
Hazus: Earthquake Global Risk Report

Region Name: SurpriseValley

Earthquake Scenario: surprisevalley2011cf_m7p2_se

Print Date: May 03, 2024

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 7 county(ies) from the following state(s):

California

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 25,724.98 square miles and contains 101 census tracts. There are over 141 thousand households in the region which has a total population of 356,516 people. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 170 thousand buildings in the region with a total building replacement value (excluding contents) of 80,091 (millions of dollars). Approximately 89.00 % of the buildings (and 60.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 23,074 and 34,435 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 170 thousand buildings in the region which have an aggregate total replacement value of 80,091 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 80% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 18 hospitals in the region with a total bed capacity of 1,178 beds. There are 273 schools, 201 fire stations, 39 police stations and 7 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 57,509.00 (millions of dollars). This inventory includes over 2,103.96 miles of highways, 1,789 bridges, 72,591.05 miles of pipes.

Table 1: Transportation System Lifeline Inventory

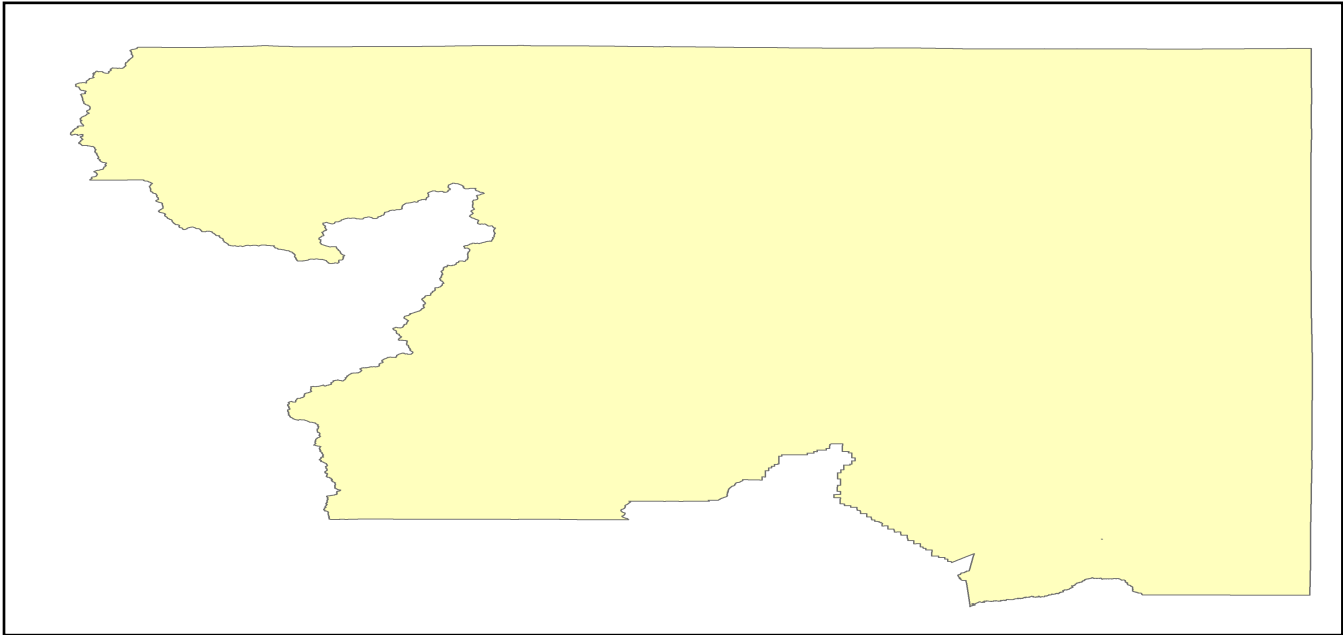
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	1,789	3516.3863
	Segments	434	13474.7058
	Tunnels	2	16.2598
	Subtotal		17007.3519
Railways	Bridges	409	2327.2100
	Facilities	2	5.3260
	Segments	511	3385.7126
	Tunnels	0	0.0000
	Subtotal		5718.2486
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	2	4.5679
	Subtotal		4.5679
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	0	0.0000
	Subtotal		0.0000
Airport	Facilities	32	177.4920
	Runways	31	166.7338
	Subtotal		344.2258
		Total	23,074.40

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	1449.3511
	Facilities	3	117.8820
	Pipelines	0	0.0000
		Subtotal	1567.2331
Waste Water	Distribution Lines	NA	869.6106
	Facilities	19	3267.0842
	Pipelines	0	0.0000
		Subtotal	4136.6948
Natural Gas	Distribution Lines	NA	579.7404
	Facilities	3	123.7305
	Pipelines	93	3087.6475
		Subtotal	3791.1184
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	60	24935.4963
		Subtotal	24935.4963
Communication	Facilities	45	5.3100
		Subtotal	5.3100
	Total		34,435.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	surprisevalley2011cf_m7p2_se
Type of Earthquake	User-defined
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	7.20
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 392 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 13 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

