

# Communication, Education, and Outreach

Mark Benthien



# *SCEC CEO Staff & Consultants*



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# ***SCEC CEO Planning Committee***



**Tim Sellnow**

**Chair & Advisory Council Rep.**

*Focus Area:* Public Education and Preparedness  
University of Central Florida



**Kate Long**

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*Focus Area:* Public Education and Preparedness  
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*Focus Area:* Implementation Interface



**Tim Dawson**

**SCEC Board Rep.**

*Focus Area:* Implementation Interface  
California Geological Survey



**Danielle Sumy**

*Focus Area:* K-14 Earthquake Education Initiative  
IRIS



**Sally McGill**

*Focus Area:* Experiential Learning and Career Advancement  
CSU San Bernardino



# *CEO Focus Areas*

## Knowledge Implementation

Engagement of  
Practicing  
Professionals

Engagement with  
Public and Private  
Decision Makers

## Public Education & Preparedness

National and Global  
Preparedness Drills  
and Resources

Earthquake Country  
Alliance

SCEC Public  
Relations and Risk  
Communication

## K-14 EQ Education Initiative

Quake Heroes Film  
and Toolkit

Quake Catcher  
Network

Educator  
Professional  
Development

## Experiential Learning & Career Advancement

SCEC Internship  
Programs

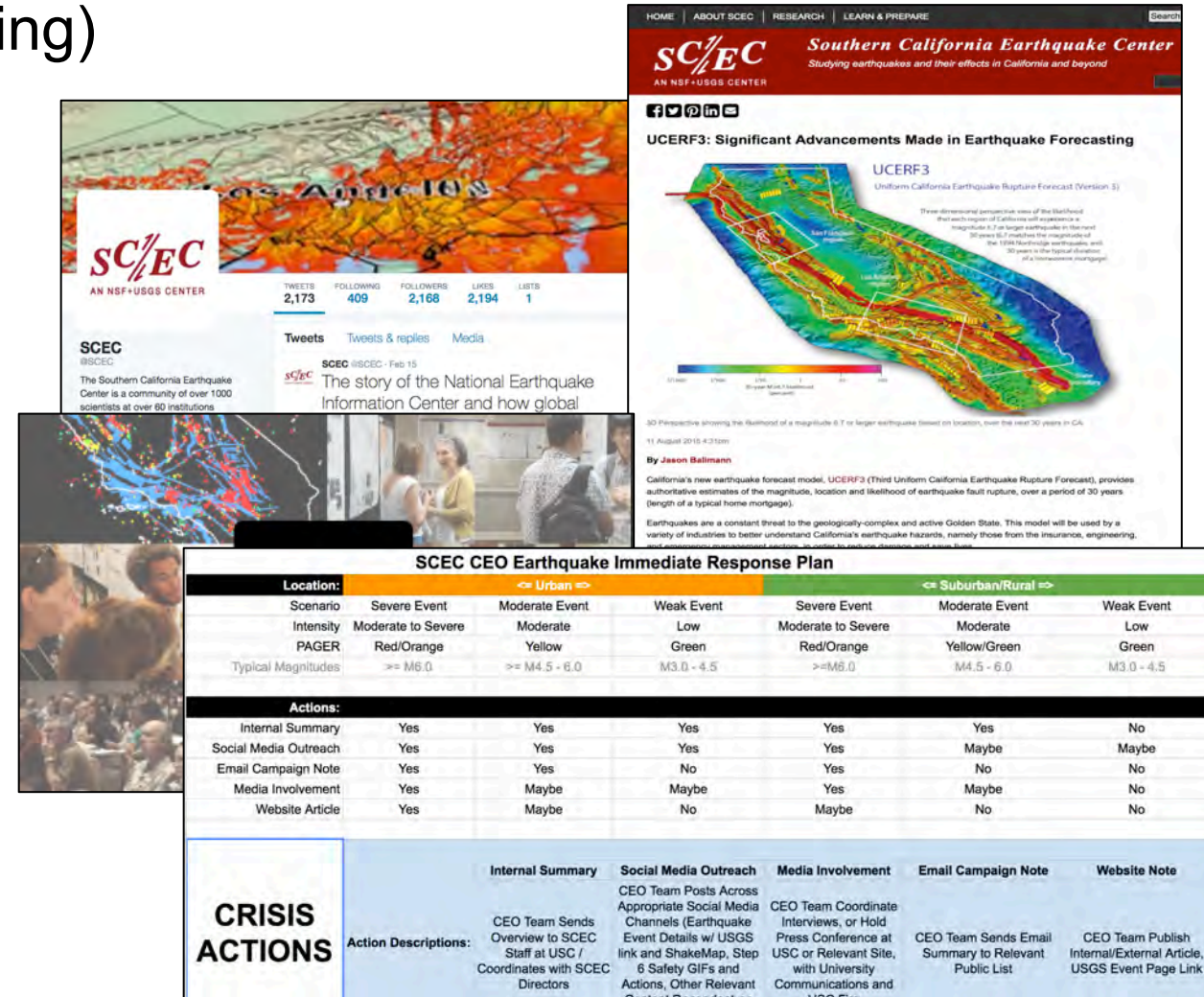
Career  
Advancement /  
Transitions  
Program

