Hazus: Earthquake Global Risk Report

Region Name: RedMountain

Earthquake Scenario: redmountainshaw09mod_m7p41_se

Print Date: June 13, 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 15 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 79,782.50 square miles and contains 5,910 census tracts. There are over 8,566 thousand households in the region which has a total population of 25,739,719 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 7,345 thousand buildings in the region with a total building replacement value (excluding contents) of (millions of dollars). Approximately 90.00 % of the buildings (and % of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 306,492 and 213,527 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 7,345 thousand buildings in the region which have an aggregate total replacement value of (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 87% 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 368 hospitals in the region with a total bed capacity of 68,000 beds. There are 8,346 schools, 1,512 fire stations, 514 police stations and 134 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 520,019.00 (millions of dollars). This inventory includes over 13,698.75 miles of highways, 13,028 bridges, 295,561.95 miles of pipes.

Table 1: Transportation System Lifeline Inventory

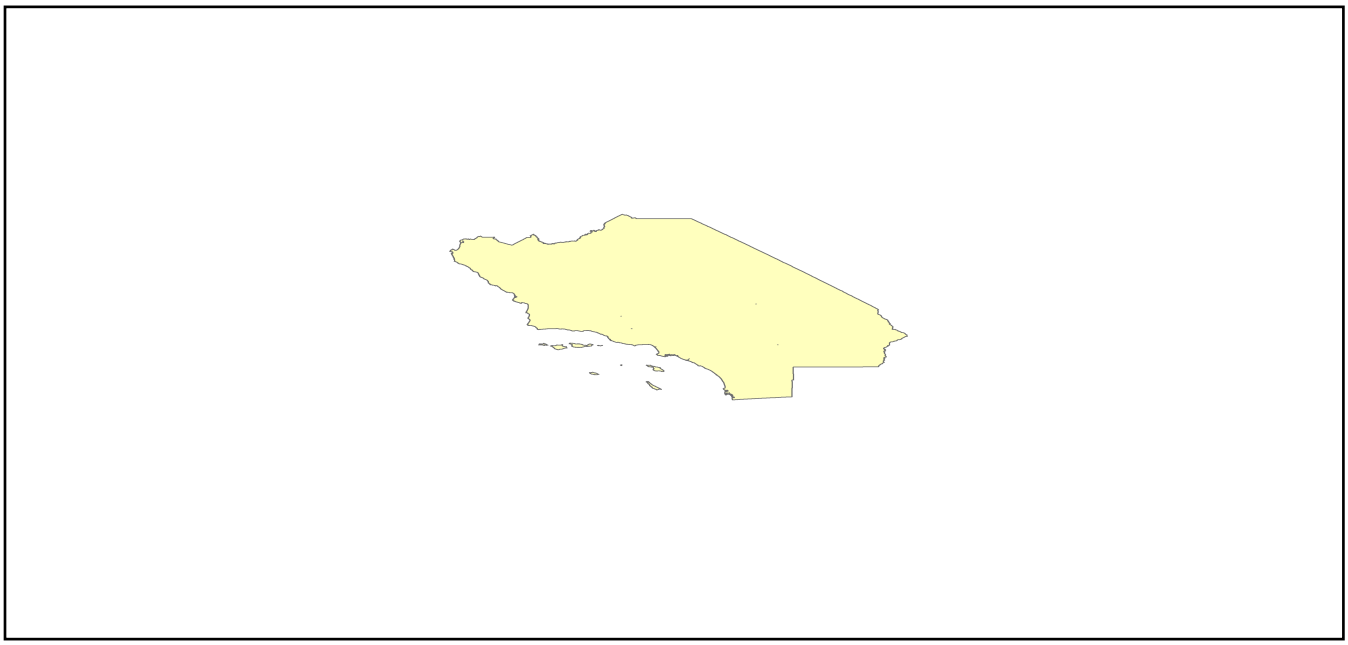
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	13,028	71344.3758
	Segments	10,736	137063.6993
	Tunnels	65	586.0681
		Subtotal	**208994.1432**
Railways	Bridges	1,914	10890.6600
	Facilities	123	327.5490
	Segments	2,084	69014.5969
	Tunnels	0	0.0000
		Subtotal	**80232.8059**
Light Rail	Bridges	51	13.2750
	Facilities	149	3200.8000
	Segments	8	5399.1047
	Tunnels	0	0.0000
		Subtotal	**8613.1797**
Bus	Facilities	55	119.7095
		Subtotal	**119.7095**
Ferry	Facilities	22	29.2820
		Subtotal	**29.2820**
Port	Facilities	357	1360.8285
		Subtotal	**1360.8285**
Airport	Facilities	177	4976.5538
	Runways	200	2166.2470
		Subtotal	**7142.8008**
		Total	**306,492.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	5870.4545
	Facilities	51	2003.9940
	Pipelines	0	0.0000
		Subtotal	**7874.4485**
Waste Water	Distribution Lines	NA	3522.2727
	Facilities	136	23385.4448
	Pipelines	0	0.0000
		Subtotal	**26907.7175**
Natural Gas	Distribution Lines	NA	2348.1818
	Facilities	45	1617.5273
	Pipelines	465	21221.0570
		Subtotal	**25186.7661**
Oil Systems	Facilities	69	8.1420
	Pipelines	0	0.0000
		Subtotal	**8.1420**
Electrical Power	Facilities	647	153485.2604
		Subtotal	**153485.2604**
Communication	Facilities	549	64.7820
		Subtotal	**64.7820**
		Total	**213,527.10**

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	redmountainshaw09mod_m7p41_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	7.41
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 47,636 buildings will be at least moderately damaged. This is over 1.00 % of the buildings in the region. There are an estimated 2,383 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

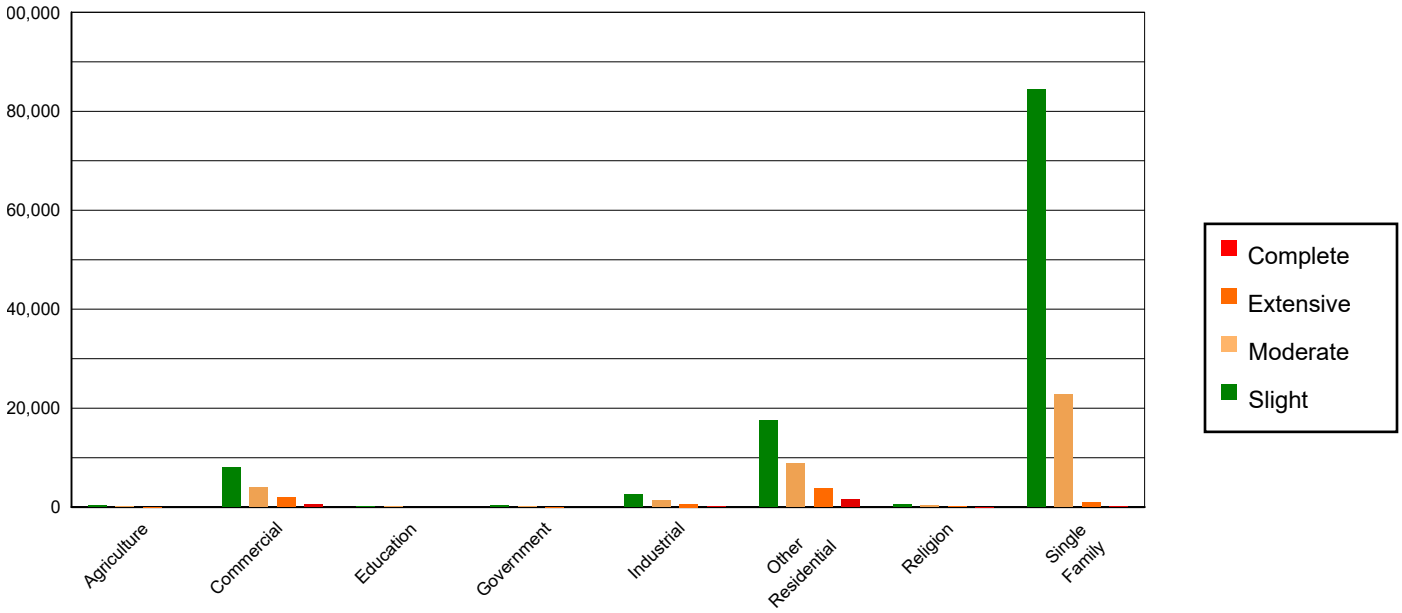


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	23872.76	0.33	311.64	0.27	144.12	0.38	50.04	0.66	16.44	0.69
Commercial	486424.29	6.77	8066.45	7.09	4034.42	10.70	1950.43	25.88	499.40	20.95
Education	13736.82	0.19	168.48	0.15	92.07	0.24	17.91	0.24	3.72	0.16
Government	35522.00	0.49	332.83	0.29	136.99	0.36	42.71	0.57	6.48	0.27
Industrial	125523.30	1.75	2496.36	2.19	1321.55	3.50	620.24	8.23	179.54	7.53
Other Residential	1100428.96	15.32	17444.37	15.33	8889.72	23.57	3821.27	50.71	1564.68	65.65
Religion	25442.82	0.35	498.36	0.44	258.81	0.69	118.79	1.58	28.22	1.18
Single Family	5373389.31	74.79	84445.86	74.23	22840.18	60.56	913.81	12.13	84.84	3.56
Total	**7,184,340**		**113,764**		**37,718**		**7,535**		**2,383**	

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

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6295478.10	87.63	97899.40	86.05	28059.87	74.39	1293.23	17.16	105.76	4.44
Steel	132775.27	1.85	2962.26	2.60	1720.23	4.56	968.13	12.85	344.11	14.44
Concrete	131041.16	1.82	2813.48	2.47	1617.25	4.29	997.99	13.24	304.54	12.78
Precast	63363.15	0.88	1666.98	1.47	1037.40	2.75	501.32	6.65	124.14	5.21
RM	315169.61	4.39	2532.43	2.23	1716.13	4.55	1033.50	13.72	123.67	5.19
URM	29998.38	0.42	2058.22	1.81	347.26	0.92	130.72	1.73	184.43	7.74
MH	216514.61	3.01	3831.57	3.37	3219.72	8.54	2610.32	34.64	1196.68	50.21
Total	**7,184,340**		**113,764**		**37,718**		**7,535**		**2,383**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 68,000 hospital beds available for use. On the day of the earthquake, the model estimates that only 65,707 hospital beds (97.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 98.00% of the beds will be back in service. By 30 days, 99.00% 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	368	8	0	358
Schools	8,346	110	7	8,192
EOCs	134	1	0	132
PoliceStations	514	6	2	497
FireStations	1,512	22	1	1,481

