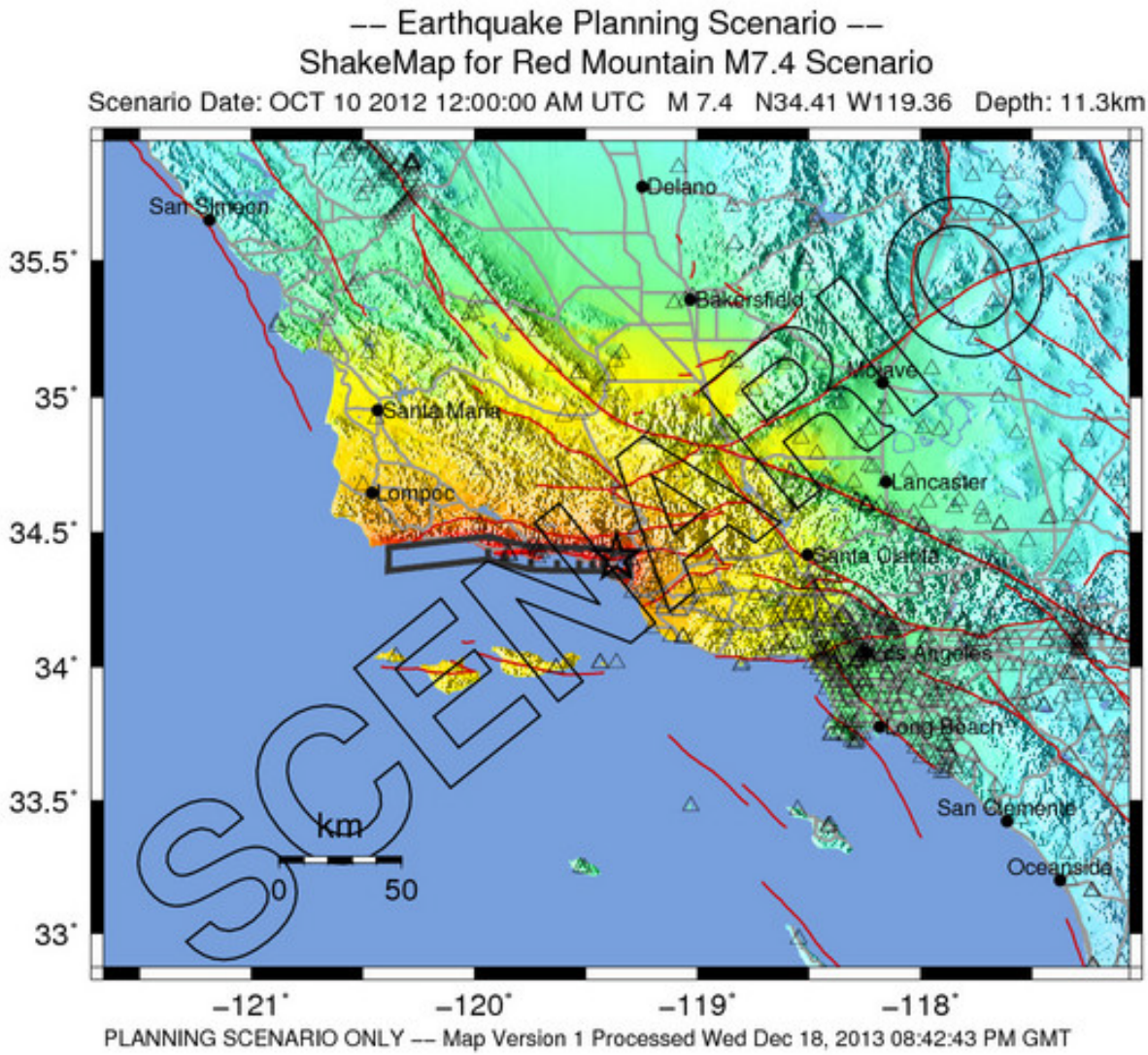
6.2.1 Earthquake and Liquefaction (High Impact/Medium Probability)

The entire geography of Santa Barbara County is exposed to some risk of shaking from an earthquake. The many fault lines, soil types, and construction types lead to a complicated assessment of vulnerability to earthquake. However, most of the land-based faults are either inactive or potentially active. Nearly all of the seismicity has been in the Santa Barbara Channel.

6.2.1.4 HAZUS-MH Earthquake Risk Assessment

Two earthquake scenarios developed by the United States Geological Survey (USGS), as shown in **Figure 6.1** and **Figure 6.2**, were selected to assess the range of impacts across the city. County-level maps of ground shaking for the same scenarios are shown in **Figure 6.3** and **Figure 6.4**.

Figure 6.1: Scenario 1 – M7.4 Earthquake on the Red Mountain Fault



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

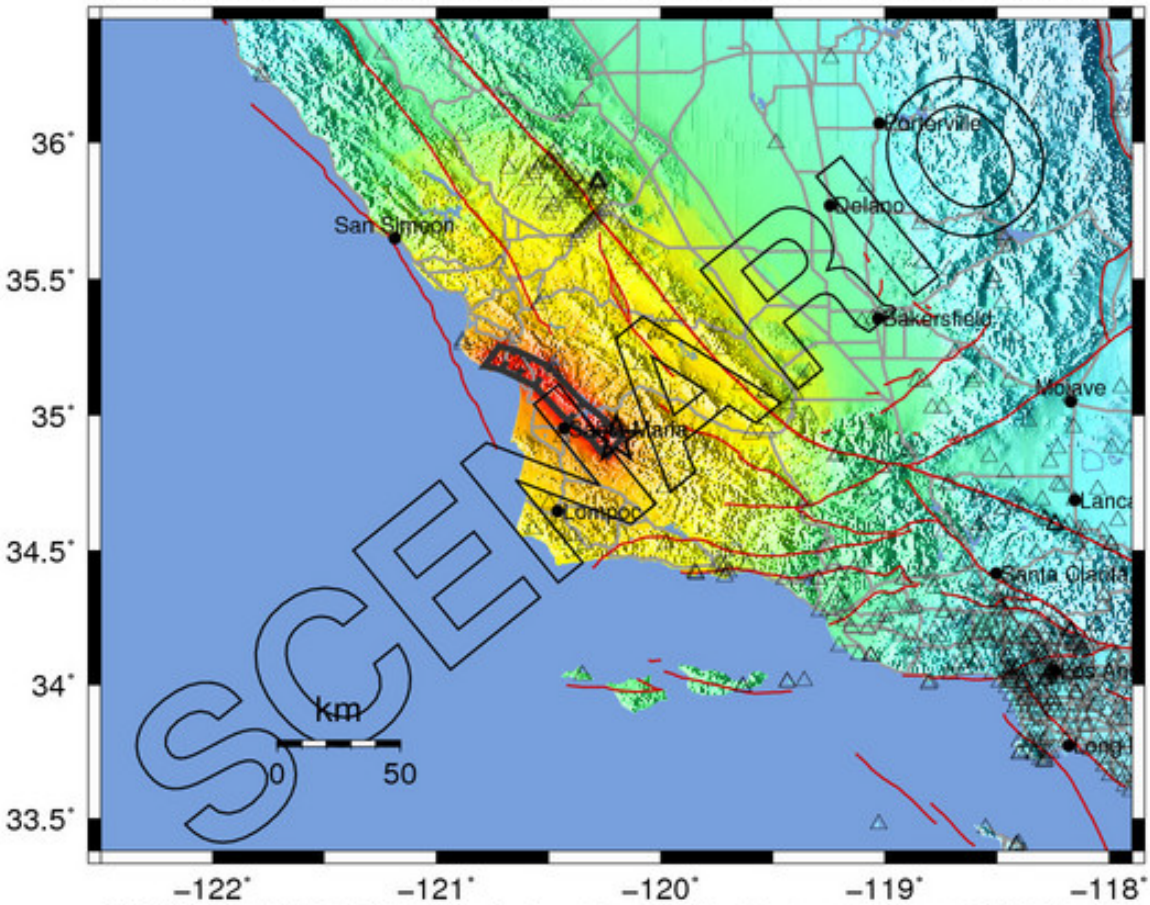
Scale based upon Wald, et al.; 1999

Figure 6-2 Scenario 2 M7.2 Earthquake on the San Luis Range Fault, South Margin

-- Earthquake Planning Scenario --

ShakeMap for San Luis Range So Margin M7.2 Scenario

Scenario Date: OCT 10 2012 12:00:00 AM UTC M 7.2 N34.91 W120.20 Depth: 7.9km



PLANNING SCENARIO ONLY -- Map Version 1 Processed Tue Dec 31, 2013 04:34:30 PM GMT

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<0.1*	*0.5*	*2.4*	*6.7*	*13*	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	*11*	*22*	*43*	*83*	*>160*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999

Figure 6.3: USGS ShakeMap Ground Motions for Santa Barbara County for a M7.4 Earthquake on the Red Mountain Fault (Scenario 1) 1

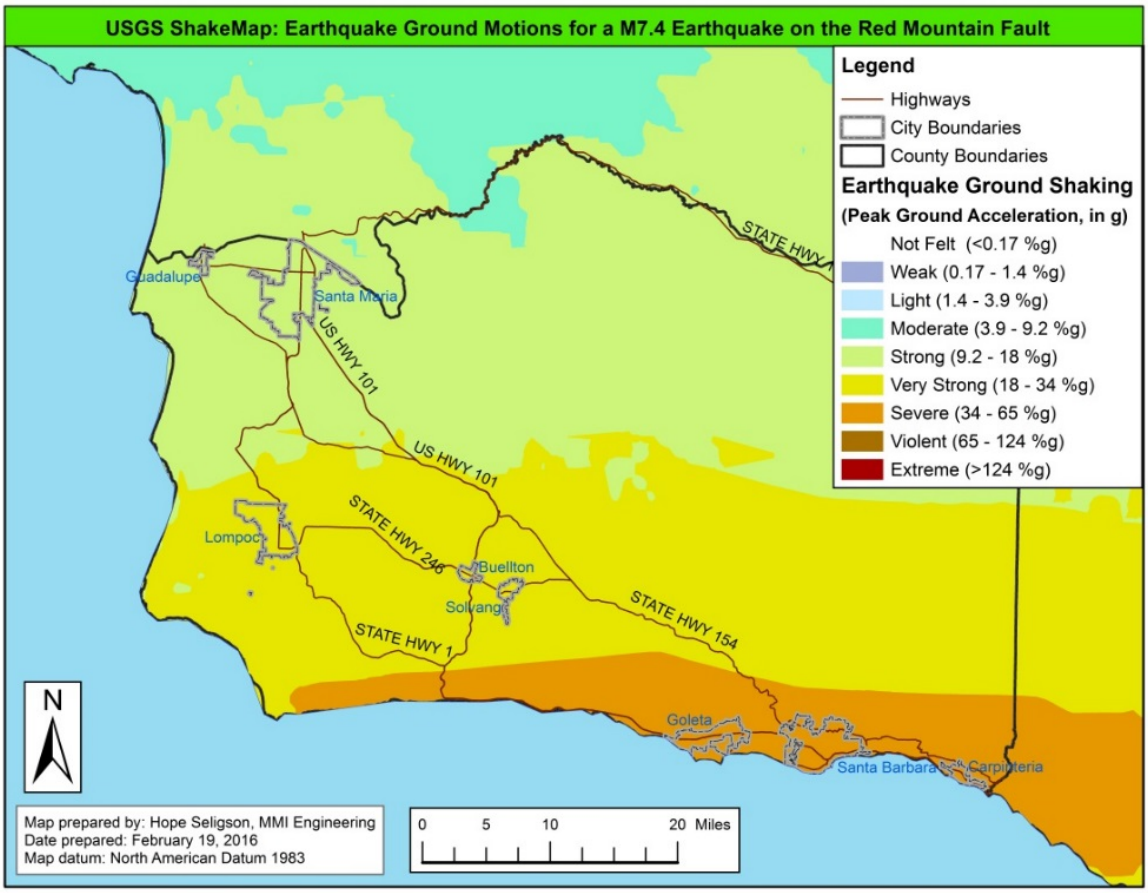
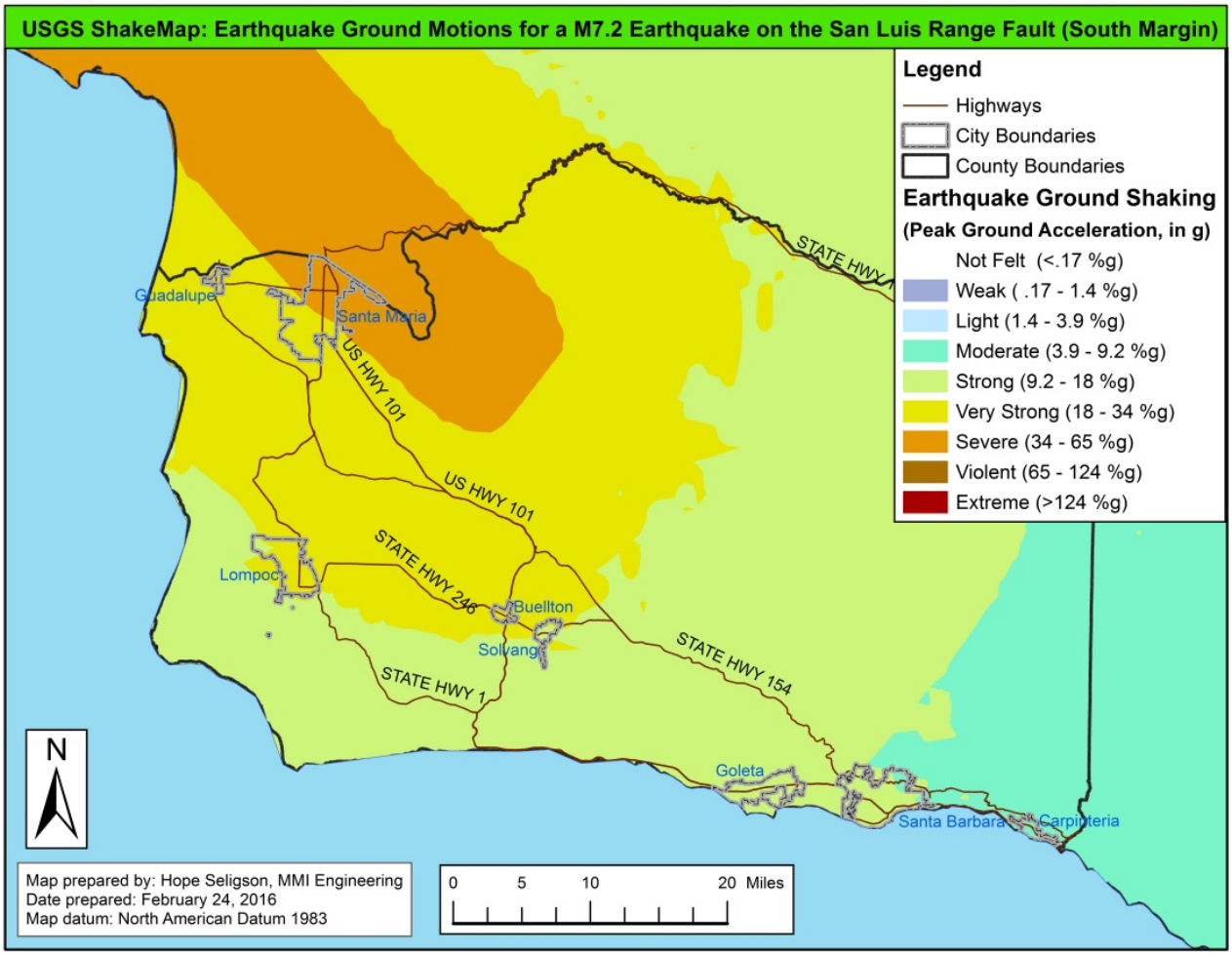


