

The Great California ShakeOut:

How to Drop, Cover and Hold On (or other recommended actions)
in a Major Rossmoor Earthquake

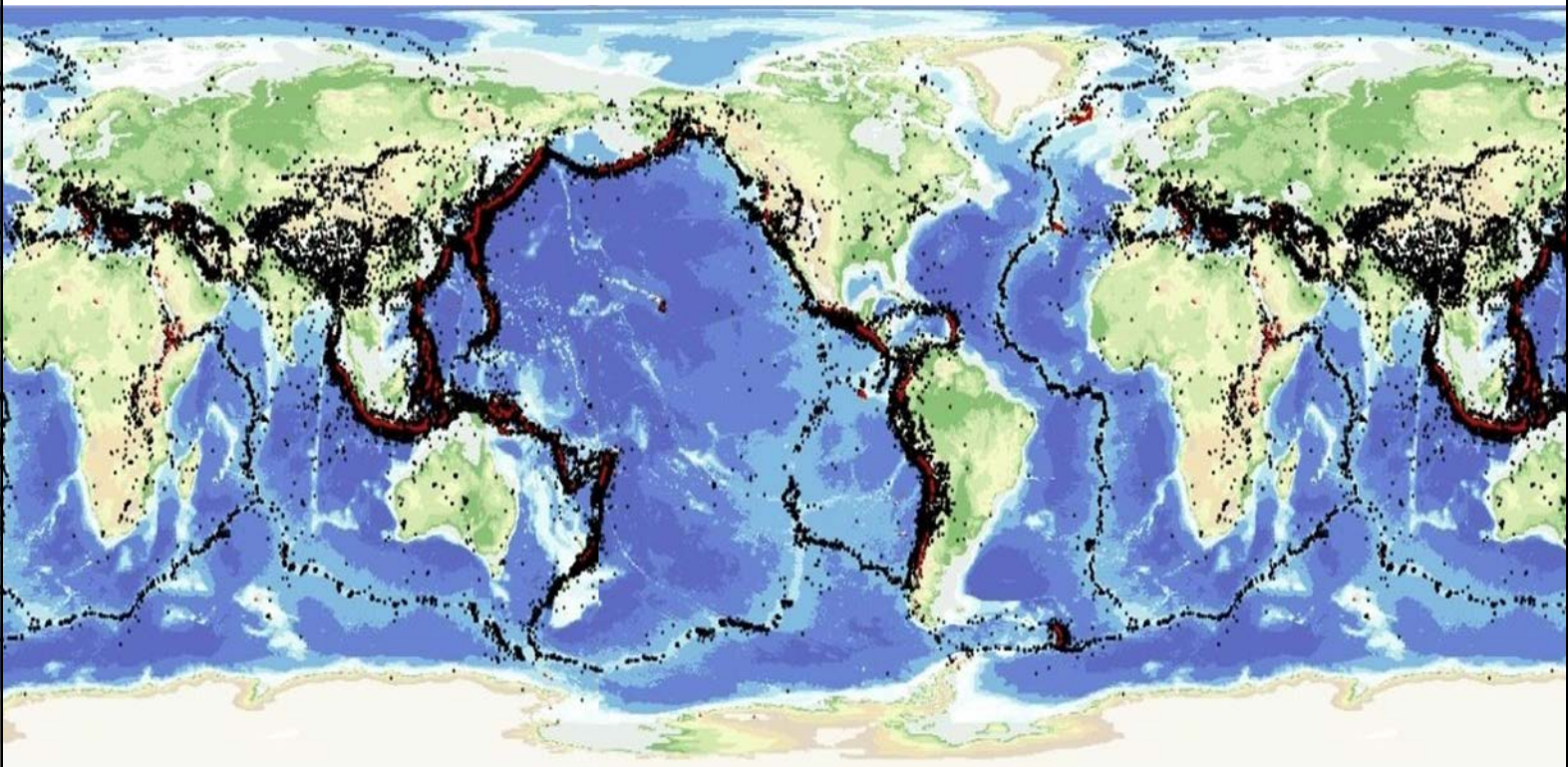
Mark Benthien

ECA Executive Director

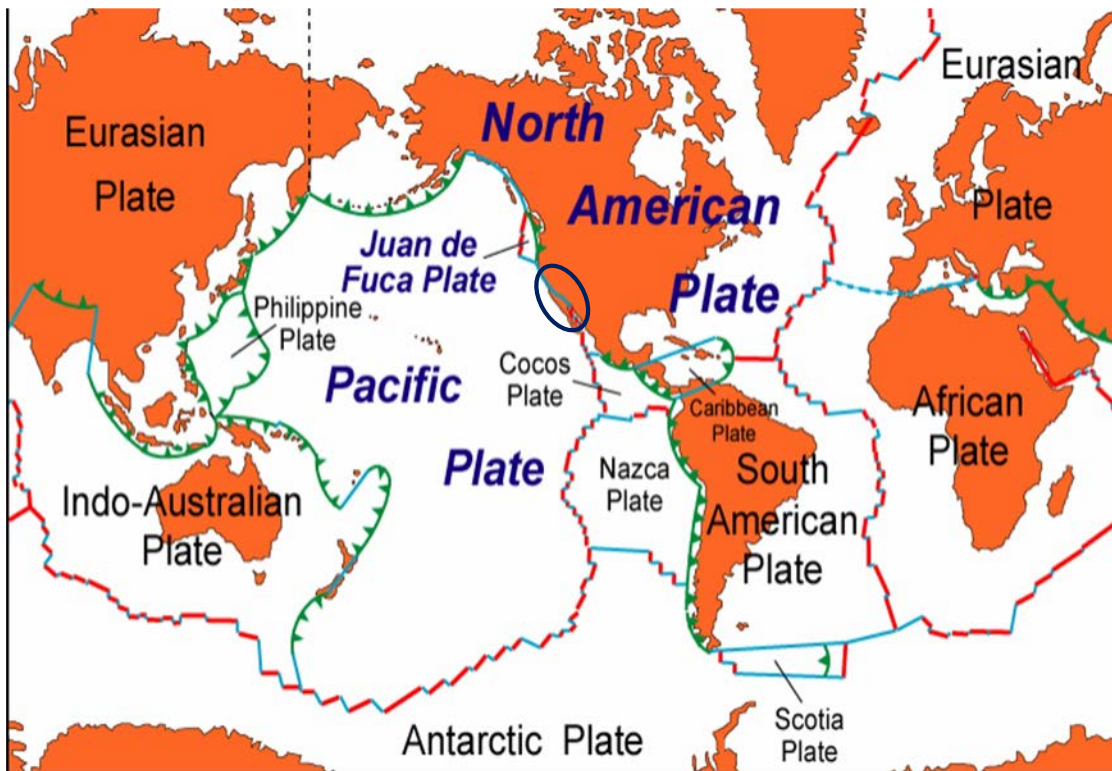
Director for Communication, Education, and Outreach
Southern California Earthquake Center @ USC



Global Earthquakes



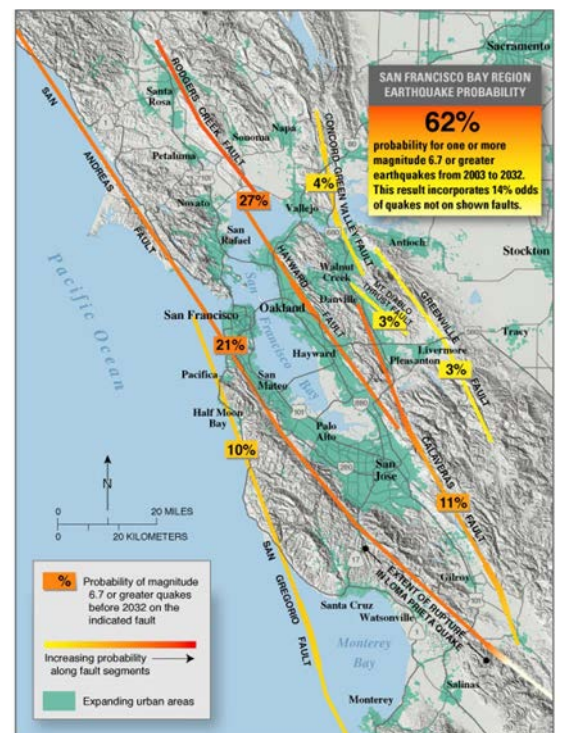
We Live on the Edge...



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Bay Area Major Faults

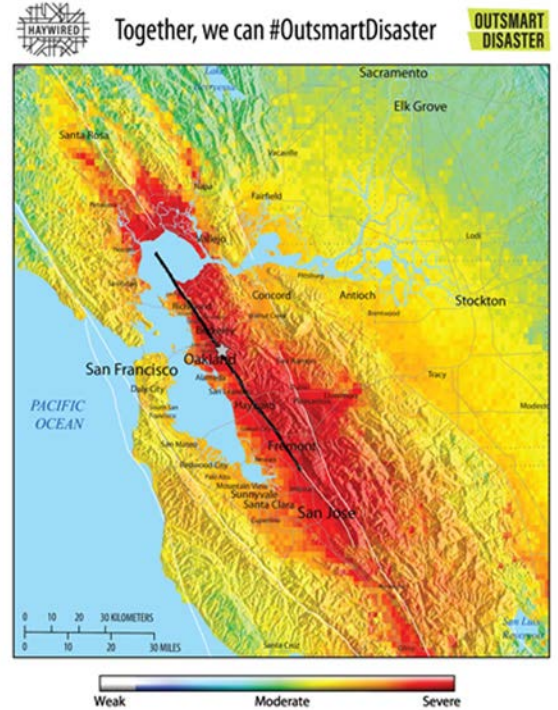
- Several faults capable of magnitude 7 or larger earthquakes
- Many smaller faults can also cause damaging shaking
- 21% chance of an earthquake larger than M6.7 on the San Andreas within 30 years
- 27% chance of >M6.7 on Hayward fault in same timeframe



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USGS HayWired Scenario

- Comprehensive assessment of what would happen if Magnitude 7 earthquake on Hayward fault
- Emphasizes impacts from modern society's lifeline interdependencies and reliance on the Internet
- Last similar earthquake was in 1868, when there were far fewer buildings, infrastructure, and people
- Search for "USGS HayWired" to read the scenario and related information



Why Prepare?



