
Hazus: Earthquake Global Risk Report

Region Name: KlamathGrabenFault

Earthquake Scenario: 843bc_m7p36_se

Print Date: April 17, 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 8 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 29,647.90 square miles and contains 133 census tracts. There are over 187 thousand households in the region which has a total population of 467,769 people. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 215 thousand buildings in the region with a total building replacement value (excluding contents) of 104,876 (millions of dollars). Approximately 89.00 % of the buildings (and 64.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 26,344 and 37,564 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 215 thousand buildings in the region which have an aggregate total replacement value of 104,876 (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 25 hospitals in the region with a total bed capacity of 1,446 beds. There are 365 schools, 262 fire stations, 58 police stations and 8 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 63,908.00 (millions of dollars). This inventory includes over 2,414.03 miles of highways, 1,940 bridges, 82,352.78 miles of pipes.

Table 1: Transportation System Lifeline Inventory

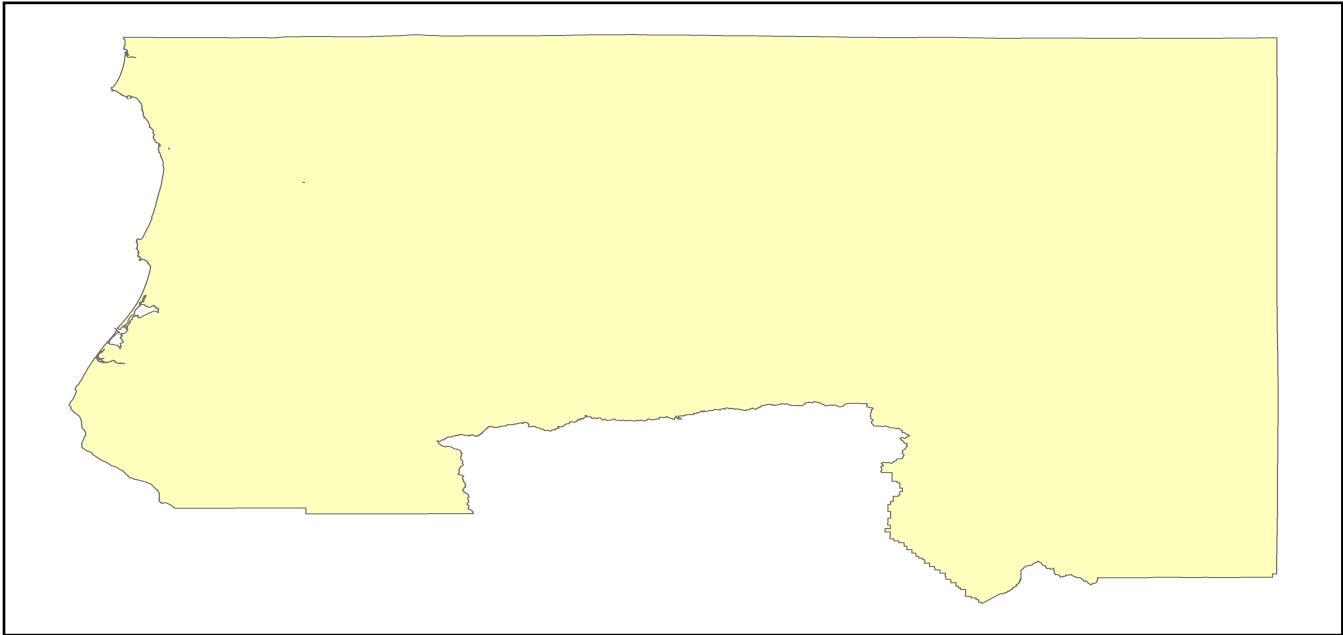
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	1,940	4552.6596
	Segments	468	15620.0492
	Tunnels	3	40.8928
	Subtotal		20213.6016
Railways	Bridges	354	2014.2600
	Facilities	2	5.3260
	Segments	561	3512.3309
	Tunnels	0	0.0000
	Subtotal		5531.9169
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	5	11.3696
	Subtotal		11.3696
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	23	87.6724
	Subtotal		87.6724
Airport	Facilities	46	254.7422
	Runways	47	245.5996
	Subtotal		500.3418
		Total	26,344.90

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	1646.5844
	Facilities	3	117.8820
	Pipelines	0	0.0000
		Subtotal	1764.4664
Waste Water	Distribution Lines	NA	987.9506
	Facilities	28	4814.6504
	Pipelines	0	0.0000
		Subtotal	5802.6010
Natural Gas	Distribution Lines	NA	658.6338
	Facilities	2	82.4870
	Pipelines	61	2844.6487
		Subtotal	3585.7695
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	61	26402.9127
		Subtotal	26402.9127
Communication	Facilities	70	8.2600
		Subtotal	8.2600
	Total		37,564.00

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	843bc_m7p36_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	7.36
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 43 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 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

