

Insights and tools that insurance agents
can use to help their Nevada clients
understand the earthquake hazard,
anticipate potential earthquake damage,
and make informed decisions.

Nevada Earthquake Guide for Insurance Agents

Prepared by CREW.org
September 2025

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and

Nevada Office of Emergency Management / Homeland Security



*Funding for this publication was provided by an FY2024 grant from
FEMA: National Earthquake Hazards Reduction Program*



FEMA



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Part I. Know Your Earthquake Hazard

1 | Nevada's Earthquake Hazard

What's the Difference Between Hazard and Risk?

The term “**hazard**” refers to the presence of active earthquake faults that will cause the ground to shake when the fault moves suddenly (known as fault “slip” or “rupture”). The hazard is present whether or not people live within the area that will be affected by ground shaking.

“**Risk**” refers to the potential consequences of ground-shaking for people and the structures they build within an earthquake hazard area.

So, if a building or other structure was built in an earthquake hazard area, it is at risk. How high the risk is—and how serious the damage caused by an earthquake—will depend on a number of factors, most notably:

- The strength of earthquake shaking.
- The type of ground the structure was built on.
- The design of the structure.
- Any retrofitting that may have been done to improve an existing structure's ability to withstand the effects of shaking.
- The measures taken to secure furnishings and other non-structural parts of the building to prevent them from moving, falling, or breaking during an earthquake.



Chimney damaged by the 2008 Wells earthquake (Photo: Nevada Bureau of Mines and Geology Special Publication 36, 2011)

Where Do Earthquakes Occur in Nevada?

Types of Earthquakes in Nevada

Large, potentially damaging earthquakes have occurred in western and central Nevada in the last 150 years and can occur anywhere in the state.

- The highest earthquake hazard is in western Nevada, but Nevada has a history of earthquakes in the central and eastern parts of the state as well.
- Nevada is the third most seismically active state in the US, after California and Alaska.

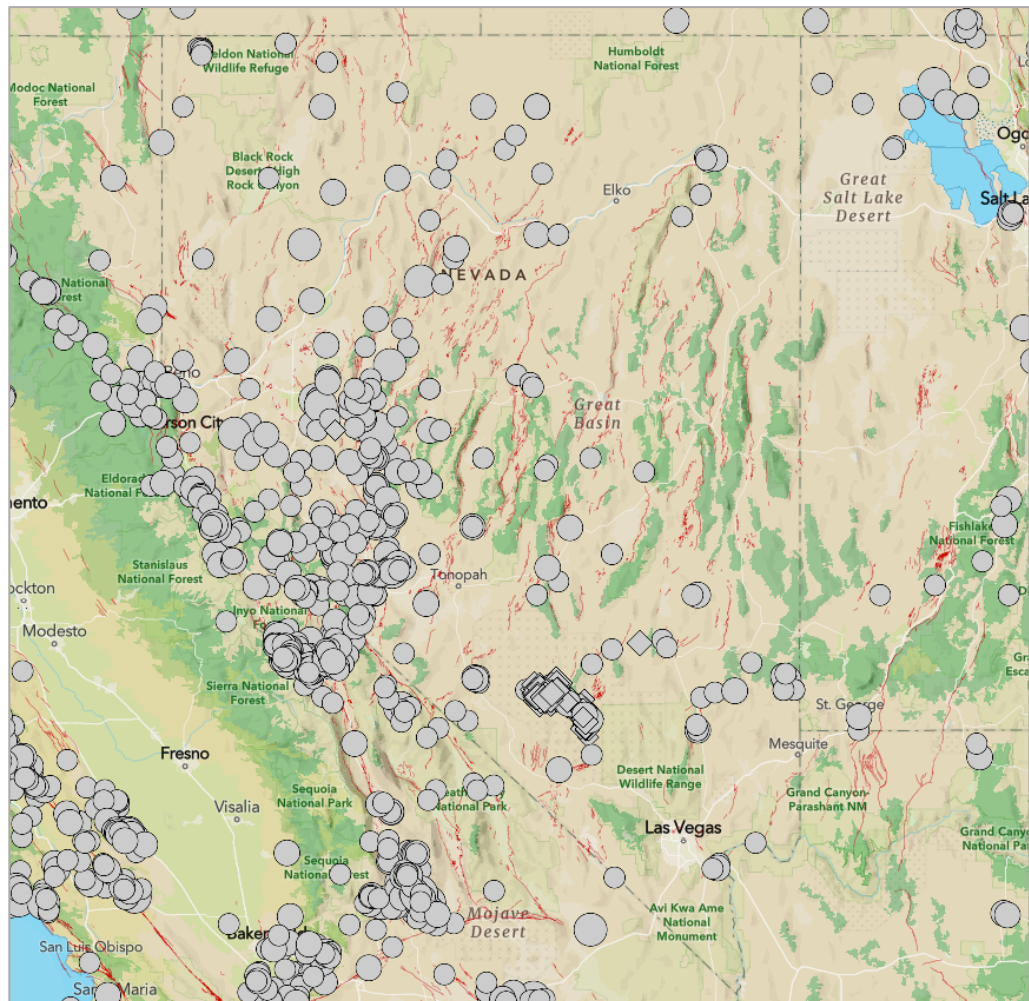
- Between 1850 and 1954, Nevada experienced more significant earthquake activity than it has in the years since 1954, but no one can predict when this recent “seismically quiet” period will end. Meanwhile, Nevada’s population—and exposure to the earthquake hazard—has increased.
- Most of the faults beneath Nevada are “normal” faults, while a few are what geologists call “strike-slip” faults (*learn more about [fault types at the U.S. Geological Survey website](#)*).