Transportation Lifeline Damage

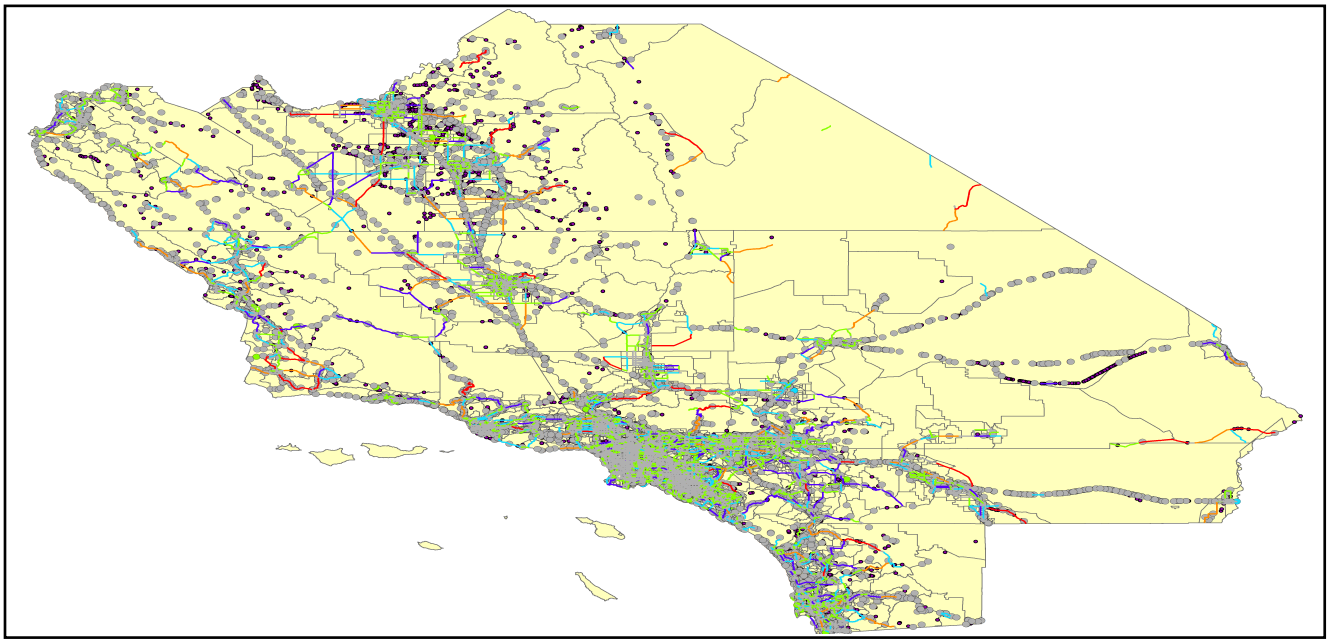


Table 6: Expected Damage to the Transportation Systems

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	10,736	0	0	10,736	10,736
	Bridges	13,028	81	2	12,963	13,015
	Tunnels	65	0	0	65	65
Railways	Segments	2,084	0	0	2,084	2,084
	Bridges	1,914	0	0	1,914	1,914
	Tunnels	0	0	0	0	0
	Facilities	123	3	0	120	123
Light Rail	Segments	8	0	0	8	8
	Bridges	51	0	0	51	51
	Tunnels	0	0	0	0	0
	Facilities	149	0	0	149	149
Bus	Facilities	55	0	0	55	55
Ferry	Facilities	22	0	0	22	22
Port	Facilities	357	8	0	349	357
Airport	Facilities	177	1	0	176	177
	Runways	200	0	0	200	200

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	51	2	0	49	51
Waste Water	136	6	0	124	131
Natural Gas	45	6	0	39	45
Oil Systems	69	3	0	66	66
Electrical Power	647	10	2	639	643
Communication	549	32	0	523	549

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

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	182,386	4346	1087
Waste Water	109,432	2183	546
Natural Gas	3,744	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	8,566,681	79,554	63,657	34,273	0	0
Electric Power		88,023	67,909	37,706	6,907	104

Induced Earthquake Damage

Fire Following Earthquake

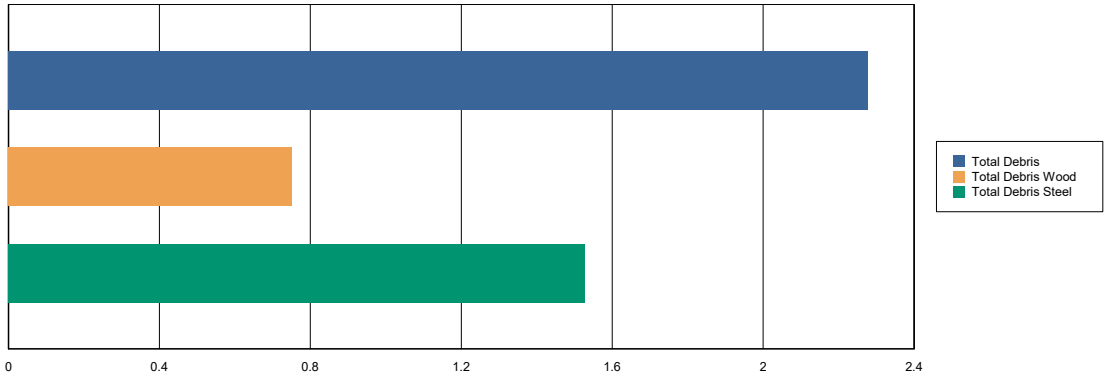
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 27 ignitions that will burn about 0.11 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 1,328 people and burn about 162 (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 2,279,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 33.00% 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 91,160 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



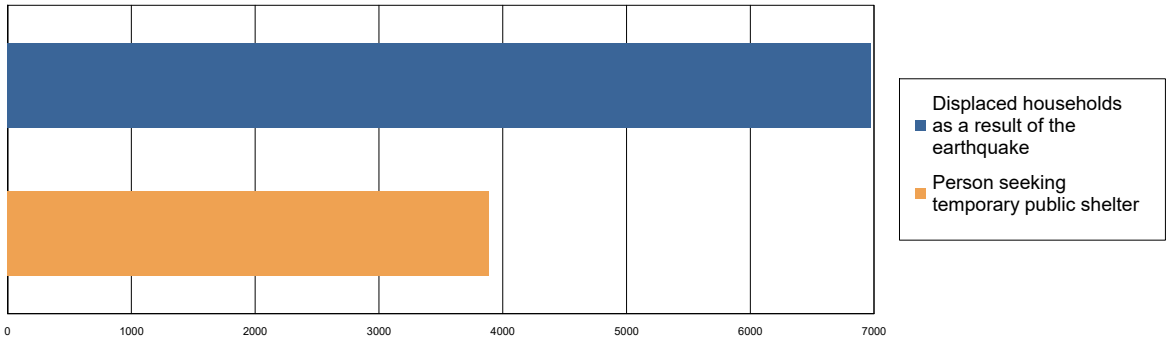
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.75	1.53	2.28	91,160 (@25 tons/truck)

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 6,974 households to be displaced due to the earthquake. Of these, 3,888 people (out of a total population of 25,739,719) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
6,974	3,888

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	19.32	4.43	0.64	1.25
	Commuting	0.18	0.33	0.44	0.09
	Educational	0.00	0.00	0.00	0.00
	Hotels	1.88	0.41	0.06	0.11
	Industrial	26.11	6.31	0.91	1.79
	Other-Residential	750.48	153.71	15.75	29.72
	Single Family	319.01	24.33	0.35	0.65
	Total	**1,117**	**190**	**18**	**34**
2 PM	Commercial	1273.45	293.55	42.44	82.96
	Commuting	1.60	2.94	3.99	0.82
	Educational	517.15	104.30	13.80	26.77
	Hotels	0.36	0.08	0.01	0.02
	Industrial	191.91	46.38	6.72	13.07
	Other-Residential	237.43	48.71	5.17	9.53
	Single Family	99.77	8.06	0.15	0.24
	Total	**2,322**	**504**	**72**	**133**
5 PM	Commercial	853.52	197.26	28.72	55.47
	Commuting	31.71	57.63	78.71	16.18
	Educational	155.31	30.09	3.83	7.38
	Hotels	0.56	0.12	0.02	0.03
	Industrial	119.94	28.98	4.20	8.17
	Other-Residential	279.89	57.85	6.15	11.33
	Single Family	119.33	9.35	0.17	0.27
	Total	**1,560**	**381**	**122**	**99**

Economic Loss

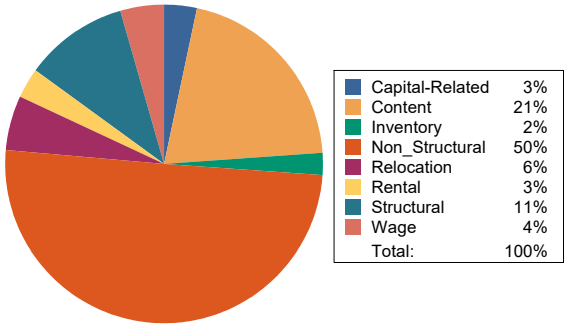
The total economic loss estimated for the earthquake is 19,365.93 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

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 15,572.23 (millions of dollars); 16 % 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 43 % 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)