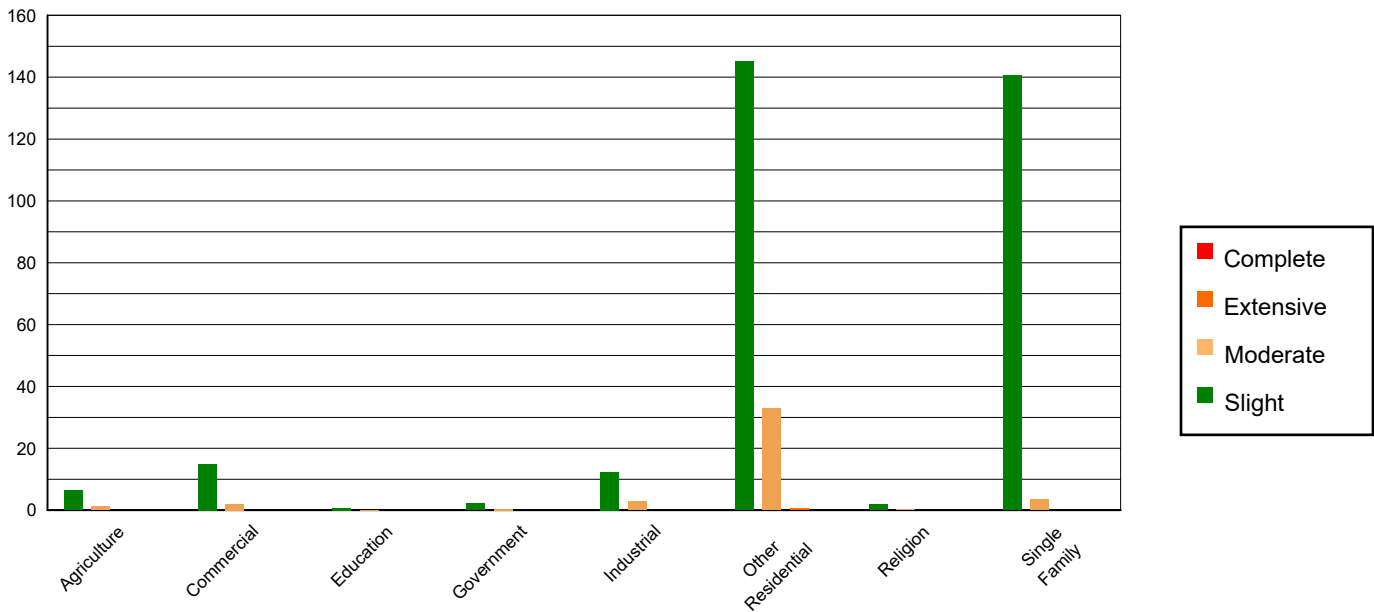


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4286.47	1.99	6.44	1.99	1.08	2.52	0.02	2.23	0.00	0.00
Commercial	14340.05	6.67	14.91	4.60	2.02	4.71	0.02	3.36	0.00	0.00
Education	481.25	0.22	0.68	0.21	0.07	0.17	0.00	0.04	0.00	0.00
Government	524.47	0.24	2.17	0.67	0.36	0.84	0.00	0.55	0.00	0.00
Industrial	2761.80	1.28	12.38	3.82	2.78	6.50	0.04	5.97	0.00	0.00
Other Residential	48791.38	22.68	145.15	44.78	32.88	76.90	0.59	87.72	0.00	100.00
Religion	487.01	0.23	1.81	0.56	0.18	0.41	0.00	0.14	0.00	0.00
Single Family	143413.97	66.68	140.63	43.38	3.40	7.95	0.00	0.00	0.00	0.00
Total	215,086		324		43		1		0	

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

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	171324.37	79.65	166.48	51.36	4.03	9.42	0.00	0.00	0.00	0.00
Steel	5362.48	2.49	15.01	4.63	4.33	10.13	0.11	16.47	0.00	17.17
Concrete	5450.30	2.53	8.53	2.63	1.06	2.47	0.08	11.40	0.00	64.98
Precast	3386.92	1.57	6.59	2.03	1.41	3.31	0.01	2.04	0.00	0.00
RM	6853.35	3.19	6.47	2.00	1.10	2.57	0.01	0.94	0.00	0.00
URM	461.02	0.21	1.63	0.50	0.36	0.85	0.02	2.99	0.00	17.85
MH	22247.97	10.34	119.45	36.85	30.46	71.24	0.45	66.17	0.00	0.00
Total	215,086		324		43		1		0	

*Note:

- RM Reinforced Masonry
- URM Unreinforced Masonry
- MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 1,446 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,444 hospital beds (100.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service. By 30 days, 100.00% 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	25	0	0	25
Schools	365	8	0	357
EOCs	8	0	0	8
PoliceStations	58	0	0	56
FireStations	262	0	0	260

Transportation Lifeline Damage

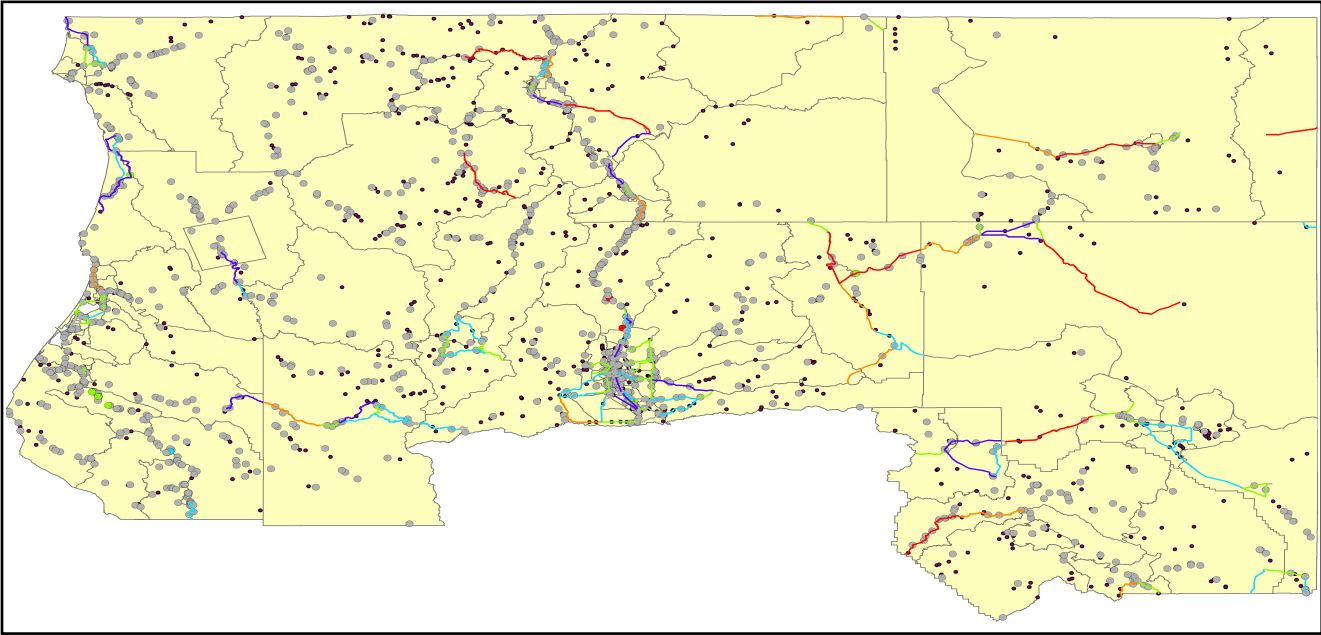


Table 6: Expected Damage to the Transportation Systems

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	468	0	0	468	468
	Bridges	1,940	0	0	1,940	1,940
	Tunnels	3	0	0	3	3
Railways	Segments	561	0	0	561	561
	Bridges	354	0	0	354	354
	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	5	0	0	5	5
Ferry	Facilities	0	0	0	0	0
Port	Facilities	23	0	0	23	23
Airport	Facilities	46	0	0	46	46
	Runways	47	0	0	47	47