# *CEO Funding Sources*

- **NSF & USGS:** Overall
- **FEMA:** Great ShakeOut Earthquake Drills
- **CalOES/FEMA:** Earthquake Country Alliance
- **CalOES/NOAA:** TsunamiZone
- **AAA:** Great ShakeOut Earthquake Drills
- **State Farm:** Quake Heroes School Programs
- **California Earthquake Authority:** ShakeOut PSAs, etc.

# *SCEC Public Relations & Crisis Communications*

- SCEC Media Relations (trainings, pitching)
- SCEC Social Media
  - [Twitter.com/scec](https://twitter.com/scec)
  - [Facebook.com/scec](https://facebook.com/scec)
  - [Linkedin.com](https://linkedin.com) (search for SCEC)
  - [Youtube.com/scecmovies](https://Youtube.com/scecmovies)
  - [Instagram.com/SCECinsta](https://Instagram.com/SCECinsta)
- SCEC.org website articles
- Crisis Communications Development
- UseIT Communications Work Group



**SCEC**  
AN NSF-USGS CENTER

**SCEC**  
@SCEC  
The Southern California Earthquake Center is a community of over 1000 scientists at over 60 institutions

**SCEC**  
@SCEC · Feb 15  
The story of the National Earthquake Information Center and how global

**UCERF3: Significant Advancements Made in Earthquake Forecasting**

**UCERF3**  
Uniform California Earthquake Rupture Forecast (Version 3)

These three-dimensional perspective views of the likelihood that swaths of California will experience a magnitude 6.7 or larger earthquake in the next 30 years (6.7 matches the magnitude of the 1906 San Francisco earthquake, and 30 years is the typical duration of a home mortgage).

3D Perspective showing the likelihood of a magnitude 6.7 or larger earthquake based on location, over the next 30 years in CA.

11 August 2015 4:37pm  
By Jason Ballmann

California's new earthquake forecast model, UCERF3 (Third Uniform California Earthquake Rupture Forecast), provides authoritative estimates of the magnitude, location and likelihood of earthquake fault rupture, over a period of 30 years (length of a typical home mortgage).

Earthquakes are a constant threat to the geologically-complex and active Golden State. This model will be used by a variety of industries to better understand California's earthquake hazards, namely those from the insurance, engineering, and transportation development sectors, in order to reduce disaster and save lives.