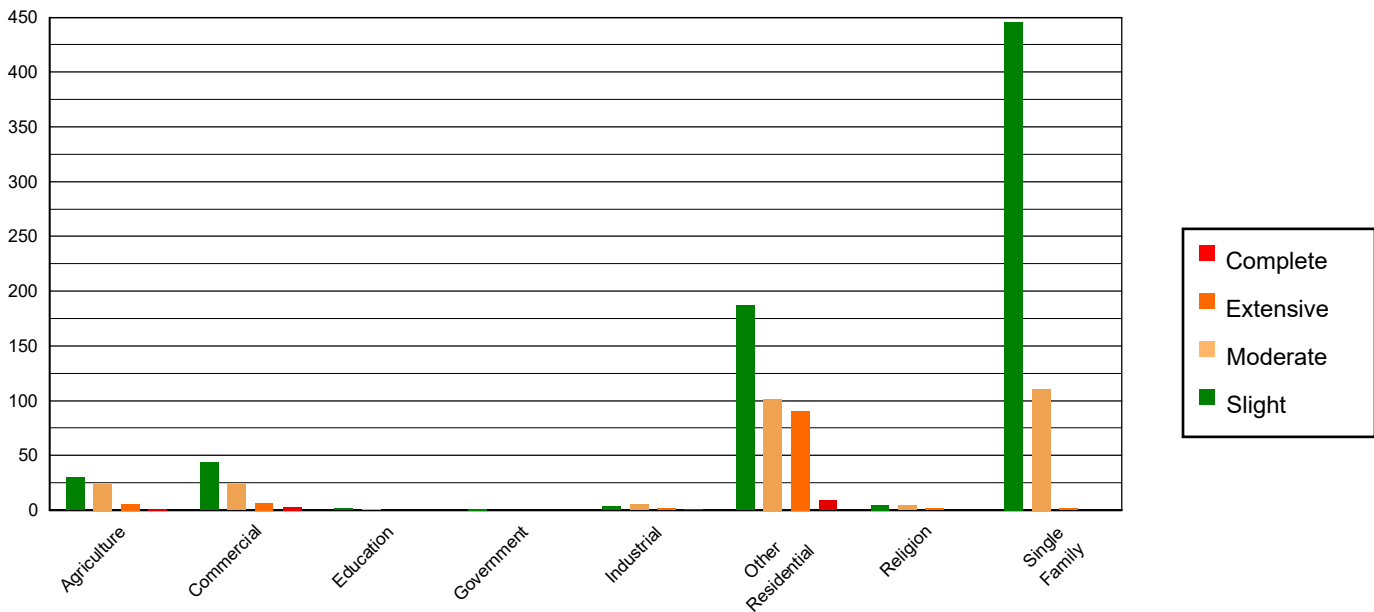


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4250.95	2.51	29.70	4.14	24.22	8.99	6.15	5.64	0.98	7.16
Commercial	10839.35	6.39	43.92	6.12	23.15	8.60	6.65	6.10	2.94	21.38
Education	366.94	0.22	1.65	0.23	0.41	0.15	0.01	0.01	0.00	0.00
Government	478.30	0.28	1.41	0.20	0.28	0.10	0.01	0.01	0.00	0.00
Industrial	2524.97	1.49	3.60	0.50	5.09	1.89	1.91	1.75	0.43	3.13
Other Residential	35453.16	20.90	186.80	26.04	101.29	37.60	90.67	83.10	9.09	66.15
Religion	441.56	0.26	4.52	0.63	3.95	1.47	1.67	1.53	0.30	2.18
Single Family	115309.15	67.96	445.85	62.14	110.96	41.20	2.05	1.88	0.00	0.00
Total	169,664		717		269		109		14	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	135439.57	79.83	495.25	69.03	124.82	46.34	2.32	2.12	0.00	0.00
Steel	4364.02	2.57	11.13	1.55	16.13	5.99	9.61	8.81	3.00	21.82
Concrete	3799.39	2.24	12.56	1.75	7.20	2.67	1.82	1.67	0.51	3.68
Precast	2790.19	1.64	9.93	1.38	11.11	4.13	2.49	2.28	0.46	3.32
RM	5639.01	3.32	13.36	1.86	12.91	4.79	1.54	1.41	0.01	0.05
URM	471.98	0.28	6.84	0.95	1.77	0.66	0.93	0.85	0.68	4.98
MH	17160.23	10.11	168.37	23.47	95.40	35.42	90.40	82.86	9.09	66.15
Total	169,664		717		269		109		14	

*Note:

RM Reinforced Masonry
 URM Unreinforced Masonry
 MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 1,178 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,095 hospital beds (93.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 94.00% of the beds will be back in service. By 30 days, 95.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	18	1	0	17
Schools	273	2	0	271
EOCs	7	0	0	7
PoliceStations	39	0	0	39
FireStations	201	5	0	196

Transportation Lifeline Damage

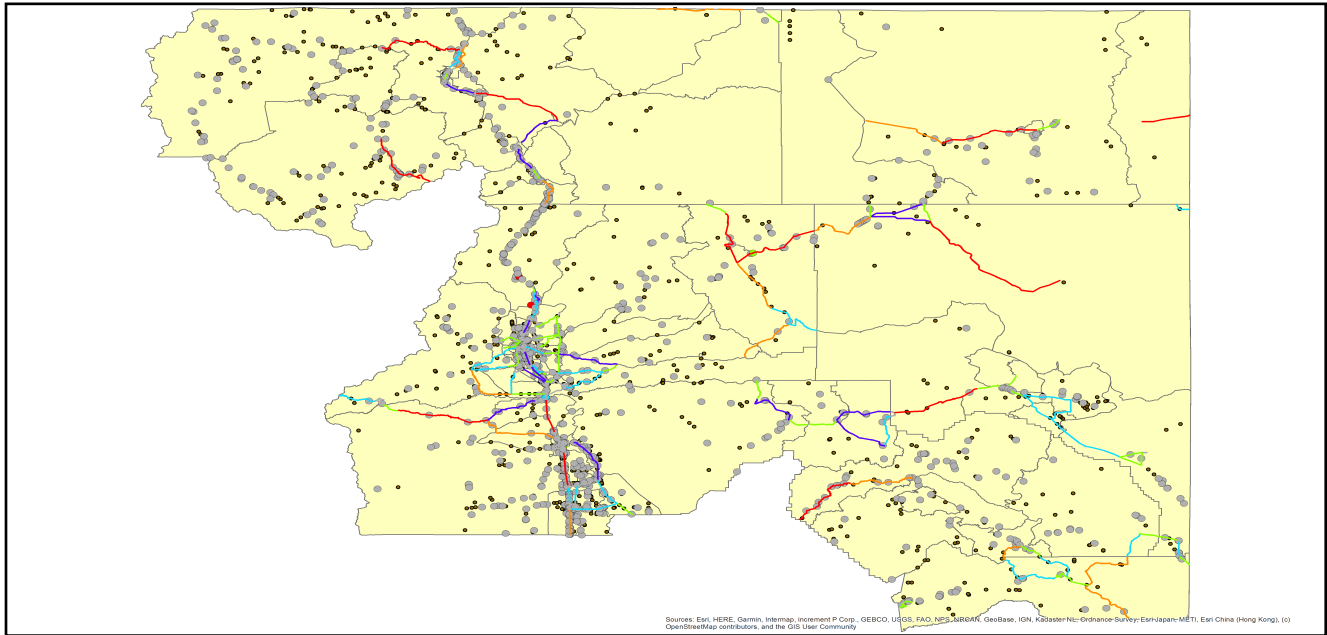


Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations_				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	434	0	0	434	434
	Bridges	1,789	0	0	1,789	1,789
	Tunnels	2	0	0	2	2
Railways	Segments	511	0	0	511	511
	Bridges	409	0	0	409	409
	Tunnels	0	0	0	0	0
	Facilities	2	0	0	2	2
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	2	0	0	2	2
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	32	2	0	32	32
	Runways	31	0	0	31	31

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	3	0	0	3	3
Waste Water	19	0	0	19	19
Natural Gas	3	0	0	3	3
Oil Systems	0	0	0	0	0
Electrical Power	60	0	0	60	60
Communication	45	0	0	45	45

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	45,029	549	137
Waste Water	27,018	276	69
Natural Gas	545	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	141,257	14	1	0	0	0
Electric Power		362	235	96	8	0

Induced Earthquake Damage

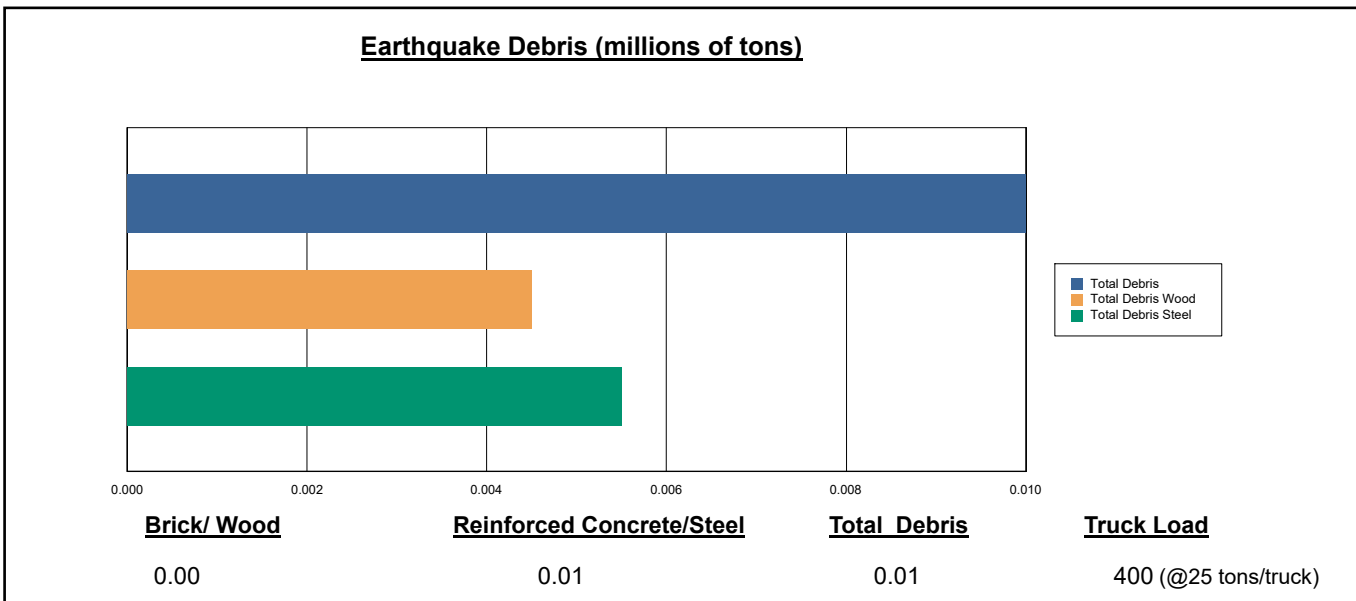
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi (0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