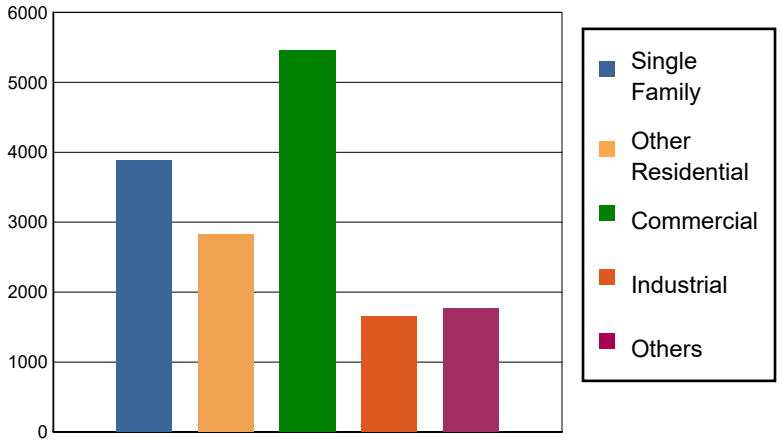


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	149.0109	458.1634	19.5744	45.5553	672.3040
	Capital-Related	0.0000	63.3584	415.3564	12.0974	15.3512	506.1634
	Rental	49.9587	172.0496	219.8564	11.3066	23.6470	476.8183
	Relocation	180.7453	102.4979	318.0810	51.3570	203.7980	856.4792
	Subtotal	**230.7040**	**486.9168**	**1411.4572**	**94.3354**	**288.3515**	**2511.7649**
Capital Stock Losses							
	Structural	406.8913	280.4945	617.5190	195.6086	176.4833	1,676.9967
	Non_Structural	2387.5237	1659.7543	2124.8279	762.5275	903.7283	7,838.3617
	Content	854.4887	397.1154	1075.8048	512.9447	372.7708	3,213.1244
	Inventory	0.0000	0.0000	222.9936	80.1922	28.7973	331.9831
	Subtotal	**3648.9037**	**2337.3642**	**4041.1453**	**1551.2730**	**1481.7797**	**13060.4659**
	Total	**3879.61**	**2824.28**	**5452.60**	**1645.61**	**1770.13**	**15572.23**

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	137063.6993	0.0000	0.00
	Bridges	71344.3758	176.6908	0.25
	Tunnels	586.0681	0.6291	0.11
	Subtotal	**208994.1432**	**177.3199**	
Railways	Segments	69014.5969	0.0000	0.00
	Bridges	10890.6600	68.0270	0.62
	Tunnels	0.0000	0.0000	0.00
	Facilities	327.5490	9.2824	2.83
	Subtotal	**80232.8059**	**77.3094**	
Light Rail	Segments	5399.1047	0.0000	0.00
	Bridges	13.2750	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	3200.8000	30.3038	0.95
	Subtotal	**8613.1797**	**30.3038**	
Bus	Facilities	119.7095	2.4964	2.09
	Subtotal	**119.7095**	**2.4964**	
Ferry	Facilities	29.2820	0.9865	3.37
	Subtotal	**29.2820**	**0.9865**	
Port	Facilities	1360.8285	38.4494	2.83
	Subtotal	**1360.8285**	**38.4494**	
Airport	Facilities	4976.5538	133.0388	2.67
	Runways	2166.2470	0.0000	0.00
	Subtotal	**7142.8008**	**133.0388**	
	Total	**306,492.75**	**459.90**	

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	2003.9940	36.7835	1.84
	Distribution Lines	5870.4545	19.5587	0.33
	Subtotal	**7874.4485**	**56.3422**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	23385.4448	591.4377	2.53
	Distribution Lines	3522.2727	9.8248	0.28
	Subtotal	**26907.7175**	**601.2625**	
Natural Gas	Pipelines	21221.0570	0.0000	0.00
	Facilities	1617.5273	73.6511	4.55
	Distribution Lines	2348.1818	3.3659	0.14
	Subtotal	**25186.7661**	**77.0170**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	8.1420	0.1462	1.80
	Subtotal	**8.1420**	**0.1462**	
Electrical Power	Facilities	153485.2604	2596.4144	1.69
	Subtotal	**153485.2604**	**2596.4144**	
Communication	Facilities	64.7820	2.6085	4.03
	Subtotal	**64.7820**	**2.6085**	
	Total	**213,527.12**	**3,333.79**	

Appendix A: County Listing for the Region

Fresno,CA

Inyo,CA

Kern,CA

Kings,CA

Los Angeles,CA

Monterey,CA

Orange,CA

Riverside,CA

San Benito,CA

San Bernardino,CA

San Diego,CA

San Luis Obispo,CA

Santa Barbara,CA

Tulare,CA

Ventura,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Fresno	1,008,654	98,532	61,772	160,304
	Inyo	19,016	2,951	1,970	4,921
	Kern	909,235	87,567	59,168	146,736
	Kings	152,486	13,719	7,861	21,581
	Los Angeles	10,014,009	950,697	566,995	1,517,692
	Monterey	439,035	47,655	28,750	76,405
	Orange	3,186,989	363,381	176,806	540,188
	Riverside	2,418,185	281,482	137,249	418,731
	San Benito	64,209	9,440	3,799	13,239
	San Bernardino	2,181,654	225,045	152,557	377,602
	San Diego	3,298,634	375,834	193,238	569,072
	San Luis Obispo	282,424	41,720	20,896	62,616
	Santa Barbara	448,229	49,971	28,481	78,452
	Tulare	473,117	43,262	31,210	74,472
	Ventura	843,843	99,299	52,072	151,371
Total Region		**25,739,719**	**2,690,555**	**1,522,824**	**4,213,382**

Red Mountain

Building Inspection Tagging (Counts)

Inspected		Restricted		Unsafe	
Residential	31.7K	Residential	4.74K	Residential	1.65K
Commercial	4.03K	Commercial	1.95K	Commercial	499
Industrial	1.32K	Industrial	620	Industrial	180
Agricultural	144	Agricultural	50	Agricultural	16.4
Educational	92.1	Educational	17.9	Educational	3.72
Government	137	Government	42.7	Government	6.48
Religious	259	Religious	119	Religious	28.2

Total Economic Loss

Total: $15.6B

Top Counties	State	Total
Santa Barbara	CA	$10.1B
Ventura	CA	$4.39B
Los Angeles	CA	$960M
Orange	CA	$57.5M
Kern	CA	$54.7M
San Luis Obispo	CA	$25.3M
San Bernardino	CA	$6.85M

Injuries & Fatalities

Total Day: 3.03K
Total Night: 1.36K

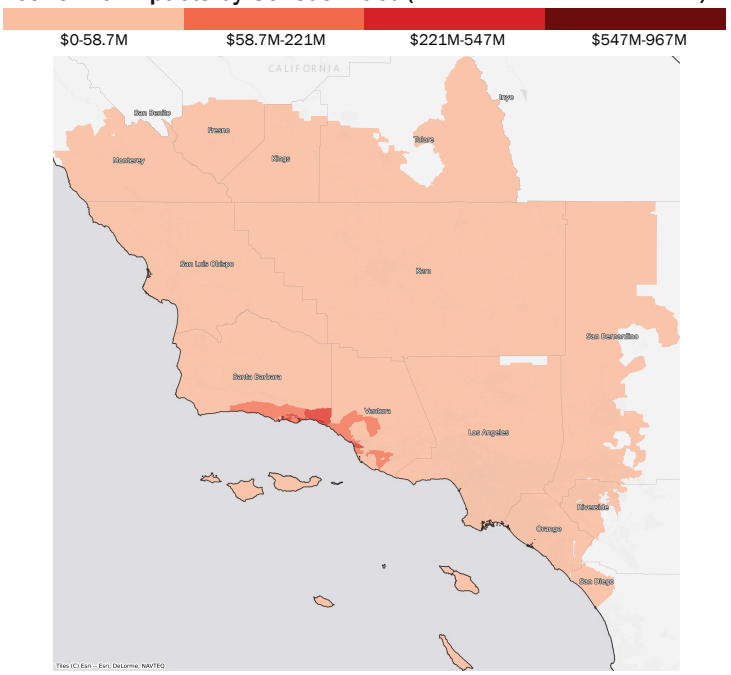
Top Counties	State	Injuries (day/night)	Fatalities (day/night)
Santa Barbara	CA	2.21K/904	110/24.9
Ventura	CA	622/382	22.9/8.73
Los Angeles	CA	60.2/34.6	0.0209/0.00849
Orange	CA	2.25/1.28	0.00045/0.000146
Kern	CA	2.13/1.5	0.00068/0.000182
San Luis Obispo	CA	0.763/0.827	0.000198/0.00003
San Bernardino	CA	0.0826/0.0723	0.000037/0.000021

Displaced Households & Short-Term Shelter Needs

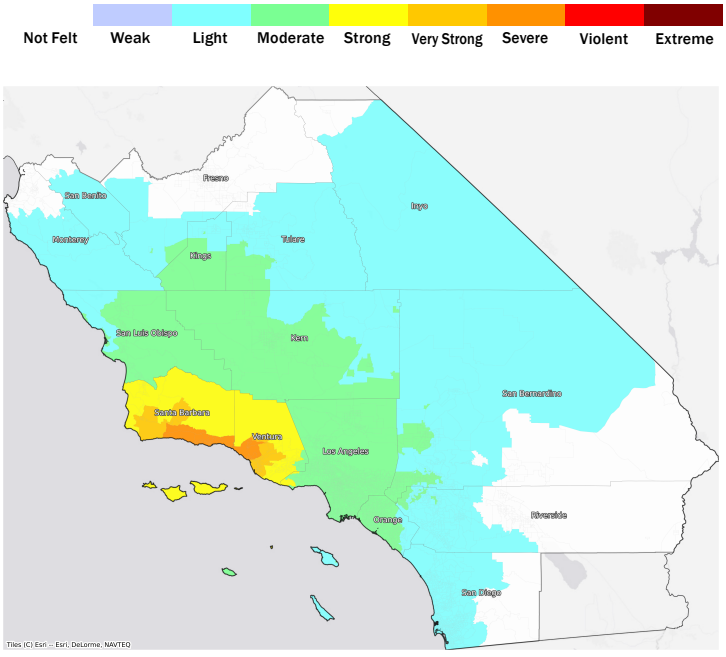
Total Displaced: 6.97K
Total Needing Shelter: 3.89K

Top Counties	State	Displaced	Needing Shelter
Santa Barbara	CA	5.68K	3.21K
Ventura	CA	1.28K	678
Los Angeles	CA	7.06	3.46
Kern	CA	0.0819	0.0656
San Luis Obispo	CA	0.0389	0.0172
Orange	CA	0.0143	0.00952
Fresno	CA	0	0

