

# Putting Down Roots in Earthquake Country

*Are You Prepared for “The Big One”?*

By Tania Larson

Earthquakes are scary because they are largely unpredictable. We don't know exactly when, where or with how much force they are going to strike, but we do know they will strike again. It's easy to feel powerless in the face of such information, but there are several things you can do to protect yourself and your loved ones. In fact, preparedness is key to survival.

“Putting Down Roots in Earthquake Country,” developed by the USGS and numerous partners, contains a wealth of earthquake information. There are two versions of the handbook, one for Northern California and one for Southern. Both provide information to help you prepare for, survive and recover from future earthquakes.

“All Californians need to be made aware of earthquake hazards and how to survive them,” said California state geologist John Parish. “This handbook is a valuable primer for preparedness.”

Because earthquakes can strike previously unknown faults, even those who don't believe they are in an earthquake-prone area could benefit from the handbook's clear explanations and practical advice.

The handbook contains seven steps to earthquake safety and is filled with recommendations you can start on today. One tip is to make sure areas where people sit

or sleep are clear of dangerous items — bookcases, glass picture frames and other heavy objects — that could fall during an earthquake. Other tidbits of wisdom are to prepare your loved ones for earthquakes by making disaster kits, practicing earthquake safety with children, and making sure you don't forget Fido and Fluffy in your disaster-preparedness plan.

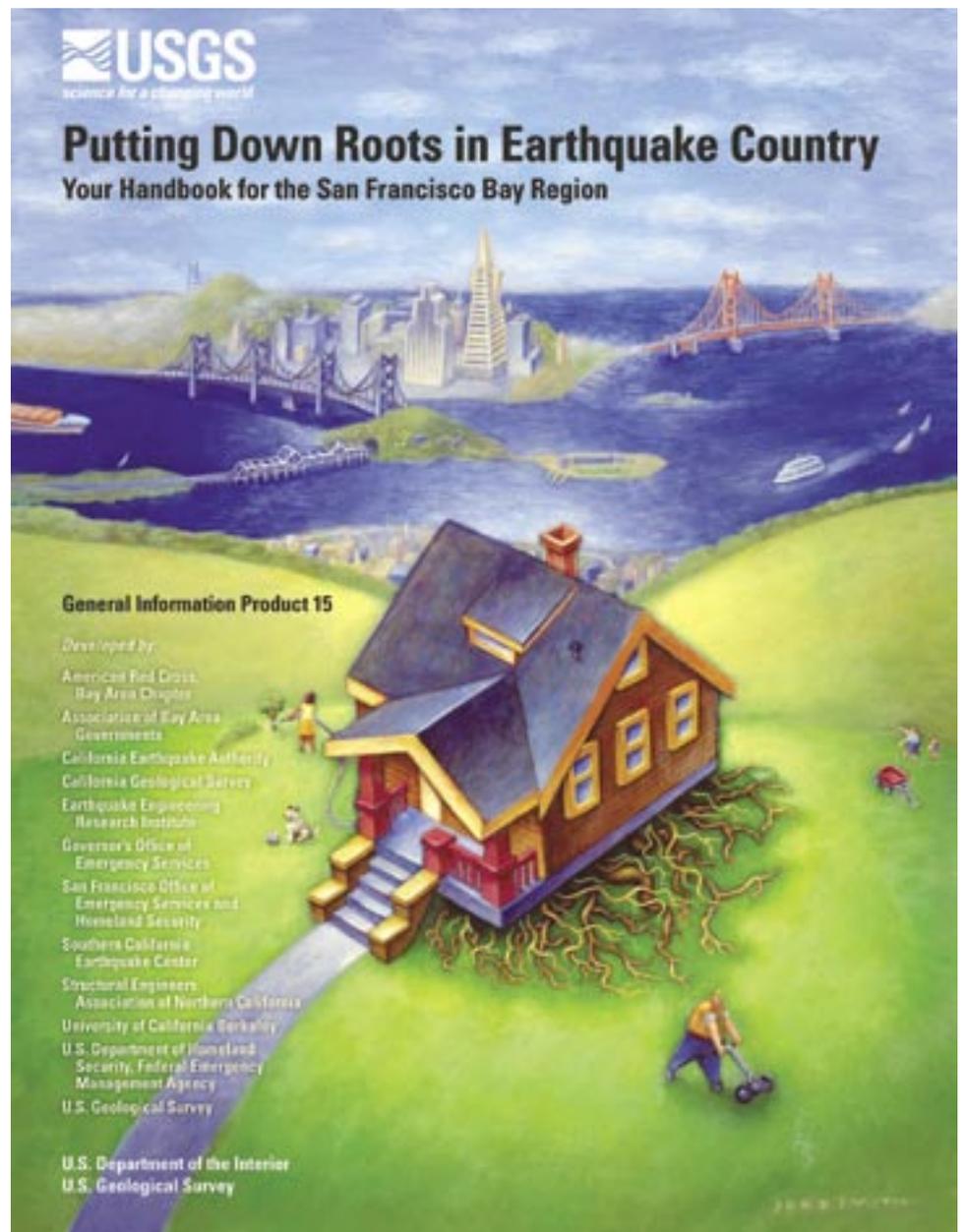
So, what do you do when the earth actually starts shaking? — “Drop, Cover and Hold On.”