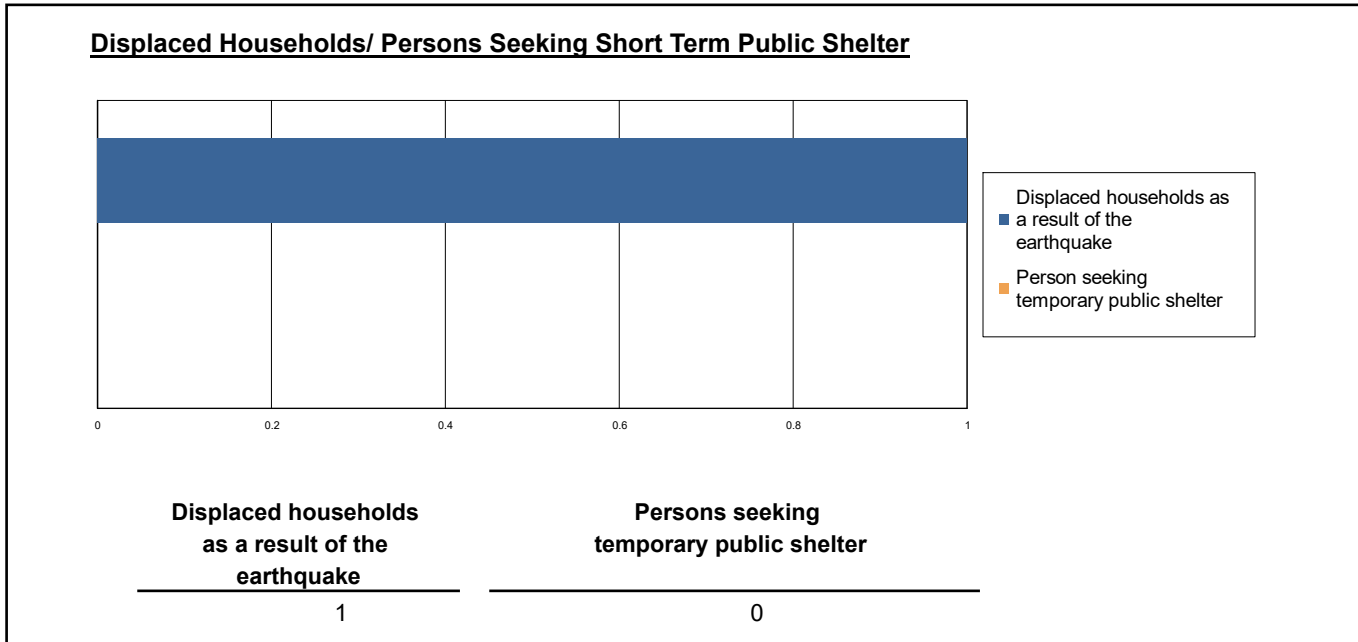
The model estimates that a total of 10,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 45.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 400 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 356,516) will seek temporary shelter in public shelters.



Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.05	0.01	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.02	0.01	0.00	0.00
	Other-Residential	2.96	0.43	0.02	0.03
	Single Family	0.78	0.05	0.00	0.00
	Total	4	1	0	0
2 PM	Commercial	4.30	0.91	0.11	0.21
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.16	0.02	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.16	0.04	0.01	0.01
	Other-Residential	1.25	0.18	0.01	0.01
	Single Family	0.34	0.02	0.00	0.00
	Total	6	1	0	0
5 PM	Commercial	2.64	0.56	0.07	0.13
	Commuting	0.05	0.12	0.14	0.03
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.10	0.02	0.00	0.01
	Other-Residential	1.05	0.15	0.01	0.01
	Single Family	0.29	0.02	0.00	0.00
	Total	4	1	0	0

Economic Loss

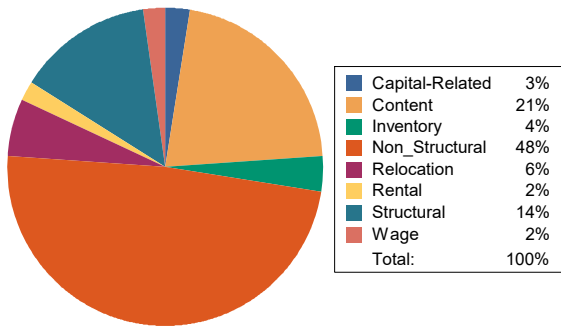
The total economic loss estimated for the earthquake is 80.41 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 57.96 (millions of dollars); 13 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 42 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type (\$ millions)



Earthquake Losses by Occupancy Type (\$ millions)

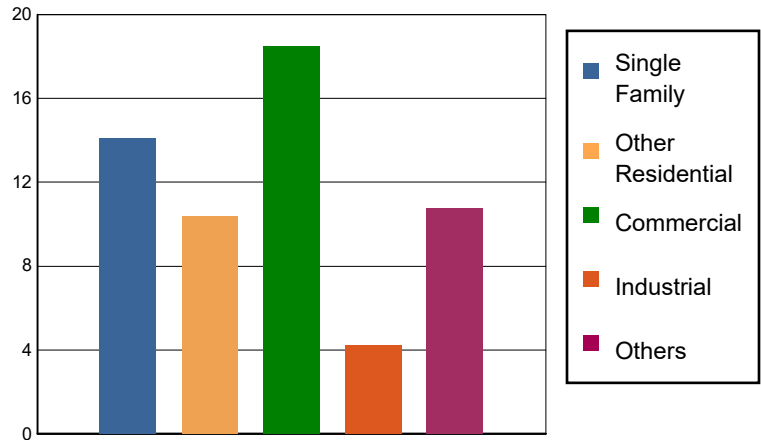


Table 11: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.1068	1.0576	0.0375	0.0739	1.2758
	Capital-Related	0.0000	0.0454	1.3925	0.0227	0.0489	1.5095
	Rental	0.2113	0.2332	0.7250	0.0381	0.0445	1.2521
	Relocation	0.7635	0.8719	0.9503	0.2203	0.5774	3.3834
	Subtotal	0.9748	1.2573	4.1254	0.3186	0.7447	7.4208
Capital Stock Losses							
	Structural	1.3466	1.6333	1.8726	0.5641	2.5800	7.9966
	Non_Structural	8.3501	6.3860	7.8511	1.8795	3.6303	28.0970
	Content	3.4289	1.0842	4.1867	1.3184	2.3812	12.3994
	Inventory	0.0000	0.0000	0.4670	0.1453	1.4333	2.0456
	Subtotal	13.1256	9.1035	14.3774	3.9073	10.0248	50.5386
	Total	14.10	10.36	18.50	4.23	10.77	57.96

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	13474.7058	0.0000	0.00
	Bridges	3516.3863	0.1335	0.00
	Tunnels	16.2598	0.0000	0.00
	Subtotal	17007.3519	0.1335	
Railways	Segments	3385.7126	0.0000	0.00
	Bridges	2327.2100	0.1739	0.01
	Tunnels	0.0000	0.0000	0.00
	Facilities	5.3260	0.0057	0.11
	Subtotal	5718.2486	0.1796	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	4.5679	0.0049	0.11
	Subtotal	4.5679	0.0049	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Airport	Facilities	177.4920	6.3164	3.56
	Runways	166.7338	0.0000	0.00
	Subtotal	344.2258	6.3164	
Total		23,074.39	6.63	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	117.8820	0.0012	0.00
	Distribution Lines	1449.3511	2.4723	0.17
	Subtotal	1567.2331	2.4735	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	3267.0842	4.9428	0.15
	Distribution Lines	869.6106	1.2419	0.14
	Subtotal	4136.6948	6.1847	
Natural Gas	Pipelines	3087.6475	0.0000	0.00
	Facilities	123.7305	0.0802	0.06
	Distribution Lines	579.7404	0.4255	0.07
	Subtotal	3791.1184	0.5057	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	24935.4963	6.6264	0.03
	Subtotal	24935.4963	6.6264	
Communication	Facilities	5.3100	0.0218	0.41
	Subtotal	5.3100	0.0218	
	Total	34,435.85	15.81	