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	28	0	0	27	28
Natural Gas	2	0	0	2	2
Oil Systems	0	0	0	0	0
Electrical Power	61	0	0	61	61
Communication	70	0	0	70	70

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

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	51,157	256	64
Waste Water	30,694	129	32
Natural Gas	502	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	187,410	0	0	0	0	0
Electric Power		0	0	0	0	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 0 tons of debris will be generated. Of the total amount, Brick/Wood comprises 51.00% 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 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

<u>Earthquake Debris (millions of tons)</u>			
<u>Brick/ Wood</u>	<u>Reinforced Concrete/Steel</u>	<u>Total Debris</u>	<u>Truck Load</u>
0.00	0.00	0.00	0 (@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 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 467,769) will seek temporary shelter in public shelters.

<u>Displaced Households/ Persons Seeking Short Term Public Shelter</u>	
<u>Displaced households as a result of the earthquake</u>	<u>Persons seeking temporary public shelter</u>
0	0

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	0.00	0.00	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	0.01	0.00	0.00	0.00
	Other-Residential	0.33	0.02	0.00	0.00
	Single Family	0.16	0.00	0.00	0.00
	Total	0	0	0	0
2 PM	Commercial	0.20	0.01	0.00	0.00
	Commuting	0.01	0.01	0.02	0.00
	Educational	0.06	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.04	0.00	0.00	0.00
	Other-Residential	0.12	0.01	0.00	0.00
	Single Family	0.06	0.00	0.00	0.00
	Total	0	0	0	0
5 PM	Commercial	0.13	0.01	0.00	0.00
	Commuting	0.13	0.16	0.29	0.06
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.03	0.00	0.00	0.00
	Other-Residential	0.12	0.01	0.00	0.00
	Single Family	0.06	0.00	0.00	0.00
	Total	0	0	0	0

Economic Loss

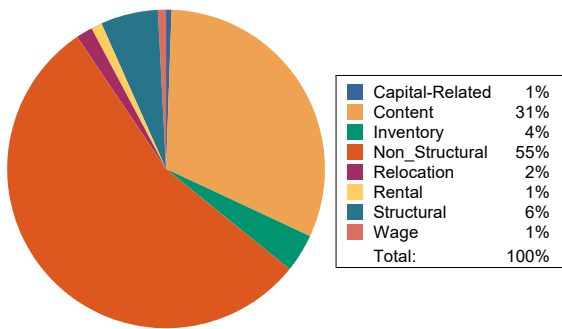
The total economic loss estimated for the earthquake is 111.70 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

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 16.70 (millions of dollars); 4 % 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 35 % 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)

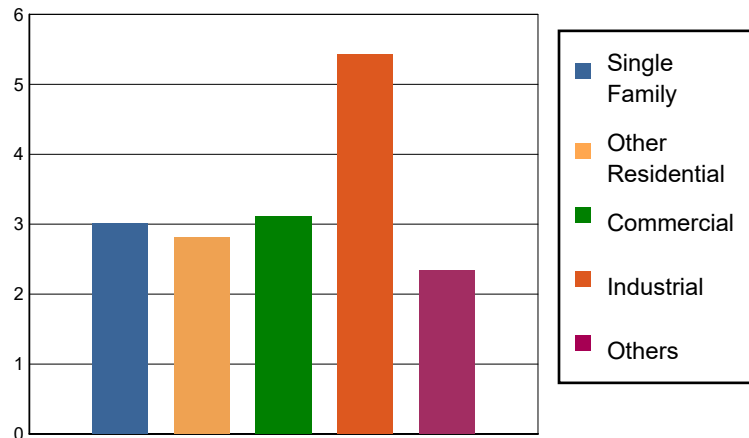


Table 11: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0011	0.0605	0.0384	0.0272	0.1272
	Capital-Related	0.0000	0.0005	0.0867	0.0232	0.0036	0.1140
	Rental	0.0144	0.0554	0.0731	0.0266	0.0107	0.1802
	Relocation	0.0223	0.0869	0.0492	0.0615	0.0399	0.2598
	Subtotal	0.0367	0.1439	0.2695	0.1497	0.0814	0.6812
Capital Stock Losses							
	Structural	0.2083	0.2248	0.1309	0.2821	0.1589	1.0050
	Non_Structural	1.8866	1.8786	1.5856	2.6733	1.1056	9.1297
	Content	0.8754	0.5579	1.0418	2.0284	0.7276	5.2311
	Inventory	0.0000	0.0000	0.0871	0.2983	0.2679	0.6533
	Subtotal	2.9703	2.6613	2.8454	5.2821	2.2600	16.0191
	Total	3.01	2.81	3.11	5.43	2.34	16.70

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	15620.0492	0.0000	0.00
	Bridges	4552.6596	0.7972	0.02
	Tunnels	40.8928	0.0000	0.00
	Subtotal	20213.6016	0.7972	
Railways	Segments	3512.3309	0.0000	0.00
	Bridges	2014.2600	2.2051	0.11
	Tunnels	0.0000	0.0000	0.00
	Facilities	5.3260	0.0285	0.54
	Subtotal	5531.9169	2.2336	
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	11.3696	0.0317	0.28
	Subtotal	11.3696	0.0317	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	87.6724	0.0938	0.11
	Subtotal	87.6724	0.0938	
Airport	Facilities	254.7422	2.3285	0.91
	Runways	245.5996	0.0000	0.00
	Subtotal	500.3418	2.3285	
	Total	26,344.90	5.48	