SCEC CEO Earthquake Immediate Response Plan						
Location:	Urban			Suburban/Rural		
Scenario	Severe Event	Moderate Event	Weak Event	Severe Event	Moderate Event	Weak Event
Intensity	Moderate to Severe	Moderate	Low	Moderate to Severe	Moderate	Low
PAGER	Red/Orange	Yellow	Green	Red/Orange	Yellow/Green	Green
Typical Magnitudes	>= M6.0	>= M4.5 - 6.0	M3.0 - 4.5	>= M6.0	M4.5 - 6.0	M3.0 - 4.5
<b>Actions:</b>						
Internal Summary	Yes	Yes	Yes	Yes	Yes	No
Social Media Outreach	Yes	Yes	Yes	Yes	Maybe	Maybe
Email Campaign Note	Yes	Yes	No	Yes	No	No
Media Involvement	Yes	Maybe	Maybe	Yes	Maybe	No
Website Article	Yes	Maybe	No	Maybe	No	No

CRISIS ACTIONS	Internal Summary	Social Media Outreach	Media Involvement	Email Campaign Note	Website Note
	Action Descriptions:	CEO Team Sends Overview to SCEC Staff at USC / Coordinates with SCEC Directors	CEO Team Posts Across Appropriate Social Media Channels (Earthquake Event Details w/ USGS link and ShakeMap, Step 6 Safety GIFs and Actions, Other Relevant Content Provided as USGS Files)	CEO Team Coordinate Interviews, or Hold Press Conference at USC or Relevant Site, with University Communications and USGS Files	CEO Team Sends Email Summary to Relevant Public List

# *GeoHazards Messaging Collaboratory (GMC)*

- IRIS, UNAVCO, and SCEC communications collaboration
- Webinars for media and scientists, special outreach campaigns, and conference workshops/panels
- Messaging consistency and resource leveraging, rooted in social science research
- New involvement of USGS (Lisa Wald) and NOAA (Cindi Preller)





# *SCEC Communications Workshops*

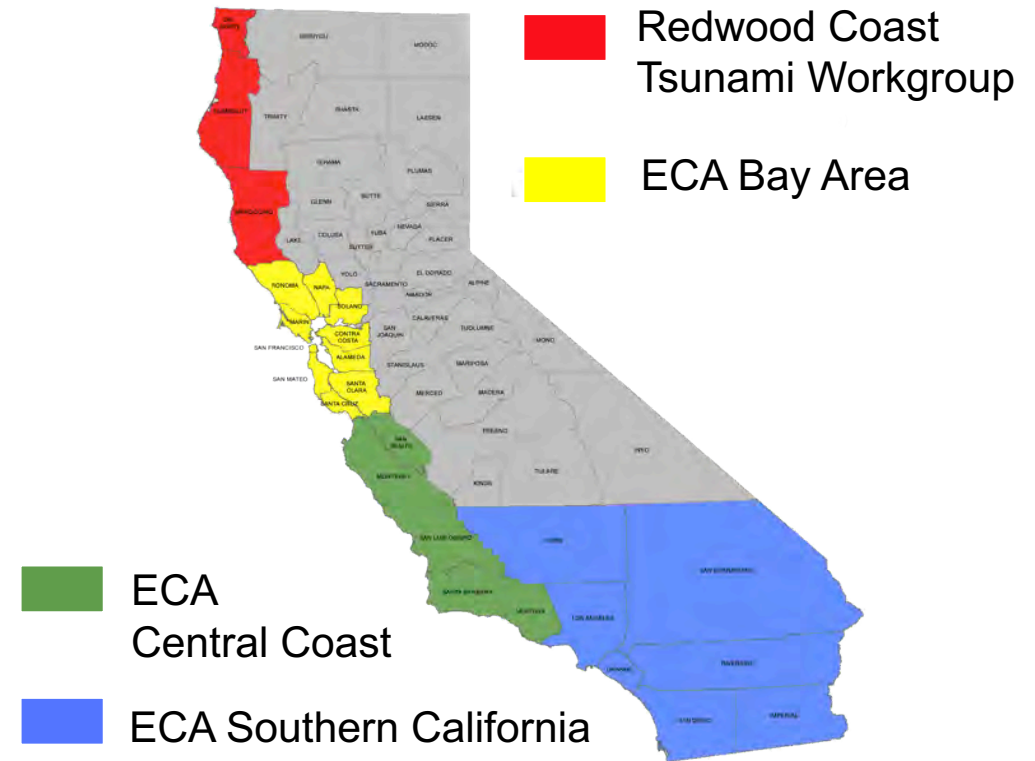
- 2<sup>nd</sup> Annual
- *Public Communications Theory and Practice for Scientists*
- Organized by Jason Ballmann and Dr. Zachary Hall, Cuesta College
- Presentations skills and press conference training