Appendix A: County Listing for the Region

Lassen,CA

Modoc,CA

Plumas,CA

Shasta,CA

Sierra,CA

Siskiyou,CA

Tehama,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California	Lassen	32,730	4,033	2,008	6,042
	Modoc	8,700	1,435	1,468	2,904
	Plumas	19,790	6,128	2,276	8,405
	Shasta	182,155	21,572	15,715	37,288
	Sierra	3,236	596	419	1,015
	Siskiyou	44,076	6,856	4,758	11,615
	Tehama	65,829	7,705	5,113	12,818
Total Region		356,516	48,325	31,757	80,087

Building Inspection Tagging (Counts)

Total Economic Loss
Total:

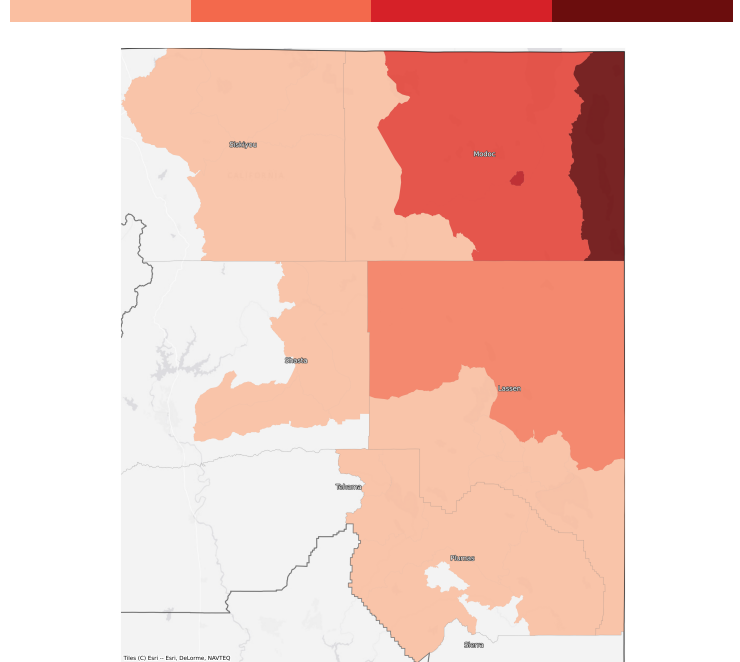
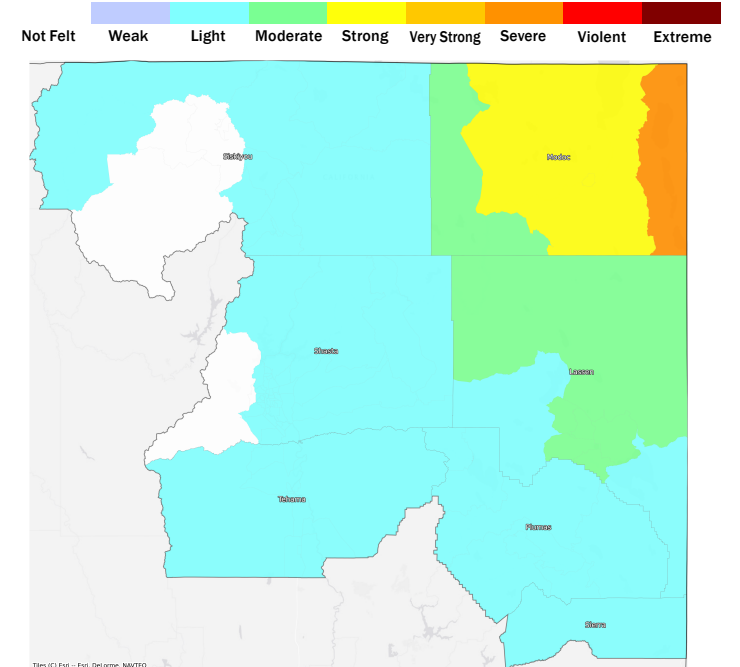
Top Counties	State	Total

Injuries & Fatalities
**Total Day:
Total Night:**

Top Counties	State	Injuries (day/night)	Fatalities (day/night)

Displaced Households & Short-Term Shelter Needs
**Total Displaced:
Total Needing Shelter:**