## About the Handbooks

These practical guides to earthquake survival are the result of many groups coming together to meet a public need. When a magnitude-6.9 earthquake struck Loma Prieta, Calif., on October 17, 1989, it caused extensive damages and took many lives. Many people, having seen the destructive power of earthquakes but still having little understanding of how to protect themselves, came out of the event with an overly heightened sense of fear; others thought they had survived “the big one” and came out with an overly heightened sense of safety. However, this earthquake, though strong and damaging, had only released 3 percent of the energy of the “Great 1906 Quake” and was not “the big one” that scientists believe is likely to occur in the area. Something needed to be done to give residents both a realistic understanding of the dangers and knowledge of the things they should do to protect themselves.



“Putting Down Roots” is full of helpful hints to protect you, your loved ones and your property from earthquake hazards. This cutaway diagram shows how weak cripple walls can be strengthened with properly attached plywood sheets.



“Putting Down Roots” cover art by Jere Smith.

Peter Ward, now retired, was a USGS seismologist at the time of the Loma Prieta earthquake. He said, “While we in the geosciences were studying the scientific causes and effects of Loma Prieta, those in the social sciences asked us how we could help them educate the public to be better prepared for future earthquakes that we told them would surely happen.” In response, Ward contacted Red Cross

officials and offered to write a booklet explaining why and how frequently earthquakes occur in the San Francisco Bay area and what people could do to prepare to survive future earthquakes.

The Red Cross and other disaster-relief agencies pitched in the funds to produce the booklet, and three months later, “The Next Big Earthquake In the Bay Area May Come Sooner Than You Think — Are You Prepared?” was published. With a press run of ultimately more than 3 million copies, this helpful, easy-to-read booklet became the most widely distributed

publication ever prepared by the USGS.

The magnitude-6.7 Northridge earthquake in 1994, created the need for a book targeting the southern part of the state, and “Putting Down Roots in Earthquake Country — Your Handbook for Living in Southern California” was produced. The handbook was first written in 1995 by Lucy Jones, USGS scientist-in-charge for Southern California. She said, “It took a year of my life but was extremely satisfying. I was able to bring my understanding of earthquakes to many people and reduce fear and empower change.”

Two million copies were printed and distributed between 1995 and 2003. For the 10<sup>th</sup> anniversary of the Northridge earthquake, Jones teamed up with Mark Benthien, of the Southern California Earthquake Center, to update the handbook.

Shortly after the Southern California edition was updated, a version for Northern California was underway, and “Putting Down Roots in Earthquake Country — Your Handbook for the San Francisco Bay Region” was published in 2005.