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	1646.5844	1.1529	0.07
	Subtotal	1764.4664	1.1541	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	4814.6504	18.5330	0.38
	Distribution Lines	987.9506	0.5791	0.06
	Subtotal	5802.6010	19.1121	
Natural Gas	Pipelines	2844.6487	0.0000	0.00
	Facilities	82.4870	0.7329	0.89
	Distribution Lines	658.6338	0.1984	0.03
	Subtotal	3585.7695	0.9313	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	26402.9127	68.3103	0.26
	Subtotal	26402.9127	68.3103	
Communication	Facilities	8.2600	0.0027	0.03
	Subtotal	8.2600	0.0027	
	Total	37,564.01	89.51	

Appendix A: County Listing for the Region

Del Norte,CA

Humboldt,CA

Lassen,CA

Modoc,CA

Plumas,CA

Shasta,CA

Siskiyou,CA

Trinity,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California	Del Norte	27,743	5,004	1,876	6,881
	Humboldt	136,463	19,361	8,683	28,044
	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
	Siskiyou	44,076	6,856	4,758	11,615
	Trinity	16,112	2,209	1,485	3,694
Total Region		467,769	66,598	38,269	104,873

Building Inspection Tagging (Counts)

Total Economic Loss
Total:

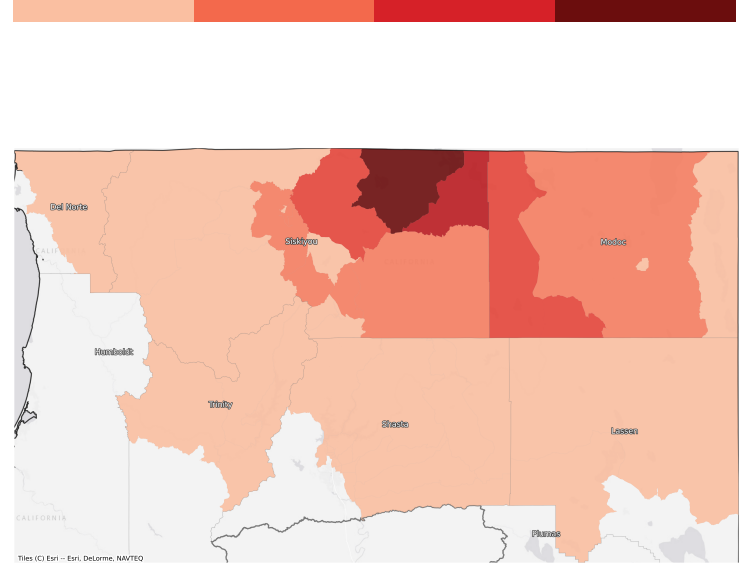
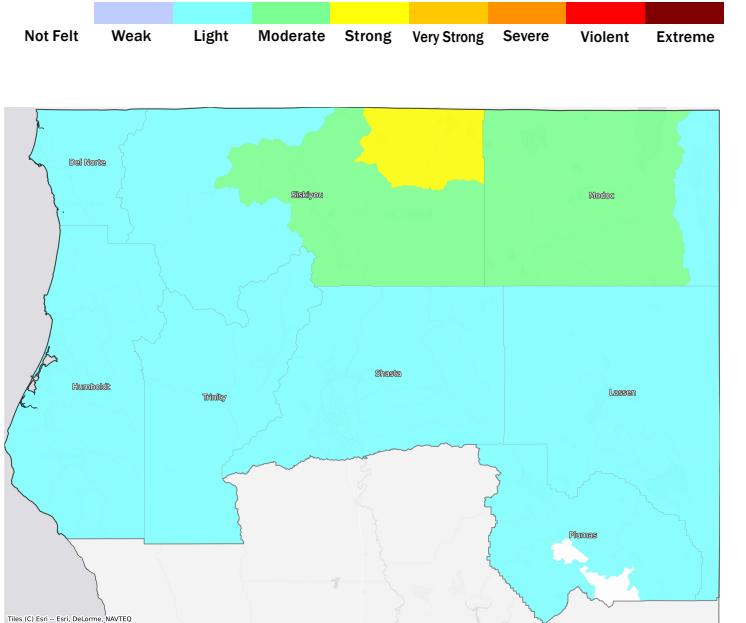
Top Counties	State	Total