Aftershocks. The main shock of an earthquake is followed by aftershocks, which vary in size and typically continue over a period of months. Some aftershocks may be strong enough to cause additional damage; in certain cases, an aftershock may be more damaging than the main shock.

Right: Map of Nevada, showing past earthquakes of magnitude 4.5 and above, from 1915 to 2025.

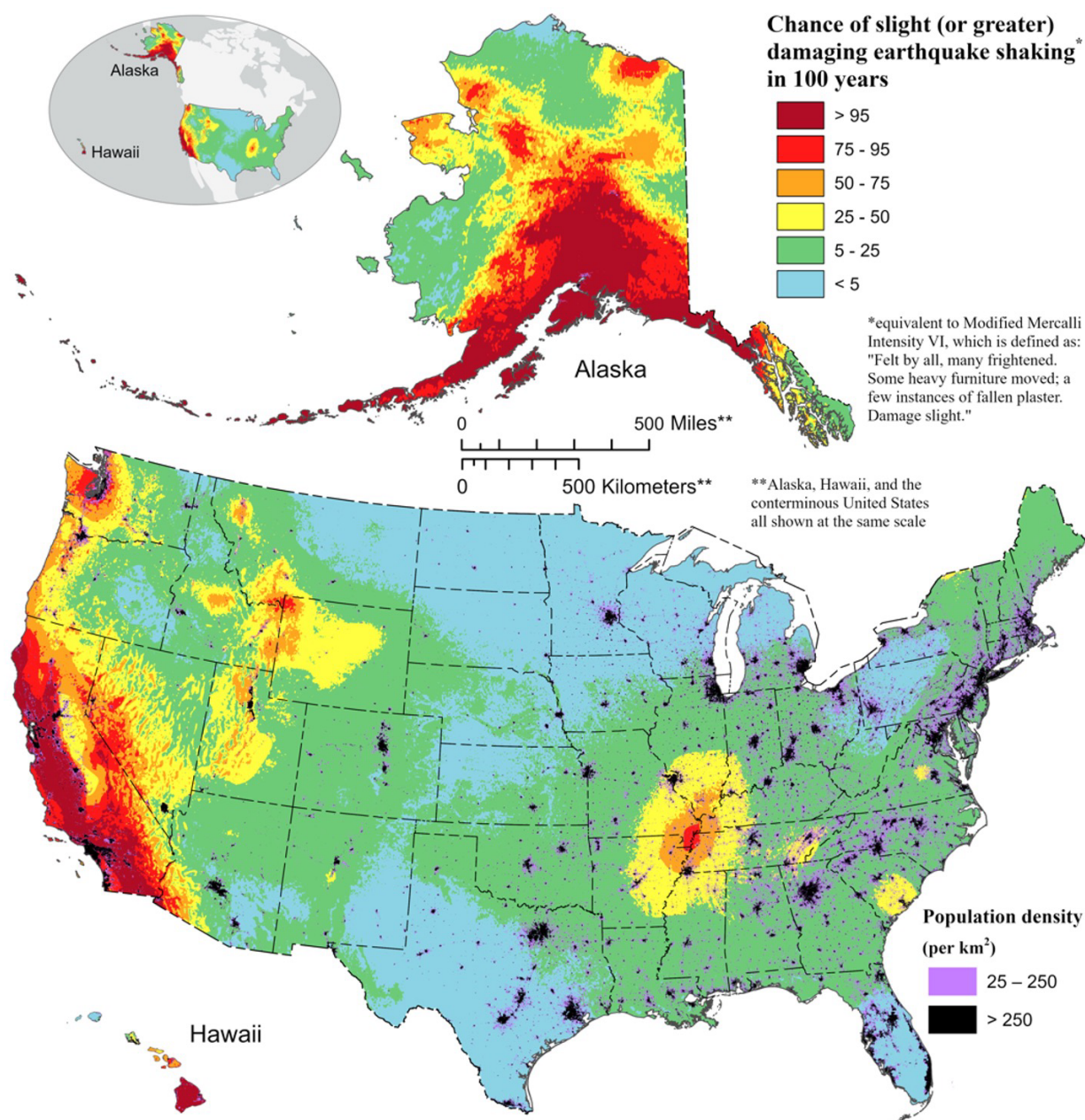
Grey circles indicate natural earthquakes; diamonds mark human-caused explosions; and short red lines indicate active faults.

