Part 3 Hazard Identification and Risk Assessment

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Risk Assessment of Hazards in Santa Cruz

Requirement: §201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

It is important for a community's risk assessment, mitigation, and preparedness efforts to be founded on accurate information about the types and scale of damage hazards pose to the community. This section of the Plan contains a description of those hazards identified as potential significant threats to Santa Cruz – earthquakes, wildfires, floods, drought, tsunami, extreme weather, coastal erosion, debris flows and landslides as well as the lesser threats of dam failure and expansive soils – and the exposure and vulnerability of the County to these hazards. These risks have been identified based on current experiences and historical information of hazard events including researching past disaster declarations in the County, region and state, input from geologic, climatic, and wildfire specialists and organizations as well as public comments and newspaper articles. Probable damage and the consequences to the county's quality of life are described.

The County of Santa Cruz has expanded and updated its GIS database, mapping critical facilities and hazard risk areas. Data from this mapping was used to determine hazards that present the greatest risk to the County.

Each hazard type was mapped as a GIS layer. In some cases, the hazard layers were developed and provided by outside agencies. Estimated loss is based on assessed valuation of improvements associated with the 2020 Assessment Roll. Total assessed valuation is the total assessed value of land and improvements. Values at risk are limited to the improvement values and not the land value. Therefore, the assessed value of improvements was joined to the county's parcel layer to estimate potential losses. The unincorporated parcels were queried out (which excluded the city parcels in the analysis). For each hazard type, the unincorporated parcels that fell within the hazard type were selected and the assessed value of improvements were totaled. Valuation of parcels is based on improvement and land values as they appear on the Assessment Roll. They do not reflect potential sale or replacement value. ESRI's ArcGIS software was used to develop the hazard layers and conduct the analysis.

The Assessment Roll normally varies from year to year and over the long term. A review of Assessed valuation and property tax data during this update period indicates there has been an increase in property value, or value at risk, since the original LHMP was adopted (Table 1).

This update focuses on how risk has changed since the previous plan was completed, particularly changes related to land use development and new hazard information. Overall, there has not been significant new development in hazard-prone areas since the previous plan was adopted. However, the winter storms of 2016-2017 caused approximately $120 million in damage to public infrastructure and the CZU Lightning Complex Fire caused approximately $ 340 million in damage to private structures and public infrastructure, and both events led to federal disaster declarations. The County's Climate Action Strategy, adopted in 2013, and containing new hazard information, was incorporated into the LHMP during the 2016 update to address the risk of climate change and sea level rise. In 2020, the General

Plan Public Safety Element was updated to implement a recommendation in the Climate Action Strategy to prepare coastal areas for sea level rise. The Public Safety Element now contains a section incorporating the LHMP by reference. Other sections of the Public Safety Element that were updated include seismic hazards, flood hazards, fire hazards, landslide hazards, and grading and erosion control. Table 8 is a list of all hazards as they relate to Santa Cruz County.

Hazard	Risk	Probability	Consequences	Loss of Life
Avalanche (snow)	None	N/A	N/A	N/A
Climate Change	High	High	High	Low
Coastal Erosion	High	High	High	Low
Coastal Storm	High	High	High	Low
Dam Failure	Low	Low	High	High
Debris Flows	High	High	High	Medium
Drought	High	High	High	Low
Earthquake	High	High	High	Medium
Expansive soils	Low	Medium	Low	N/A
Extreme Heat	Low	Low	Low	Low
Flood	High	High	High	Low
Freezing Events	Medium	Low	Medium	Low
Hailstorm	Low	Low	Low	N/A
Hurricane	None	N/A	N/A	N/A
Land subsidence	Low	Low	Low	low
Landslide	High	High	Medium	Low
Liquefaction	High	High	High	Low
Winter Snowstorm	None	N/A	N/A	N/A
Tornado	None	N/A	N/A	N/A
Tsunami	High	Low	High	High
Volcano	None	N/A	N/A	N/A
Wildfire	High	High	High	Low

Table 7 Review of all hazards relative to County of Santa Cruz

Santa Cruz County is exposed to a number of natural hazards that vary in their potential intensity and impact. This mitigation plan addresses eight high-risk natural hazards, selected because of the

likelihood of occurrence or the potential consequences, as well as two additional hazards that present either less risk of occurrence or extent of damage (Table 8). The natural hazards of floods, earthquake, and tsunami are of great concern because they can occur independently, or in combinations that can trigger secondary hazards such as dam failure. Another high-risk hazard, drought, can exacerbate the potential for wildfires. Climate change had been considered a lesser risk in the last update but is now considered a higher risk due to increasing scientific concern regarding magnitude and certainty of potential affects.

Risk	**Affected Areas**
Very Significant Risk	
Earthquake (including liquefaction)	Entire County
Wildfire	Mapped fire hazard areas (State and local)
Flood (including coastal storms)	Mapped flood hazards areas (FEMA)
Drought	Entire County
Tsunami	Mapped Coastal Areas
Coastal Erosion	Coastal Areas
Landslide (including Debris Flows)	Mapped landslide hazard areas
Climate Change	Entire County
Lesser risk	
Dam Failure	Mapped inundation area
Expansive Soils	Mapped areas

Table 8 Hazard screening for Santa Cruz County

The natural hazards included in this plan were identified through a community-based process including input from scientific experts in various fields and in conjunction with the update of the General Plan including the Public Safety Element and the preparation of the Climate Action Strategy. The original LHMP was the result of a number of public meetings, project team meetings, scientific expert, and community input as well as suggestions submitted by community members of the county. Key contributors included members of the Project Team, the Emergency Management Council, County staff, and local academic and professional experts who worked on programs and research that were incorporated in the General Plan and Public Safety Element. The preparation of the Climate Action Strategy was the result of a similar public process. Other natural hazards that are extremely rare or non-existent in the county are not included in this plan but are listed in Appendix A.

The worst potential disaster that Santa Cruz County might face involves multiple hazards occurring at the same time. A major earthquake could trigger tsunamis, wildfires, or floods, which would be exacerbated by damage to dams, stream culverts and storm drains. The County of Santa Cruz plans for and responds to emergency events in accordance with the Santa Cruz County Operation Area Memorandum of Understanding (MOU). The Emergency Management Plan describes the role and

operation of the County departments and personnel during a major emergency. In addition to researching each hazard individually, this Plan explores how the hazards interact, and how mitigation activities for each hazard impact the overall disaster risk in Santa Cruz.