Utilities may not work

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Why Prepare?



Roads may be
impassible



Transportation
may be
unavailable

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Why Prepare?



Grocery stores, pharmacies,
banks, etc. may be closed



Getting accurate information
will be difficult

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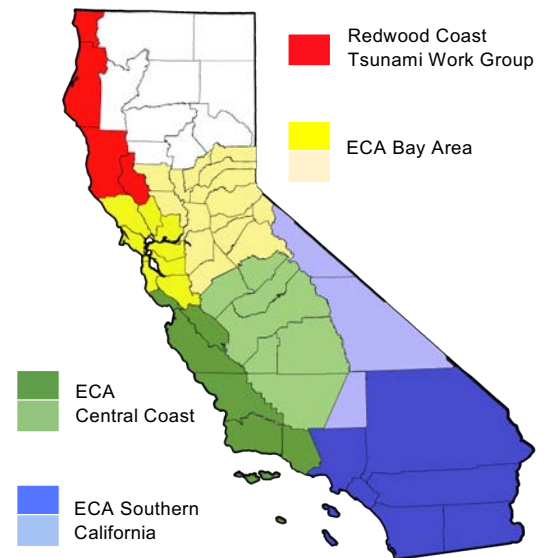
More Can and Must Be Done...

- ...at every level
- ...before, during, and after
- ...by each and all of us



Earthquake Country Alliance

- 4000+ *Public-Private-Grassroots* leaders
- Statewide *committees* develop resources and deliver programs
- *Regional Alliances* organize meetings and outreach activities
- California's Office of Emergency Services provides NEHRP funding for ECA earthquake mitigation activities
- USC's Southern California Earthquake Center (SCEC.org) administers ECA



Join: EarthquakeCountry.org/join



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National Earthquake Hazards Reduction Program (NEHRP)

- Cal OES applies to FEMA for NEHRP funding, which is then subawarded to USC for SCEC to administer ECA's earthquake education, outreach, and mitigation activities.
- NEHRP is a partnership of four federal agencies that provide resources to mitigate and reduce losses caused by earthquakes in the U.S., including support for:
 - Research on the causes and effects of earthquakes
 - Building design recommendations to reduce earthquake damage and disruption
 - Activities that advocate earthquake risk reduction awareness and practices
- ECA also receives funding from NSF and USGS via their support of SCEC.



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ECA Statewide Activities

Develop Messaging and Resources:

EarthquakeCountry.org
EarthquakeCountry.org/resources
Terremotos.org



Support Tsunami Preparedness Week:

TsunamiZone.org/california



**March
27-31
2023**

Created and Coordinate
 The Great California ShakeOut:

ShakeOut.org/california



**Oct. 20
in 2022!**

Webinars & other events

EarthquakeCountry.org/calendar

ECA Bay Area Activities

- **Quarterly Workshops**– February 16, May 25, August 24, November 30 (at SFO)
- **ECA Bay Area ShakeOut Media Event**– Partnering with City of Oakland
- **HayWired Scenario**– Exercise Toolkit, Workshops & Webinars; coming this Fall
EarthquakeCountry.org/haywired - see page for interest form
- **ECA Events Bureau**– request speakers or event tables
EarthquakeCountry.org/events
- **Neighborfest**– Promotion/Expansion across Bay Area and Statewide:
EmpowerSF.org/neighborfest
- **2023 ECA Bay Area Mini Awards**– application period opens in early October