Figure 6.4: USGS Shake Map Ground Motions for Santa Barbara County for a M7.2 Earthquake on the San Luis Range Fault, South Margin (Scenario 2)



As noted above, the latest version of Hazus (Hazus 3.0, released in November, 2015) was used to conduct county-wide earthquake risk assessments. The Hazus results, computed at the census tract level, were aggregated to produce city-level impact summaries. An overview of the city-wide results for both scenarios is provided in **Table 6.7**, along with the sub-set of results that represent the unincorporated county areas. As shown, the M7.4 Red Mountain Fault earthquake scenario (which impacts the southern part of the county) generates more building damage and loss in the County and in the unincorporated county areas, than the M7.2 San Luis Range Fault earthquake scenario (which impacts the northern part of the County).

Table 6.8 provides a breakdown of estimated building damage (building count by Hazus damage state) by general building type, allowing for an understanding of the distribution of predicted damage in the modeled scenarios.

Functionality of essential facilities included in the Hazus default database (with additional fire station facilities added) in the two scenario earthquakes is summarized in **Table 6.9** for Santa Barbara County and the unincorporated county areas.

Table 6-7: Estimated Impacts for Two Earthquake Scenario Events Affecting the City of Santa Barbara

		Earthquake Scenario	
		M7.4 Red Mountain Scenario	**M7.2 San Luis Range South Margin Scenario**
Direct Economic Losses for Buildings ($1,000)			
	Total Building Exposure Value	**11,636,462**	
Capital Stock Losses	Cost of Structural Damage	218,144	750
	Cost of Non-Structural Damage	883,301	11,024
	Total Building Damage (Str. + Non-Str.)	**1,101,445**	**11,775**
	Building Loss Ratio %	9.5%	0.1%
	Cost of Contents Damage	334,401	5,887
	Inventory Loss	6,814	124
Income Losses	Relocation Loss	100,633	115
	Capital-Related Loss	78,502	106
	Rental Income Loss	69,218	193
	Wage Losses	96,347	126
	Total Direct Economic Loss	**1,787,360**	**18,325**
	% Of Countywide Loss	**50.9%**	**2.2%**
Casualties			
Day Casualties	**Casualties - 2 pm**		
	Level 1 - minor injuries, basic first aid	568	1
	Level 2 - hospital treat & release	150	0
	Level 3 - injuries requiring hospitalization	24	0
	Level 4 - fatalities	**45**	**0**
	Total Casualties	**787**	**1**
Night Casualties	**Casualties - 2 am**		
	Level 1 - minor injuries, basic first aid	193	1
	Level 2 - hospital treat & release	42	0
	Level 3 - injuries requiring hospitalization	6	0
	Level 4 - fatalities	**11**	**0**
	Total Casualties	**252**	**1**
Shelter			
Shelter	Number of Displaced Households	1,456	0
	Number of People Requiring Short-term Shelter	893	0
Debris (thousands of tons)			
Debris	Brick, Wood & Other (Light) Debris	112.5	0.6
	Concrete & Steel (Heavy) Debris	320.4	0.3

		Earthquake Scenario	
		M7.4 Red Mountain Scenario	**M7.2 San Luis Range South Margin Scenario**
	Total Debris	**432.9**	**0.9**

Table 6-8: Estimated Building Damage (Building Count by General Building type, by Damage State) for Two Earthquake Scenario Events Affecting the City Santa Barbara

		Earthquake Scenario	
		M7.4 Red Mountain Scenario	**M7.2 San Luis Range South Margin Scenario**
Concrete	None	73	740
	Slight	213	13
	Moderate	245	1
	Extensive	143	0
	Complete	80	0
	TOTAL	**754**	**754**
Manuf. Housing	None	0	439
	Slight	1	49
	Moderate	71	6
	Extensive	286	0
	Complete	136	0
	TOTAL	**494**	**494**
Precast Concrete	None	27	590
	Slight	113	18
	Moderate	273	2
	Extensive	148	0
	Complete	49	0
	TOTAL	**610**	**610**
Reinforced Masonry	None	165	1101
	Slight	301	9
	Moderate	420	1
	Extensive	166	0
	Complete	60	0
	TOTAL	**1,112**	**1,111**
Steel	None	26	776
	Slight	87	21
	Moderate	278	3

	Extensive	305	0
	Complete	103	0
	TOTAL	**799**	**800**
Unreinforced Masonry	None	5	220
	Slight	31	12
	Moderate	77	1
	Extensive	66	0
	Complete	53	0
	TOTAL	**232**	**233**
Wood Frame (Other)	None	64	627
	Slight	238	9
	Moderate	229	0
	Extensive	84	0
	Complete	21	0
	TOTAL	**636**	**636**
Wood Frame (Single family)	None	5410	23260
	Slight	14555	228
	Moderate	3490	1
	Extensive	34	0
	Complete	0	0
	TOTAL	**23,489**	**23,489**
ALL BUILDING TYPES	None	5,770	27,753
	Slight	15,539	359
	Moderate	5,083	15
	Extensive	1,232	0
	Complete	502	0
	TOTAL	**28,126**	**28,127**

Notes:

1) Totals may not match due to rounding

Table 6-9: Predicted Essential Facility Functionality in Two Earthquake Scenario Events Affecting The City of Santa Barbara

		Earthquake Scenario	
	FACILITY TYPE	**M7.4 Red Mountain Scenario**	**M7.2 San Luis Range South Margin Scenario**
Fire Stations	**Santa Barbara Fire Department**		
	Total Number of Facilities in Hazus Default Database*	**8 (Stations 1-8)**	
	Default Structural Class and Design Level	**W1 (Wood Frame ≤ 5,000 SqFt), Moderate Code Design Level**	
	Damage:		
	# Facilities with >50% Probability of Moderate or Greater Damage	0	0

	# Facilities with >50% Probability of Complete Damage	0	0
	Functionality:		
	Functionality < 50 % on Day 1	8	0
	Functionality 50 - 75% on Day 1	0	0
	Functionality >75% Day 1	0	8
Police Stations	**Santa Barbara Police Department**		
	Total Number of Facilities in Hazus Default Database	**1**	
	Default Structural Class and Design Level	**W1 (Wood Frame ≤ 5,000 SqFt), Moderate Code Design Level**	
	Damage:		
	# Facilities with >50% Probability of Moderate or Greater Damage	0	0
	# Facilities with >50% Probability of Complete Damage	0	0
	Functionality:		
	Functionality < 50 % on Day 1	1	0
	Functionality 50 - 75% on Day 1	0	0
	Functionality >75% Day 1	0	1
Schools	**Santa Barbara Unified School District**		
	Total Number of Facilities in Hazus Default Database	**26 Schools ****	
	Default Structural Class and Design Level	**W1 (Wood Frame ≤ 5,000 SqFt), High Code Design Level**	
	Damage:		
	# Facilities with >50% Probability of Moderate or Greater Damage	0	0
	# Facilities with >50% Probability of Complete Damage	0	0
	Functionality:		
	Functionality < 50 % on Day 1	26	0
	Functionality 50 - 75% on Day 1	0	0
	Functionality >75% Day 1	0	26

** Note: The default fire station database was revised to include missing stations*

*** The Hazus default database includes 26 schools, but review of California Department of Education data indicate that 3 may be closed.*

Critical Facility	Potential Groundwater/ Liquefaction Severity
Public Works Buildings	Moderate/High
Public Yards	Moderate/High
Ortega treatment Well	Moderate/High
Main Desalination Plant	High/High
El Estero Wastewater Treatment Plan	High/High
Stearns Wharf	High/High
Airport Administration	High/High
Airport Terminal Museum	High/High

Critical Facility	Potential Groundwater/ Liquefaction Severity
New Airline Terminal	High/High
Harbor Patrol	High/High
Waterfront Operations	High/High
Marina 1	High/High
Marina 2	High/High
Marina 3	High/High
Marina 4	High/High
Navy Pier	High/High
City Hall	Moderate/High
Community Development	Moderate/High
Fire Station 3	Moderate/Moderate
Fire Station 2	Moderate/High
Fire Station 8	Moderate/Moderate
Police Department Headquarters	Moderate/High
Lower Westside Community Center	Moderate/Moderate
Franklin Community Center	Moderate/Moderate

6.2.2 Flood and Coastal Storm Surge (Medium Impact/High Probability)

Hazus 3.0 was used to develop a flood depth grid for the 1-percent annual chance (100-year) flood, using Hazus 3.0 built-in, basic (i.e., Level 1) flood depth estimation methodology. The Hazus 3.0 flood hazard assessment methodology uses available information and local river and floodplain characteristics, such as frequency, discharge and ground elevation to estimate flood elevation, and ultimately flood depth. Digital elevation model (DEM) data with 30-meter resolution, available from the USGS' National Elevation Dataset (see: http://nationalmap.gov/elevation.html) has been utilized in the current assessment.

It should be noted that the flood depth grid generated by Hazus 3.0 ***is not*** equivalent to regulatory floodplain data contained in FEMA's Digital Flood Insurance Rate Maps (DFIRMs), which are the result of extensive, detailed engineering study. The Hazus-generated flood depth grid is a hypothetical representation of a potential flooding scenario, intended for non-regulatory uses. Further, it should also be noted that the DEM data used in the default analysis do not reflect the presence of channels and levees. A more detailed assessment would utilize higher resolution DEM data, such as LIDAR-based DEM data, and/or would require GIS-based revisions to the DEM to better reflect local flood control structures. Given that the Hazus 3.0 Level 1 approach does not consider the presence of levees, Hazus 3.0 loss and damage estimates produced for areas with levees (e.g., along the Santa Maria River) should be considered "worst-case" flood losses, reflecting potential flood damage that could occur in the event that the levees fail. Hazus-estimated flood depths across Santa Barbara County are provided in **Figure 6.5**.

An overview of the county-wide Hazus results for the 100-year flood scenario is provided in **Table 6.10**, along with the sub-set of results that represent the unincorporated county areas. **Table 6.11**

provides a breakdown of estimated building damage (building count by percent damage range) by general occupancy. As shown, most of the flood-damaged buildings are single family homes. Functionality of essential facilities included in the Hazus default database (with additional fire station facilities added) in the flood scenario is summarized in **Table 6.12** for Santa Barbara County.