(Source: US Geological Survey, “Latest Earthquakes” interactive map)



Modeling the Earthquake Hazard in Nevada

It isn't possible to predict where a fault will rupture or when an earthquake will occur, but modeling based on geologic evidence and research can help define the hazard and shed light on potential ground shaking in different regions. The map below comes from the [2023 update of the US National Seismic Hazard Model](#). Color-coding indicates the chance that damaging shaking (measuring VI or above on the [Modified Mercalli Intensity scale](#)) will occur over the next 100 years. The National Seismic Hazard Model is produced using the best available science and is regularly updated to incorporate new discoveries and the latest research.



What Are the Odds?

Earthquakes cannot be predicted, so geologists use the best available scientific data to estimate the chances of earthquake shaking—of varying strengths and frequencies—within specified timeframes in different places across the United States. The results are then used to produce National Seismic Hazard Maps. Most probability estimates are based on the average rate of earthquakes over long periods of time in the mapped locations.

For More Information....

- [Earthquakes and Other Geologic Hazards webpage](#) | Nevada Bureau of Mines and Geology, University of Nevada, Reno
- [MyHAZARDS - Nevada interactive map](#) | Nevada Bureau of Mines and Geology, University of Nevada, Reno
- [Nevada Seismological Laboratory website](#) | University of Nevada, Reno
- [Nevada Earthquake Clearinghouse](#) | Nevada Bureau of Mines and Geology, University of Nevada, Reno

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2 | Examples of Damaging Earthquakes in Nevada

1915 Pleasant Valley Earthquake

Preceded by rumbling foreshocks, this magnitude 6.8 earthquake occurred south of Winnemucca in central Nevada and was the largest earthquake ever recorded in the state. It threw people out of bed, shattered windows, and caused a number of walls and buildings in the zone nearest the fault to collapse. Damaged chimneys and cracked walls were reported over a much wider area of central Nevada. The shaking was felt throughout most of the central and northern parts of the state.

The 1915 Pleasant Valley earthquake occurred about 50 miles south of I-80, in a region where mining activity and population have increased substantially since the mid-20th century, which in turn increases the risk associated with future, similar earthquakes.

1954 Earthquake Sequence

A series of earthquakes occurred east of Fallon, Nevada, over the course of six months in 1954. The sequence included several earthquakes measuring magnitude (M) 6.0 and greater. Among the most notable was the Rainbow Mountain M6.2 earthquake, which was felt as far away as California, Idaho, Oregon, and Utah. It severely damaged a number of concrete-block and unreinforced brick buildings in Fallon and caused many brick chimneys to fall. The earthquake sequence culminated in the M7.1 Fairview Peak and M6.9 Dixie Valley earthquakes.