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

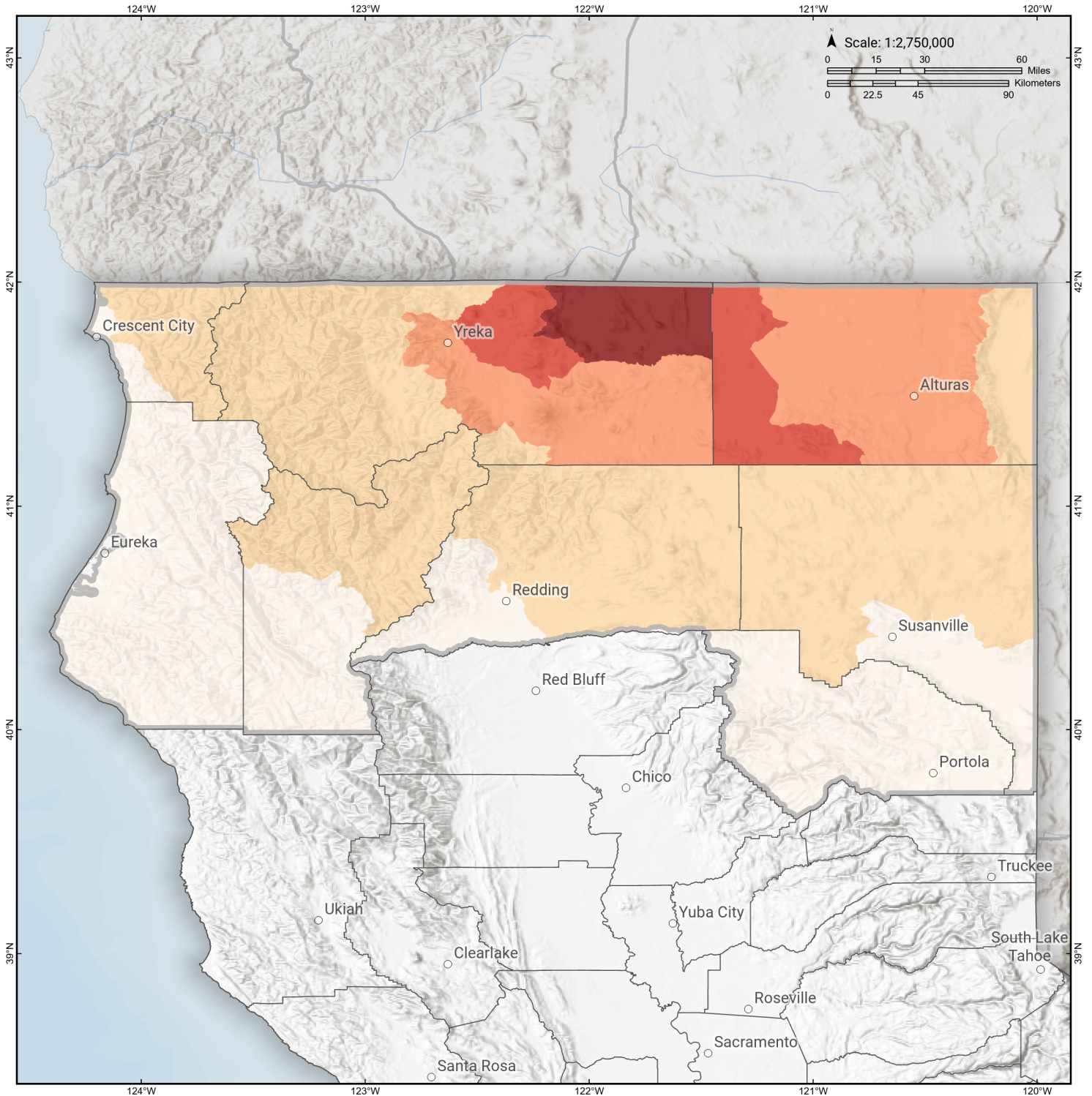
Economic Impacts by Census Tract

Ground Shaking

Debris
**Total Tons:
Total Truckloads:**

Type	Tons

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.

Klamath graben fault system (east)

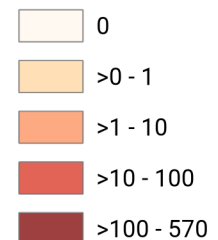
Debris Generated by Census Tract



Study Region: Klamath graben fault system (east)
Scenario: 843bc_m7p36_se



Debris Generated (in tons)



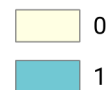
Klamath graben fault system (east)

Displaced Households by Census Tract



Study Region: Klamath graben fault system (east)
Scenario: 843bc_m7p36_se

Displaced Households



Klamath graben fault system (east)

Loss Ratio by Census Tract



Study Region: Klamath graben fault system (east)