Seven Steps To Earthquake Safety

BEFORE

1. Secure Your Space



2. Plan To Be Safe



3. Organize Supplies



4. Minimize Financial Hardship



DURING

5. Drop, Cover, and Hold On



6. Improve Safety



AFTER

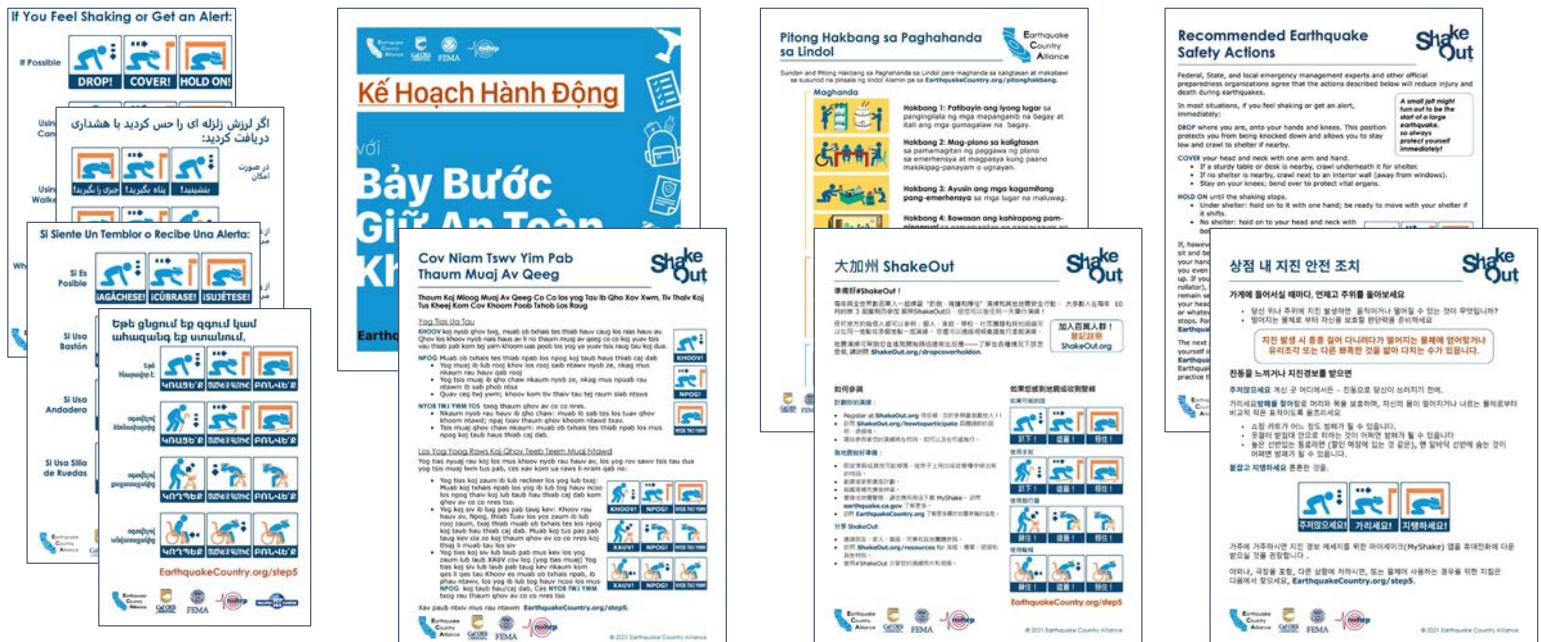
7. Reconnect and Restore



EarthquakeCountry.org/sevensteps

Terremotos.org/sietepasos

Updated Materials in 15 Languages



EarthquakeCountry.org/languages

Step 1: Secure Your Space

BEFORE

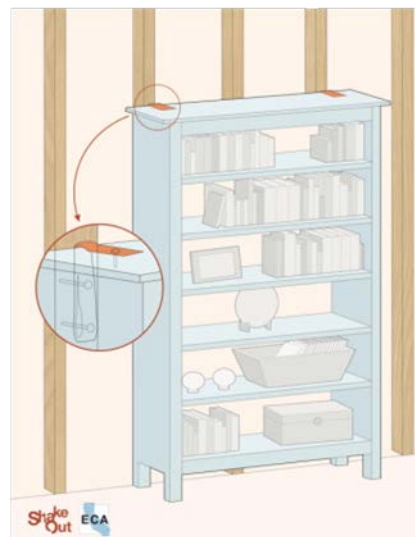
- Identify hazards
- Secure moveable items
- Reduce Injuries and damage



EarthquakeCountry.org/step1

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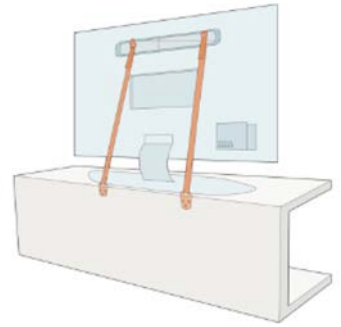
Top-Heavy Furniture



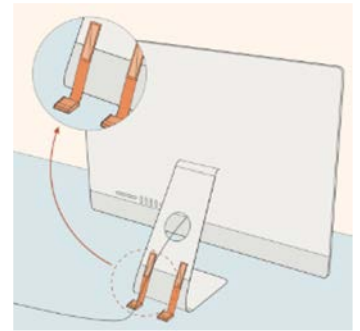
Use flexible nylon straps (buckles or velcro)

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TVs and Electronics



Straps and buckles secured with adhesive and bolted to anchor points



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Begin to Secure Your Space:

TODAY:

Move a heavy object to a lower location

- Review EarthquakeCountry.org/step1
- List potential hazards to be secured
- Secure everything in a weekend, or over time
- Show your friends, family, neighbors, tenants, etc. to encourage them to *Secure Their Space* (even better... help each other!)