Economic Impacts by Census Tract (4.33K Tracts with Losses)



Ground Shaking



Debris

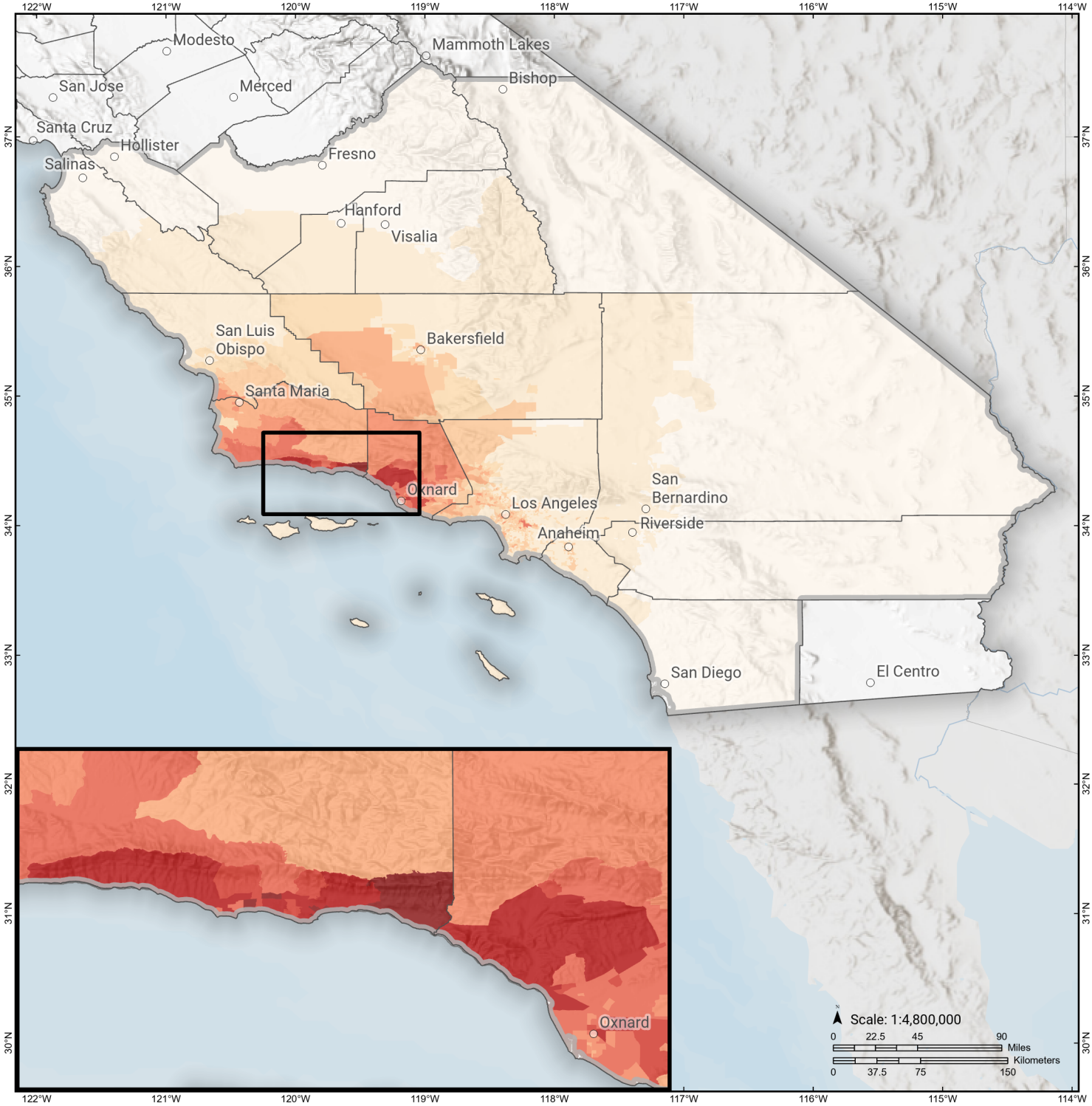
Total Tons: 2.28M
Total Truckloads: 91.2K

Type	Tons
Brick, Wood, and Other	754K
Concrete & Steel	1.52M

Red Mountain

Debris Generated by Census Tract

California Department of Conservation
California Geological Survey



Study Region: Red Mountain
Scenario: redmountainshaw09mod_m7p41_se

Debris Generated *(in tons)*

- 0
- >0 - 10
- >10 - 25
- >25 - 100
- >100 - 300
- >300 - 1,000
- >1,000 - 5,000
- >5,000 - 10,000
- >10,000 - 50,000
- >50,000 - 185,000