The 1954 earthquakes damaged the Newlands Water Project while it was under construction (learn more: [City of Fernley webpage](#)); if the same damage occurred as a result of earthquake activity today, it would disrupt the water supply of the Fallon area.

2008 Wells Earthquake

In February 2008, a magnitude 5.9 earthquake struck near the town of Wells in northeastern Nevada. Strong ground shaking caused significant damage to buildings in Wells' historic downtown: unreinforced masonry buildings were especially impacted. A few buildings collapsed, in whole or in part, and debris from more than 20 buildings, including collapsed parapets, fallen bricks, and broken glass, littered the sidewalks. Many buildings, including homes, were cracked, and more than 60 chimneys were damaged.

2020 Monte Cristo Range Earthquake

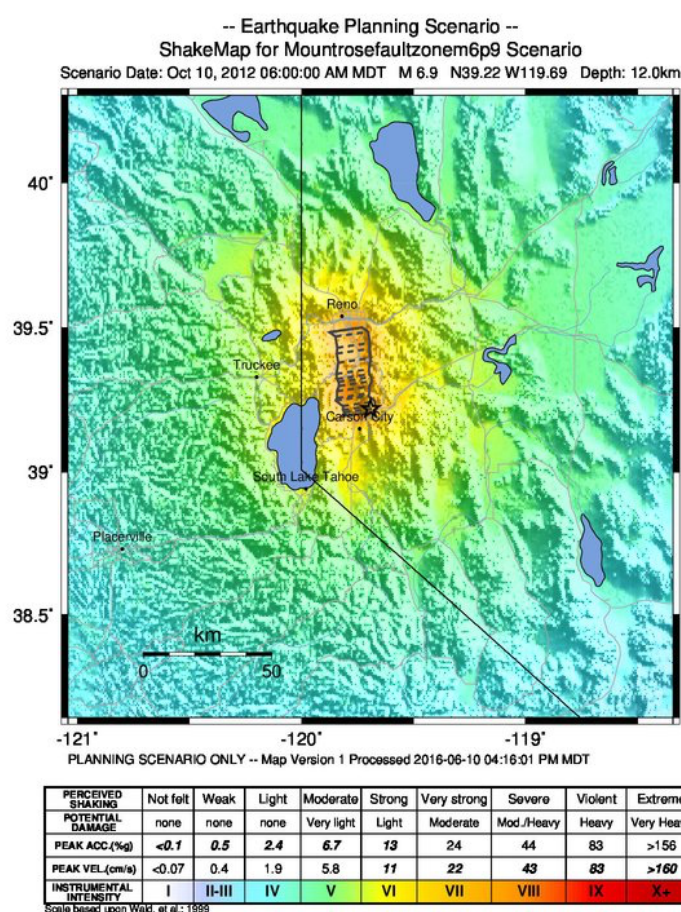
Although this magnitude 6.5 earthquake near the border with California was the largest to strike Nevada in more than 66 years, it caused no injuries and little damage to human-built structures...but only because it occurred in a sparsely populated part of Nevada. The shaking was felt as far west as San Francisco and as far east as Salt Lake City.

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Part II. Earthquake Damage & Costs

3 | Severity of Expected Earthquakes

While it isn't possible to predict when an earthquake will happen, hazard geologists work to identify active earthquake faults, and they study evidence from past earthquakes to understand both what sizes of earthquakes could occur in the future and how likely they are to happen. Geologists also study how different soils and landscapes behave during an earthquake, which can help people anticipate the potential effects of ground shaking in a given place.



Earthquake “scenario” maps are one of the tools that geoscientists create to help people understand and plan for potential earthquakes along a given fault. This [map](#) (left) illustrates a possible scenario for a future magnitude 6.9 earthquake on the Mt. Rose fault zone near Carson City and Reno, Nevada.

Magnitude vs. Intensity

“**Magnitude**” is an objective measure of the size of the earthquake at the site of the fault rupture. When an earthquake occurs, the earthquake’s size is measured by seismographs, and the final number is calculated using a magnitude scale (such as the *moment magnitude scale*). For example, the 2008 Wells, Nevada, earthquake had a magnitude of 6.0.