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Step 2: Plan to Be Safe

BEFORE

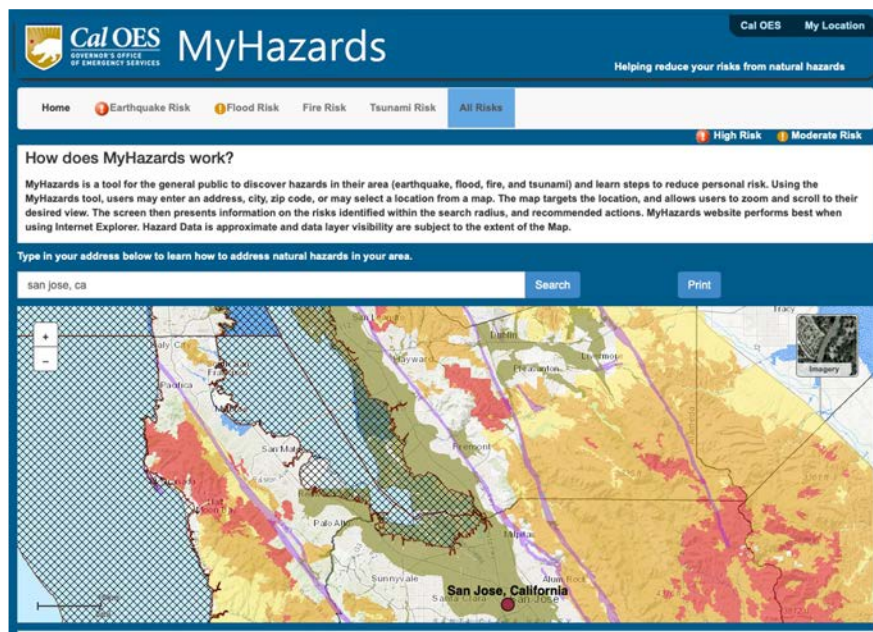
- Create a disaster plan
- Decide how to communicate in an emergency



EarthquakeCountry.org/step2

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Know Your Hazards



MyHazards.CalOES.ca.gov

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Plan Your Response: Extinguish Small Fires

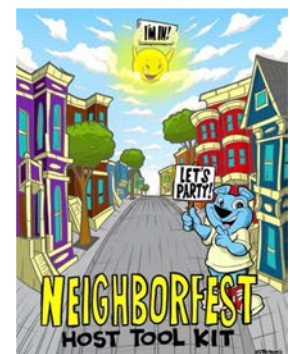
- Get a fire extinguisher for your home.
- Your local fire department can train you and your family to use it properly.



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Take Training/Networking Programs

- Learn about local programs, such as:
 - CERT
 - Map Your Neighborhood
 - Neighborfest
 - Red Cross trainings



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Step 3: Organize Disaster Supplies

BEFORE

- At home, work, and in your car
- Copies of prescriptions, extra glasses, etc.
- Essentials for 3 days, ideally 2 weeks



EarthquakeCountry.org/st

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Disaster Supplies Checklist

- Choose where you want to store your supplies:
 - Under-Bed bag?
 - Go-Bag?
 - Home?
 - Work?
 - Car?
- What personal items do you need?

Earthquake Country Alliance
We're all in this together.

Step 3: Organize Disaster Supplies
of The Seven Steps to Earthquake Safety
EarthquakeCountry.org/step3

It may be easier and cheaper than you think to organize disaster supplies in convenient locations. This is not just about "having a kit." Include supplies specific to you, such as medications, eyeglasses, clothing, shoes, toiletries, and more. This is in addition to the basic supplies everyone should have (water, food, first-aid, flashlight, radios, etc...).

The chart below can help you customize your supplies for when and where you need them: **under-bed bag** (immediate supplies), **evacuation ("go-bag")** - 3 days), **home** (2 weeks), and perhaps **at work** and in your car. Choose what makes the most sense based on your needs and budget.

Under-Bed?	Go-Bag?	Home?	Work?	Car?	Item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clothing, shoes, hard hat / helmet, gloves
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Whistle
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flashlight / headlamp
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dust mask and goggles
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Glasses / contacts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tools (gas wrench, shovel, crowbar, knife)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Contact lists (in-state, out-of-state)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Copies of ID / important documents
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Batteries, battery pack, & charging cables
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Medications / Copies of Prescriptions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	First-aid supplies and emergency blanket
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water and food (long shelf-life)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portable radio
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Toiletries (sunscreen, tissue, hygiene items)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cash (small bills)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maps (local and regional)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pet supplies (food, water, toys, leashes)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Litter / sand (spills, traction)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jumper cables, spare tire, inflator jack
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flares / road hazard lights
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personal item
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personal item

Choose... what makes sense for YOU and where to keep it!

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EarthquakeCountry.org/step3

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Under-Bed Bags

- Keep **shoes** and a **flashlight** in a **closed** bag attached to each bed.
- You can also include other items as in this picture.



Prevents...

- Cut feet and hands
- Tripping over objects

Allows you to...

- Open jammed doors
- Help injured

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Step 4: Minimize Financial Hardship

BEFORE

- Organize important documents
- Strengthen your property
- Consider insurance



EarthquakeCountry.org/step4

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Emergency Financial First Aid Kit

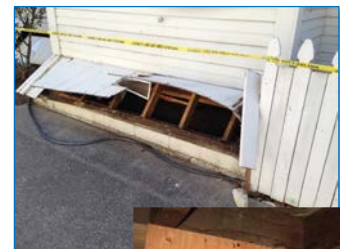
- Keep a small amount of cash at home in a safe place
- Have an emergency savings account
- Store copies of important documents and account numbers (insurance, etc.)
- Download FEMA's *Emergency Financial First Aid Kit* (EFFAK)

ready.gov/financial-preparedness



Older Buildings & Infrastructure

- Many cities require retrofit of some older, vulnerable buildings
- California Earthquake Authority offers home retrofit incentives and guidance:
EarthquakeBraceBolt.com
StrengthenMyHouse.com
- Freeway bridges are retrofitted
- Extensive work underway by water, power, and other utilities



California Earthquake Authority: Premium Calculator

- Earthquake damage is not covered by homeowners' insurance
- Many options now available for customizing your coverage
- Home, condo, mobile home, and renters' policies are available
- **EarthquakeAuthority.com:**
Click on "Free Estimate" at top right.