Red Mountain

Displaced Households by Census Tract

Study Region: Red Mountain
Scenario: redmountainshaw09mod_m7p41_se

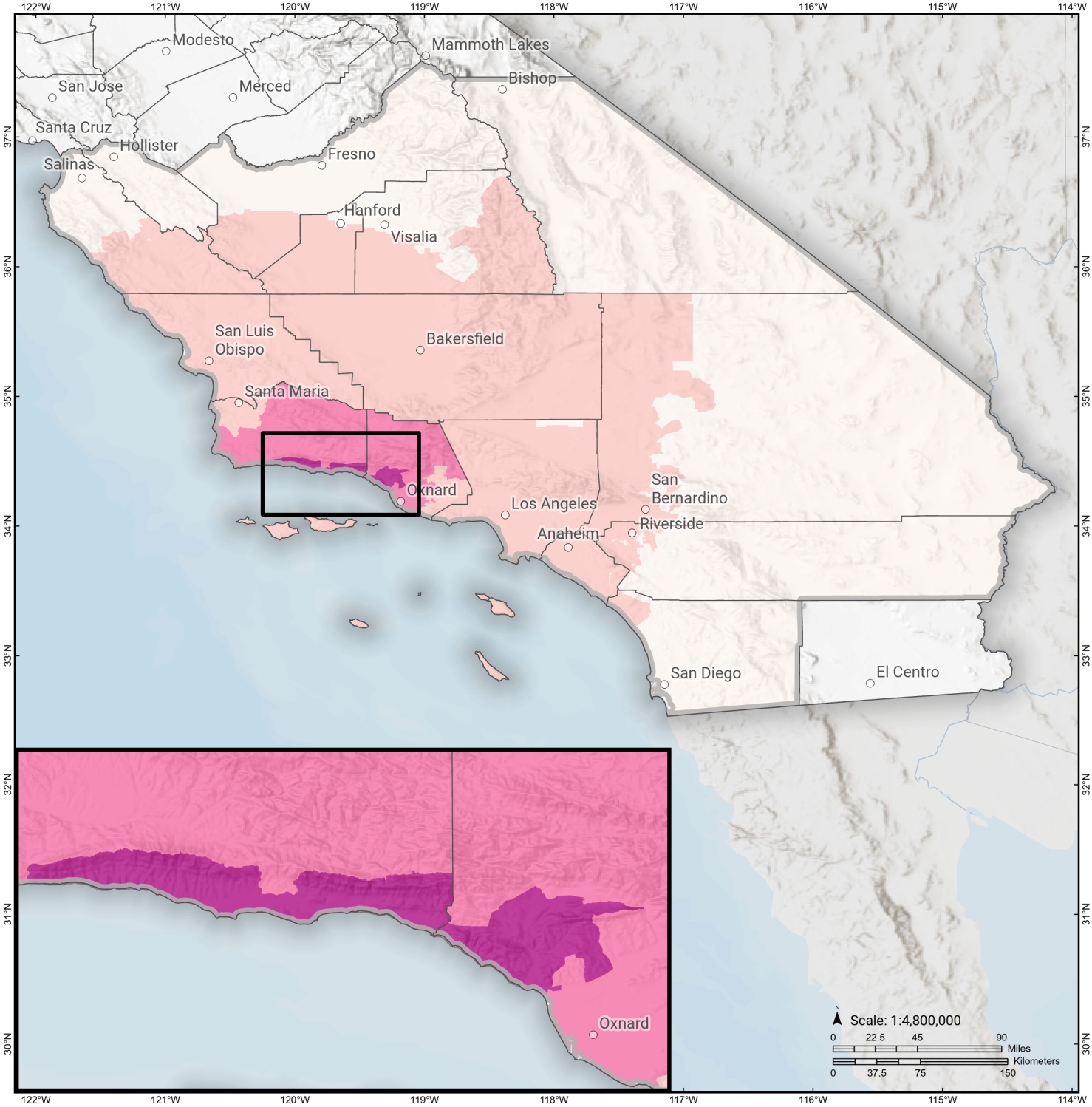
Displaced Households

- 0
- 1
- 2 - 10
- 11 - 100
- 101 - 315

Red Mountain

Loss Ratio by Census Tract

California Department of Conservation
California Geological Survey



Study Region: Red Mountain
Scenario: redmountainshaw09mod_m7p41_se

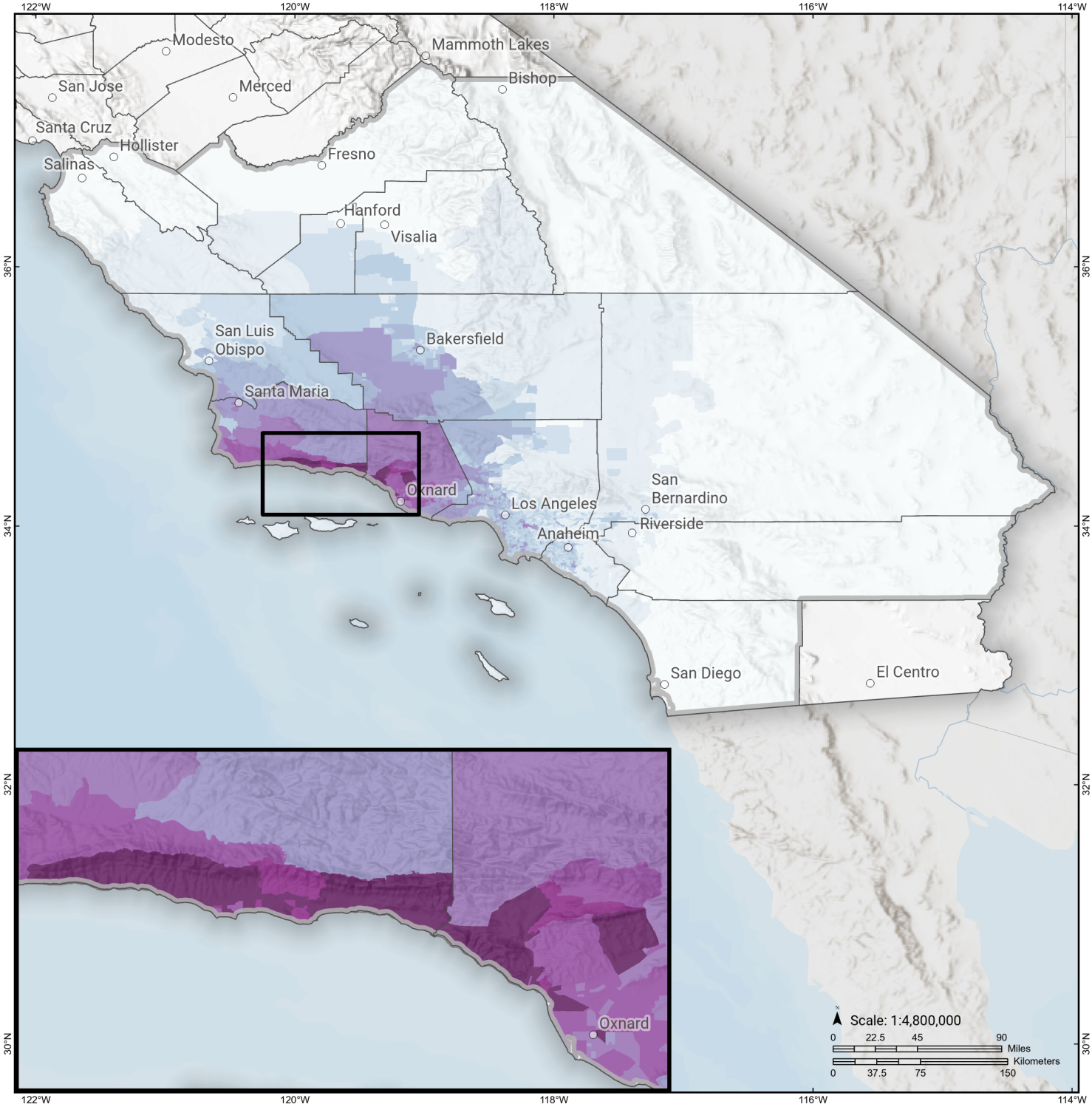
Loss Ratio *(ratio of building related economic loss to exposed value of buildings)*

- 0%
- >0 - 1%
- >1 - 10%
- >10 - 40%

Red Mountain

Total Building Related Economic Loss by Census Tract

California Department of Conservation
California Geological Survey



Study Region: Red Mountain
Scenario: redmountainshaw09mod_m7p41_se

Economic Loss *(in thousands of USD $)*

- 0
- >0 - 30
- >30 - 100
- >100 - 500
- >500 - 1,500
- >1,500 - 6,000
- >6,000 - 20,000
- >20,000 - 75,000
- >75,000 - 100,000
- >100,000 - 970,000

Building Damage by Count by General Occupancy

RiskMAP
Increasing Resilience Together

June 13, 2024

	# of Buildings					
	None	Slight	Moderate	Extensive	Complete	Total
California						
Fresno						
Agriculture	3,421	0	0	0	0	3,421
Commercial	21,054	0	0	0	0	21,054
Education	602	0	0	0	0	602
Government	291	0	0	0	0	291
Industrial	5,348	0	0	0	0	5,348
Religion	1,507	0	0	0	0	1,507
Other Residential	40,973	0	0	0	0	40,973
Single Family	226,425	0	0	0	0	226,425
Inyo						
Agriculture	32	0	0	0	0	32
Commercial	721	0	0	0	0	721
Education	41	0	0	0	0	41
Government	101	0	0	0	0	101
Industrial	257	0	0	0	0	257
Religion	57	0	0	0	0	57
Other Residential	4,050	0	0	0	0	4,050
Single Family	4,446	0	0	0	0	4,446
Kern						

		# of Buildings					
		None	Slight	Moderate	Extensive	Complete	Total
	Agriculture	*4,612*	*30*	*2*	*0*	*0*	*4,645*
	Commercial	*15,472*	*89*	*6*	*0*	*0*	*15,567*
	Education	*461*	*1*	*0*	*0*	*0*	*462*
	Government	*441*	*2*	*0*	*0*	*0*	*443*
	Industrial	*6,005*	*39*	*2*	*0*	*0*	*6,047*
	Religion	*1,514*	*9*	*1*	*0*	*0*	*1,524*
	Other Residential	*54,088*	*405*	*27*	*0*	*0*	*54,520*
	Single Family	*204,761*	*378*	*0*	*0*	*0*	*205,139*
Kings							
	Agriculture	*306*	*0*	*0*	*0*	*0*	*306*
	Commercial	*2,318*	*0*	*0*	*0*	*0*	*2,318*
	Education	*103*	*0*	*0*	*0*	*0*	*103*
	Government	*72*	*0*	*0*	*0*	*0*	*72*
	Industrial	*555*	*0*	*0*	*0*	*0*	*555*
	Religion	*210*	*0*	*0*	*0*	*0*	*210*
	Other Residential	*4,341*	*1*	*0*	*0*	*0*	*4,342*
	Single Family	*36,245*	*0*	*0*	*0*	*0*	*36,245*
Los Angeles							
	Agriculture	*2,006*	*23*	*3*	*0*	*0*	*2,032*
	Commercial	*187,963*	*2,681*	*216*	*2*	*0*	*190,861*
	Education	*5,462*	*22*	*2*	*0*	*0*	*5,486*
	Government	*2,983*	*45*	*3*	*0*	*0*	*3,031*
	Industrial	*52,504*	*566*	*55*	*1*	*0*	*53,126*
	Religion	*10,510*	*131*	*10*	*0*	*0*	*10,651*
	Other Residential	*478,812*	*2,709*	*149*	*1*	*0*	*481,671*

	# of Buildings					
	None	Slight	Moderate	Extensive	Complete	Total
Single Family	*1,796,359*	*6,730*	*51*	*0*	*0*	*1,803,140*
Monterey						
Agriculture	*1,815*	*0*	*0*	*0*	*0*	*1,815*
Commercial	*9,246*	*0*	*0*	*0*	*0*	*9,246*
Education	*239*	*0*	*0*	*0*	*0*	*239*
Government	*185*	*0*	*0*	*0*	*0*	*185*
Industrial	*1,850*	*0*	*0*	*0*	*0*	*1,850*
Religion	*580*	*0*	*0*	*0*	*0*	*580*
Other Residential	*19,809*	*0*	*0*	*0*	*0*	*19,809*
Single Family	*90,876*	*0*	*0*	*0*	*0*	*90,876*
Orange						
Agriculture	*1,133*	*2*	*0*	*0*	*0*	*1,135*
Commercial	*68,210*	*124*	*5*	*0*	*0*	*68,340*
Education	*1,889*	*1*	*0*	*0*	*0*	*1,890*
Government	*648*	*2*	*0*	*0*	*0*	*650*
Industrial	*18,761*	*33*	*1*	*0*	*0*	*18,795*
Religion	*2,052*	*5*	*0*	*0*	*0*	*2,057*
Other Residential	*85,470*	*237*	*11*	*0*	*0*	*85,718*
Single Family	*706,023*	*188*	*1*	*0*	*0*	*706,212*
Riverside						
Agriculture	*1,713*	*0*	*0*	*0*	*0*	*1,713*
Commercial	*46,356*	*0*	*0*	*0*	*0*	*46,357*
Education	*990*	*0*	*0*	*0*	*0*	*990*
Government	*7,175*	*0*	*0*	*0*	*0*	*7,175*
Industrial	*6,409*	*0*	*0*	*0*	*0*	*6,409*

	# of Buildings					
	None	Slight	Moderate	Extensive	Complete	Total
Religion	*1,319*	*0*	*0*	*0*	*0*	*1,319*
Other Residential	*122,797*	*2*	*0*	*0*	*0*	*122,799*
Single Family	*605,454*	*1*	*0*	*0*	*0*	*605,455*
San Benito						
Agriculture	*253*	*0*	*0*	*0*	*0*	*253*
Commercial	*1,080*	*0*	*0*	*0*	*0*	*1,080*
Education	*42*	*0*	*0*	*0*	*0*	*42*
Government	*45*	*0*	*0*	*0*	*0*	*45*
Industrial	*326*	*0*	*0*	*0*	*0*	*326*
Religion	*64*	*0*	*0*	*0*	*0*	*64*
Other Residential	*1,375*	*0*	*0*	*0*	*0*	*1,375*
Single Family	*14,726*	*0*	*0*	*0*	*0*	*14,726*
San Bernardino						
Agriculture	*1,815*	*0*	*0*	*0*	*0*	*1,815*
Commercial	*40,035*	*6*	*0*	*0*	*0*	*40,041*
Education	*985*	*0*	*0*	*0*	*0*	*985*
Government	*1,238*	*0*	*0*	*0*	*0*	*1,238*
Industrial	*9,473*	*1*	*0*	*0*	*0*	*9,474*
Religion	*2,320*	*0*	*0*	*0*	*0*	*2,320*
Other Residential	*98,794*	*27*	*0*	*0*	*0*	*98,821*
Single Family	*525,361*	*6*	*0*	*0*	*0*	*525,367*
San Diego						
Agriculture	*2,190*	*0*	*0*	*0*	*0*	*2,190*
Commercial	*62,369*	*0*	*0*	*0*	*0*	*62,369*
Education	*1,932*	*0*	*0*	*0*	*0*	*1,932*