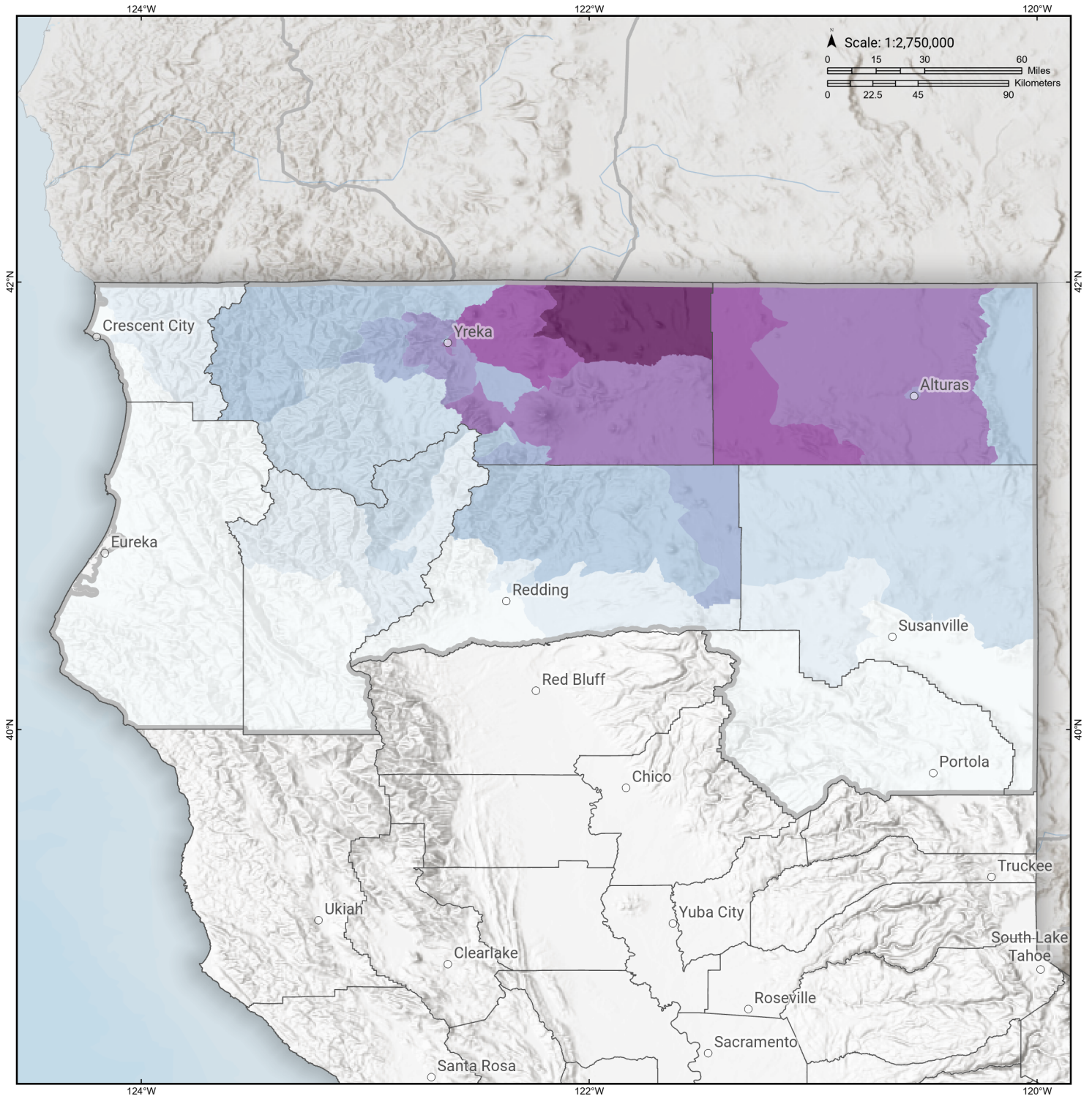
Scenario: 843bc_m7p36_se

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



Klamath graben fault system (east)

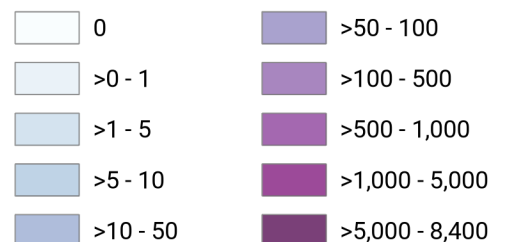
Total Building Related Economic Loss by Census Tract



Study Region: Klamath graben fault system (east)
Scenario: 843bc_m7p36_se



Economic Loss (in thousands of USD \$)



Building Damage by Count by General Occupancy

April 17, 2024

	# of Buildings					Total
	None	Slight	Moderate	Extensive	Complete	
California						
Del Norte						
<i>Agriculture</i>	134	0	0	0	0	134
<i>Commercial</i>	729	0	0	0	0	729
<i>Education</i>	31	0	0	0	0	31
<i>Government</i>	18	0	0	0	0	18
<i>Industrial</i>	61	0	0	0	0	61
<i>Religion</i>	53	0	0	0	0	53
<i>Other Residential</i>	3,861	0	0	0	0	3,861
<i>Single Family</i>	6,117	0	0	0	0	6,117
Humboldt						
<i>Agriculture</i>	150	0	0	0	0	150
<i>Commercial</i>	3,118	0	0	0	0	3,118
<i>Education</i>	127	0	0	0	0	127
<i>Government</i>	87	0	0	0	0	87
<i>Industrial</i>	740	0	0	0	0	740
<i>Religion</i>	61	0	0	0	0	61
<i>Other Residential</i>	12,058	0	0	0	0	12,058
<i>Single Family</i>	38,359	0	0	0	0	38,359
Lassen						

	# of Buildings					Total
	None	Slight	Moderate	Extensive	Complete	
<i>Agriculture</i>	37	0	0	0	0	37
<i>Commercial</i>	913	0	0	0	0	913
<i>Education</i>	40	0	0	0	0	40
<i>Government</i>	22	0	0	0	0	22
<i>Industrial</i>	140	0	0	0	0	140
<i>Religion</i>	71	0	0	0	0	71
<i>Other Residential</i>	2,627	0	0	0	0	2,627
<i>Single Family</i>	9,562	0	0	0	0	9,562
Modoc						
<i>Agriculture</i>	447	2	0	0	0	449
<i>Commercial</i>	531	1	0	0	0	532
<i>Education</i>	20	0	0	0	0	20
<i>Government</i>	16	0	0	0	0	16
<i>Industrial</i>	75	0	0	0	0	76
<i>Religion</i>	36	0	0	0	0	36
<i>Other Residential</i>	1,976	17	1	0	0	1,994
<i>Single Family</i>	3,737	3	0	0	0	3,740
Plumas						
<i>Agriculture</i>	84	0	0	0	0	84
<i>Commercial</i>	1,215	0	0	0	0	1,215
<i>Education</i>	26	0	0	0	0	26
<i>Government</i>	45	0	0	0	0	45
<i>Industrial</i>	184	0	0	0	0	184
<i>Religion</i>	30	0	0	0	0	30
<i>Other Residential</i>	5,032	0	0	0	0	5,032

		# of Buildings					
		None	Slight	Moderate	Extensive	Complete	Total
Shasta	<i>Single Family</i>	9,877	0	0	0	0	9,877
	<i>Agriculture</i>	3,235	0	0	0	0	3,235
	<i>Commercial</i>	5,254	0	0	0	0	5,254
	<i>Education</i>	136	0	0	0	0	136
	<i>Government</i>	87	0	0	0	0	87
	<i>Industrial</i>	1,038	0	0	0	0	1,038
	<i>Religion</i>	66	0	0	0	0	66
	<i>Other Residential</i>	16,949	0	0	0	0	16,949
Siskiyou	<i>Single Family</i>	51,815	0	0	0	0	51,815
	<i>Agriculture</i>	196	4	1	0	0	201
	<i>Commercial</i>	1,575	14	2	0	0	1,591
	<i>Education</i>	75	1	0	0	0	76
	<i>Government</i>	241	2	0	0	0	244
	<i>Industrial</i>	465	12	3	0	0	480
	<i>Religion</i>	125	2	0	0	0	127
	<i>Other Residential</i>	4,934	128	32	1	0	5,095
Trinity	<i>Single Family</i>	17,653	138	3	0	0	17,794
	<i>Agriculture</i>	4	0	0	0	0	4
	<i>Commercial</i>	1,005	0	0	0	0	1,005
	<i>Education</i>	26	0	0	0	0	26
	<i>Government</i>	8	0	0	0	0	8
	<i>Industrial</i>	58	0	0	0	0	58