# *Earthquake Country Alliance*

- Public-Private-Grassroots leaders
- Regional alliances organize local activities
- Statewide Sector-based committees develop resources and programs
- California's Office of Emergency Services requests FEMA support for ECA activities
- Learn more and join today:  
[EarthquakeCountry.org](https://EarthquakeCountry.org)



# *ECA Statewide Activities*

Statewide messaging and resources:

[EarthquakeCountry.org](http://EarthquakeCountry.org)

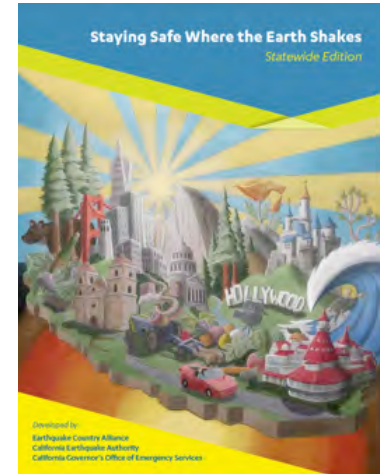
Support for Tsunami Prep. Week:

[TsunamiZone.org](http://TsunamiZone.org)

The Great California ShakeOut:

[ShakeOut.org/california](http://ShakeOut.org/california)

Sector Based Committees



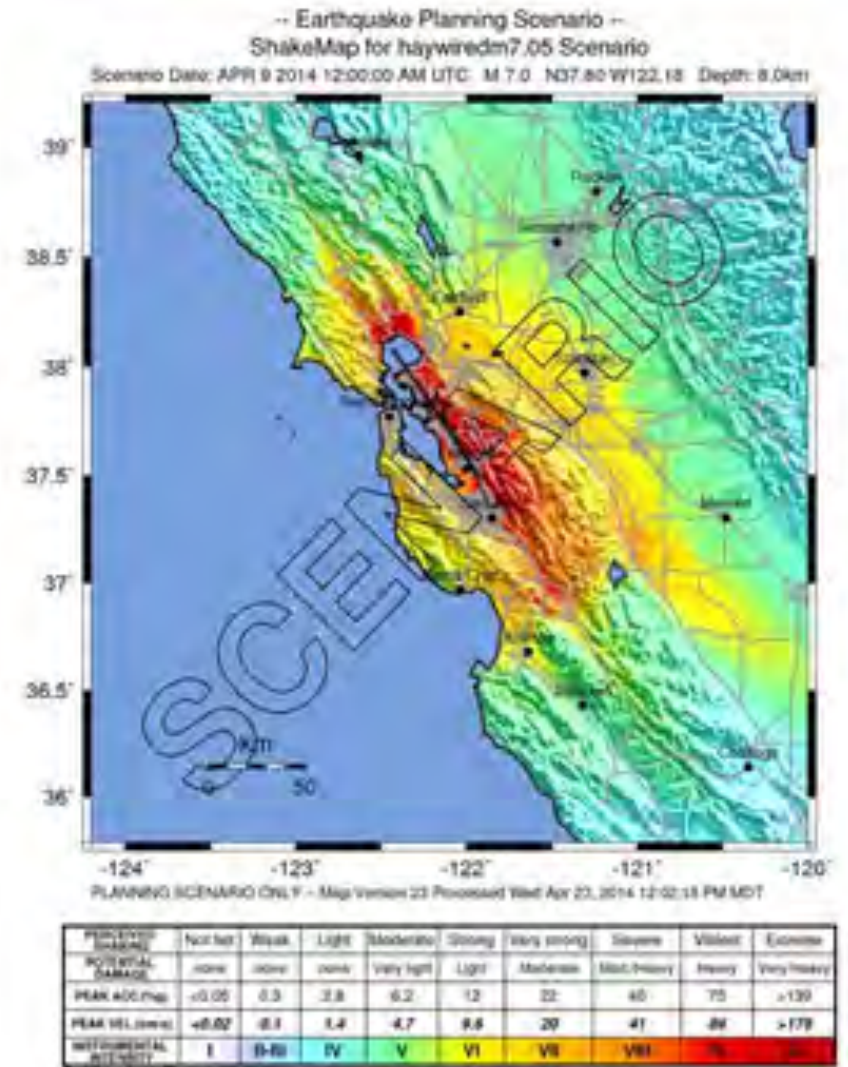
**Shake  
Out**  
TM

# *ECA Regional Alliance Activities*

- Bimonthly meetings of Coordinating Committees
- Regional Workshops (3-4x/year)
- ShakeOut and Tsunami Preparedness Week recruitment, media events, and resource development
- ECA Mini Awards
- Participation in partner conferences & events

# *USGS HayWired Scenario*

- ECA Bay Area participating in and supporting HayWired Coalition
- 2017-2018: Release of scenario chapters as they are completed & outreach to government/business
- Public release: April 18, 2018
- Basis for 2018 Bay Area ShakeOut drills: October 18, 2018