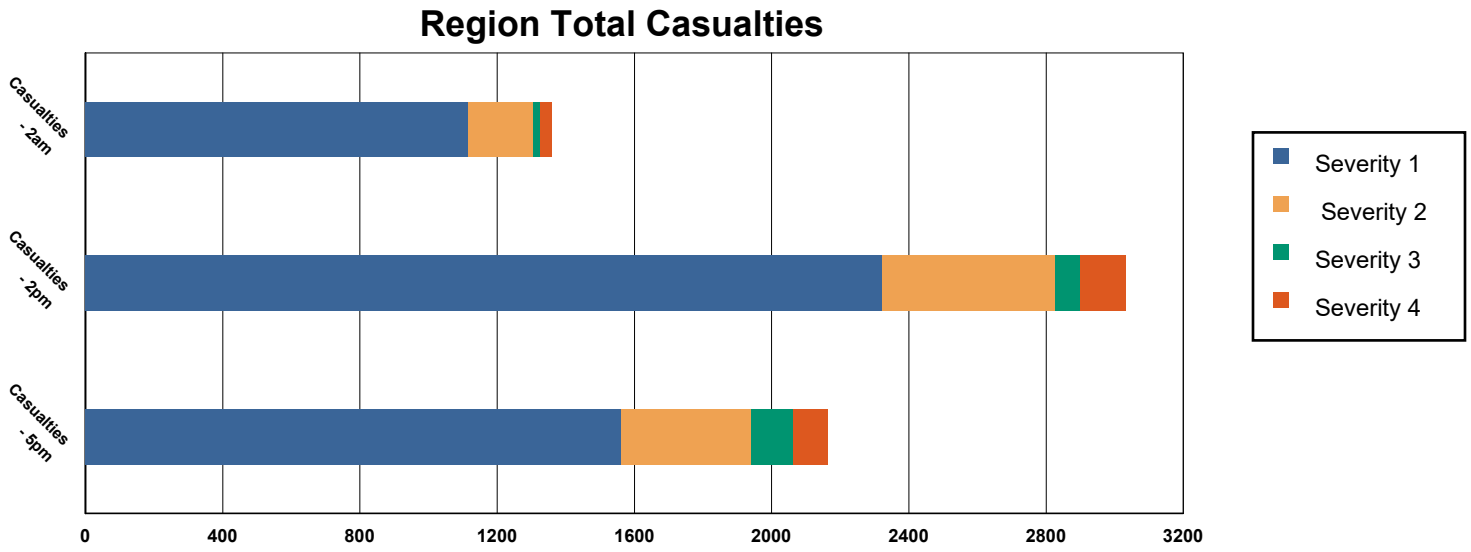
	# of Buildings					
	None	Slight	Moderate	Extensive	Complete	Total
Government	*20,924*	*0*	*0*	*0*	*0*	*20,924*
Industrial	*14,313*	*0*	*0*	*0*	*0*	*14,313*
Religion	*3,063*	*0*	*0*	*0*	*0*	*3,063*
Other Residential	*127,559*	*0*	*0*	*0*	*0*	*127,559*
Single Family	*763,020*	*0*	*0*	*0*	*0*	*763,020*
San Luis Obispo						
Agriculture	*417*	*3*	*1*	*0*	*0*	*421*
Commercial	*9,321*	*50*	*4*	*0*	*0*	*9,375*
Education	*182*	*0*	*0*	*0*	*0*	*182*
Government	*185*	*0*	*0*	*0*	*0*	*185*
Industrial	*2,539*	*16*	*1*	*0*	*0*	*2,556*
Religion	*358*	*2*	*0*	*0*	*0*	*360*
Other Residential	*19,921*	*270*	*25*	*0*	*0*	*20,216*
Single Family	*85,381*	*258*	*0*	*0*	*0*	*85,639*
Santa Barbara						
Agriculture	*224*	*102*	*84*	*41*	*13*	*464*
Commercial	*3,625*	*1,831*	*2,371*	*1,600*	*393*	*9,820*
Education	*143*	*75*	*65*	*14*	*3*	*299*
Government	*96*	*49*	*57*	*31*	*6*	*239*
Industrial	*1,167*	*488*	*592*	*452*	*141*	*2,840*
Religion	*279*	*107*	*129*	*84*	*21*	*621*
Other Residential	*9,053*	*6,107*	*5,275*	*2,490*	*1,185*	*24,111*
Single Family	*49,197*	*31,214*	*17,643*	*846*	*83*	*98,982*
Tulare						
Agriculture	*3,555*	*0*	*0*	*0*	*0*	*3,555*

		# of Buildings					
		None	Slight	Moderate	Extensive	Complete	Total
	Commercial	*8,873*	*0*	*0*	*0*	*0*	*8,873*
	Education	*269*	*0*	*0*	*0*	*0*	*269*
	Government	*461*	*0*	*0*	*0*	*0*	*461*
	Industrial	*2,148*	*0*	*0*	*0*	*0*	*2,148*
	Religion	*827*	*0*	*0*	*0*	*0*	*827*
	Other Residential	*20,019*	*3*	*0*	*0*	*0*	*20,022*
	Single Family	*112,034*	*0*	*0*	*0*	*0*	*112,034*
Ventura							
	Agriculture	*382*	*150*	*54*	*9*	*4*	*598*
	Commercial	*9,783*	*3,283*	*1,432*	*349*	*106*	*14,953*
	Education	*397*	*69*	*26*	*4*	*1*	*497*
	Government	*678*	*235*	*76*	*11*	*1*	*1,001*
	Industrial	*3,868*	*1,353*	*669*	*168*	*38*	*6,097*
	Religion	*783*	*244*	*119*	*34*	*7*	*1,187*
	Other Residential	*13,368*	*7,683*	*3,402*	*1,330*	*379*	*26,163*
	Single Family	*153,082*	*45,671*	*5,144*	*68*	*2*	*203,968*
Total		**7,184,340**	**113,764**	**37,718**	**7,535**	**2,383**	**7,345,741**
Region Total		**7,184,340**	**113,764**	**37,718**	**7,535**	**2,383**	**7,345,741**

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

June 13, 2024



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

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

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

	Injury Severity Level				
	Severity 1	Severity 2	Severity 3	Severity 4	Total
California					
Kings					
Casualties - 2pm					
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 2pm	**0**	**0**	**0**	**0**	**0**
Casualties - 5pm					
Single Family	0	0	0	0	0
Commercial	0	0	0	0	0
Commuting	0	0	0	0	0
Other-Residential	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 5pm	**0**	**0**	**0**	**0**	**0**
Los Angeles					
Casualties - 2am					
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Educational	0	0	0	0	0
Single Family	11	0	0	0	11
Commuting	0	0	0	0	0
Other-Residential	22	1	0	0	23
Commercial	1	0	0	0	1
Total Casualties - 2am	**34**	**1**	**0**	**0**	**35**
Casualties - 2pm					
Industrial	3	0	0	0	3
Other-Residential	7	0	0	0	7
Commercial	37	1	0	0	39
Commuting	0	0	0	0	0
Educational	8	0	0	0	9
Single Family	3	0	0	0	3
Hotels	0	0	0	0	0
Total Casualties - 2pm	**58**	**2**	**0**	**0**	**60**
Casualties - 5pm					
Other-Residential	8	0	0	0	8
Industrial	2	0	0	0	2
Commuting	0	0	0	0	0
Single Family	4	0	0	0	4
Commercial	24	1	0	0	25
Hotels	0	0	0	0	0
Educational	2	0	0	0	2
Total Casualties - 5pm	**40**	**1**	**0**	**0**	**41**

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

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

	Injury Severity Level				
	Severity 1	Severity 2	Severity 3	Severity 4	Total
California					
Riverside					
Total Casualties - 5pm	**0**	**0**	**0**	**0**	**0**
San Benito					
Casualties - 2am					
Other-Residential	0	0	0	0	0
Commercial	0	0	0	0	0
Commuting	0	0	0	0	0
Hotels	0	0	0	0	0
Educational	0	0	0	0	0
Single Family	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 2am	**0**	**0**	**0**	**0**	**0**
Casualties - 2pm					
Hotels	0	0	0	0	0
Educational	0	0	0	0	0
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Commercial	0	0	0	0	0
Commuting	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
Other-Residential	0	0	0	0	0
Single Family	0	0	0	0	0
Industrial	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Total Casualties - 5pm	**0**	**0**	**0**	**0**	**0**
San Bernardino					
Casualties - 2am					
Hotels	0	0	0	0	0
Single Family	0	0	0	0	0
Commercial	0	0	0	0	0
Commuting	0	0	0	0	0
Educational	0	0	0	0	0
Other-Residential	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 2am	**0**	**0**	**0**	**0**	**0**
Casualties - 2pm					
Industrial	0	0	0	0	0

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

	Injury Severity Level				
	Severity 1	Severity 2	Severity 3	Severity 4	Total
California					
San Diego					
Casualties - 5pm					
Hotels	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 5pm	**0**	**0**	**0**	**0**	**0**
San Luis Obispo					
Casualties - 2am					
Commercial	0	0	0	0	0
Other-Residential	0	0	0	0	1
Industrial	0	0	0	0	0
Single Family	0	0	0	0	0
Commuting	0	0	0	0	0
Educational	0	0	0	0	0
Hotels	0	0	0	0	0
Total Casualties - 2am	**1**	**0**	**0**	**0**	**1**
Casualties - 2pm					
Single Family	0	0	0	0	0
Educational	0	0	0	0	0
Other-Residential	0	0	0	0	0
Hotels	0	0	0	0	0
Commuting	0	0	0	0	0
Commercial	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 2pm	**1**	**0**	**0**	**0**	**1**
Casualties - 5pm					
Industrial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Commuting	0	0	0	0	0
Single Family	0	0	0	0	0
Commercial	0	0	0	0	0
Hotels	0	0	0	0	0
Educational	0	0	0	0	0
Total Casualties - 5pm	**1**	**0**	**0**	**0**	**1**
Santa Barbara					
Casualties - 2am					
Industrial	19	5	1	1	26
Commercial	15	4	1	1	20
Other-Residential	517	113	12	22	663
Commuting	0	0	0	0	1
Educational	0	0	0	0	0
Single Family	196	20	0	1	217
Hotels	2	0	0	0	2