The creation and distribution of these booklets has been a phenomenal collaborative effort, bringing federal and state agencies, private companies, nonprofit organizations and the media together to

identify and meet the needs of local communities.

Zoback said, "The amazing thing about 'Roots's' Northern California version was the coming together of all the groups and agencies in the greater Bay Area with 'ownership' of the earthquake problem — science, engineering and emergency response. The best thing about the effort was that it was a true team collaboration, all 12 groups listed on the cover as authors actually contributed to the writing in a significant way."

This edition of the handbook is part of the 1906 Earthquake Centennial Alliance effort, and thanks to the Pacific Gas & Electric (PG&E) Foundation, plans for the handbook now include translation into Spanish and several Asian languages.

When the new version was released, Harold Brooks, CEO of the Red Cross Bay Area Chapter, said, "The American Red Cross will be working over the next three years to get more than 1 million additional families in the Bay Area prepared for a large earthquake. This handbook will play an important role in our training efforts."

On September 18, 2005, booklets were distributed to more than 500,000 readers in the Sunday edition of the *San Francisco Chronicle*. On April 9, 2006, the handbook was sent to more than 1 million readers with the Sunday *Los Angeles Times*, and upon completion, the forthcoming Spanish version will be included in *Oy*, the *LA Times's* Spanish language daily.

"The real story of the success," Zoback said, "is the amazing continued demand for the booklet." The San Francisco General Hospital requested 5,000 copies for their employees. The Solano County Jail requested 200 for concerned inmates. But Zoback thinks the best compliment came from former ambassador and *Sunset Magazine* publisher William (Bill) Lane. She said, "Bill called and said he loved 'Roots' and wanted to give a copy to every household in his town, Portola Valley. He drove his station wagon to our office, and we loaded up 21 boxes (2,100 copies!) in the back. He then took them to the Menlo Park post office where he paid to have the postmaster deliver one to every household in Portola Valley."

A Web site was created that allows people to order up to 10 copies of the handbook, and Zoback is happy to report that many people are ordering multiple copies. She said, "We were sending them to auto body shops, beauty shops, etc. — absolutely the best type of grass roots distribution, folks giving them to folks they care about."

If you would like copies for yourself and loved ones, visit <http://pubs.usgs.gov/gip/2005/15> or call the Red Cross at (510) 595-4459 for the Northern California Handbook. For the Southern, go to <http://www.earthquakecountry.info/>.

# A Profusion of Products and Events for the 1906 Earthquake Centennial

In addition to those already mentioned in this publication, the U.S. Geological Survey is involved with a number of products and several events commemorating the 1906 centennial, many of which are listed below. Please continue to visit <http://earthquake.usgs.gov/regional/nca/1906/> for more information.

## PRODUCTS

**The USGS Gives Tours of the 1906 San Francisco Earthquake** — This USGS tour offers a variety of information, from ground-shaking maps and fault locations to historic photographs and quotes from those who were actually there. This tour uses Google Earth™, a computer program that combines satellite imagery with geospatial information to allow users to view and interact with actual images of the Earth's surface in three dimensions.

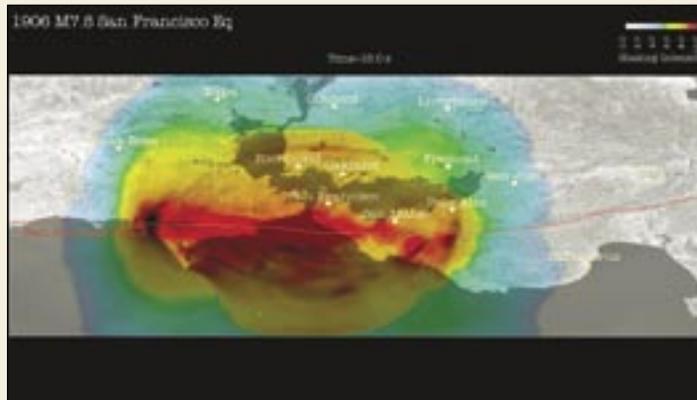
**The USGS Gives a Virtual Tour of the Hayward Fault** — This is a Web-based strip map. This tour offers a virtual helicopter tour of the Hayward Fault with parcel scale resolution so that property owners can locate their land.