Top Counties	State	Displaced	Needing Shelter

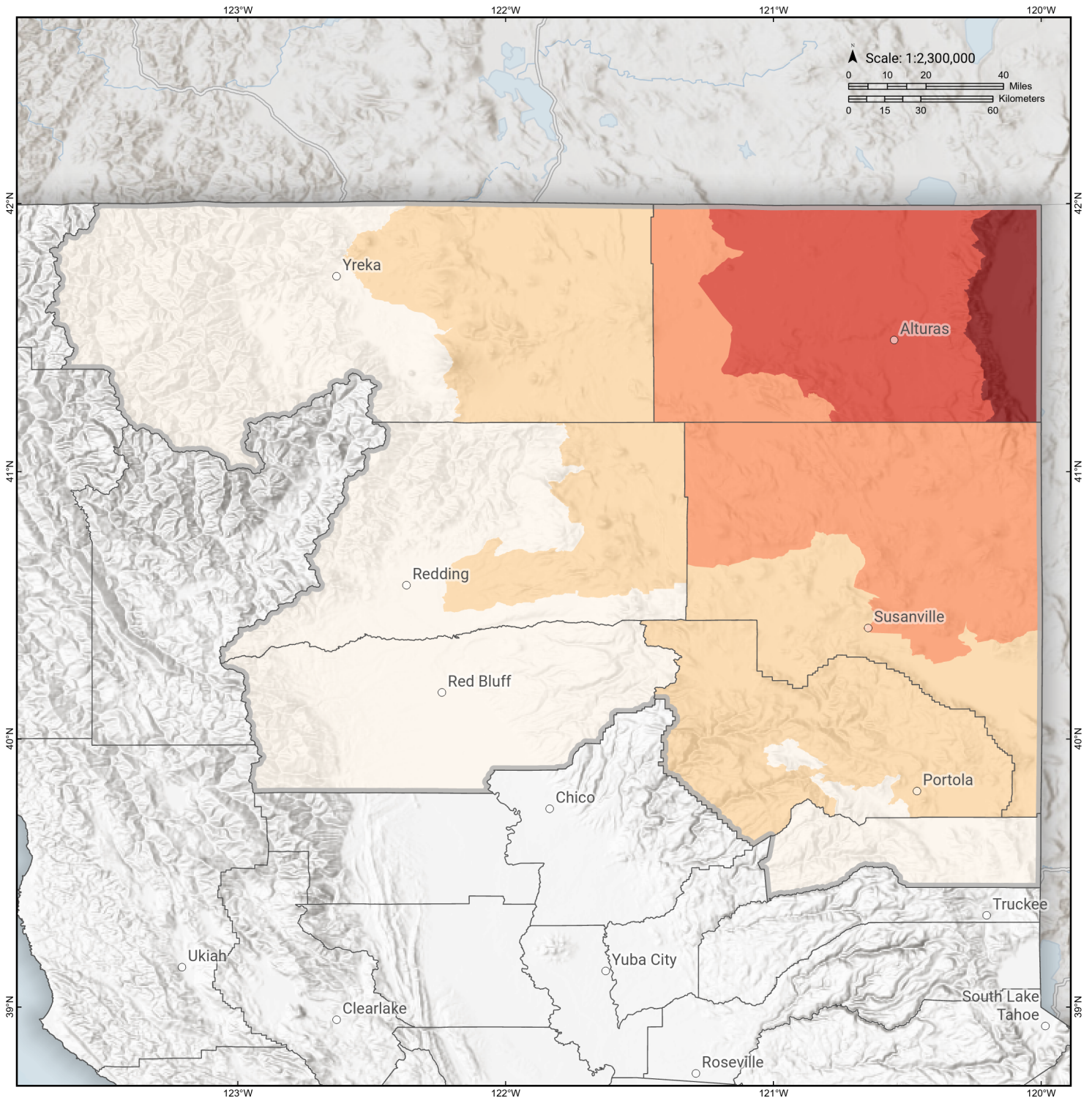
Economic Impacts by Census Tract

Ground Shaking

Debris
**Total Tons:
Total Truckloads:**

Type	Tons

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Surprise Valley

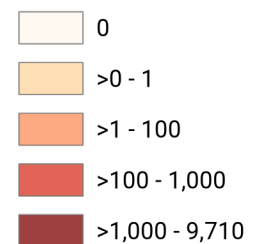
Debris Generated by Census Tract



Study Region: Surprise Valley
Scenario: surprisevalley2011cf_m7p2_se



Debris Generated (*in tons*)



Surprise Valley

Displaced Households by Census Tract



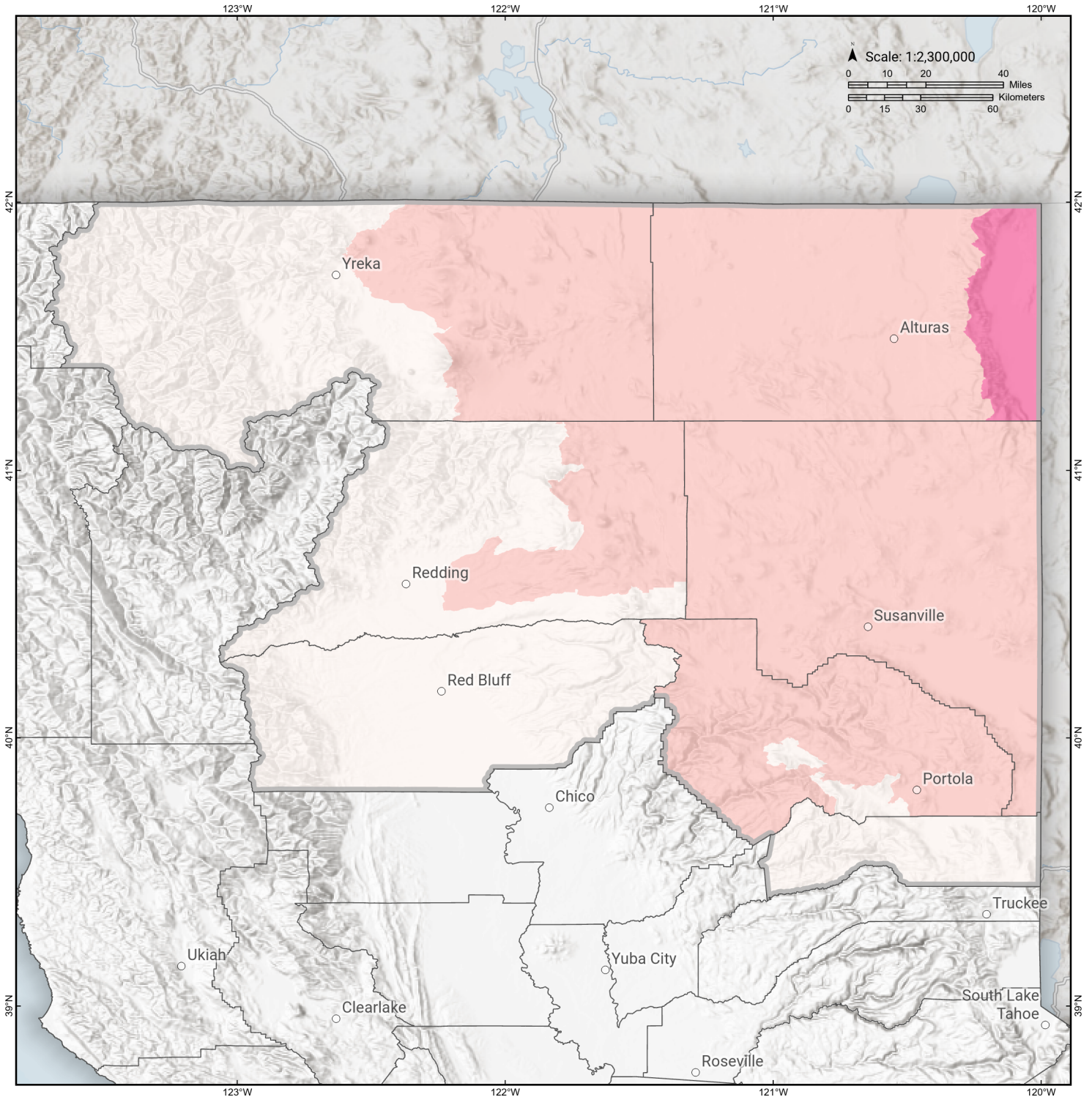
Study Region: Surprise Valley
Scenario: surprisevalley2011cf_m7p2_se

Displaced Households



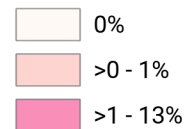
Surprise Valley

Loss Ratio by Census Tract



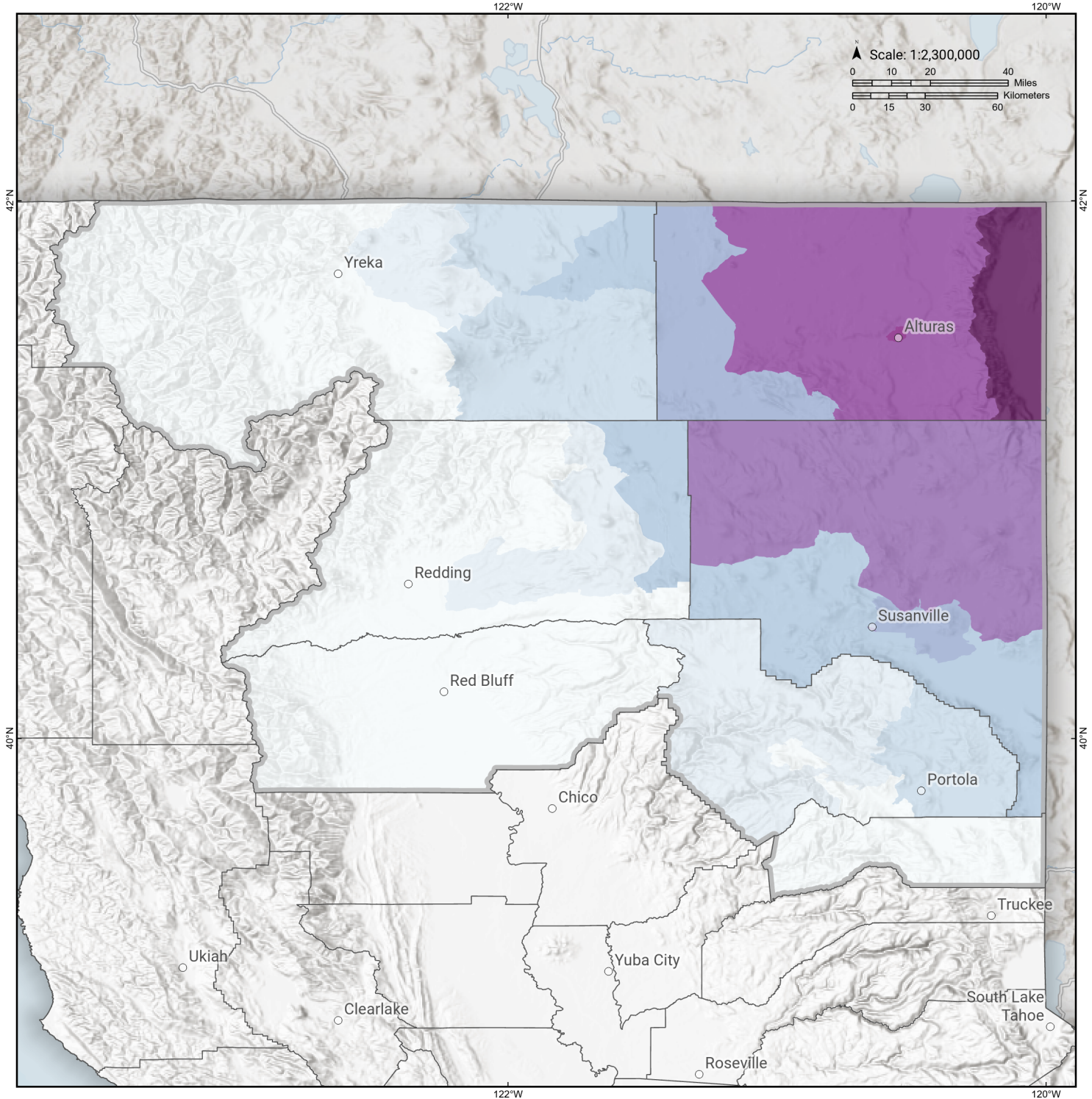
Study Region: Surprise Valley
Scenario: surprisevalley2011cf_m7p2_se