# *Great ShakeOut Earthquake Drills*

- 2016: **55+ million** people worldwide
- Schools, organizations, and families practice earthquake safety and other aspects other emergency plans
- 2017 International ShakeOut Day:  
**October 19**
- Learn more and register:  
**[ShakeOut.org](http://ShakeOut.org)**

## **Protect Yourself During Earthquakes!**



[www.EarthquakeCountry.org/disability](http://www.EarthquakeCountry.org/disability)

# *What SCEC Provides*

- Manages the California ShakeOut, and the websites of 27 other customized ShakeOut websites on behalf of state or regional partners
- Creates and distributes regionally customized monthly update emails
- Sends regular emails to people who haven't renewed their registration
- Calls larger organizations nationwide to invite them to renew or register
- Posts frequent social media messaging, new content, etc.
- Provides resources and training to ShakeOut Regional Coordinators
- Coordinates Evaluation (via Michele Wood, CSU Fullerton)

[illegible]

**Participating States, Territories, Provinces, & Countries**

- U.S. (October)** (Orange)
- U.S. (April)** (Green)
- International** (Blue)

**Multi-state regions:**

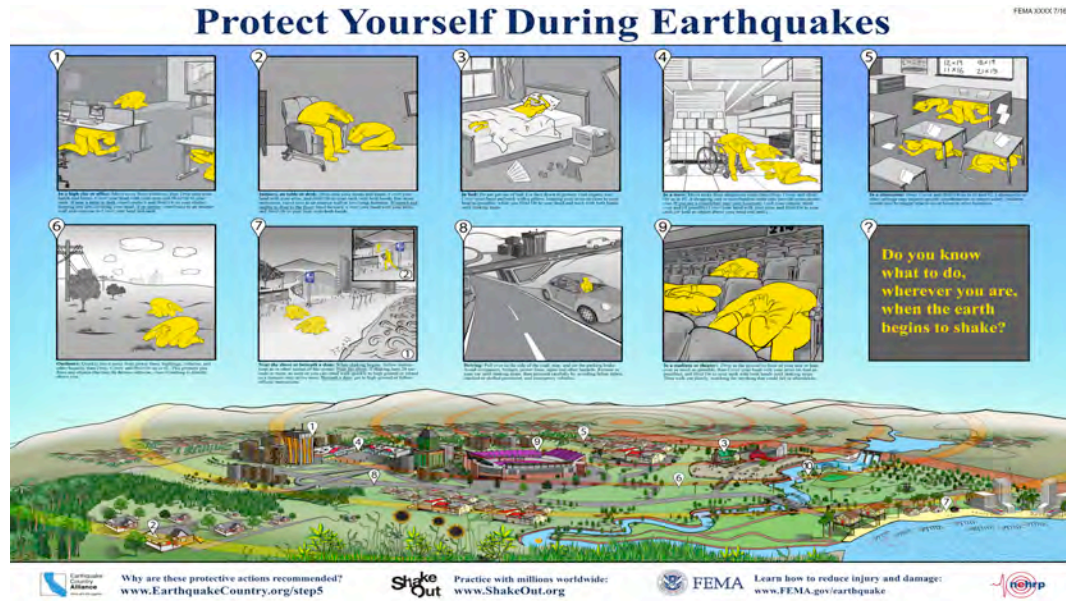
- Central US ShakeOut (Orange)
- Southeast US ShakeOut (Green)
- Northeast US ShakeOut (Orange)