The screenshot shows the 'Homeowners Choice' section of the calculator. It displays a ZIP Code of 90038 and an effective policy start date of 2019. The estimated monthly premium is \$79.25, and the annual premium is \$951.00. Below this, there are several sliders and checkboxes for customizing coverage: 'SELECT YOUR DWELLING DEDUCTIBLE' (10%, 25%, 5%), 'WOULD YOU LIKE TO INCREASE YOUR BUILDING CODE UPGRADE COVERAGE?' (\$20,000, \$10K, \$30K), 'WOULD YOU LIKE TO ADD MASONRY VENEER COVERAGE?' (NO, YES), 'HOW MUCH PERSONAL PROPERTY COVERAGE WOULD YOU LIKE?' (\$50,000, NONE, \$200K), 'WOULD YOU LIKE A SEPARATE PERSONAL PROPERTY DEDUCTIBLE?' (10%, NO, 5%), 'WOULD YOU LIKE TO ADD COVERAGE FOR BREAKABLE ITEMS?' (NO, YES), and 'HOW MUCH LOSS-OF-USE COVERAGE WOULD YOU LIKE?' (\$15,000, NONE, \$100K).

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Step 5: Drop (Lock), Cover and Hold On

DURING

- When the earth shakes, act immediately
- Protect yourself from falling to the ground, or from falling objects



EarthquakeCountry.org/step5

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Why Drop, Cover, and Hold On?

- Strong consensus for many years, based on data for how people are injured, and experience of Urban Search and Rescue firefighters
- Prevents being thrown to the ground
- Reduces injury from falling or flying items... including structural elements and exterior façades (brick, glass, etc.)
- Increases chance of surviving collapse



Classroom in Calexico, CA
April 2010 M7.2



EarthquakeCountry.org/step5

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Adapt to Your Situation

- if you can't get back up on your own, don't drop down
- Practice your preferred method with others who assist you
- EarthquakeCountry.org/accessibility

If You Feel Shaking or Get an Alert:



EarthquakeCountry.org/step5

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Know How to Protect Yourself

In *most* situations and building types:



Drop on to your hands and knees, where you are



See EarthquakeCountry.org/step5 for advice for a variety of settings

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Know How to Protect Yourself

In *most* situations and building types:



Cover your head and neck with one arm and hand

- If a sturdy table or desk is nearby, crawl underneath it for shelter
- If no table/desk, crawl against a wall or next to low furniture for sideways protection



See EarthquakeCountry.org/step5 for advice for a variety of settings

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Know How to Protect Yourself

In *most* situations and building types:



Hold On to your shelter until shaking stops

- Be ready to move with your shelter
- *If not under a shelter*, hold on to your head/neck with both arms and hands



See EarthquakeCountry.org/step5 for advice for a variety of settings

Earthquake Safety Video Series

Shake Out
IF NEAR A STURDY
DESK OR TABLE

Shake Out
IF THERE'S NO STURDY
DESK OR TABLE

- Separate short (1-8 min) videos:
 - indoors, nearby table/desk
 - indoors, no table/desk
 - theater/stadium
 - near the shore
 - in a car
 - in bed
 - for users of mobility devices/aids
- View full videos at Youtube.com/greatshakeout
- Download full videos at ShakeOut.org/messaging

**Shake
Out™**

IF USING A CANE

**Shake
Out™**

IF USING A WHEELCHAIR

The logo for 'Shake Out' is displayed in a bold, blue, sans-serif font. The word 'Shake' is positioned above 'Out', and a small 'TM' trademark symbol is located at the bottom right of the word 'Out'. The entire logo is centered within a white rectangular area that is framed by a thick blue border.

**Shake
OutTM**

IF USING A WALKER

The logo for 'Shake Out' is displayed in a bold, blue, sans-serif font. The word 'Shake' is positioned above 'Out', and a small 'TM' trademark symbol is located at the bottom right of the word 'Out'. The entire logo is centered within a white rectangular area that is framed by a thick blue border.

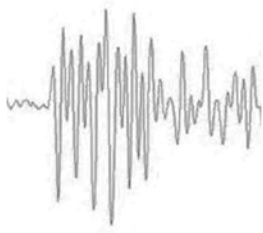
**Shake
OutTM**

IF YOU'RE IN BED

When Should You Protect Yourself?