Figure 6.5: Hazus-Estimated Flood Depths for a 1-percent Annual Chance (100-year) Flood

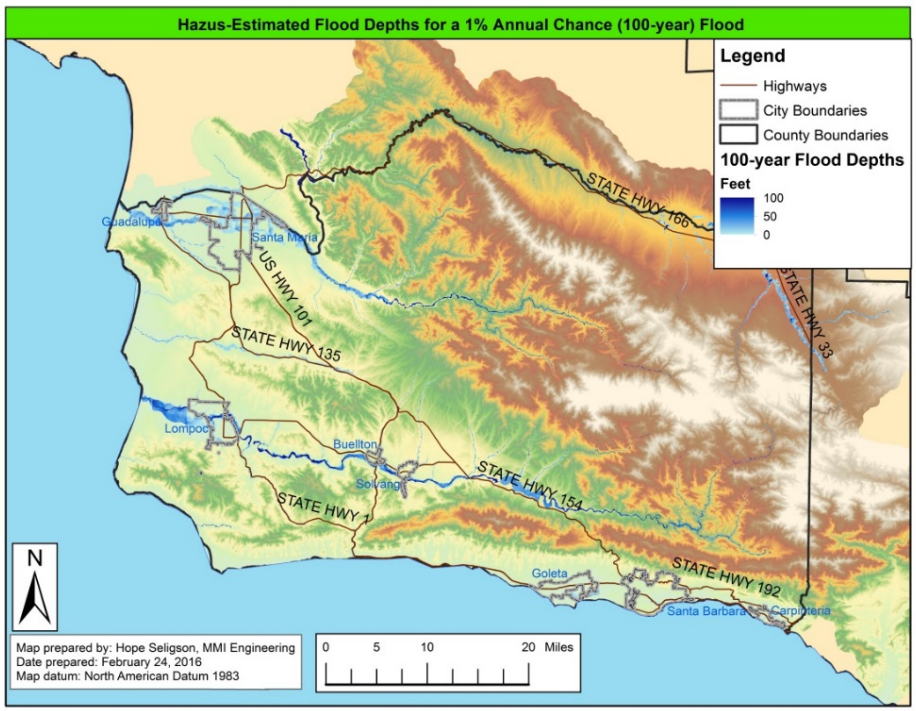


Table 6-10: Hazus -Estimated Impacts for the 1-Percent Annual Chance (100-Year) Flood Scenario Affecting the City of Santa Barbara

		Flood Scenario
		1-percent chance annual flood (100-year flood)
Direct Economic Losses for Buildings ($1,000)		
	Total Building Exposure Value	**11,636,462**
Capital Stock Losses	Total Building Damage	11,149
	Building Loss Ratio %	0.1%
	Cost of Contents Damage	7,790
	Inventory Loss	24
Income Losses	Relocation Loss	79
	Capital-Related Loss	268
	Rental Income Loss	50

		Flood Scenario
		1-percent chance annual flood (100-year flood)
	Wage Losses	158
	Total Direct Economic Loss	**19,518**
	% Of Countywide Loss	1.7%
Shelter		
Shelter	Number of Displaced Households	2,099
	Number of People Requiring Short-term Shelter	1,964
Debris (thousands of tons)		
Debris	Finishes	1.1
	Structures	0.4
	Foundations	0.4
	Total Debris	**2.0**

Table 6-11 Estimated Building Damage (Building Count by General Occupancy, by Percent Damage Range) for a 1-percent Annual Chance (100-year) Flood Scenario Affecting the City of Santa Barbara

		Flood Scenario
		1-percent chance annual flood (100-year flood)
Single Family Homes	None	106
	1 - 10%	37
	11 - 20%	33
	21 - 30%	2
	31 - 40%	3
	41 - 50%	1
	Substantial Damage	4
	TOTAL	**186**
Manufactured Housing	None	0
	1 - 10%	0
	11 - 20%	0
	21 - 30%	0
	31 - 40%	0
	41 - 50%	0

	Substantial Damage	0
	TOTAL	**0**
Other Residential	None	10
	1 - 10%	0
	11 - 20%	2
	21 - 30%	0
	31 - 40%	0
	41 - 50%	0
	Substantial Damage	0
	TOTAL	**12**
Commercial	None	6
	1 - 10%	1
	11 - 20%	0
	21 - 30%	0
	31 - 40%	0
	41 - 50%	0
	Substantial Damage	0
	TOTAL	**7**
Industrial	None	0
	1 - 10%	0
	11 - 20%	0
	21 - 30%	0
	31 - 40%	0
	41 - 50%	0
	Substantial Damage	0
	TOTAL	**0**
Other Occupancies	None	0
	1 - 10%	0
	11 - 20%	0
	21 - 30%	0
	31 - 40%	0
	41 - 50%	0
	Substantial Damage	0
	TOTAL	**0**
ALL OCCUPANCIES	None	122
	1 - 10%	38
	11 - 20%	35
	21 - 30%	2
	31 - 40%	3
	41 - 50%	1
	Substantial Damage	4
	TOTAL	**205**

Table 6-12 Predicted Essential Facility Functionality for a 1-percent Annual Chance (100-year) Flood Scenario Affecting the City of Santa Barbara

		Flood Scenario
	FACILITY TYPE	**1-percent chance annual flood (100-year flood)**
Fire Stations	**Santa Barbara Fire Department**	
	Total Number of Facilities in Hazus Default Database*	**8 (Stations 1-8)**
	Flood Exposure	
	# facilities located within flooded areas	0
	Damage:	
	# Facilities with Moderate or Greater Damage	0
	# Facilities with Substantial Damage	0
	Functionality:	
	# facilities expected to be non-functional on Day 1	0
Police Stations	**Santa Barbara Police Department**	
	Total Number of Facilities in Hazus Default Database	**1**
	Flood Exposure	
	# facilities located within flooded areas	0
	Damage:	
	# Facilities with Moderate or Greater Damage	0
	# Facilities with Substantial Damage	0
	Functionality:	
	# facilities expected to be non-functional on Day 1	0
Schools	**Santa Barbara Unified School District**	
	Total Number of Facilities in Hazus Default Database	**26 Schools ****
	Flood Exposure	
	# facilities located within flooded areas	0
	Damage:	
	# Facilities with Moderate or Greater Damage	0
	# Facilities with Substantial Damage	0
	Functionality:	
	# facilities expected to be non-functional on Day 1	0

** Note: The default fire station database was revised to include missing stations*

*** The Hazus default database includes 26 schools, but review of California Department of Education data indicate that 3 may be closed.*

6.3 Critical Facilities Analysis

6.3.1 Flood and Coastal Storm Surge (Medium Impact/High Probability)

Although Flood and Coastal Surge damage was well delineated in the previous section (Scientific Loss Estimation modeling), the County Planning Team and the MAC wanted to include additional vulnerability e data for the Critical Facilities. The exposure of the critical facilities to flood zones is summarized in **Table 6.13** and depicted on **Figure 6.6**.

Table 6-13 Critical Facilities by Category in Flood Zones

Critical Facilities
Public Works Yanonali Yard
Public Works Communications
Stearns Wharf
Airport Administration
Airport Runways
Airport Terminal Museum
New Airline Terminal
Stearns Wharf
Waterfront/Harbor Patrol
All Waterfront Marinas
Fire Station 2
Parks & Recreation Administration
Parks & Recreation Maintenance Yard
Ortega Well
El Estero Water Treatment Plant

Figure 6.6 Critical Facilities in 100 Year Flood Zone

MISSING FIGURE

6.3.2 Wildfire *(Medium Impact/High Probability)*

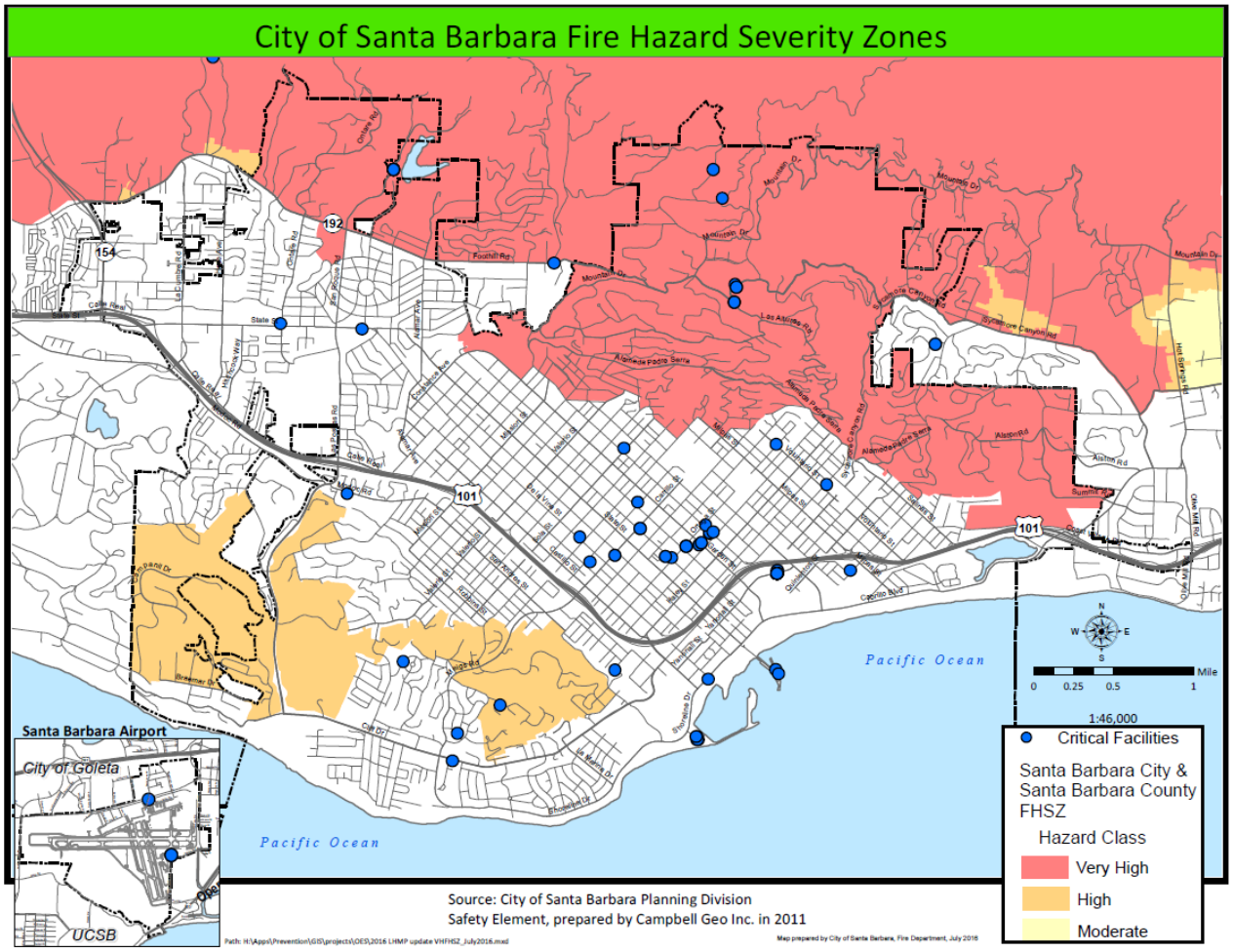
In looking at critical facilities' vulnerability to wildfire, there were three measures that were evaluated. The first is whether a critical facility is within the Fire Severity Zone (FSZ). The FSZ is mapped by the CA Department of Forestry and Fire Protection. It shows the geographic extents for areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. The second measure for vulnerability is the Wildland Urban Interface which is the potential treatment zone where projects could be conducted to reduce wildland fire threats to people. For the purposes of this analysis, "within the WUI" represents those critical facilities that are in the geographical area where the three factors of "threat to people", "communities at risk",

and “distance to developed areas” intersect. The final measure is that of “Fire Threat”. Fire Threat is a combination of the factors of fire frequency and potential fire behavior. The two factors are combined to create five (5) threat classes ranging from “Little or No Threat” to “Extreme”. The exposure of the critical facilities to these three measures is indicated in the tables (**Table 6.14**, **Table 6.15**, and **Table 6.16**) and figures (**Figure 6.7**. **Figure 6.8**, and **Figure 6.9**) below. It is worth noting that all critical facilities have at least some threat from one or more of the three measures. Because of this, the exposure has been color coded low too high in a yellow, orange, red scheme to make it easier for the reader to discern the different designations.