	Injury Severity Level				
	Severity 1	Severity 2	Severity 3	Severity 4	Total
California					
Santa Barbara					
Total Casualties - 2am	**748**	**142**	**13**	**25**	**929**
Casualties - 2pm					
Commercial	958	237	35	69	1,299
Single Family	66	7	0	0	73
Other-Residential	171	37	4	7	220
Commuting	1	2	3	1	7
Educational	407	87	12	23	529
Hotels	0	0	0	0	0
Industrial	141	36	5	11	193
Total Casualties - 2pm	**1,744**	**407**	**60**	**110**	**2,321**
Casualties - 5pm					
Other-Residential	193	42	4	8	248
Single Family	75	8	0	0	83
Commercial	630	157	24	45	856
Commuting	24	46	60	13	142
Educational	139	28	4	7	179
Industrial	88	23	3	7	121
Hotels	0	0	0	0	1
Total Casualties - 5pm	**1,149**	**304**	**95**	**80**	**1,629**
Tulare					
Casualties - 2am					
Commercial	0	0	0	0	0
Commuting	0	0	0	0	0
Single Family	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
Total Casualties - 2am	**0**	**0**	**0**	**0**	**0**
Casualties - 2pm					
Industrial	0	0	0	0	0
Hotels	0	0	0	0	0
Commercial	0	0	0	0	0
Other-Residential	0	0	0	0	0
Educational	0	0	0	0	0
Commuting	0	0	0	0	0
Single Family	0	0	0	0	0
Total Casualties - 2pm	**0**	**0**	**0**	**0**	**0**
Casualties - 5pm					
Other-Residential	0	0	0	0	0
Commercial	0	0	0	0	0

	Injury Severity Level				
	Severity 1	Severity 2	Severity 3	Severity 4	Total
California					
Tulare					
Casualties - 5pm					
Single Family	0	0	0	0	0
Hotels	0	0	0	0	0
Commuting	0	0	0	0	0
Educational	0	0	0	0	0
Industrial	0	0	0	0	0
Total Casualties - 5pm	**0**	**0**	**0**	**0**	**0**
Ventura					
Casualties - 2am					
Educational	0	0	0	0	0
Commuting	0	0	0	0	0
Single Family	111	5	0	0	115
Hotels	0	0	0	0	0
Industrial	6	1	0	0	8
Commercial	4	1	0	0	5
Other-Residential	210	40	4	8	261
Total Casualties - 2am	**331**	**47**	**5**	**9**	**391**
Casualties - 2pm					
Industrial	48	10	1	3	61
Educational	101	17	2	4	123
Commuting	0	1	1	0	2
Hotels	0	0	0	0	0
Other-Residential	59	11	1	2	74
Commercial	275	55	7	14	352
Single Family	31	1	0	0	32
Total Casualties - 2pm	**514**	**95**	**13**	**23**	**645**
Casualties - 5pm					
Commuting	8	12	19	4	42
Other-Residential	78	15	2	3	98
Commercial	197	39	5	10	252
Hotels	0	0	0	0	0
Educational	14	2	0	0	16
Single Family	40	2	0	0	42
Industrial	30	6	1	2	38
Total Casualties - 5pm	**368**	**76**	**26**	**19**	**489**
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

RiskMAP
Increasing Resilience Together

June 13, 2024

All values are in thousands of tons.

	Brick, Wood & Others	Concrete & Steel	Total
California			
Fresno	0	0	0
Inyo	0	0	0
Kern	2	1	3
Kings	0	0	0
Los Angeles	55	19	74
Monterey	0	0	0
Orange	2	1	3
Riverside	0	0	0
San Benito	0	0	0
San Bernardino	0	0	0
San Diego	0	0	0
San Luis Obispo	1	0	2
Santa Barbara	479	1,127	1,606
Tulare	0	0	0
Ventura	215	377	592
Total	**754**	**1,525**	**2,279**
Region Total	**754**	**1,525**	**2,279**

Study Region : RedMountain

Scenario : redmountainshaw09mod_m7p41_se

	Brick, Wood & Others	Concrete & Steel	Total

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

June 13, 2024

All values are in thousands of dollars

	Capital Stock Losses					Income Losses				
	Cost Structural Damage	Cost Non-struct. Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	Total Loss
California										
Inyo	0	0	0	0	0.00	0	0	0	0	0
San Bernardino	108	3,826	2,457	388	0.00	12	14	16	30	6,851
Riverside	9	642	431	40	0.00	0	1	1	3	1,127
Fresno	0	10	7	1	0.00	0	0	0	0	18
Kings	3	146	99	17	0.00	0	0	0	0	267
San Luis Obispo	1,407	14,936	7,191	878	0.03	228	184	191	260	25,274
Tulare	11	443	316	107	0.00	0	1	1	1	880
San Benito	0	0	0	0	0.00	0	0	0	0	0
Santa Barbara	1,157,728	4,955,489	1,889,139	191,655	7.79	650,826	377,819	507,417	346,205	10,076,279

Study Region : RedMountain

Scenario : redmountainshaw09mod_m7p41_se

	Capital Stock Losses					Income Losses				
	Cost Structural Damage	Cost Non-struct. Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	Total Loss
Kern	2,876	30,508	16,276	3,336	0.02	385	396	466	503	54,747
Ventura	451,833	2,266,891	994,889	107,256	1.80	193,283	115,555	149,702	110,328	4,389,736
Monterey	0	6	5	3	0.00	0	0	0	0	15
Orange	2,129	32,740	18,655	2,089	0.01	258	411	469	699	57,451
San Diego	0	0	0	0	0.00	0	0	0	0	0
Los Angeles	60,892	532,723	283,659	26,213	0.04	11,487	11,783	14,041	18,789	959,588
Total	**1,676,997**	**7,838,362**	**3,213,125**	**331,983**	**0.65**	**856,479**	**506,164**	**672,304**	**476,819**	**15,572,233**
Region Total	**1,676,997**	**7,838,362**	**3,213,125**	**331,983**	**0.65**	**856,479**	**506,164**	**672,304**	**476,819**	**15,572,233**

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

June 13, 2024

All values are in thousands of dollars

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
California								
Fresno								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	51	51
Total	**0**	**0**	**0**	**0**	**0**	**0**	**51**	**51**
Inyo								
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**
Kern								
Segments	0	0	0					0
Bridges	223	0	0					224
Tunnels	0	0	0					0
Facilities		180	0	83	0	0	1,205	1,467

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	**223**	**180**	**0**	**83**	**0**	**0**	**1,205**	**1,690**
Kings								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		60	0	41	0	0	40	141
Total	**0**	**60**	**0**	**41**	**0**	**0**	**40**	**141**
Los Angeles								
Segments	0	0	0					0
Bridges	3,602	3	0					3,605
Tunnels	4	0	0					4
Facilities		1,540	29,333	658	7,894	128	91,421	130,973
Total	**3,606**	**1,542**	**29,333**	**658**	**7,894**	**128**	**91,421**	**134,582**
Monterey								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	24	0	0	108	132
Total	**0**	**0**	**0**	**24**	**0**	**0**	**108**	**132**
Orange								
Segments	0	0	0					0
Bridges	101	0	0					101
Tunnels	0	0	0					0
Facilities		205	0	0	587	51	4,217	5,061

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	**101**	**205**	**0**	**0**	**587**	**51**	**4,217**	**5,161**
Riverside								
Segments	0	0	0					0
Bridges	1	0	0					1
Tunnels	0	0	0					0
Facilities		103	0	32	0	0	343	478
Total	**1**	**103**	**0**	**32**	**0**	**0**	**343**	**479**
San Benito								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
San Bernardino								
Segments	0	0	0					0
Bridges	4	0	0					4
Tunnels	0	0	0					0
Facilities		373	0	43	0	0	2,507	2,924
Total	**4**	**373**	**0**	**43**	**0**	**0**	**2,507**	**2,927**
San Diego								
Segments	0	0	0					0
Bridges	3	0	0					3
Tunnels	0	0	0					0
Facilities		20	971	2	408	4	915	2,320

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	**3**	**20**	**971**	**2**	**408**	**4**	**915**	**2,323**
San Luis Obispo								
Segments	0	0	0					0
Bridges	205	3	0					207
Tunnels	0	0	0					0
Facilities		161	0	41	294	0	871	1,366
Total	**205**	**163**	**0**	**41**	**294**	**0**	**871**	**1,574**
Santa Barbara								
Segments	0	0	0					0
Bridges	110,763	58,510	0					169,272
Tunnels	458	0	0					458
Facilities		4,627	0	1,122	14,357	348	24,240	44,695
Total	**111,221**	**63,137**	**0**	**1,122**	**14,357**	**348**	**24,240**	**214,425**
Tulare								
Segments	0	0	0					0
Bridges	2	0	0					2
Tunnels	0	0	0					0
Facilities		0	0	46	0	0	113	159
Total	**2**	**0**	**0**	**46**	**0**	**0**	**113**	**162**
Ventura								
Segments	0	0	0					0
Bridges	61,786	9,512	0					71,297
Tunnels	167	0	0					167
Facilities		2,015	0	403	14,910	455	7,004	24,785

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	61,953	11,526	0	403	14,910	455	7,004	96,249
Total	177,320	77,309	30,304	2,496	38,449	987	133,039	459,904
Region Total	177,320	77,309	30,304	2,496	38,449	987	133,039	459,904

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

June 13, 2024

All values are in thousands of dollars

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
California							
Fresno							
Facilities	0	0	0	0	779	0	780
Pipelines	54	27	0	0			81
Total	54	27	0	0	779	0	860
Inyo							
Facilities	0	0	0	0	64	0	64
Pipelines	32	16	0	0			49
Total	32	16	0	0	64	0	113
Kern							
Facilities	433	1,770	2	1,056	331,369	18	334,648
Pipelines	791	397	0	0			1,189
Total	1,224	2,168	2	1,056	331,369	18	335,837
Kings							
Facilities	0	0	0	134	6,334	0	6,469

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
Pipelines	78	39	0	0			117
Total	78	39	0	134	6,334	0	6,586
Los Angeles							
Facilities	2,663	15,072	8	3,437	959,868	40	981,087
Pipelines	1,365	686	0	0			2,051
Total	4,028	15,757	8	3,437	959,868	40	983,138
Monterey							
Facilities	0	0	0	0	616	0	616
Pipelines	67	34	0	0			101
Total	67	34	0	0	616	0	718
Orange							
Facilities	84	1,107	0	62	8,284	2	9,539
Pipelines	182	92	0	0			274
Total	266	1,198	0	62	8,284	2	9,813
Riverside							
Facilities	61	994	0	3	2,681	0	3,739
Pipelines	141	71	0	0			212
Total	202	1,065	0	3	2,681	0	3,951
San Benito							
Facilities	0	0	0	0	0	0	0
Pipelines	16	8	0	0			24