When You
Feel
Earthquake
Shaking



When You
Get an
Earthquake
Warning



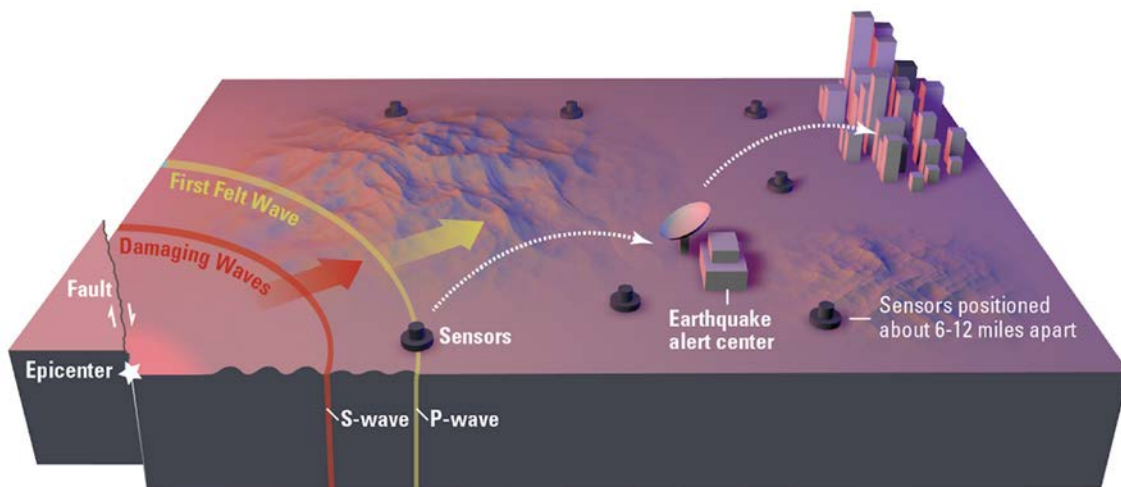
When You
Do an
Earthquake
Drill



ShakeOut.org
2022: October 20

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Earthquake Early Warning



Powered by **ShakeAlert®**

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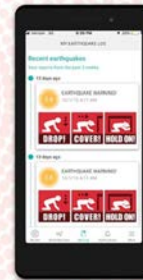
Earthquake Warning California

Earthquake Early Warnings
Now Available through Wireless
Emergency Alerts (WEA)



Magnitude = 5 or greater
and
Intensity at your location =
greater than IV

Download the **MyShake**TM
Earthquake Early Warning App.



Magnitude = 4.5 or greater
and
Intensity at your location =
greater than III



Magnitude = 4.5 or greater
and
Intensity at your location =
greater than III

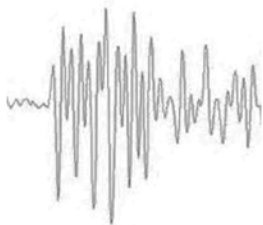
earthquake.ca.gov

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When Should You Protect Yourself?



When You
Feel
Earthquake
Shaking



When You
Get an
Earthquake
Warning



When You
Do an
Earthquake
Drill



ShakeOut.org
2022: October 20

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Social Science Research Basis for ShakeOut

People Get Motivated to Prepare When:



- They see and hear consistent information about what to do frequently, in many forms, and from many sources
- They see others like themselves getting prepared
- They talk about preparedness with people they know
- They learn potential consequences, and how to avoid them

Based on research results of Mileti, D., Wood, M., Bourque, L., and others

ShakeOut puts these findings into practice

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ShakeOut Goals

Shift the culture about earthquakes and preparedness



Shift happens.



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ShakeOut Goals

Increase earthquake resilience at all levels



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ShakeOut Goals

Encourage people worldwide to practice earthquake safety



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Example Statistics and Participant List

2014 participation by ShakeOut Region		
Alaska (Mar. 27)	103,931	
Alaska (Oct. 16)	80,536	
American Samoa	5,102	
Arizona	123,595	
British Columbia	743,126	
California	10,410,401	
Central U.S. (AL AR IL IN KS KY MO MS OH OK TN)	2,761,667	
CNMI	12,508	
Colorado	35,971	
Guam	78,281	
Hawaii	30,007	
Idaho	75,220	
Japan	4,453,244	
Montana	157,189	
Nevada	571,494	
New Mexico	106,838	
NorthEast U.S. (CT MA ME NH NJ NY PA RI VT)	505,590	
Oregon	398,815	
Puerto Rico	595,954	
Quebec	152,808	
SouthEast U.S. (DC DE FL GA MD NC SC VA WV)	2,192,111	
Southern Italy	12,285	
U.S. Virgin Islands	7,249	
Utah	835,729	
Washington State	1,089,820	
Wyoming	10,698	
Yukon	9,770	
Other States and Countries	1,105,606	

Category	Participants
Total: California	10,410,401
Individuals/Families	11,941
Childcare and Pre-Schools	50,111
K-12 Schools and Districts	6,366,514
Colleges and Universities	1,954,438
Local Government	461,805
State Government	149,993
Federal Government (Including Military)	221,009
Tribes/Rancherias	3,402
Businesses	628,600
Hotels and Other Lodgings	2,331
Healthcare	185,402
Senior Facilities/Communities	17,445
Disability/AFN Organizations	9,727
Non-Profit Organizations	82,167
Neighborhood Groups	30,737
Preparedness Organizations	13,498
Faith-based Organizations	166,366
Museums, Libraries, Parks, etc.	8,407
Volunteer/Service Clubs	258
Youth Organizations	1,993
Animal Shelter/Service Providers	273
Agriculture/Livestock	1,340
Volunteer Radio Groups	931
Science/Engineering Organizations	5,096
Media Organizations	13,671
Other	24,598