Loss Ratio (ratio of building related economic loss to exposed value of buildings)



Surprise Valley

Total Building Related Economic Loss by Census Tract



Study Region: Surprise Valley
Scenario: surprisevalley2011cf_m7p2_se



Economic Loss (in thousands of USD \$)



Building Damage by Count by General Occupancy

May 03, 2024

	# of Buildings					Total
	None	Slight	Moderate	Extensive	Complete	
California						
Lassen						
<i>Education</i>	40	0	0	0	0	40
<i>Commercial</i>	911	1	0	0	0	913
<i>Industrial</i>	140	0	0	0	0	140
<i>Religion</i>	71	0	0	0	0	71
<i>Other Residential</i>	2,621	6	0	0	0	2,627
<i>Government</i>	22	0	0	0	0	22
<i>Agriculture</i>	37	0	0	0	0	37
<i>Single Family</i>	9,561	1	0	0	0	9,562
Modoc						
<i>Government</i>	14	1	0	0	0	16
<i>Agriculture</i>	388	30	24	6	1	449
<i>Education</i>	18	2	0	0	0	20
<i>Industrial</i>	65	3	5	2	0	76
<i>Religion</i>	26	4	4	2	0	36
<i>Commercial</i>	457	42	23	7	3	532
<i>Other Residential</i>	1,612	181	101	91	9	1,994
<i>Single Family</i>	3,183	444	111	2	0	3,740
Plumas						

	# of Buildings					Total
	None	Slight	Moderate	Extensive	Complete	
<i>Other Residential</i>	5,032	0	0	0	0	5,032
<i>Commercial</i>	1,215	0	0	0	0	1,215
<i>Industrial</i>	184	0	0	0	0	184
<i>Religion</i>	30	0	0	0	0	30
<i>Agriculture</i>	84	0	0	0	0	84
<i>Government</i>	45	0	0	0	0	45
<i>Single Family</i>	9,877	0	0	0	0	9,877
<i>Education</i>	26	0	0	0	0	26
Shasta						
<i>Commercial</i>	5,254	0	0	0	0	5,254
<i>Other Residential</i>	16,949	0	0	0	0	16,949
<i>Government</i>	87	0	0	0	0	87
<i>Agriculture</i>	3,235	0	0	0	0	3,235
<i>Education</i>	136	0	0	0	0	136
<i>Single Family</i>	51,815	0	0	0	0	51,815
<i>Religion</i>	66	0	0	0	0	66
<i>Industrial</i>	1,038	0	0	0	0	1,038
Sierra						
<i>Agriculture</i>	7	0	0	0	0	7
<i>Government</i>	16	0	0	0	0	16
<i>Education</i>	14	0	0	0	0	14
<i>Single Family</i>	1,858	0	0	0	0	1,858
<i>Commercial</i>	141	0	0	0	0	141
<i>Other Residential</i>	153	0	0	0	0	153
<i>Religion</i>	12	0	0	0	0	12

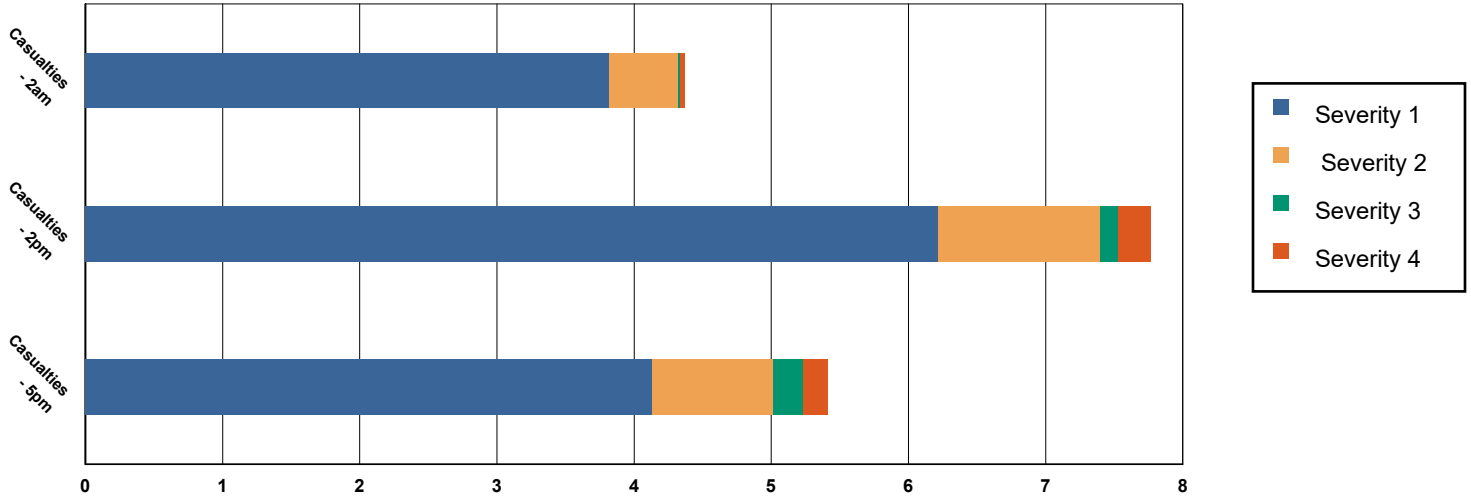
	# of Buildings					Total
	None	Slight	Moderate	Extensive	Complete	
<i>Industrial</i>	66	0	0	0	0	66
Siskiyou						
<i>Industrial</i>	480	0	0	0	0	480
<i>Religion</i>	127	0	0	0	0	127
<i>Commercial</i>	1,591	0	0	0	0	1,591
<i>Other Residential</i>	5,095	0	0	0	0	5,095
<i>Agriculture</i>	201	0	0	0	0	201
<i>Single Family</i>	17,794	0	0	0	0	17,794
<i>Government</i>	244	0	0	0	0	244
<i>Education</i>	76	0	0	0	0	76
Tehama						
<i>Agriculture</i>	299	0	0	0	0	299
<i>Education</i>	57	0	0	0	0	57
<i>Government</i>	50	0	0	0	0	50
<i>Single Family</i>	21,222	0	0	0	0	21,222
<i>Religion</i>	110	0	0	0	0	110
<i>Industrial</i>	552	0	0	0	0	552
<i>Commercial</i>	1,270	0	0	0	0	1,270
<i>Other Residential</i>	3,991	0	0	0	0	3,991
Total	169,664	717	269	109	14	170,774
Region Total	169,664	717	269	109	14	170,774