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
Total	16	8	0	0	0	0	24
San Bernardino							
Facilities	85	1,235	0	78	57,124	2	58,523
Pipelines	341	171	0	0			513
Total	426	1,406	0	78	57,124	2	59,036
San Diego							
Facilities	1	67	0	3	1,418	0	1,489
Pipelines	73	37	0	0			110
Total	75	104	0	3	1,418	0	1,599
San Luis Obispo							
Facilities	28	5,188	2	0	97,705	10	102,934
Pipelines	270	136	0	0			406
Total	298	5,323	2	0	97,705	10	103,339
Santa Barbara							
Facilities	0	373,091	52	56,567	184,510	1,604	615,824
Pipelines	8,982	4,512	0	0			13,493
Total	8,982	377,602	52	56,567	184,510	1,604	629,317
Tulare							
Facilities	0	5	0	0	2,761	1	2,767
Pipelines	102	51	0	0			153
Total	102	56	0	0	2,761	1	2,920

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
Ventura							
Facilities	33,428	192,910	82	12,312	942,900	929	1,182,563
Pipelines	7,063	3,548	0	0			10,611
Total	40,491	196,458	82	12,312	942,900	929	1,193,173
Total	**56,342**	**601,263**	**146**	**73,651**	**2,596,414**	**2,608**	**3,330,425**
Region Total	**56,342**	**601,263**	**146**	**73,651**	**2,596,414**	**2,608**	**3,330,425**

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	4.80 - 19.00
	Building Contents	0.60 - 2.40
	Business Interruption	1.30 - 5.00
Infrastructure	Lifelines Damage	
	Total	7.80 - 31.10

Preliminary Damage Assessment (PDA) Estimates

Description	Residential	Commercial	Other	Total
Affected	101,900	8,100	3,600	113,600
Minor	31,700	4,000	1,900	37,600
Major	4,700	2,000	850	7,550
Destroyed	1,600	500	230	2,330
Total	139,900	14,600	6,580	161,080

Estimated Casualties : Night Time

Severity Level	Description	# Persons
Level 1	Medical Aid	600 - 2,000
Level 2	Hospital Care	100 - 400
Level 3	Life-threatening	10 - 40
Level 4	Fatalities	20 - 70

Estimated Shelter Needs

Type	Households	People
Displaced Households	3,000 - 14,000	7,500 - 35,000
Public Shelter	1,560	3,890

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, goetechnical, and observed ground motion data.

Earthquake Information

Location :

Origin Time:

Magnitude : 7.41

Epicenter Latitude/Longitude :

/

Depth & Type : /U

Name :
NA

Ground Motion /Attenuation :

Maximum PGA: 1.00

Information Sources:

Comments :

Population and Building Exposure

Population: 25,739,719

Building Exposure : ($ Millions)

Residential	
Commercial	868,953
Other	653,877
Total	

Counties : See Appendix

Major Metro Area :

Hazus Quick Assessment Report

Estimated Economic Loss ($ Billions)

Category	Description	Range
General Building Stock	Building Damage	4.80 - 19.00
	Building Contents	0.60 - 2.40
	Business Interruption	1.30 - 5.00
Infrastructure	Lifelines Damage	
	Total	7.80 - 31.10

Preliminary Damage Assessment (PDA) Estimates

Description	Residential	Commercial	Other	Total
Affected	101,900	8,100	3,600	113,600
Minor	31,700	4,000	1,900	37,600
Major	4,700	2,000	850	7,550
Destroyed	1,600	500	230	2,330
Total	139,900	14,600	6,580	161,080

Estimated Casualties : Day Time

Severity Level	Description	# Persons
Level 1	Medical Aid	1,200 - 5,000
Level 2	Hospital Care	300 - 1,000
Level 3	Life-threatening	40 - 140
Level 4	Fatalities	70 - 300

Estimated Shelter Needs

Type	Households	People
Displaced Households	3,000 - 14,000	7,500 - 35,000
Public Shelter	1,560	3,890

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:

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Earthquake Information

Location :

Origin Time:

Magnitude : 7.41

Epicenter Latitude/Longitude :

/

Depth & Type : /U

Name :
NA

Ground Motion /Attenuation :

Maximum PGA: 1.00

Information Sources:

Comments :

Population and Building Exposure

Population: 25,739,719

Building Exposure : ($ Millions)

Residential	
Commercial	868,953
Other	653,877
Total	

Counties : See Appendix

Major Metro Area :

Time of report: June 13, 2024 11:13 am

Hazus Quick Assessment Report

Estimated Economic Loss ($ Billions)

Category	Description	Range
General Building Stock	Building Damage	4.80 - 19.00
	Building Contents	0.60 - 2.40
	Business Interruption	1.30 - 5.00
Infrastructure	Lifelines Damage	
	Total	7.80 - 31.10

Preliminary Damage Assessment (PDA) Estimates

Description	Residential	Commercial	Other	Total
Affected	101,900	8,100	3,600	113,600
Minor	31,700	4,000	1,900	37,600
Major	4,700	2,000	850	7,550
Destroyed	1,600	500	230	2,330
Total	139,900	14,600	6,580	161,080

Estimated Casualties : Commute Time

Severity Level	Description	# Persons
Level 1	Medical Aid	800 - 3,000
Level 2	Hospital Care	190 - 800
Level 3	Life-threatening	60 - 200
Level 4	Fatalities	50 - 200

Estimated Shelter Needs

Type	Households	People
Displaced Households	3,000 - 14,000	7,500 - 35,000
Public Shelter	1,560	3,890

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, goetechnical, and observed ground motion data.

Earthquake Information

Location :

Origin Time:

Magnitude : 7.41

Epicenter Latitude/Longitude :

/

Depth & Type : /U

Name :
NA

Ground Motion /Attenuation :

Maximum PGA: 1.00

Information Sources:

Comments :

Population and Building Exposure

Population: 25,739,719

Building Exposure : ($ Millions)

Residential	
Commercial	868,953
Other	653,877
Total	

Counties : See Appendix

Major Metro Area :

Time of report: June 13, 2024 11:14 am

HAZUS™

FEMA

RiskMAP
Increasing Resilience Together

Shelter Summary Report

June 13, 2024

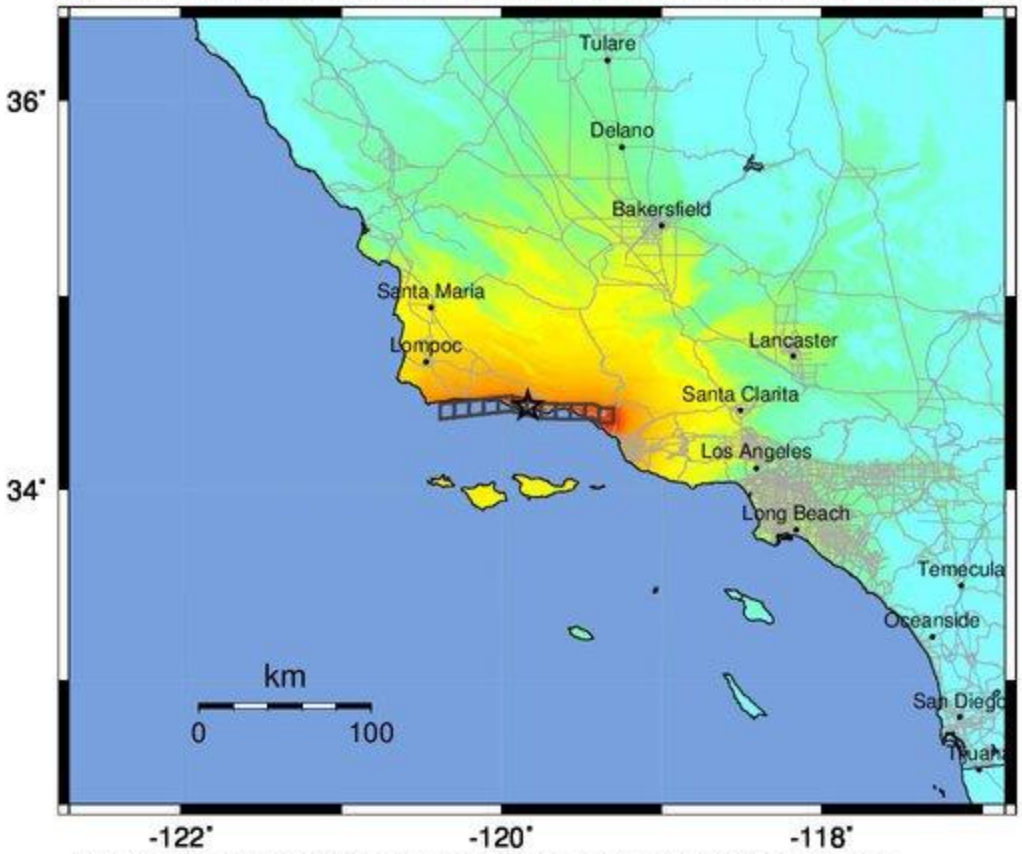
	# of Displaced Households	# of People Needing Short Term Shelter
California		
Fresno	0	0
Inyo	0	0
Kern	0	0
Kings	0	0
Los Angeles	7	3
Monterey	0	0
Orange	0	0
Riverside	0	0
San Benito	0	0
San Bernardino	0	0
San Diego	0	0
San Luis Obispo	0	0
Santa Barbara	5,684	3,207
Tulare	0	0
Ventura	1,283	678
Total	**6,974**	**3,889**
Region Total	**6,974**	**3,889**

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 Red Mountain - Median ground motions Scenario

Scenario Date: May 16, 2017 08:31:54 AM MDT M 7.4 N34.43 W119.84 Depth: 9.0km



PLANNING SCENARIO ONLY -- Map Version 10 Processed 2017-05-17 12:38:57 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)