Table 6-14 Critical Facilities by Name in Fire Hazard Severity Zone

Critical Facility within the Wildland Urban interface Zone
Public Works Yard
Cater Treatment Plant
Sheffield Treatment Plant
Tunnell Reservoir
El Cielito
Hope Reservoir
Escondido Pump Station
Skofield Pump Station
Bothin Pump Station
Skofield Park
Fire Station 7
Fire Station 6
Franklin Community Center
Ortega Well
Franchesci Park – Communication Building

Figure 6.7 Critical Facilities in Fire Hazard Severity Zone



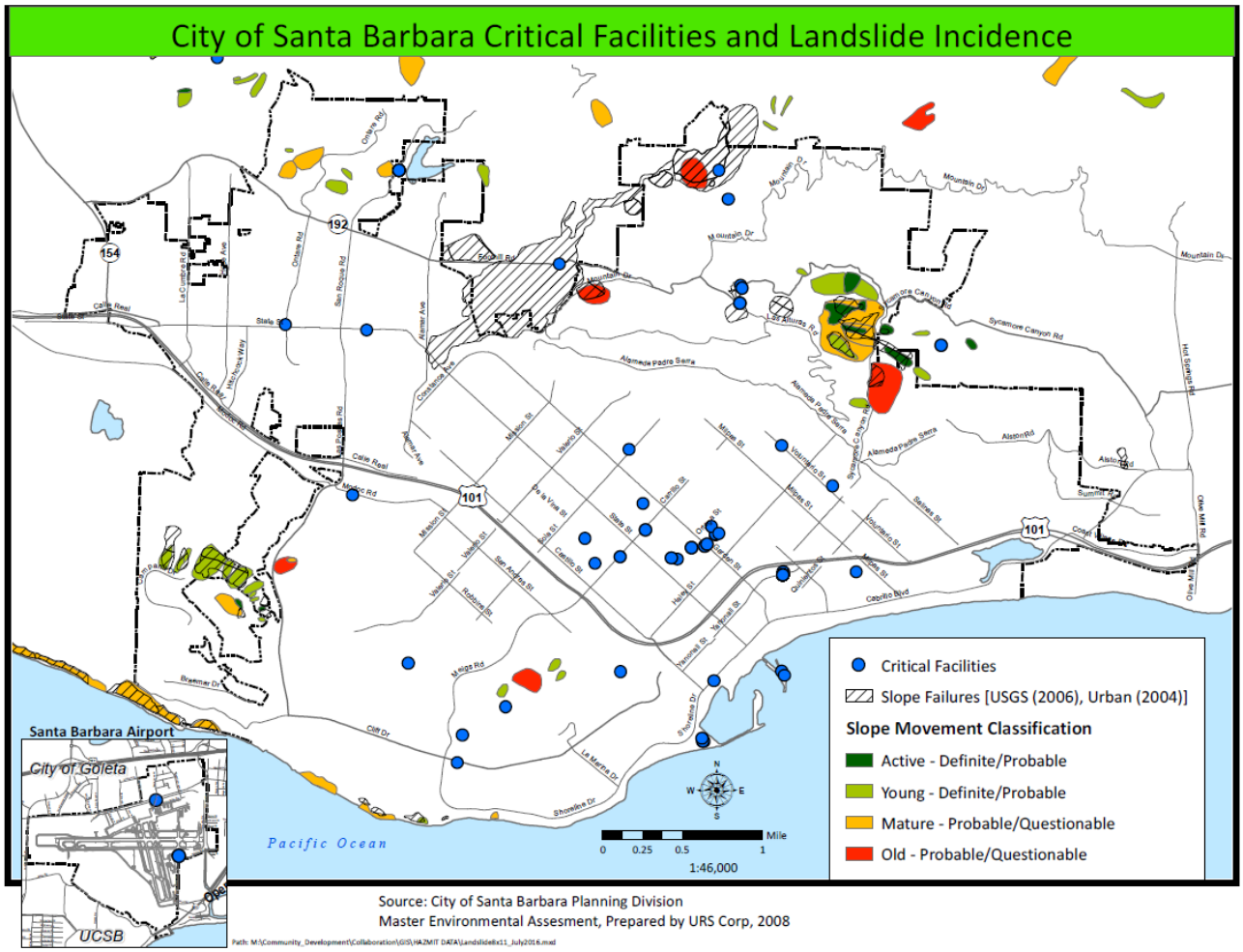
6.3.3 Landslide and other Earth Movement *(Medium Impact/High Probability)*

In an effort to assess vulnerability for landslides, data was collected from the United States Geological Survey (USGS) that represents landslide incidence and susceptibility. The geographies impacted are categorized into low, moderate, and high zones. These layers were intersected with the critical facilities to estimate exposure and show that there is approximately $14.4 million in structure value and just under $4 million in contents with at least moderate risk to landslides. The table below (**Table 6-17**) summarizes the total exposure and **Figure 6-10** depicts the location of those facilities that fall into a moderate risk. None of the County's critical facilities have a high risk of landslide vulnerability. All facilities not shown fall into the low risk category.

Table 6-17 Critical Facilities by Category in Landslide Zones

Currently in the Santa Barbara City there are no impacts to critical facilities in the landslide areas identified. The City continues to assess its vulnerabilities with the continued collection of data. This will assist in improving the City's risk assessment process in order to direct planning and mitigation decisions.

Figure 6.10 Critical Facilities and Landslide Incidence



6.3.4 Sea Level Rise, Coastal Storm Surge and Erosion *(Medium Impact/High Probability)*

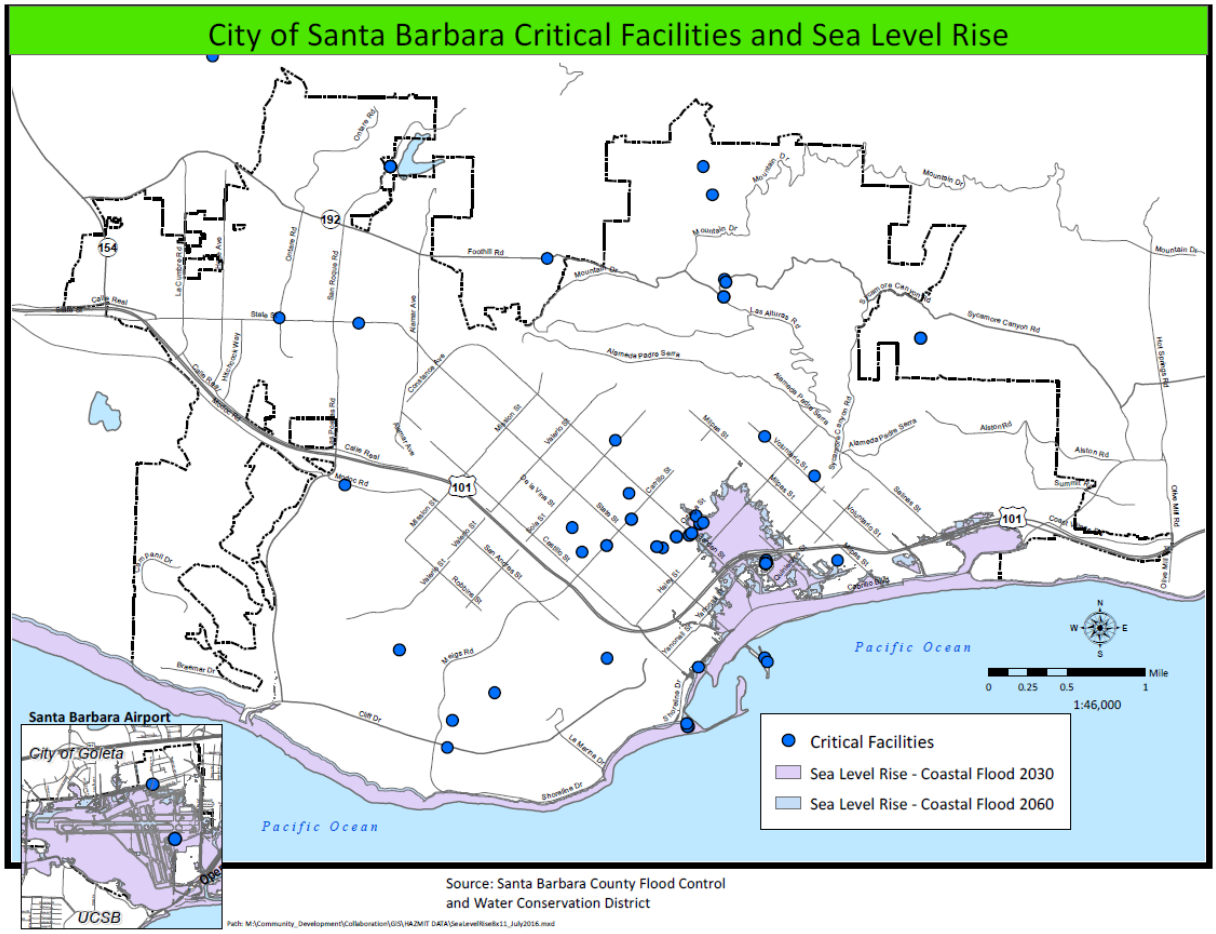
Santa Barbara County will be vulnerable to Sea Level Rise (SLR) along its 110 mile long coastline. SLR coupled with increased frequency, severity, and duration of high tide and storm events related to climate change will result in more frequent and severe extreme events along the coast. These events could expose the coast to severe flooding and erosion, damage to coastal Critical Facilities and real estate, and salinity intrusion into delta areas and coastal aquifers (Projecting Future Sea Level, A Report from the California Climate Change Center, 2006).

Table 6-18 illustrates the potential impact to Critical Facilitates from SLR, while **Figure 6.11** illustrates the vulnerability of the County's Critical Facilities to Sea Level Rise over the next 30 years.

Table 6-18 Critical Facilities by Category in SLR Zones

Currently, the City of Santa Barbara is continuing to assess data to develop policies for planning and mitigation. No critical facilities have been identified.

Figure 6-11 Critical Facilities and Sea Level Rise



6.3.5 Dam Failure *(High Impact/Low Probability)*

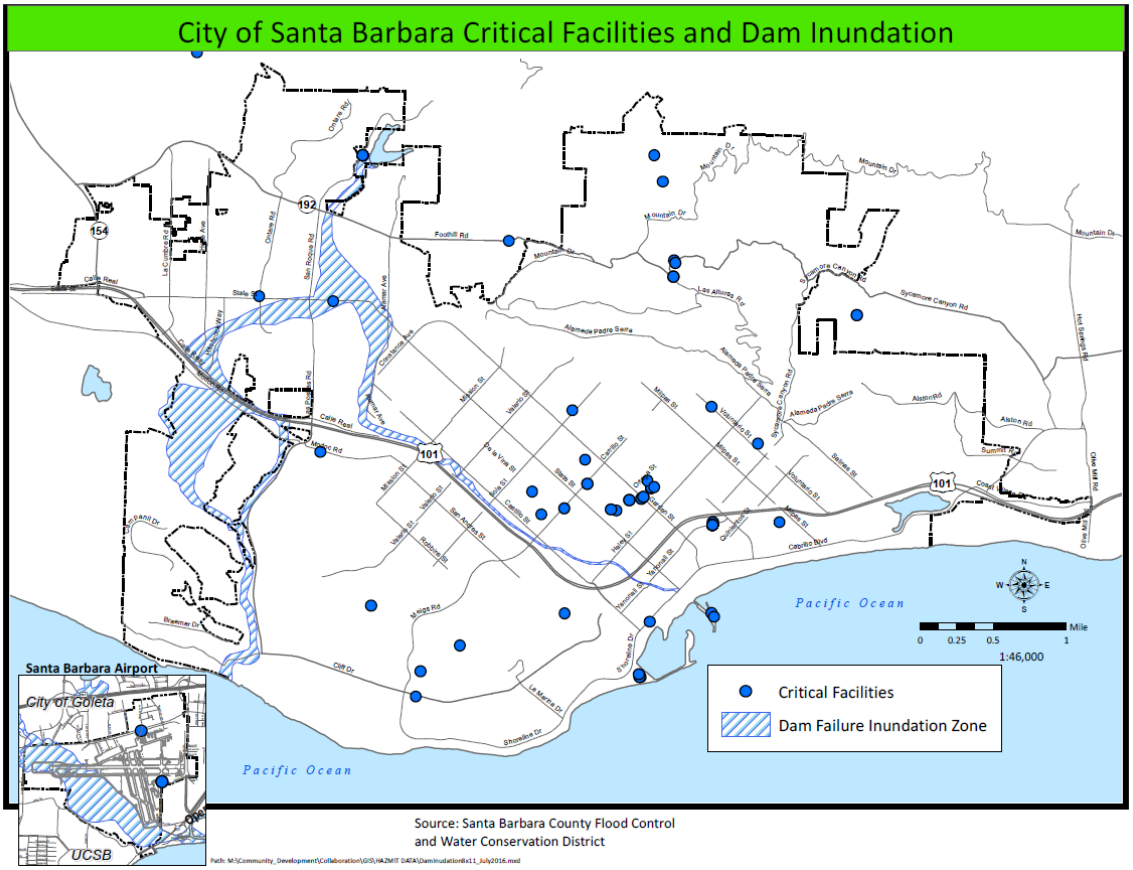
There are nine major dams in the County: Alisal Creek, Bradbury, Dos Pueblos, Gibraltar, Glen Anne, Juncal, Ortega, Rancho Del Ciervo, and Twitchell. Bradbury dam has the largest concern of failure because floodwaters from this dam would affect Cachuma Village, Solvang, Buellton, Lompoc City, Lompoc Valley, and south Vandenberg AFB. A failure of the remaining eight (8) dams would affect portions of populated cities and communities, forest and agricultural lands, roads, and highways. The dam failure vulnerability is simply a look at those critical facilities exposed to risk as indicated by whether they fall into a geographic region that represents a dam inundation zone. There are 39 County critical facilities within the dam inundation zones. The 39 critical facilities represent approximately $XX million in building value and almost $XX million in contents exposed to the risk (**Table 6-19**); however, over half of the critical facilities, nineteen

(19) of the 39 at risk facilities, did not have any dollar information available. **Figure 6-12** depicts the location of the critical facilities in relation to the dam failure inundation zones.