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Casualties Summary Report

May 03, 2024

Region Total Casualties



Injury Severity Level

Severity 1	Severity 2	Severity 3	Severity 4	Total
------------	------------	------------	------------	-------

California

Lassen

Casualties - 2am

	Severity 1	Severity 2	Severity 3	Severity 4	Total
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0

Total Casualties - 2am

0	0	0	0	0
---	---	---	---	---

Casualties - 2pm

	Severity 1	Severity 2	Severity 3	Severity 4	Total
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Lassen					
Total Casualties - 2pm	0	0	0	0	0
Casualties - 5pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 5pm	0	0	0	0	0
Modoc					
Casualties - 2am					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	3	0	0	0	3
<i>Single Family</i>	1	0	0	0	1
Total Casualties - 2am	4	1	0	0	4
Casualties - 2pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	4	1	0	0	6
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	1	0	0	0	1
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 2pm	6	1	0	0	8
Casualties - 5pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	3	1	0	0	3
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	1	0	0	0	1
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 5pm	4	1	0	0	5
Plumas					
Casualties - 2am					
<i>Commuting</i>	0	0	0	0	0

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Plumas					
Casualties - 2am					
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2am	0	0	0	0	0
Casualties - 2pm					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2pm	0	0	0	0	0
Casualties - 5pm					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 5pm	0	0	0	0	0
Shasta					
Casualties - 2am					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2am	0	0	0	0	0
Casualties - 2pm					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Shasta					
Casualties - 2pm					
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2pm	0	0	0	0	0
Casualties - 5pm					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 5pm	0	0	0	0	0
Sierra					
Casualties - 2am					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2am	0	0	0	0	0
Casualties - 2pm					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2pm	0	0	0	0	0
Casualties - 5pm					
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 5pm	0	0	0	0	0

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Siskiyou					
Casualties - 2am					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 2am	0	0	0	0	0
Casualties - 2pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 2pm	0	0	0	0	0
Casualties - 5pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 5pm	0	0	0	0	0
Tehama					
Casualties - 2am					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 2am	0	0	0	0	0
Casualties - 2pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Tehama					
Casualties - 2pm					
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 2pm	0	0	0	0	0
Casualties - 5pm					
<i>Commuting</i>	0	0	0	0	0
<i>Commercial</i>	0	0	0	0	0
<i>Educational</i>	0	0	0	0	0
<i>Hotels</i>	0	0	0	0	0
<i>Industrial</i>	0	0	0	0	0
<i>Other-Residential</i>	0	0	0	0	0
<i>Single Family</i>	0	0	0	0	0
Total Casualties - 5pm	0	0	0	0	0
Region Total	NA	NA	NA	NA	NA

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Debris Summary Report

May 03, 2024

All values are in thousands of tons.

	Brick, Wood & Others	Concrete & Steel	Total
California			
Lassen	0	0	0
Modoc	5	6	10
Plumas	0	0	0
Shasta	0	0	0
Sierra	0	0	0
Siskiyou	0	0	0
Tehama	0	0	0
Total	5	6	10
Region Total	5	6	10

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Direct Economic Losses For Buildings

May 3, 2024

All values are in thousands of dollars

	Capital Stock Losses				Loss Ratio %	Income Losses				Total Loss
	Cost Structural Damage	Cost Non-struct. Damage	Cost Contents Damage	Inventory Loss		Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	
California										
Plumas	0	3	2	0	0.00	0	0	0	0	5
Shasta	0	6	4	1	0.00	0	0	0	0	10
Siskiyou	0	9	6	1	0.00	0	0	0	0	15
Tehama	0	0	0	0	0.00	0	0	0	0	0
Sierra	0	0	0	0	0.00	0	0	0	0	0
Modoc	7,977	27,649	12,136	2,028	1.23	3,380	1,503	1,271	1,246	57,189
Lassen	19	432	252	16	0.01	3	7	5	7	741
Total	7,997	28,097	12,400	2,046	0.18	3,384	1,510	1,276	1,252	57,961

	Capital Stock Losses				Loss Ratio %	Income Losses				Total Loss
	Cost Structural Damage	Cost Non-struct. Damage	Cost Contents Damage	Inventory Loss		Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	
Region Total	7,997	28,097	12,400	2,046	0.18	3,384	1,510	1,276	1,252	57,961

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Direct Economic Loss For Transportation

May 03, 2024

All values are in thousands of dollars

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
California								
Lassen								
Segments	0	0	0					0
Bridges	25	0	0					25
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	473	473
Total	25	0	0	0	0	0	473	497
Modoc								
Segments	0	0	0					0
Bridges	108	174	0					282
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	5,492	5,492
Total	108	174	0	0	0	0	5,492	5,774
Plumas								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	221	221

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	0	0	0	0	0	0	221	221
Shasta								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		3	0	2	0	0	57	62
Total	0	3	0	2	0	0	57	62
Sierra								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	6	6
Total	0	0	0	0	0	0	6	6
Siskiyou								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		3	0	2	0	0	57	62
Total	0	3	0	2	0	0	57	62
Tehama								
Segments	0	0	0					0
Bridges	1	0	0					1
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	11	11

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	1	0	0	0	0	0	11	12
Total	134	180	0	5	0	0	6,316	6,634
Region Total	134	180	0	5	0	0	6,316	6,634

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Direct Economic Loss For Utilities

May 03, 2024

All values are in thousands of dollars

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
California							
Lassen							
Facilities	0	123	0	0	1,523	1	1,646
Pipelines	192	96	0	0			288
Total	192	219	0	0	1,523	1	1,934
Modoc							
Facilities	0	4,415	0	75	0	21	4,511
Pipelines	2,122	1,066	0	0			3,188
Total	2,122	5,481	0	75	0	21	7,699
Plumas							
Facilities	1	251	0	0	1,145	0	1,397
Pipelines	36	18	0	0			53
Total	36	269	0	0	1,145	0	1,450
Shasta							
Facilities	1	21	0	3	3,907	0	3,931

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
<i>Pipelines</i>	30	15	0	0			46
Total	31	36	0	3	3,907	0	3,976
Sierra							
<i>Facilities</i>	0	0	0	0	10	0	10
<i>Pipelines</i>	10	5	0	0			15
Total	10	5	0	0	10	0	24
Siskiyou							
<i>Facilities</i>	0	126	0	0	30	0	156
<i>Pipelines</i>	59	30	0	0			88
Total	59	155	0	0	30	0	244
Tehama							
<i>Facilities</i>	0	8	0	3	12	0	22
<i>Pipelines</i>	24	12	0	0			36
Total	24	20	0	3	12	0	58
Total	2,474	6,185	0	80	6,626	22	15,387
Region Total	2,474	6,185	0	80	6,626	22	15,387

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

Hazus Quick Assessment Report

Estimated Economic Loss (\$ Billions)

Category	Description	Range
General Building Stock	Building Damage	0.00 - 0.10
	Building Contents	< 0.1
	Business Interruption	< 0.1
Infrastructure	Lifelines Damage	
Total		0.00 - 0.10

Preliminary Damage Assessment (PDA) Estimates

Description	Residential	Commercial	Other	Total
Affected	630	40	40	710
Minor	210	20	30	260
Major	90	< 10	10	100
Destroyed	< 10	< 10	< 10	< 10
Total	930	60	80	1,070

Estimated Casualties : Night Time

Severity Level	Description	# Persons
Level 1	Medical Aid	< 10
Level 2	Hospital Care	< 10
Level 3	Life-threatening	< 10
Level 4	Fatalities	< 10

Estimated Shelter Needs

Type	Households	People
Displaced Households	0 - 2	0 - 5
Public Shelter	0	0

Comments :

*Hazus damage estimates are presented using FEMA Preliminary Damage Assessment (PDA) categories. These estimates should be used for planning purposes and may not reflect actual observed damages from the PDA process.