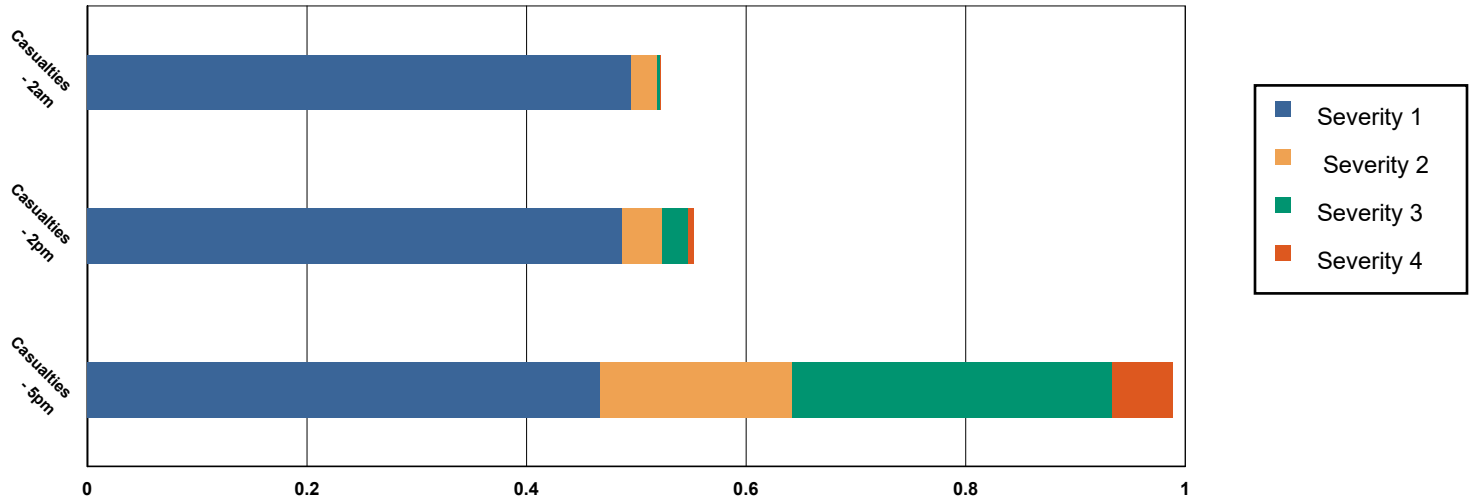
	# of Buildings					Total
	None	Slight	Moderate	Extensive	Complete	
<i>Religion</i>	45	0	0	0	0	45
<i>Other Residential</i>	1,354	0	0	0	0	1,354
<i>Single Family</i>	6,294	0	0	0	0	6,294
Total	215,086	324	43	1	0	215,454
Region Total	215,086	324	43	1	0	215,454

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

April 17, 2024

Region Total Casualties



Injury Severity Level

Severity 1	Severity 2	Severity 3	Severity 4	Total
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California

Del Norte

Casualties - 2am

	Severity 1	Severity 2	Severity 3	Severity 4	Total
<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

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Del Norte					
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
Humboldt					
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
Lassen					
Casualties - 2am					
<i>Commuting</i>	0	0	0	0	0

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Lassen					
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
Modoc					
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					
Modoc					
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
Plumas					
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					
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
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
Siskiyou					
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

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Siskiyou					
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	1
Casualties - 5pm					
<i>Commuting</i>	0	0	0	0	1
<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	1
Trinity					
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

	Injury Severity Level				Total
	Severity 1	Severity 2	Severity 3	Severity 4	
California					
Trinity					
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



April 17, 2024

All values are in thousands of tons.

	Brick, Wood & Others	Concrete & Steel	Total
California			
Del Norte	0	0	0
Humboldt	0	0	0
Lassen	0	0	0
Modoc	0	0	0
Plumas	0	0	0
Shasta	0	0	0
Siskiyou	0	0	1
Trinity	0	0	0
Total	1	0	1
Region Total	1	0	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.

Direct Economic Losses For Buildings

April 17, 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										
Humboldt	0	0	0	0	0.00	0	0	0	0	0
Del Norte	0	0	0	0	0.00	0	0	0	0	0
Plumas	0	0	0	0	0.00	0	0	0	0	0
Shasta	0	28	20	4	0.00	0	0	0	0	52
Siskiyou	955	8,489	4,813	522	0.08	254	111	125	176	15,444
Trinity	0	2	1	0	0.00	0	0	0	0	3
Modoc	50	611	397	127	0.02	6	3	2	5	1,201
Lassen	0	1	1	0	0.00	0	0	0	0	2

	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	
Total	1,005	9,130	5,231	653	0.01	260	114	127	180	16,702
Region Total	1,005	9,130	5,231	653	0.01	260	114	127	180	16,702

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

April 17, 2024

All values are in thousands of dollars

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
California								
Del Norte								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	2	4	0	17	24
Total	0	0	0	2	4	0	17	24
Humboldt								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	5	90	0	49	143
Total	0	0	0	5	90	0	49	143
Lassen								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	79	79

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	0	0	0	0	0	0	79	79
Modoc								
Segments	0	0	0					0
Bridges	41	922	0					963
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	842	842
Total	41	922	0	0	0	0	842	1,805
Plumas								
Segments	0	0	0					0
Bridges	0	0	0					0
Tunnels	0	0	0					0
Facilities		0	0	0	0	0	17	17
Total	0	0	0	0	0	0	17	17
Shasta								
Segments	0	0	0					0
Bridges	1	0	0					1
Tunnels	0	0	0					0
Facilities		3	0	2	0	0	71	76
Total	1	3	0	2	0	0	71	77
Siskiyou								
Segments	0	0	0					0
Bridges	755	1,283	0					2,038
Tunnels	0	0	0					0
Facilities		26	0	22	0	0	1,226	1,273

	Highway	Railway	Light Rail	Bus Facility	Ports	Ferries	Airport	Total
Total	755	1,309	0	22	0	0	1,226	3,311
Trinity								
<i>Segments</i>	0	0	0					0
<i>Bridges</i>	0	0	0					0
<i>Tunnels</i>	0	0	0					0
<i>Facilities</i>		0	0	0	0	0	28	28
Total	0	0	0	0	0	0	28	28
Total	797	2,234	0	32	94	0	2,328	5,485
Region Total	797	2,234	0	32	94	0	2,328	5,485