As a measure, think of magnitude as akin to the watts of a lightbulb: wattage indicates how much energy is used, not how the light that results will illuminate or cast shadows in different spaces of a room. While we may generally expect a larger magnitude earthquake to cause stronger shaking than a smaller one, magnitude is not a measure of the strength of the shaking (“**intensity**”) that people will experience or the amount of damage caused—these factors vary depending on both the local geology (particularly the type of soil) and how near people and

structures are to the source of the earthquake. In the US, an earthquake's intensity is measured using the Modified Mercalli Intensity (MMI) scale: the resulting measurements are subjective (based on local observations of shaking and damage), and they differ from place to place.

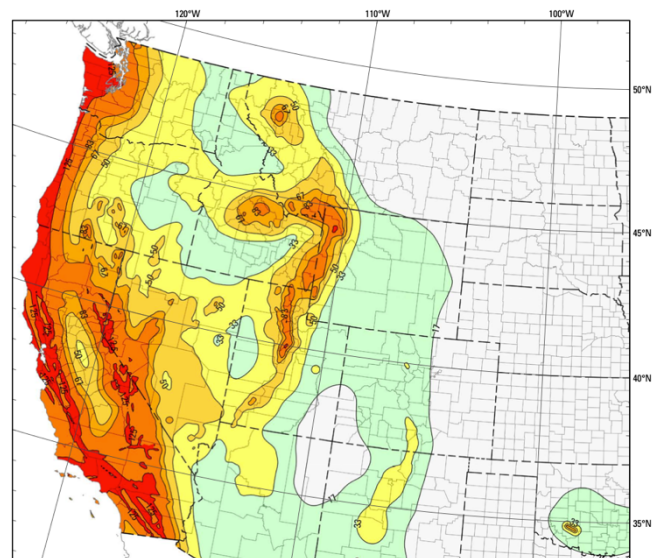
Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

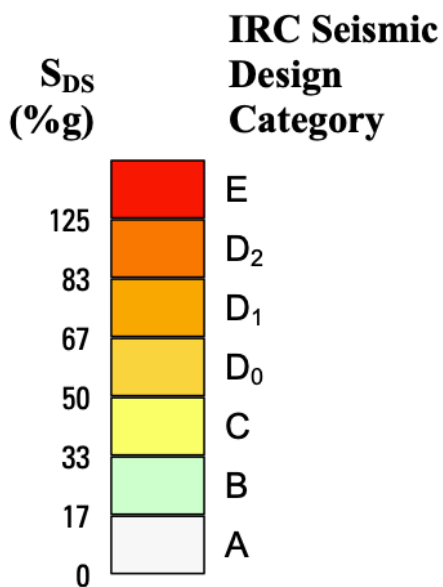
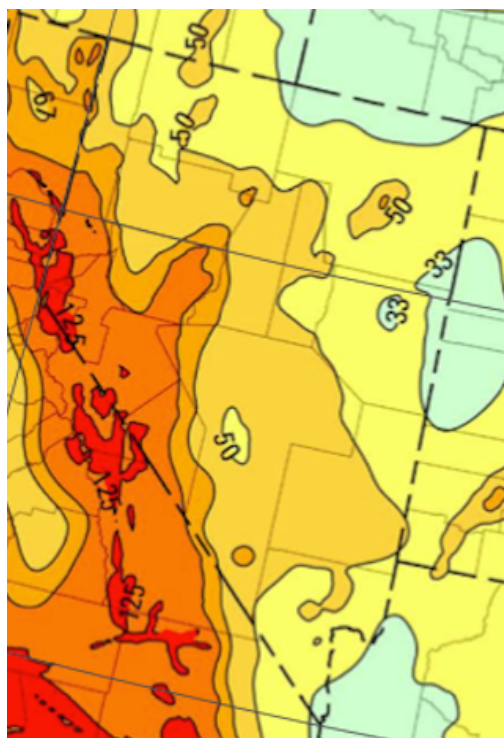
The [Modified Mercalli Intensity scale](#), including abbreviated descriptions of the types and degrees of damage associated with each level. (Source: US Geological Survey)

How Intense Could the Shaking Be Here?

One way to get an idea of the level of possible shaking at a given location is to look up the seismic design category for that area. A **seismic design category map** is a hazard tool that shows building professionals the possible earthquake shaking across each state and territory so that they can take this into account when they design structures.

Right: Seismic Design Category Map for International Residential Code (IRC), showing the seismic design categories for the western United States. (Source: FEMA P-2192-4)





Left: Closeup of Nevada, showing seismic design categories A–E across each county.