**Two New USGS Maps Identify San Francisco Bay Area Liquefaction Risk** — The first of these products is a new map of the young geologic deposits in the low-lying sections of the Bay Area. Some of these areas can undergo liquefaction, the phenomenon in which saturated soils lose their stiffness and strength during shaking, and some can greatly increase the severity of shaking that is transmitted through the deposits.

The second of the map products, derived from the first map, shows the likelihood that these young deposits will liquefy due to the strong shaking a big earthquake will produce.

**Two New USGS Maps Show the Bay Area's Active Faults and Geologic Materials** — The first of these products is a new map of the known Quaternary-active faults in the Bay Area that have pushed up mountains and generated earthquakes over the past 2 million years.

The second product is a new map of the geologic materials and structures of the Bay Area.



A 1906 ground-shaking simulation shows how the earthquake spread from its epicenter, about two miles west of the San Francisco Zoo, and grew to cause strong shaking and damage along more than 300 miles of the San Andreas Fault.

**USGS Partnership Puts Curriculum Into the Classroom** — The USGS has created two new educational resources to help teachers explain earthquake science.

"**Earthquake Science Explained**" highlights how scientists study earthquakes, what evidence they collect and what they have learned since the 1906 Earthquake.

"**Living in Earthquake Country: A Teaching Box**," a newly released online earthquake hazard resource, provides teachers with lessons including fully developed hands-on earthquake curriculum, teaching points and easy-to-reproduce handouts.

**The USGS Unveils New Digital Map to Show Active Portions of the San Andreas Fault near San Francisco to Help the Public Be Better Prepared for Earthquakes** — This is the first-ever comprehensive digital strip map of the San Andreas Fault on the San Francisco peninsula. The map features new, more accurate mapping of the 1906 fault rupture and also includes digital versions of previous paper-only maps along with earthquake reports from the 1906 earthquake, designated fault hazard zones, trenches and historical photos.

## EVENTS

### April 18

"**Shock Waves: 100 Years After the 1906 Earthquake**" — The USGS' Steve Wessels hosts this one-hour documentary, scheduled for prime time on San Francisco Bay Area CBS affiliate KPIX Channel 5.

### April 18-22

**The International Earthquake Conference** — The conference will fo-

cus on the 1906 earthquake, a century of progress in earthquake science and engineering and the likely impact of future earthquakes in the Bay Area. Organized by Disaster Resistant California, the Seismological Society of America and the Earthquake Engineering Research Institute.

### April or May

**Meet the Hayward Fault Face to Face** — The USGS will host "The Hayward Fault — An Interpretive Viewing and Educational Exhibit" along the Hayward Fault, near Sailway Drive at Central Park in Fremont, Calif.

The exhibit will feature a 12-to-15-foot-deep trench across the Hayward Fault in Fremont. The fault is easily visible within the sediments at this location, and visitors will be encouraged to descend a staircase to meet the Hayward face to face. For safety reasons, the trench walls will not be vertical, and the space will not feel too confining.

**Recreation of the Famous 1906 Kite Photograph of San Francisco After the Earthquake and Fire** — The Drachen Foundation and the USGS' Scott Haefner recreate photographer George Lawrence's famous aerial image of San Francisco, taken from a kite three weeks after the earthquake and fire of 1906.

### Late May/Early June

**USGS Open House in Menlo Park** — This is an opportunity for the public and partners to see displays of USGS research and talk to scientists about their work in a variety of fields. A special earthquake tent will focus on 1906 and other topics. There will also be interactive displays and activities for adults and children.