Table 6-19 Critical Facilities by Category in Dam Inundation Zones

Currently, there are no critical facilities within the path of a dam failure. However, the City continues to assess its vulnerabilities with the continued collection of data. This will assist in improving the City's risk assessment process in order to direct planning and mitigation decisions.

Figure 6-12 Critical Facilities and Dam Failure Inundation Areas



6.3.6 Tsunami *(Medium Impact/Low Probability)*

Tsunami waves travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed diminishes, its wavelength decreases, and its height increases. Depending on the type of event that creates the tsunami, as well the remoteness of the event, the tsunami could reach land within a few minutes or after several hours. Low-lying areas could experience severe inland inundation of water and deposition of debris more than 3,000 feet inland.

The University Of Southern California Tsunami Research Group has modeled areas in Santa Barbara County that could potentially be inundated in the event of a tsunami. This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources were mapped and used to profile maximum potential exposure.

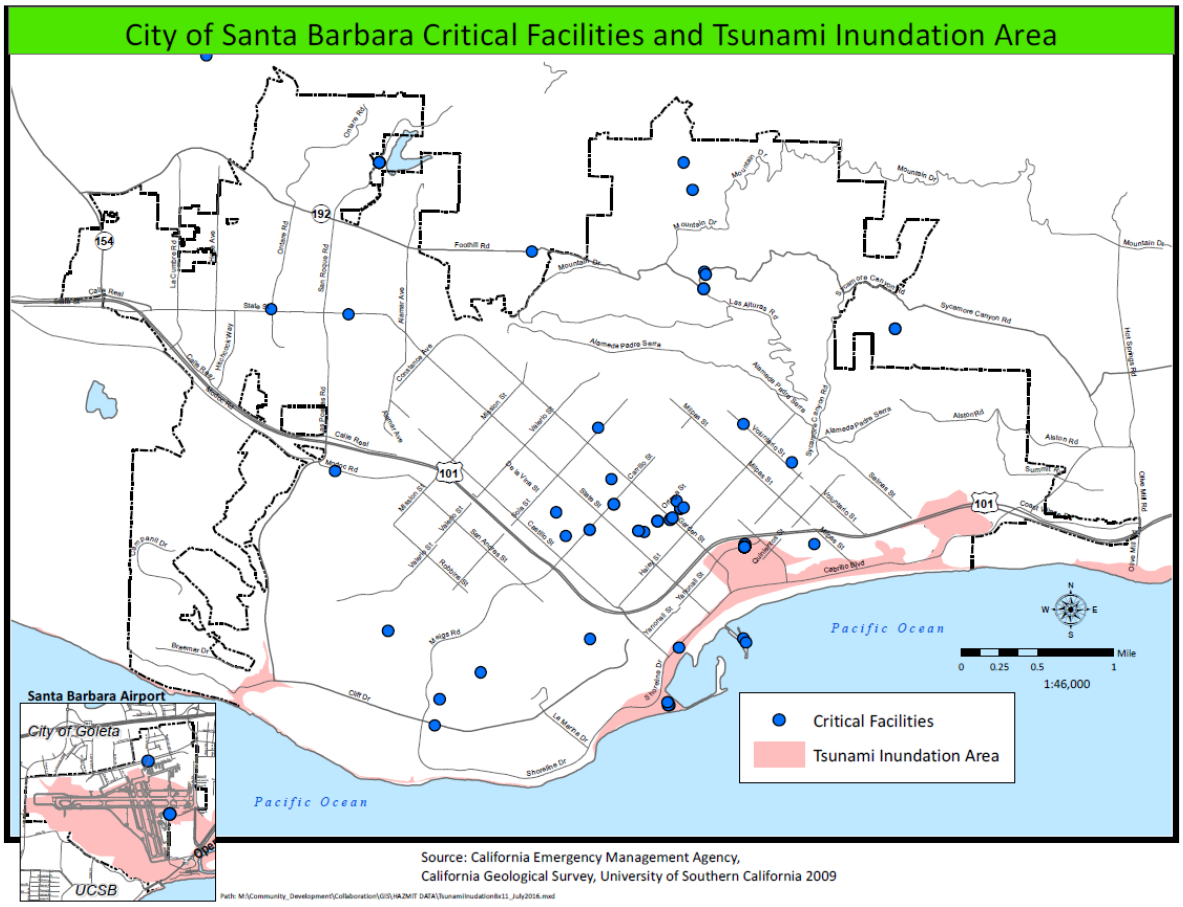
Critical facilities provided by the City were compared against the extreme tsunami inundation zone overlay to see whether they fell within the geographic extent of the hazard. (**Table 6-21**). **Figure 6-14** depicts the critical facilities in relation to the extreme tsunami inundation zone.

Table 6-21 Critical Facilities by Category in Extreme Tsunami Inundation Zone

It is worth noting that a majority of the Santa Barbara City critical facilities evaluated could be moderately impacted by a Tsunami event. The City continues to assess its vulnerabilities with the continued collection of data. This will assist in improving the City's risk assessment process in order to direct planning and mitigation decisions. Below is a table of critical facilities that are within the Tsunami Inundation Map develop in 2009.

Critical Facility
El Estero Wastewater Treatment Plan
Stearns Wharf
Airport Terminal Museum
New Airline Terminal
Waterfront/Harbor Patrol
All Harbor Marinas

Figure 6-14 Critical Facilities and Tsunami Inundation Areas



6.4 Qualitative Estimate of Impacts Analysis

6.4.1 Drought and Water Shortage *(Medium Impact/High Probability)*

A drought is present when a region receives below-average precipitation, resulting in prolonged shortages in its water supply, whether atmospheric, surface, or ground water. A drought can last for months or years, or may be declared after as few as 15 days. The effects of the drought are most visible in Santa Barbara County; including the City of Santa Barbara, when looking at the current capacity and maximum storage of the two main water reservoirs in the county, Lake Cachuma and Twitchell. On February 16, 2016, Cachuma was reported to be at 14.9% capacity, and Twitchell was at 0.2% capacity.

Climate change has the potential to make drought events more common in California, including Santa Barbara. Extreme heat creates conditions more conducive for evaporation of moisture from the ground, increasing the possibility of drought. A warming planet could lead to earlier melting of winter snow packs, leaving lower stream flows and drier conditions in the late spring and summer. Snow packs in northern California are important for water storage and ensuring adequate supply in the summer months when water is most needed. Changing precipitation distribution and intensity have the potential to cause more of the fallen precipitation run-off rather than be stored. The result is an increased potential for more frequent and more severe periods of drought.

Past experience with Santa Barbara droughts tells us that drought impacts are felt first by those most dependent on or affected by annual rainfall – fire departments, ranchers engaged in dryland grazing, rural residents relying on wells in low-yield rock formations, or other small water systems lacking a reliable water source. Drought and water shortage can happen countywide; and have significant impacts on the populations and the economy. Significant economic impacts on Santa Barbara's agriculture industry can occur as a result of short- and long-term drought conditions; these include hardships to farmers, farm workers, packers, and shippers of agricultural products. In some cases, droughts can also cause significant increases in food prices to the consumer due to shortages. Drought can also result in lack of water and subsequent feed available to grazing livestock, potentially leading to risk of livestock death and resulting in losses to the Santa Barbara's agricultural economy.

Drought can have secondary impacts. For example, drought is a major determinant of wildfire hazard, in that it creates greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes.

*6.4.2 Severe Weather (*Medium Impact/High Probability)

6.4.2.4 *Extreme Heat*

Extreme heat can have significant impacts on the populations, lifeline infrastructure, and the economy. Heat events also highlight the importance of thoughtful social vulnerability analyses, consideration for socially isolate elderly populations, and illustrate how seemingly unrelated phenomena combine to create disaster, such as when increased use of air conditioners during heat waves can lead to power outages, which makes the events even more deadly.

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." For example, the 1989 Loma Prieta Earthquake resulted in 63 deaths, the 1992 Northridge Earthquake was responsible for the loss of 55 lives, and the 2003 Southern California Firestorms resulted in 24 deaths; however, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave is said to have resulted in 946 deaths. The July 2006 heat wave in California caused the deaths of about 140 people over a 13-day period.

Because of this, the following groups could be considered vulnerable or at greater risk in a heat emergency:

- People with developmental/intellectual disabilities - refers to a severe and chronic disability that is attributable to a mental or physical impairment that begins before an individual reaches adulthood. These disabilities include cerebral palsy, epilepsy, mobility and autism.
- Blind/low vision
- Deaf/Hard of hearing
- Mobility Injuries: from auto accidents, falls, sports, and or war. These injuries can cause damage to the brain, spinal cord, hearing, sight and mobility
- Chronic Conditions: Diabetes, Arthritis, dialysis, asthma and epilepsy
- Older adults: Have age-related limitations. (move slower, sight and sound limitations, etc.)

- Children: Challenges include dependency not only for care, but decision-making, processing information and trauma differently than adults, they may be unable to articulate their needs, may decompensate faster than adults, and are generally more susceptible to thirst, hunger, temperature, etc. than adults.
- Animals, including domestic pets, livestock, and poultry are also susceptible to extreme heat. For example, dogs and cats are in danger of heat stroke in temperatures of 110°F. The heat wave of 2006 resulted in 15 reported pet deaths and more than 25,000 cattle, and 700,000 fowl heat- related deaths. Heat wave impacts to livestock can lead to financial losses in California's agricultural economy.

The Spatial Hazard Events and Loss Data for the United States (SHELDUS), estimates that approximately 47 heat events occurred in California between the years 1960 and 2008. Adjusted to 2008 dollars, SHELDUS reports that severe heat events in California caused roughly $1.8 million in property damage and $531.7 million in crop damage.

6.4.2.5 Freeze

Sustained temperatures below freezing in Santa Barbara's generally mild weather regions can cause life loss and health risks to vulnerable populations; and have significant impacts on the lifeline infrastructure and the economy. Similar to Extreme Heat events, the same populations, lifeline infrastructure, and parts of the economy are vulnerable to and could be impacted by Freeze events.

Although infrequent, freezes can severely affect Santa Barbara agriculture. Freezing temperatures occurring during winter and spring growing seasons can cause extensive crop damage. Secondary impacts of freeze disasters can include major economic impacts on farmers, farm workers, packers, and shippers of agricultural products. Freezes can also cause significant increases in food prices to the consumer due to shortages. Freezing spells are likely to become less frequent as climate temperatures increase; if emissions follow higher pathways, freezing events could occur only once per decade in a sizable portion of the state by the second half of the 21st century. While fewer freezing spells would decrease cold-related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

6.4.2.6 *Hailstorm*

Although ranked as part of the Serve Weather, hailstorms are rare in Santa Barbara County and as such represent a relatively low risk for most areas, compared to areas in the Midwest and southern United States where risk exposure is severe and many lives and millions of dollars are lost annually due to this hazard. In the event of a large hailstorm event, it is not expected to have significant impact on the population, built environment, lifeline infrastructure, or the economy.

6.4.2.7 Windstorm

Also ranked as part of the Serve Weather. Santa Barbara County is predominately known to have damaging hot winds known as Sundowners. These winds can reach up to 80 mph and fuel raging wildfires on the south coast. In the north county, the winds can damage agriculture if they are

severe enough. In the unlikelihood of a significant event, windstorms could have a considerable impact on the population, built environment, lifeline infrastructure, and the economy.