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Earthquake Information

Location :

Origin Time:

Magnitude : 7.20

Epicenter Latitude/Longitude :
/

Depth & Type : /U

Name :
NA

Ground Motion /Attenuation :

Maximum PGA: 0.00

Information Sources:

Comments :

Population and Building Exposure

Population: 356,516

Building Exposure : (\$ Millions)

Residential	48,330
Commercial	15,954
Other	15,806
Total	80,090

Counties :

Major Metro Area :

Hazus Quick Assessment Report

Estimated Economic Loss (\$ Billions)

Category	Description	Range
General Building Stock	Building Damage	0.00 - 0.10
	Building Contents	< 0.1
	Business Interruption	< 0.1
Infrastructure	Lifelines Damage	
Total		0.00 - 0.10

Preliminary Damage Assessment (PDA) Estimates

Description	Residential	Commercial	Other	Total
Affected	630	40	40	710
Minor	210	20	30	260
Major	90	< 10	10	100
Destroyed	< 10	< 10	< 10	< 10
Total	930	60	80	1,070

Estimated Casualties : Day Time

Severity Level	Description	# Persons
Level 1	Medical Aid	< 10
Level 2	Hospital Care	< 10
Level 3	Life-threatening	< 10
Level 4	Fatalities	< 10

Estimated Shelter Needs

Type	Households	People
Displaced Households	0 - 2	0 - 5
Public Shelter	0	0

Comments :

**Hazus damage estimates are presented using FEMA Preliminary Damage Assessment (PDA) categories. These estimates should be used for planning purposes and may not reflect actual observed damages from the PDA process.*

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Earthquake Information

Location :

Origin Time:

Magnitude : 7.20

Epicenter Latitude/Longitude :
/

Depth & Type : /U

Name :
NA

Ground Motion /Attenuation :

Maximum PGA: 0.00

Information Sources:

Comments :

Population and Building Exposure

Population: 356,516

Building Exposure : (\$ Millions)

Residential	48,330
Commercial	15,954
Other	15,806
Total	80,090

Counties :

Major Metro Area :

Hazus Quick Assessment Report

Estimated Economic Loss (\$ Billions)

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Major	90	< 10	10	100
Destroyed	< 10	< 10	< 10	< 10
Total	930	60	80	1,070

Estimated Casualties : Commute Time

Severity Level	Description	# Persons
Level 1	Medical Aid	< 10
Level 2	Hospital Care	< 10
Level 3	Life-threatening	< 10
Level 4	Fatalities	< 10

Estimated Shelter Needs

Type	Households	People
Displaced Households	0 - 2	0 - 5
Public Shelter	0	0

Comments :

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Counties :

Major Metro Area :

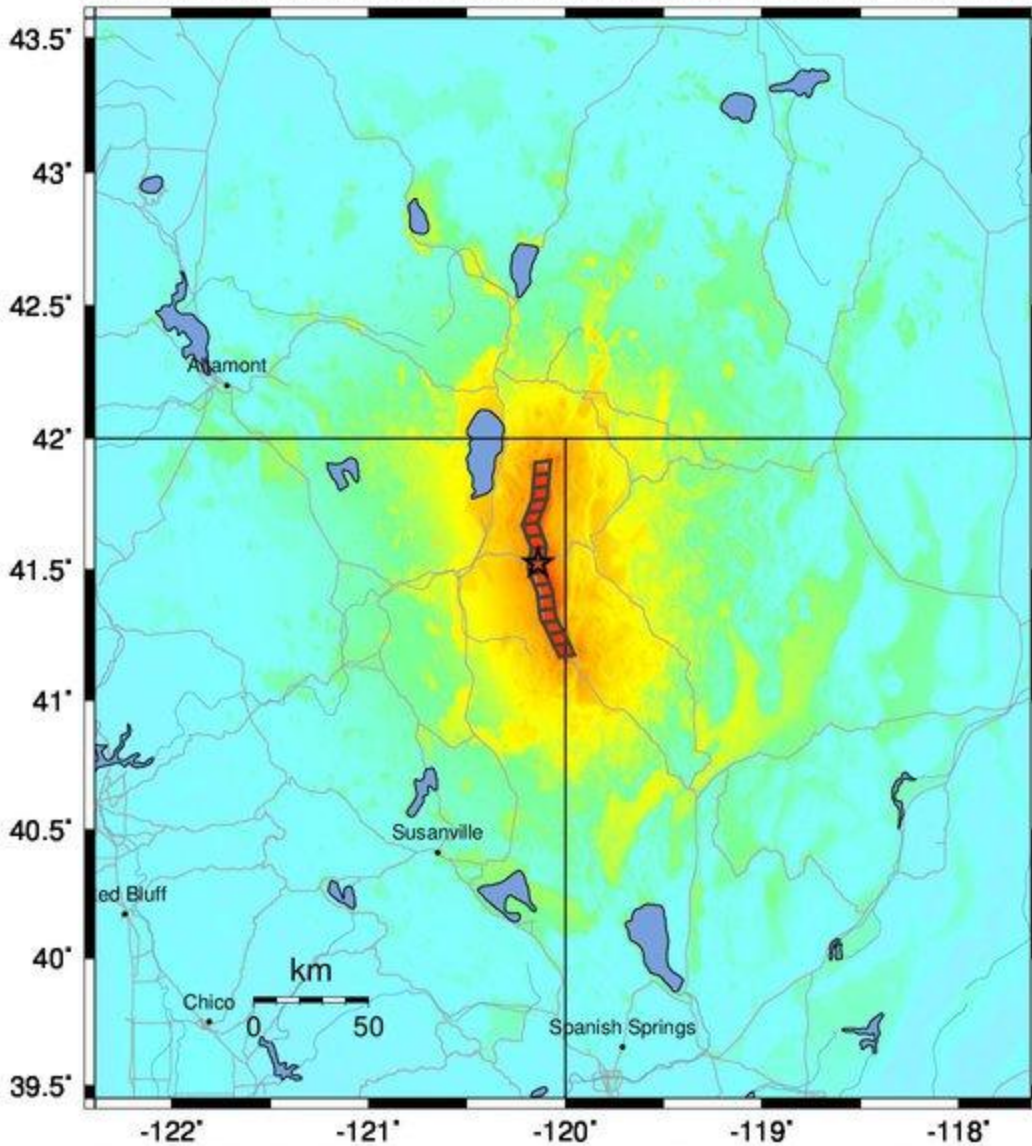
Shelter Summary Report

May 03, 2024

	# of Displaced Households	# of People Needing Short Term Shelter
California		
Lassen	0	0
Modoc	1	1
Plumas	0	0
Shasta	0	0
Sierra	0	0
Siskiyou	0	0
Tehama	0	0
Total	1	1
Region Total	1	1

Totals only reflect data for those census tracts/blocks included in the user's study region and will reflect the entire county/state only if all of the census blocks for that county/states were selected at the time of study region creation.

-- Earthquake Planning Scenario --
ShakeMap for Surprise Valley - Median ground motions Scenario
 Scenario Date: May 16, 2017 08:32:08 AM MDT M 7.2 N41.52 W120.14 Depth: 5.4km



PLANNING SCENARIO ONLY -- Map Version 14 Processed 2017-05-17 11:52:58 AM MDT

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

Scale based upon Worden et al. (2012)