Del Norte	Mary Dorman - State Farm Agent, Crescent City Walmart 1910, Crescent City
El Dorado	Businesses AAA AAA Northern California, Nevada and Utah, Folsom Branch, Folsom
Fresno	ADT Security Services, LLC, Fresno SSO, Fresno DaVita Healthcare Davita Sanger, Sanger F & F Contracting, Inc./ Etbe Trucking/Golden Eagle Charter, Inc., Fresno HD Supply HD Supply White Cap, Fresno Branch, Fresno Humanscale, Fresno facility, Fresno Kohl's Department Stores Kohl's Department Store, Fresno Kohl's Department Store, Fresno Kohl's Department Store, Clovis Landscape Contractors Insurance Services, Inc., Fresno Macerich Fashion Fair Mall, Fresno Rabobank, Fresno
Humboldt	Cafe Nooner, Cafe Nooner Too, Eureka Cal-Ore Life Flight, Humboldt Base, Eureka GHD, Inc., Eureka Kohl's Department Stores Kohl's Department Store, Eureka Pacific Gas and Electric Company Pacific Gas and Electric Company, ISFSI & Humboldt Bay Generators PMFW Productions, Eureka Stewart Telecommunications, Eureka
Imperial	Kohl's Department Stores Kohl's Department Store, El Centro United States Gypsum, Plaster City Plant, El Centro
Kern	AEG Rabobank Arena, Theater & Convention Center, Bakersfield Allstate, Sales, Ridgecrest DaVita Healthcare Davita-Bakersfield Dialysis Center, Bakersfield Environmental Resources Management ERM-Bakersfield, Bakersfield, Bakersfield FedEx Ground, Bakersfield Golden Empire Transit, Bakersfield HD Supply Construction & Industrial White Cqp, Bakersfield Branch 9

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Benefits of Registering



- Be **counted** in the world's largest earthquake drill
- Be **updated** with news and safety tips
- Be **listed** with other participants
- Be an **example** that motivates others
- Have **peace of mind** that you have taken action and helped others
- Be **better prepared** to survive and recover!

ShakeOut.org/register

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Example ShakeOut Resources



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ShakeOut Drill Leader Presentations

- Support remote working / distance learning
- Include:
 - Guidance for leading online drills
 - Slides to explain DCHO and why
 - Slides with ShakeOut "drill narration" with and without sound effects
 - Questions for before and after
- 5 Presentations Available:
 - Grades K-4
 - Grades 5-12
 - Higher Education
 - Organizations
 - Spanish Organizations
 - Download: [ShakeOut.org/COVID-19](https://www.shakeout.org/COVID-19)

Drill Leader Instructions: Content and Resources	If a Table or Desk is Nearby
<p>CONTENT:</p> <ul style="list-style-type: none"> • Drill Leader Instructions • Pre-Drill Discussion (optional) • Brief earthquake hazard information (optional) • Great ShakeOut introduction • Overview of Drop, Cover, and Hold On, and other protective actions • Drill Narration options (choose one) (narration audio files and text) • Discussion for after drill (optional) <p>Total time for the activity will depend on the content you choose to include; the shortest time might be 10 minutes, but with discussion could be up to 20-30 minutes.</p> <p>Delete or hide slides you will not use before your drill.</p> <p>Visit ShakeOut.org/resources for materials to share before your drill.</p> <p>Visit ShakeOut.org/step5 for self-protective guidance for various situations, and for why Drop, Cover, and Hold On is recommended.</p>	<p>Drop where you are, onto your hands and knees.</p> <p>Cover your head and neck with one arm and hand. Then crawl underneath the table or desk for additional shelter. Stay on your knees and bend forward to protect vital organs.</p> <p>Hold On to your shelter with one hand. Keep covering your head/neck with your other hand.</p>
<p>Time to ShakeOut!</p> <p>ShakeOut 60-second Drill Narration (with Sound Effects)</p> <p>(Click speaker to Play)</p>	<p>Earthquake Experience</p> <ul style="list-style-type: none"> • If you have experienced an earthquake, what was it like? • What do we normally do at work for earthquake drills? • Why is practicing for earthquakes and other emergencies important? • What can we do before earthquakes to be prepared?

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Step 6: Improve Safety

DURING

- Evacuate if necessary
- Help the injured
- Prevent further injuries or damage



EarthquakeCountry.org/step6

Step 7: Reconnect and Restore

AFTER

- Restore daily life
- Reconnect with others
- Repair damage
- Rebuild community



EarthquakeCountry.org/step7

Together We Prepare

- Start preparing *TODAY!*
- Share information with your family, friends, & community
- Become engaged in community preparedness & other stakeholder opportunities (CERT, RYLAN, Red Cross, ECA...)



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Connect with ECA

- EarthquakeCountry.org
- info@earthquakecountry.org
- Terremotos.org
- [Twitter.com/eca](https://twitter.com/eca)
- info@earthquakecountry.org
- benthien@usc.edu



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