6.4.3 Energy Shortage and Energy Resilience *(Medium Impact/High Probability)*

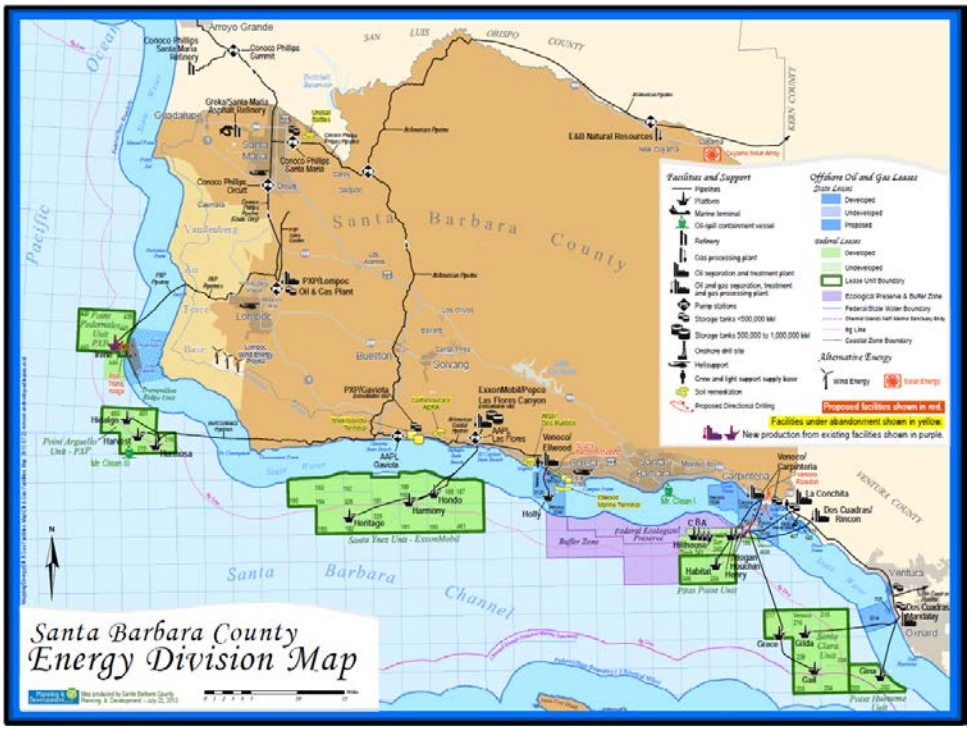
Energy disruptions are considered a form of lifeline system failure. Disruptions can be the consequence of another hazard, or can be a primary hazard, absent of an outside trigger. Santa Barbara County has two power providers. Pacific Gas and Electric provides electricity in the northern part of the county, with termination of services north of the Gaviota area. Southern California Edison provides power to the Southern part of the county, with service terminating in Gaviota. The two systems are not connected. Thus, if there is a major interruption of service in the Santa Barbara area, then all service is denied west of the outage to Gaviota. Likewise, if there is a major interruption of service coming from the north, power south to Gaviota from the outage may be affected.

Santa Barbara continues to experience both population growth and weather cycles that contribute to a heavy demand for power. Predicted increases in heat waves as well as increasingly severe winter storms will put ever greater strain on Santa Barbara's two electricity providers and the Southern California Gas Company. In the event of a significant energy shortage it will have a significant impact on the population, built environment, lifeline infrastructure, and the economy.

6.4.4 Oil Spill *(Medium Impact/High Probability)*

In the event of a significant oil spill it will have a significant impact on the environment and the economy. The environmental impacts contribute to short- and long-term impacts on economic activities in areas affected by oil spills. Moratoriums may be temporarily imposed on fisheries, and tourism may decline in beach communities, resulting in economic hardship on individuals dependent on those industries for their livelihood and on the economic health of the community as well. Currently, there are 11 Oil Platforms off of the Santa Barbara County Coast and nearly (NEED NUMBER) oil and gas wells in Santa Barbara County. **Figure 6.12** show the Oil Platforms and their proximity to Santa Barbara.

Figure 6.12 Oil Platform Map of Santa Barbara Coast



6.4.5 Agricultural Pests and Disease *(Low Impact/High Probability)*

In the event of a significant agricultural pest or disease event it will have a significant impact on the environment and the economy. The actual acreage of agriculture exposed to pests and disease, as well as other hazards, is 546,512.61 acres including 138,723.18 acres of crop land.

6.4.6 Epidemic/Pandemic/Vector Borne Disease *(Low Impact/Medium Probability)*

The county, as well as the state and country, has been subject recent increases in epidemic/pandemic/vector borne diseases. While a significant epidemic/pandemic/vector borne disease event can have a considerable impact on the population, environment, and economy, the epidemic/pandemic/vector borne disease response plan, developed through the coordination efforts of 75 county employees and partner agencies, establishes a solid foundation for improved coordination and intervention by all participants not only in response to a pandemic but for the prevention as well. Implementation of this plan will enable County Department's to fulfill their significant roles and responsibilities for a coordinated strategy aimed at protecting the public's health and minimizing the impact of the pandemic influenza in Santa Barbara County.

6.4.7 Hazardous Materials Release *(Medium Impact/Medium Probability)*

The release of hazardous materials into the environment can cause a multitude of problems for the population, built environment, lifeline infrastructure, environment, and the economy. Although these incidents can happen almost anywhere, certain areas of the County are at higher risk, such as near roadways that are frequently used to transport hazardous materials and locations with

industrial facilities that use, store, and/or dispose of such materials. Aras crossed by railways, waterways, airways, and pipelines also have increased potential for mishaps.

Incidences can occur during production, storage, transportation, use or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long lasting health effects, and damage to buildings, the environment, homes, and other property.

The locations and identity of facilities that store hazardous materials are reported to local and federal governments. Security measures at these facilities can be heightened. Many facilities have their own hazardous materials guides and response plans, including transportation companies who transport hazardous materials.

6.4.8 Radiological Incident *(High Impact/Low Probability)*

Minor radiological accidents are possible at several facilities in Santa Barbara County that utilize some form of uranium including UCSB and area hospitals; however, a major concern for residents of Santa Barbara County is the Diablo Canyon Power Plant (DCPP). A significant radiological incident will have significant impacts on the population, built environment, lifeline infrastructure, environment, and the economy.

6.4.9 Terrorism *(Medium Impact/Medium Probability)*

In the unlikelihood of a significant terrorism event, there could be considerable impact on the population, built environment, lifeline infrastructure, environment, and the economy.

As of this date, there have been no know terrorist incidents in the City.

6.4.10 Cyber Threat *(Low Impact/Medium Probability)*

In the unlikelihood of a significant cyber event, there could be considerable impact on the population, built environment, lifeline infrastructure, environment, and the economy.

A cyber threat can infiltrate many institutions including banking, medical, education, government, military, and communication and infrastructure systems. The majority of effective malicious cyber-activity has become web-based. Recent trends indicate that hackers are targeting users to steal personal information and moving away from targeting computers by causing system failure. The duration of a cyber-attack is dependent on the complexity of the attack, how widespread it is, how quickly the attack is detected, and the resources available to aid in restoring the system. A cyber-attack could be geared toward one organization, one type of infrastructure and/or a specific geographical area. The affected area could range from small to large scale. Cyber-attacks generated toward large corporations can negatively affect the economy. A 2014 report from the MacAfee Corporation stated that the annual global loss to the global economy is between $375B and $500B. Attacks geared toward critical infrastructure and hospitals can result in the loss of life and the loss of basic needs, such as power and water, to the general public. Cyber-attacks can lead to the loss of operational capacity.

Most jurisdictions have several levels of security in place, dependent upon security levels of individuals and the geographical locations (onsite or remote). Redundant dispatch centers with separate systems that can function if the primary center isn't functioning are desirable.

Humans are the weakest link in a chain of cyber security. It remains difficult to continuously monitor and manage human/operator vulnerability. However, to address this weakness it is suggested the all jurisdictions in the Santa Barbara County continue, or develop a security training program which all employees are required to complete or renew annually.

6.4.11 Aircraft Crash *(Low Impact/Medium Probability)*

In the unlikelihood of a significant aircraft crash, depending on the location, there could be considerable impact on the population and the built environment.

The City of Santa Barbara has one airport with commercial flights are available. In addition to flights in and out of the municipal airport, commercial and private air traffic passes over the county. Military aircraft utilize Vandenberg Air Force Base. The City's airport maintains an emergency response plan that is tested at regular intervals with local government response agencies in accordance with FAA regulations.

A major air accident that occurs in a heavily populated residential area can result in considerable loss of life and property. Damage assessment and disaster relief efforts associated with an air accident will require support from other local governments, private organizations, and in certain instances, from the State and Federal governments.

It is anticipated that the mental health needs of survivors and surrounding residents will have to be addressed resulting from the trauma associated with the accident. A coordinated response team, comprised of mental health professionals, should take a proactive approach meeting the mental health needs from any traumatic disaster.

6.4.12 Train Accident *(Low Impact/High Probability)*

In the unlikelihood of a significant train accident there could be considerable impact on the population, economy, and the environment.

Trains running through Santa Barbara County, and in close proximity to U.S. Highway 101 in some areas, carry commuters and all other types of commodities including hazardous materials, fuel (including oil), agriculture, meats, and non-consumables. A hazardous material incident on rails or roadway has the potential to shut down both rail and highway transportation routes where the rail line and Highway101 are in close proximity.

This was the case in the 1991 Seacliff Incident, in neighboring Ventura County where a train accident released 440 gallons of aqueous hydrazine. The accident required the evacuation of the nearby Seacliff community along with the shutting down of Highway 101, and took 5 days to cleanup.

6.4.13 Natural Gas Pipeline/Storage Facility Accidents *(Medium Impact/Low Probability)*

In the unlikelihood of a significant natural gas pipeline or storage facility accident there could be considerable impact on the population, built environment, lifeline infrastructure, economy, and the environment.

Natural gas transported via the interstate pipelines, and some of the California-produced natural gas, is delivered into the Pacific Gas & Electric (PG&E) and Southern California Gas (SoCal Gas) intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" natural gas pipeline system). Natural gas on the utilities' backbone pipeline systems is then delivered into the local transmission and distribution pipeline systems, or to natural gas storage fields. PG&E and SoCal Gas own and operate several natural gas storage fields that are located in Northern and Southern California.

Generally speaking, transmission lines are large-diameter steel pipes carrying natural gas at high pressure and compressed to provide higher carrying capacity. Transmission lines are both interstate and intrastate, with the latter connecting to smaller distribution lines delivering gas directly to homes and businesses.

6.4.14 Civil Disturbance *(Medium Impact/Low Probability)*

In the unlikelihood of a civil disturbance, depending on the cause and effect, there could be considerable impact on the population, built environment, lifeline infrastructure, economy, and the environment.

While Santa Barbara County does not have a history of riots there is no record of Civil Unrest in the City.

6.4.15 Marine Invasive Species *(Medium Impact/Low Probability)*

The introduction of non-indigenous species (NIS) into Santa Barbara County coastal marine, estuarine and lake waters can cause significant and enduring economic, human health, and environmental impacts. Ships transfer organisms to California waters from throughout the world. The transfer of ballast water from “source” to “destination” ports results in the movement of many organisms from one region to the next.

The Santa Barbara Coast and Lake Cachuma are vulnerable to Marine Invasive Species and close monitoring of marine and lake vessels as well as water dropping (snorkeling) aircraft is needed.

SECTION 7 MITIGATION STRATEGY

In preparation of the 2016 update of this plan, the City's Local Hazard Mitigation Planning (LHMP) Team made no revisions to the countywide goals and objectives due to the fact that they continue to reflect the needs of the City. This section contains the City's updated and most current mitigation strategy as of March 2016.

Mitigation Priorities

The City's LHMP Team accepted and agreed to the following Goals and Objectives.

Goal 1: Promote disaster-resistant future development.
Objective 1.A: Facilitate the development (or updating) of the Comprehensive Plan, City's General Plans and zoning ordinances to limit (or ensure safe) development in hazard areas.
Objective 1.B: Facilitate the incorporation and adoption of building codes and development regulations that encourage disaster resistant design.
Objective 1.C: Facilitate consistent implementation of plans, zoning ordinances, and building and fire codes.
Goal 2: Building support capacity and commitment for existing assets, including people, critical facilities/infrastructure, and public facilities, to become less vulnerable to hazards.
Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Objective 2.B: Mitigate vulnerable populations
Objective 2.C: Support a coordinated permitting processes and consistent enforcement
Goal 3: Enhance hazard mitigation coordination and communication.
Objective 3.A: Address data limitations identified in Hazard Profiling and Risk Assessment
Objective3.B: Increase awareness and knowledge of hazard mitigation principles and practice among local government officials
Objective 3.C: Provide technical assistance to implement mitigation plans
Objective 3.D: Educate the public to increase awareness of hazards, potential impacts and opportunities for mitigation actions
Objective 3.E: Monitor and publicize the effectiveness of mitigation actions implemented within the City
Objectives 3.F: Educate the professional community on design and construction techniques that will minimize damage from the identified hazard
Objective 3.G: Participate in initiative that have mutual hazard mitigation benefits County-wide

Objective 3.H: Encourage other organizations, within the public, private, and no-profit sectors, to incorporate hazard mitigation activities into their existing programs and plans
Objective 3.I: Continue partnership between the state, county, local and tribal governments to identify, prioritize and implement mitigation actions
Objective 3.J: continuously improve the County's capability and efficiency at administering pre- and post-disaster mitigation programs, including providing technical support to the special districts within the City

Mitigation Progress

The City's Local Hazard Mitigation Planning (LHMP) Team reviewed the mitigation actions listed in the 2011 plan to determine the status of each action. Once reviewed, deferred projects from 2011 were renumbered to reflect 2016 updates. NOTE: All projects deferred from 2011 are due to lack of funding. All projects from 2011 have been deferred to 2016.

Mitigation Approach

The following table presents mitigation actions identified in the 2011 plan that were deferred and those that have been added to this plan by the LHMP Team in March 2016. The projects that were deferred were given new action numbers in the format of 2016 - # to allow all the current actions to be numbered. Projects deferred from 2011 are identified in the Comments Section. As actions are added in future updates they will be numbered in similar format to allow for tracking the year each action was added, deferred or deleted to the list (e.g. 2016 - #). The actions below and their status will be tracked and updated annual by the City's Office of Emergency Services, the Emergency Managers Task Team and LHMP Team.