**Great Upper Midwest ShakeOut** (Red Oval)

Plus participation in 70+ other countries that are not yet Official ShakeOut Regions

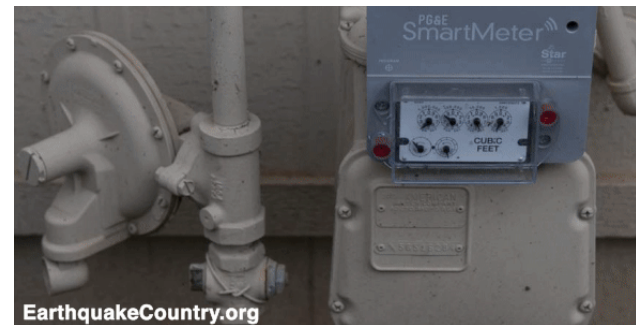


# New ShakeOut Resources



**Shake Out**<sup>TM</sup>  
If you are in a stadium or theatre

**Shake Out**<sup>TM</sup>  
If You Are Driving a Car



**Step 1:**



**[ShakeOut.org/messaging](http://ShakeOut.org/messaging)**



# Higher Education ShakeOut Resources

## Letter to Deans, Department Chairs, and Directors

Dear \_\_\_\_\_,

You may have already seen [President Smith's / my] letter about this year's *Great California ShakeOut* ([www.shakeout.org/california](http://www.shakeout.org/california)). I encourage you to mobilize your faculty and staff to participate in the largest earthquake drill ever, along with the rest of the university.

This year's ShakeOut drill will be at **10:18 a.m. on October 18, 2012**. Millions of Californians will practice **Drop, Cover, and Hold On**, along with millions of others in many other states and countries:

- **DROP** to the ground (before the earthquake knocks you down)
- Take **COVER** by getting under a sturdy desk or table, and
- **HOLD ON** to your shelter and be prepared to move with it until the shaking stops.

If there is no table or desk near you, drop to the ground and then if possible move to an inside corner of the room. Be in a crawling position to protect your vital organs and be ready to move if necessary, and cover your head and neck with your hands and arms. Do not move to another location or run outside. Earthquakes occur without any warning and may be so violent that you cannot run or crawl. These are guidelines for most situations. Visit [www.dropcoverholdon.org](http://www.dropcoverholdon.org) to learn what to do in specific settings.

Last year more than 8.6 million people participated in California alone. All colleges and universities are encouraged to participate in the drill along with K-12 schools, businesses, government agencies, other organizations, and families.

Please request all your students, staff, and faculty to participate in this year's Shakeout drill. This includes directing students and others you may supervise to participate wherever they may be at drill time.

Visit [www.ShakeOut.org/california/colleges](http://www.ShakeOut.org/california/colleges) for an instructional guide and 4-slide PowerPoint presentation for use by instructors in their classes. The presentation links to a 60-second "Drill Broadcast" narration with earthquake sound effects that can be played during your drill.