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

April 17, 2024

All values are in thousands of dollars

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
California							
Del Norte							
<i>Facilities</i>	0	3	0	0	0	0	3
<i>Pipelines</i>	9	4	0	0			13
Total	9	7	0	0	0	0	15
Humboldt							
<i>Facilities</i>	0	26	0	0	96	0	122
<i>Pipelines</i>	35	18	0	0			53
Total	35	44	0	0	96	0	175
Lassen							
<i>Facilities</i>	0	3	0	0	952	0	954
<i>Pipelines</i>	56	28	0	0			84
Total	56	31	0	0	952	0	1,039
Modoc							
<i>Facilities</i>	0	123	0	658	0	0	781

	Potable Water	Waste Water	Oil Systems	Natural Gas	Electric Power	Communication	Total
<i>Pipelines</i>	196	99	0	0			295
Total	196	222	0	658	0	0	1,076
Plumas							
<i>Facilities</i>	0	3	0	0	340	0	343
<i>Pipelines</i>	22	11	0	0			32
Total	22	13	0	0	340	0	375
Shasta							
<i>Facilities</i>	1	141	0	75	35,873	1	36,091
<i>Pipelines</i>	93	47	0	0			139
Total	94	188	0	75	35,873	1	36,230
Siskiyou							
<i>Facilities</i>	0	18,235	0	0	30,701	1	48,938
<i>Pipelines</i>	719	361	0	0			1,080
Total	719	18,597	0	0	30,701	1	50,018
Trinity							
<i>Facilities</i>	0	0	0	0	347	0	347
<i>Pipelines</i>	24	12	0	0			36
Total	24	12	0	0	347	0	383
Total	1,154	19,112	0	733	68,310	3	89,312
Region Total	1,154	19,112	0	733	68,310	3	89,312

Potable Water

Waste Water

Oil Systems

Natural Gas

Electric Power

Communication

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.

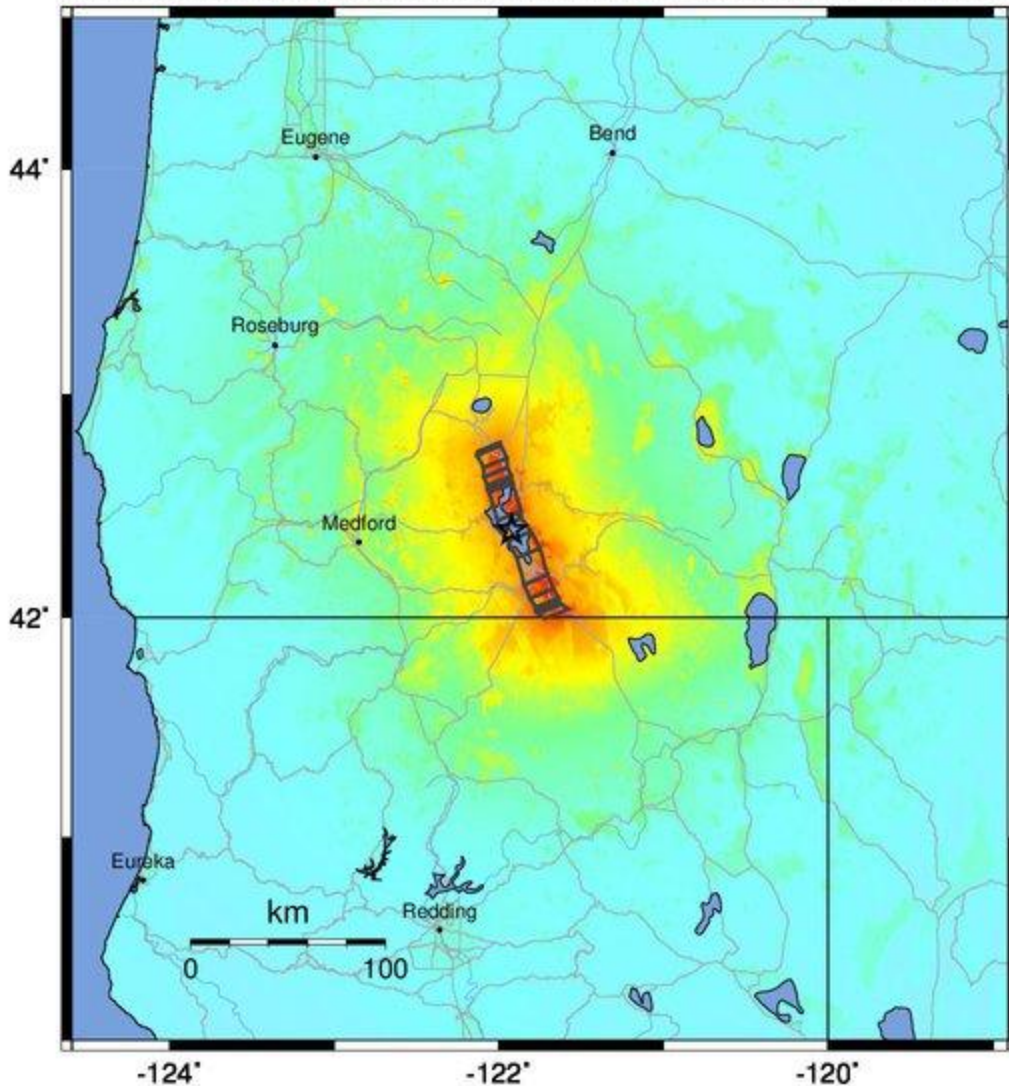
Shelter Summary Report

April 17, 2024

	# of Displaced Households	# of People Needing Short Term Shelter
California		
Del Norte	0	0
Humboldt	0	0
Lassen	0	0
Modoc	0	0
Plumas	0	0
Shasta	0	0
Siskiyou	0	0
Trinity	0	0
Total	0	0
Region Total	0	0

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 Klamath graben fault system (east) - Median ground motions Scenario
 Scenario Date: May 12, 2017 02:14:08 PM MDT M 7.4 N42.40 W121.92 Depth: 9.0km



-124° -122° -120°
 PLANNING SCENARIO ONLY -- Map Version 3 Processed 2017-05-16 01:01:53 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)