Table Mitigation Projects

2016 Mitigation Action #	Mitigation Action Description -	Status	Comments
2016-1	Pedregosa Storm Drain	Deferred	Previously from 2011 – construction will significantly reduce flooding in the Mission Creek area around Pedregosa
2016-2	Replacement Storm Drain Outfall (Airport)	Deferred	Previously from 2011 – This project is planned but not budgeted. Will significantly reduction flooding on Hollister Avenue.
2016-3	Flood Wall Construction (Airport)	Deferred	Flood Wall Construction - Around buildings 223, 304, 314, and 315 to protect these structures from flooding. Eliminate frequent water intrusion into buildings subsequent clean-up costs due to storm events, many of which are less than10 year events.
2016-4	Honda Valley Hillside Stabilization in location of High Pressure Gas Line Serving City	Deferred	Previously from 2011- High pressure gas line serving the City is located in an areas of Honda Valley where stabilization of soil is needed.

Table Mitigation Projects			
2016 Mitigation Action #	**Mitigation Action Description**	**Status**	**Comments**
2016-5	Hidden Valley Park Slope Stability	Deferred	Previously from 2011 – To reduce risk to life and property from slides and flooding.
2016-6	Stevens Park Eastern Access Erosion Remediation	Deferred	Previously from 2011 – Benefit to secure life and property and the preservation of an effective and ecologically sound creek system.
2016-7	Francheschi Park/Mission Ridge Hillside geotechnical stabilization of retaining wall	Deferred	Previously moved from in-progress to defer in 2011 due to lack of funding – retaining wall is crucial to evacuation and emergency response.
2016-8	Bluff Retreat Management at Shoreline Park	Deferred	Previously moved from in-progress to deferred in 2011 due to lack of funding – This project is on-going due to continuous bluff erosion.
2016-9	Rebuild 1000 Steps	Deferred	Previously moved from In-Progress in 2011 to Deferred in 2016 due to lack of funding – coastal erosion to beach access.
2016-10	Police Department Remodel	Deferred	Previously New in 2011 now Deferred due to lack of funding.
2016-11	High Fire Area Roadways	Deferred	Previously from 2011 - Erosions and landslides due to steep slopes and unreinforced retaining walls will hamper evacuation and emergency response.
2016-12	Laguna Pump Station	Deferred	Previously from 2011 - If the pump station is not replaced and/or repaired there will be massive closures in the downtown area.
2016-13	Replace deluge system on Stearns Wharf	Deferred	Previously from 2011 – Continues to be an on-going maintenance Project to promote firefighting on Stearns Wharf, which is an historical site in the Waterfront area.
2016-14	Backup generator for Waterfront Department Operating Center.	Deferred	Previously from 2011 - Upgraded power needed for Harbor Patrol and Waterfront DOC.
2016-15	Current Harbor facilities are old early 60s type construction – seismic renovation needed for safety	Deferred	Previously from 2011 - Current Harbor facilities are early 60s' type construction that would not withstand a large earthquake.
2016-16	Mesa Lane Coastal Access	Deferred	Previously from 2011 - Coastal erosion has already damaged a good portion of this coastal access.
2016-17	Salsipuedes Street Storm Drain Improvement	NEW	Potential improvements include connection of storm drain inlets on Micheltorena Street to existing storm drain on Salsipuedes Street and the construction of a new storm drain pipe along Salsipuedes and Victoria Streets

Table Mitigation Projects			
2016 Mitigation Action #	**Mitigation Action Description**	**Status**	**Comments**
2016 -18	Corrugated Metal Pipe Repairs	NEW	Repair through slip lining or to completely replace the highest priority corrugated metal pipe drain lines annually.
2016-19	Guiterrez Storm Drain Improvements	NEW	Construct additional storm drains to reduce the duration and severity of flooding when the upstream storm drain system is overwhelmed. The project is intended to improve the ability to remove runoff from the area by providing increased inlet capacity and by providing larger conduits between the street inlets and the box culverts under Hwy 101.
2016-20	Goleta Slough Mouth Management	NEW	Project will control the water level in the Goleta Slough to minimize flood hazard, mosquito population blooms, and waterfowl attractants that pose a greater bird-strike risk. The project will be designed to minimize adverse effects to the Federally-endangered tidewater goby and steelhead trout, while avoiding significant flood and bird-strike hazards such as those experienced in November 2012, May 2013 and February 2014.
2016-21	Hollister Drainage Improvement	NEW	The project includes establishing new swales to connect to an existing culvert emptying to Carneros Creek. To preserve the wetland habitat within the project site, the swales will be "eco-channels" which are constructed to allow a certain depth of water to still fill the wetlands, but now allow the water to overflow into Hollister Avenue. There will be a significant component of wetland enhancement/planting to offset any detrimental impacts of the project to the wetland habitat.
2016-22	Sea Level Rise Adaptation Plan	NEW	Develop a comprehensive Sea Level Rise Adaptation Plan for the low-lying coastal area from Ledbetter Point to the coastal bluffs at the eastern City limits to identify, manage, and reduce sea level rise effects on coastal resources and critical City facilities.
2016-23	Review/Revise the City's Critical Facilities List	NEW	Develop a more comprehensive list of Critical Facilities that would include hospitals, skilled nursing facilities and private companies; as applicable.

Implementation Plan

Mitigation Action # 2016 – 1 Deferred from 2011		
Project Description: Pedregosa Storm Drain This is a cooperatively funded project of the County Flood Control and the City to solve drainage problem along Pedregosa Avenue to De la Vina Street. This is scheduled to be constructed next year. The affected area is from Mission Creek to Sheridan Avenue vicinity.		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☒ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☐ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: Santa Barbara County Flood Control District Benefits Assessments/Streets Capital Fund – estimated cost of project $700,000		
Responsible Department: Santa Barbara County Flood Control - Tom Fayram, Deputy Public Works Director		
Target Completion Date: Undetermined due to funding		
Additional Comments / Status Report: Construction will significantly reduce flooding.		
Generating Department/Division: Public Works – Streets Division		

Mitigation Action # 2016 – 2	Deferred from 2011	
Project Description: Replacement Storm Drain Outfall Replace steel pipe culvert at Carneros Creek and improve associated drainage channels. As recommended in Santa Barbara Airport "Master Drainage Plan". This will assist in eliminating over bank flooding along Hollister Ave near Carneros Way up to a 10 year storm event		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☒ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☐ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: Federal Aviation Administration Grant Funds, FEMA, and Airport Revenue. Design approximately $15,000, Construction approximately $95,000.		
Responsible Department: Owen Thomas Supervising Engineer City of Santa Barbara Airport Department		
Target Completion Date: 2021		
Additional Comments / Status Report: This Project is planned but not budgeted. Targeted to complete in 5 Years Planning/Permitting and Design approximately 9 months. Construction time estimated at approximately 60 days. Significant reduction in flooding of Hollister Ave (main through fare) eliminating this traffic hazard for up to 10-year storm event and traffic.		
Generating Department/Division: Airport Engineering		

Mitigation Action # 2016 – 3	Deferred from 2011	
Project Description: Flood Wall Construction - Around buildings 223, 304, 314, and 315 to protect these structures from flooding.		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☒ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☐ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: Airport revenue and/or FEMA funds. Design and Construction cost of Storm walls - approximately $120,000		
Responsible Department: Owen Thomas Supervising Engineer City of Santa Barbara Airport Department		
Target Completion Date: Undetermined due to funding		
Additional Comments / Status Report: Eliminate frequent water intrusion into buildings subsequent clean-up costs due to storm events, many of which are less than10 year events.		
Generating Department/Division: Airport Engineering		

Mitigation Action # 2016 – 4	Deferred from 2011

Project Description: Honda Valley Hillside Stabilization in location of High Pressure Gas line Serving the City

An area near a roadway and private property where high pressure gas lines are buried erodes frequently due to runoff and the steepness of the slope. This necessitates stabilization of the continually eroding hillside containing the gas line. An engineering consultant would prepare plans for slope stabilization and native revegetation, and infrastructure relocation if necessary.

- Identify Funding
- Prepare scope of work
- Hire consultation firm to design job
- Acquire all necessary permits.
- Write Specifications
- Bid construction
- Construct project

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Funding has not been specified

Responsible Department: City of Santa Barbara Parks and Recreation Department working with City of Santa Barbara Public Works and the Gas Company

Target Completion Date: Undetermined due to funding

Additional Comments / Status Report: The benefits of public safety and a secure utility delivery would outweigh the likely fiscal costs of planning and implementation of a slope stabilization project.

Generating Department/Division: Parks & Recreation – Parks Division

Mitigation Action # 2016 – 5	Deferred from 2011

Project Description: Hidden Valley Park Slope Stability

At numerous locations throughout the park, slope stability problems are reoccurring along steep creek banks causing public safety hazards from slides and flooding, as well as stability issues on private and public property that lines the park. Potential hazards to park users and public and private economic losses would be reduces if the slopes were stabilized.

- Identify Funding
- Hire consultation firm to design job
- Acquire all necessary permits.
- Write Specifications
- Bid construction
- Construct project

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Funding has not been specified

Responsible Department: City of Santa Barbara Parks and Recreation working with County of Santa Barbara Flood Control, and City of Santa Barbara Creeks Division.

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report: Reduced risk to life and property from slides and flooding would outweigh likely fiscal costs.

Generating Department/Division: Parks & Recreation – Parks Division

Mitigation Action # 2016 – 6	Deferred from 2011

Project Description: Stevens Park Eastern Access Erosion Remediation

The sole emergency access point to the majority of Stevens Park is subject to severe erosion, undercutting, potential slope failure and substantial sedimentation into San Rogue Creek from storm damage and poor drainage. In order to reduce the hazard to life and property from slides and flooding and to maintain a functional flood control system the area must be repaired by means of bank stabilization, revegetation, and appropriate drainage control.

- Identify Funding
- Prepare scope of work
- Hire consultation firm to design job
- Acquire all necessary permits.
- Write Specifications
- Bid construction
- Construct project

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Funding has not been specified

Responsible Department: City of Santa Barbara Parks and Recreation Department

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report: The benefit of secure life and property and the preservation of an effective and ecologically sound creek system would outweigh the likely fiscal costs.

Generating Department/Division: Parks & Recreation – Parks Division

Mitigation Action # 2016 – 7	Deferred from 2011	
Project Description: Francheschi Park/Mission Ridge Hillside geotechnical stabilization of retaining wall Improve storm drain infrastructure improvements.		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☒ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☒ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: No current funding sources.		
Responsible Department: Parks & Recreation and Community Development		
Target Completion Date: Undetermined due to funding.		
Additional Comments / Status Report: Retaining wall is crucial to ingress and egress in the area; especially for evacuation and emergency response		
Generating Department/Division: Parks & Recreation – Parks Division and Community Development - Planning		

Mitigation Action # 2016 – 8	Deferred from 2011

Project Description: Bluff Retreat Management at Shoreline Park

Since the late 90's the Park's bluff has been subject to numerous slides. Management of sidewalks and parkway needs to be continually addressed.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project

Responsible Department: Parks & Recreation

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

Currently the erosion to the park continues and will continue into the future. Keeping the management of sidewalks and vegetation in the area is an on-going issue.

Generating Department/Division: Park & Recreation – Parks Division and Public Works - Engineering

Mitigation Action # 2016 – 9	Deferred from 2011

Project Description: Rebuild 1000 Steps

Coastal erosion to the access on the beach has been on-going. The steps need to be rebuilt for safety of coastal access.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☒ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project

Responsible Department: Parks & Recreation and Public Works

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

Generating Department/Division: Parks & Recreation – Parks Division and Public Works – Engineering Division

Mitigation Action # 2016 – 10	Deferred from 2011

Project Description: Police Department

Police Building has been assessed by outside architectural firm and has been determined that the building needs seismic renovation.

Applicable Hazards

High	**Medium**	**Low**
☒ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☐ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: No current funding potential

Responsible Department: Police Department and Community Development

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

Concept designs have been submitted. The Communication Center, housed on the first floor (basement) of the Police Department has been relocated to another facility off site due to the safety issues. Completion date for the building is dependent on securing funding.

Generating Department/Division: Police Department and Community Development – Planning Division

Mitigation Action # 2016 – 11	Deferred from 2011

Project Description: High Fire Area Road

- Many steep slopes in the high fire areas are subject to erosion and has already failed in areas in past flooding events
- Gravity/unreinforced retaining walls subject to land slide and earthquake

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☒ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project

Responsible Department: Public Works

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

Erosions and landslides will hamper emergency responders from access these high fire areas and will drastically slow down calls times if these roads are hampered.

Generating Department/Division: Public Works – Engineering and Fire Department – Fire Prevention Bureau, Wildland Fire Specialist

Mitigation Action # 2016 – 12	Deferred from 2011

Project Description: Laguna Pump Station

Replace and repair pump station.