(Source: FEMA P-2192-4)

Leaving aside the technical details that building professionals use, a homeowner or renter can use the seismic design categories—A (white) through E (red)—to get an idea of the intensity of earthquake shaking they could experience.

Find Your County

Carson City: D₂ and E

Churchill: D₀, D₁, and D₂

Clark: C and D₀

Douglas: D₂ and E

Elko: B, C, D₀, and D₁

Esmeralda: D₀, D₁, D₂, and E

Eureka: C and D₀

Humboldt: C and D₀

Lander: C, D₀, and D₁

Lincoln: C and D₀

Lyon: D₂ and E

Mineral: D₂ and E

Nye: C, D₀, D₁, and D₂

Pershing: C, D₀, D₁

Storey: D₂ and E

Washoe: C, D₀, D₁, D₂, and E

White Pine: B, C, and D₀

Refer to the table below to see what each letter/color signifies in terms of earthquake shaking and damage.

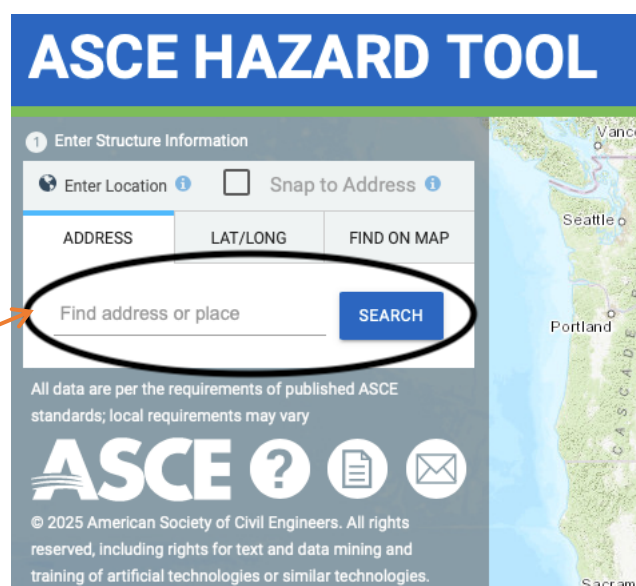
Seismic Design Category / Map Color	Earthquake Hazard	Potential Effects of Shaking	MMI*
A white	Very small probability of experiencing damaging earthquake effects.		
B green	Could experience shaking of moderate intensity.	Moderate shaking —Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.	VI
C yellow	Could experience strong shaking.	Strong shaking —Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built structures.	VII
D D ₀ / gold D ₁ / light orange D ₂ / dark orange	Could experience very strong shaking (the darker the color, the stronger the shaking).	Very strong shaking —Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures.	VIII
E red	Near major active faults capable of producing the most intense shaking.	Strongest shaking —Damage considerable in specially designed structures; frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. Shaking intense enough to completely destroy buildings.	IX

*MMI = [Modified Mercalli Intensity Scale](#)

Find the Seismic Design Category for a Specific Address

Few counties are uniformly one color, so to learn which seismic design category applies at a particular address, go to the [ASCE Hazard Tool](#) online and follow these steps:

Step 1: Type the address into the Address prompt and then click the **SEARCH** button.



Step 2: Under **Requested Data** select the following settings:

- **Standard Version:** ASCE/SEI 7-22
- **Risk Category:** II (for home or ordinary business/office buildings)
- **Site Soil Class:** Default
- **Measurements:** Customary
- **Load Types:** Seismic

Step 3: Click the **VIEW RESULTS** button.

Step 4: Click the **SUMMARY** button; then find the S_{DS} value in the summary chart.

Seismic Data

S_S	0.94
S_1	0.35
S_{MS}	1.15
S_{M1}	0.78
S_{DS}	0.77
S_{D1}	0.62
T_L	16
PGA_M	0.5
V_{S30}	260
Seismic Design Category	D

Step 5: Use the table below to find the seismic design category that corresponds with the S_{DS} value for the address that you entered.

CALCULATED S_{DS}	Seismic Design Category
S_{DS} is less than or equal to 0.17g	A
S_{DS} is greater than 0.17g but less than or equal to 0.33g	B
S_{DS} is greater than 0.33g but less than or equal to 0.50g	C
S_{DS} is greater than 0.50g but less than or equal to 0.67g	D₀
S_{DS} is greater than 0.67g but less than or equal to 0.83g	D₁
S_{DS} is greater than 0.83g but less than or equal to 1.25g	D₂
S_{DS} is greater than 1.25g	E

Table reproduced from [content](https://content.iccsafe.org) at codes.iccsafe.org

For More Information....

- Read about [magnitude vs. intensity](#) at the US Geological Survey (USGS) website.
- Find Nevada earthquake scenarios on the US Geological Survey (USGS) website: [earthquake scenarios webpage](#) | [interactive scenarios map](#)

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4 | Anticipating Earthquake Damage

Common Forms of Earthquake Damage

- **Broken Personal Property and Inventory.** Shaking can knock items off shelves and out of cupboards and cabinets; items that fall may break or may damage whatever they fall against. Appliances, bookcases, and other unanchored furniture may move or overturn.
- **Damage to Fixtures and Non-Structural Elements of a Building.** An earthquake can break windows and non-flexible utility connections. Light fixtures may fall. Shaking may shift, disconnect, or otherwise damage a building's unsecured mechanical, plumbing, and electrical components (such as a hot water heater, air conditioner, or furnace). Some damage, such as broken gas lines, can cause a fire.
- **Building Shifted Off Its Foundation.** A wood-frame house, for example, may not be bolted to its foundation if it was built prior to the date when seismic building codes were enforced. Unless the house has been retrofitted, an earthquake could move it off its foundation. Even a small shift can cause a lot of damage and be very expensive to fix.
- **Collapse of Unreinforced Masonry.** Older masonry buildings and even wood-frame homes with brick chimneys may be vulnerable to severe damage during an earthquake:
 - **Chimneys.** Damage to unreinforced masonry chimneys is a common—and dangerous and costly—type of damage. Chimneys may crack and shift position, or they may break off entirely: a chimney could fall away from the building and onto whatever is next to it; or it could fall onto or through the roof.

I Own a House in Earthquake Country

What kind of damage could an earthquake do?



And how expensive will it be to repair?

I Own a House in Earthquake Country

This free brochure can be shared with insurance clients to help them imagine potential earthquake damage and expenses.

The brochure is available in both digital (PDF) and printable (trifold flier) forms in the Featured Outreach Products section of educate.insureagainstearthquakes.org

- **Parapets and Walls.** Unreinforced masonry buildings are older structures that predate seismic building codes. They may be built of brick, adobe, concrete, or stone. Earthquake shaking can cause parapets to fall to the ground and walls to crack or even separate from the structure and collapse.

Tips to Share with Insurance Clients. Buildings constructed before seismic building codes were adopted and enforced may be more vulnerable to earthquake damage unless they have been retrofitted.

- The county assessor's office is likely to have a record of a building's date of construction. Ask the local building department what seismic codes were enforced when it was built.
- Consult a structural engineer or qualified contractor to learn how specifically the building could be damaged in an earthquake and what type of retrofitting they'd recommend.

Site Conditions that Can Make Damage Worse

Earthquakes can trigger other hazards that may cause greater damage. For example:

- Structures built on soft soils may experience a greater intensity of shaking than those on firmer types of ground. Soft soils typically include artificial fill and loose sediments such as soils found in river valleys and around estuaries.
- Certain types of soil can behave like a liquid when shaken by an earthquake. (This phenomenon is called "liquefaction.")
- Unanchored buildings on steeply sloping ground may be more vulnerable to damage than those on level ground.
- Some buildings may be constructed on or below existing landslides that an earthquake can set in motion.

To learn more about the conditions of a particular site, check with the local county engineer's office or hire a consulting geologist or engineering firm to do a site study

For More Information....