Applicable Hazards

High	**Medium**	**Low**
☒ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☒ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project

Responsible Department: Public Works

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

If pump station goes out, the downtown area will have massive closure between Anacapa and Quenientos Street and Ortega and Canon Perdido Street. It will also cause upstream flooding and coastal erosion.

Generating Department/Division: Public Works – Water Resources and Engineering Divisions

Mitigation Action # 2016 – 13	Deferred from 2011

Project Description: Replace deluge system on Stearns Wharf

In the past Stearns Wharf, which is an historical site, has suffered three massive fires. The current deluge system is not adequate if there is another fire.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☐ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☒ Fire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project; however is part of the City's Capital Improvement Project (CIP)

Responsible Department: Waterfront

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

This is life essential equipment for the wharf

Generating Department/Division: Waterfront – Operations Division

Mitigation Action # 2016 – 14	Deferred from 2011

Project Description: Backup generator for Waterfront Department Operating Center (DOC)

Upgrade power for Harbor Patrol and Department's DOC

Applicable Hazards

High	**Medium**	**Low**
☒ Earthquake	☐ Agricultural Pests / Disease	☒ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently no funding sources

Responsible Department: Waterfront

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

Planning design work is currently being generated.

Generating Department/Division: Waterfront – Operations Division

Mitigation Action # 2016 – 15	Deferred from 2011

Project Description: Seismic Upgrades to City Facilities in the Harbor

Current Harbor facilities are old early 60s type construction – seismic renovation needed for safety

Applicable Hazards

High	**Medium**	**Low**
☒ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☐ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project

Responsible Department: Waterfront

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

Generating Department/Division: Waterfront – Operations Division and Public Works – Engineering Division

Mitigation Action # 2016 – 16	Deferred from 2011

Project Description: Mesa Lane Coastal Access

Coastal Erosion has damaged a good portion of the access to the beach.

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Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☒ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project

Responsible Department: Parks & Recreation

Target Completion Date: Undetermined due to funding.

Additional Comments / Status Report:

A significant storms could element this beach access

Generating Department/Division: Parks & Recreation – Parks Division

Mitigation Action # 2016 – 17		**NEW**
Project Description: Salsipuedes Street Storm Drain Improvements The project first involves the study of existing public and private storm drain facilities beginning on Salsipuedes Street at Micheltorena Street and continuing south to Victoria Street. Potential improvements include connection of storm drain inlets on Micheltorena Street to an existing storm drain on Salsipuedes Street and the construction of a new storm drain pipe along Salsipuedes and Victoria Streets.		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☒ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☐ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: No current funding sources		
Responsible Department: City of Santa Barbara Public Works Department		
Target Completion Date: Undetermined due to funding.		
Additional Comments / Status Report: Public Works will pursue completion of an initial study and design for this project in the event that grant funding or a cost sharing agreement with County Flood Control can be secured to cover 50% of the cost for construction.		
Generating Department/Division: Public Works- Engineering Division		

Mitigation Action # 2016 – 18		**NEW**
Project Description: Corrugated Metal Pipe Repairs Studies done in the several areas within the City noted many corrugated metal pipes will need to be replaced. This project would seek to repair through slip lining or to completely replace the highest priority corrugated metal pipe drain lines annually.		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☒ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☐ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: To be determined		
Responsible Department: City of Santa Barbara Public Works Department		
Target Completion Date: Undetermined		
Additional Comments / Status Report: Many of the City owned corrugated metal pipes were installed over 50 years ago and may require replacement. Due to lack of funding for this project, repairs are typically only completed as emergency maintenance projects in response to failures evident at the street level (typically as sinkholes following rain events).		
Generating Department/Division: Public Works – Engineering Division		

Mitigation Action # 2016 – 19 NEW

Project Description: Gutierrez Storm Drain Improvements

The project would construct additional storm drains to reduce the duration and severity of flooding when the upstream storm drain system is overwhelmed. The project is intended to improve the ability to remove runoff from the area by providing increased inlet capacity and by providing larger conduits between the street inlets and the box culverts under Hwy 101.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: To be determined

Responsible Department: City of Santa Barbara Public Works Department

Target Completion Date: Undetermined

Additional Comments / Status Report:

The area north of Hwy 101 within the Laguna Channel watershed is within the 100-year flood plain. During flooding events where the City's storm drain system is unable to transport peak runoff, the overflow travels overland to the area along Gutierrez Street between Rose Avenue and Olive Street. The local storm drain system in this area is inadequate to handle these overflow events and local flooding occurs.

Generating Department/Division: Public Works – Engineering Division

Mitigation Action # 2016 – 20	**NEW**

Project Description: Goleta Slough Mouth Management
Narrative: This project will control the water level in the Goleta Slough to minimize flood hazard, mosquito population blooms, and waterfowl attractants that pose a greater bird-strike risk. This project will be designed to minimize adverse effects to the Federally-endangered tidewater goby and steelhead trout, while avoiding significant flood and bird-strike hazards such as those experienced in November 2012, May 2013 and February 2014.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☒ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☒ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Project formulation and biological assessment are underway and are expected to be finalized in May 2015. Funding sources include funding from FAA and the Airport.

Responsible Department: Airport Department

Target Completion Date: 2021

Additional Comments / Status Report: The Federal Aviation Administration (FAA) requires that wildlife strike risk be avoided to the maximum extent feasible within environmental constraints. The Santa Barbara County Flood Control District completed an Environmental Impact Report for their maintenance activities, including slough mouth management in 2011.

Generating Department/Division: Public Works - Engineering Division and Airport – Operations Division

Mitigation Action # 2016 – 21	**NEW**

Project Description: Hollister Drainage Improvement
Narrative: The project includes establishing new swales to connect to an existing culvert emptying to Carneros Creek. To preserve the wetland habitat within the project site, the swales will be "eco-channels" which are constructed to allow a certain depth of water to still fill the wetlands, but now allow the water to overflow into Hollister Avenue. There will be a significant component of wetland enhancement/planting to offset any detrimental impacts of the project to the wetland habitat.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☒ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☐ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☐ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources:

Responsible Department: Airport Department

Target Completion Date: 2021

Additional Comments / Status Report: The area south of Hollister Avenue and east and west of Los Carneros Way is twelve acre moisture of upland and wetland habitats. The area is drained by several poorly defined swales which have not been maintained for many years. In moderate storm event (3-5 year storms) the swales, which are severely choked by bulrush, back up with storm runoff and flood over Hollister Avenue. The depth of water on Hollister Avenue is as much as 12 inches and the road has to be closed for safety reasons. Hollister Avenue is an important access route to the Airport and needs to remain as safe and dependable route to the Airport in moderate and heavy rains. The project is consistent with Public Works Engineering standards that require roads to be adequately drained during a 10-year storm.

Generating Department/Division: Airport – Operations Division

Mitigation Action # 2016 – 22	**NEW**

Project Description: Sea Level Rise Adaptation Plan**.**
Develop a comprehensive Sea Level Rise Adaptation Plan for the low-lying coastal area from Ledbetter Point to the coastal bluffs at the eastern City limits to identify, manage, and reduce sea level rise effects on coastal resources and critical City facilities.

Applicable Hazards

High	**Medium**	**Low**
☐ Earthquake	☐ Agricultural Pests / Disease	☐ Tsunami
☐ Flooding	☐ Epidemic/Pandemic	☐ Dam Failure
☐ Wildfire	☐ HazMat Release	☐ Commercial Aircraft
☒ Sea Level Rise	☐ Oil Spills	☐ Terrorism
☐ Drought	☒ Landslide/Coastal Erosion	☐ Cyber Threat

Existing and Potential Resources: Currently an unfunded project. Grant sources are being sought.

Responsible Department: Community Development Department

Target Completion Date: Undetermined

Additional Comments / Status Report: Sea level rise modeling has shown that erosion, wave uprush, and coastal flooding threatens City facilities along the shoreline and downtown area in the 2060-2100 timeframe for medium and high sea level rise scenarios. This could worsen if tidal inundation were compounded with high groundwater, local surface runoff, and fluvial flooding. Adaptation planning is needed to reduce risks to critical City facilities. Policy direction for this project is found in the 2013 Safety Element.

Submitted by:
Generating Department/Division: Community Development Department, Long Range Planning Division

Mitigation Action # 2016 – 23		**NEW**
Project Description: Review/Revise the City's Critical Facilities List Develop a more comprehensive list of Critical Facilities that would include hospitals, skilled nursing facilities and private companies; as applicable.		
Applicable Hazards		
High	**Medium**	**Low**
☐ Earthquake ☐ Flooding ☐ Wildfire ☐ Sea Level Rise ☐ Drought	☐ Agricultural Pests / Disease ☐ Epidemic/Pandemic ☐ HazMat Release ☐ Oil Spills ☐ Landslide/Coastal Erosion	☐ Tsunami ☐ Dam Failure ☐ Commercial Aircraft ☐ Terrorism ☐ Cyber Threat
Existing and Potential Resources: Cost of in-kind staff cost.		
Responsible Department: Finance – Risk Management		
Target Completion Date: 2020		
Additional Comments / Status Report: In order to have a comprehensive Hazard Mitigation Plan, the City will need to develop a critical infrastructure list that includes outside agencies and businesses, such; hospitals, skilled nursing facilities, dialysis clinics, etc.		
Submitted by: **Generating Department/Division:** Fire/Office of Emergency Services		

SECTION 8 PLAN MAINTENANCE

This section of the Plan describes the formal process that will ensure that the Plan remains an active and pertinent document. The plan process includes a schedule for monitoring and evaluating the Plan annually, which will produce a plan revision every five (5) years.

This section will describe how the City will integrate public participation throughout the plan maintenance process.

Plan Monitoring

The City of Santa Barbara Office of Emergency Services (OES) will be responsible to ensure that the City's Local Hazard Mitigation Planning Team monitoring the overall Plan for updates on an annual basis.

Plan Evaluation

City OES will call the Local Hazard Mitigation Planning (LHMP) team together on an annual basis to evaluate the Plan and Mitigation Actions set forth in this plan and discuss effectiveness of the Plan. The LHMP team will develop a list of items to be updated, added, or removed in revisions of this Plan.

City OES will report the outcomes of the annual meeting to the County Office of Emergency Management (OEM) and the City's Disaster Council.

The Plan will also be a work item on the City's Emergency Managers Task Team (EMTT) agenda annually. Department heads and other emergency preparedness staff who serve in the City's Emergency Operations Center (EOC) will focus on evaluating the Plan in light of technological, budgetary, political changes, or other significant events that may occur during the year.

Plan Updates

Since the plan's first adoption in 2005, the LHMP Planning Team has participated in an annual review. The Planning Team reviewed all aspects of the plan and mitigation actions that were either deferred, begun, continued or completed during that year.

After FEMA approval and City Council adoption, the 2011 HMP was integrated into the Safety Element of the City of Santa Barbara's Comprehensive Plan by City Council Resolution 12-004. City planning efforts and Capital Projects directed by the City were influenced by the information taken from the 2011 HMP. The 2011 HMP was also utilized and referenced to update the 2013 City Emergency Operations Plan, City's General Plan, Tsunami Response Guidelines, and Watershed Response Guidelines.

The review process has been effective in identifying gaps and shortfalls in funding, support, and other resources. It has also allowed the re-prioritization of specific actions as circumstances change. It allows the City to maintain the plan as a living document.

All Planning Team members will continue to be responsible to provide City OES with updates annually. City OES will be responsible to take all revisions to the County Mitigation Advisory Committee (MAC) annually. However, major disasters affecting the City, legal changes, and/or other events may trigger a meeting of the LHMP team before the annual meeting. The Planning

Team will be responsible for determining the revisions to the plan after any activation due to an emergency or disaster.

Continued Public Involvement

The City and all stakeholders continue to be dedicated to involving the public directly in the review process and updates of the Plan. The Planning Team is responsible for monitoring, evaluating, and updating the Plan as described above. During all phases of plan maintenance the public will have the opportunity to provide feedback.

A copy of the Plan will be available for review on the City's OES website and Facebook page. In addition, hard copies will be available at City Hall, the main library at the reference desk, and the City's Office of Emergency Services (OES). In addition, to facilitate public comments, the OES website will contain an email address for the public's use which is monitored on a daily basis by the City's Emergency Services Manager or designee. Any questions or comments received on this website will be forwarded to the appropriate Planning Team member or Department for review and response.

A press release requesting public comments will also be used for each update and after each evaluation. City OES will also use social media (Facebook, Twitter, etc.) to notify the public of any changes they should be aware of. Coupled with the dedicated email address for comments, this provides the public a simple and easily accessible to allow them to express their concerns, opinions, or ideas about any updates/changes that are proposed to the Plan. The City will continue to be responsible for publicizing any changes to the Plan and maintaining public involvement.

The City will also make reference to the Plan at all community events and training, e.g. Community Emergency Response Team (CERT), Community Disaster Education (CDE), Listos (class for the Hispanic Community), etc.

Point of Contact

Comments or suggestions regarding this plan may be submitted at any time to Yolanda McGlinchey, City Emergency Services Manager using the following information:

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