- About retrofitting to reduce or prevent earthquake damage:
 - "From General to Particular: What an Earthquake Could Do to Your House" [podcast](#) | [Ready to Recover](#) podcast series (crew.org)
 - Home mitigation guide: [Earthquake Safety at Home \(FEMA P-530\)](#), pages 25–49

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5 | Talking About Earthquake Insurance

Points to Emphasize

Insurance agents are in a position to help people understand both the earthquake hazard and earthquake insurance. When talking with insurance clients and shoppers, here are a few points to emphasize:

- ***Standard homeowners, renters, condo, and business insurance policies don't cover earthquake damage.*** Many people think that their standard property insurance policy includes earthquake coverage.¹ Explain that:
 - No base property insurance policy covers all types of perils.
 - Damage caused by an earthquake isn't covered unless the policyholder chooses to buy earthquake insurance, either as an endorsement or as a separate policy.
 - Without earthquake insurance, all repairs and any additional living expenses resulting from earthquake damage must be paid for out of pocket.
- ***Earthquake insurance covers physical damage and loss caused by ground shaking.***
 - Explain that earthquake coverage also typically covers additional living expenses, including costs such as rent for temporary housing if the policyholder must live elsewhere while repairs are made. Note, however, that not all policies include this coverage.
 - Consider recommending that the insured's earthquake coverage limit be at least as much as their standard property policy limit.
 - Explain that some insurers may offer premium discounts for properties that meet seismic building codes.
- ***Earthquake insurance typically doesn't cover damage resulting from secondary effects of an earthquake, such as a landslide, water damage, or fire.*** Explain that:
 - Damage and loss caused by fire may be covered by a standard homeowners or renters policy, even if the fire was caused by an earthquake.
 - Damage and loss caused by flooding is typically covered by a flood insurance policy, which may be purchased through the National Flood Insurance Program (FloodSmart.gov) or from private flood insurance companies.

¹ A consumer survey conducted by the National Association of Insurance Commissioners (NAIC) suggests that this misapprehension is common (see pp. 37 and 41 of the [NAIC report](#)).

Explain the Deductible

Insurance clients may not be familiar with how an earthquake insurance deductible works. In Nevada, the deductible is usually a percentage (typically 10–20%) of the insured amount, which may be the replacement value of the property. When speaking to clients and shoppers:

- Explain what the deductible is and how it works. Point out any separate deductibles, such as a deductible for contents or for a detached structure like a garage.
- Explain that the policyholder is responsible for paying for their repair and recovery expenses up to the amount of the deductible(s) before the insurance policy pays out.
- Explain that insurance purchasers can choose lower deductibles. Demonstrate how this choice may impact premiums and claim payments in different scenarios.

Examples to Illustrate:

“Understanding Earthquake Deductibles” in [A Consumer’s Guide to Earthquake Insurance](#) (pp. 4–6) | The National Association of Insurance Commissioners offers an illustrated explanation.

[A New Option for Disaster Insurance: Parametric](#) | United Policyholders provides illustrations of both a deductible and how a parametric earthquake insurance policy might be applied toward paying the deductible of a conventional insurance policy.

For More Information....

- About earthquake insurance:
 - [Earthquake Insurance webpage](#) | Nevada Division of Insurance
 - [Earthquake Insurance 101](#) (This free self-guided learning module discusses both residential and business coverage.) | CREW.org
- Free resources to help educate people about earthquake insurance:
 - [educate.insureagainsteearthquakes.org](#)
 - [Nevada Consumer’s Guide to Earthquake Insurance](#) (PDF) | Nevada Division of Insurance
 - [A Consumer’s Guide to Earthquake Insurance](#) (PDF) | National Association of Insurance Commissioners
- About flood insurance: FloodSmart.gov
 - National Flood Insurance Program webpage [for insurance agents](#)
 - National Flood Insurance Program webpage [for consumers](#)

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Appendices

Appendix A. Acknowledgments

CREW would like to thank everyone who contributed their time and expertise to review and improve the content of this guide. In particular, we would like to acknowledge:

- Nevada Bureau of Mines and Geology, University of Nevada, Reno, with special thanks to Rich D. Koehler, Associate Professor, who reviewed the earthquake hazard and risk sections of the guide.
- Nevada Seismological Laboratory, University of Nevada, Reno, with special thanks to Christie Rowe, Director, who reviewed the earthquake hazard and risk sections of the guide.
- Nevada Office of Emergency Management | Homeland Security, with special thanks to Heather Lafferty, Chief Resilience Officer (CRO) / State Hazard Mitigation Officer (SHMO).
- Nevada Division of Insurance, Department of Business and Industry.
- Professional Insurance Agents Western Alliance, with special thanks to Kim Legato, Executive Vice President.
- NW Insurance Council, with special thanks to Kenton Brine, President.

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