Other preparedness recommendations:

- Everyone should sign up for our school's emergency notification system ([include link](#))
- Everyone should also have an emergency kit in your car and home and an out-of-state contact you and your family can call to check-in after a major earthquake.
- For preparedness information and resources specific to **XYZ University**, visit [www.xyz.edu/preparedness](http://www.xyz.edu/preparedness).

Best regards,

Campus Emergency Manager / President

## Great ShakeOut Earthquake Drill Classroom Instruction Guide

Thank you for playing your important role in teaching or reminding our students how to be safe during major earthquakes. This may be the first time some of our out-of-state students have ever participated in an earthquake drill, and it may be their only opportunity to practice what to do to protect themselves ("Drop, Cover, and Hold On") before our next major earthquake.

The 2012 ShakeOut will be held statewide on **October 18<sup>th</sup> at 10:18 a.m.** This is when most people will participate, but you are welcome to shift the time to the start or end of your class. As many students may not be in class at this time, you are welcome to hold similar drills in other classes this day as well.

### Instructions:

1. Prior to the start of your drill, start the 4-slide PowerPoint and display the first slide, or read the following:
  - California is earthquake country... an earthquake can happen at any time and cause intense shaking at USC! To protect your life, you need to know what to do in an event of an earthquake.
  - The Great California ShakeOut is an annual statewide earthquake drill for practicing what to do to protect ourselves during earthquakes.
2. Advance to the second slide and read the content about protective actions during earthquakes:
  - a. Classroom or auditorium:
    - **Drop** to the floor
    - Take **Cover** under your desk or table as best as possible. If in an auditorium with no tables, take cover between the rows of chairs. Cover the back of your head and neck with your other hand.
    - **Hold on** to the leg of the desk/table with one hand.
  - b. Laboratory or other room with no tables/shelter:
    - Step back from the lab table.
    - **Drop** to the floor on your knees next to a wall, away from glass and other hazards if possible.
    - **Cover** your head and neck with your arms.
    - **Hold On** to something sturdy during the shaking, if possible
    - Once the shaking has stopped carefully exit the building.
3. Advance to the third slide and play the 60-second Drill Broadcast narration, or read this:
  - This is an earthquake drill. Drop, Cover, and Hold on.
  - **Drop** to the ground now, before the ground jerks strongly and throws you down.
  - Take **Cover** under something sturdy to protect yourself from objects being hurled across the room. Or stay low and protect yourself from flying objects with your hands and arms.
  - **Hold On** to your shelter or hold your position until the shaking stops.
4. Once the narration is over and the students return to their seats, you can hold an optional brief discussion. Possible topics:
  - a) Do you always keep your cell phone and computer charged? If you have a car, do you always keep at least half a tank of gas in it?
  - b) How would you contact your family in case of an emergency? Do your parents/family members know how to respond to emails/texts/etc.?
  - c) If the ATMs are down after a major earthquake, will you have enough money to sustain yourself?
  - d) Do you know what "check in" services and hotlines are available for your use through USC?
  - e) Learn more: <http://www.earthquakecountry.org>

Thank you for participating in the ShakeOut Drill and putting safety first!

## What Are We About To Do?

*People get injured by falling objects and when they try to run, which is why we will practice **Drop, Cover, and Hold On**:*

### In a CLASSROOM OR AUDITORIUM:

- **Drop** to the floor. Do not try to exit during shaking.
- **Cover** your head and neck with one hand and seek shelter under your desk or table as best as possible. If in an auditorium with no tables, take cover between the rows of chairs.
- **Hold on** to the leg of the desk/table with your other hand.

### In a LABORATORY:

- Step back from the lab table.
- **Drop** to the floor on your knees next to a wall, away from glass and other hazards if possible.
- **Cover** your head and neck with your hands and arms.
- **Hold On** to something sturdy during the shaking

"Wait a Minute" after shaking stops. Then look around for hazards, including behind you, before getting up. Carefully exit the building if instructed.



Messaging templates, instructor's guide, and PowerPoint slides (with link to Drill Broadcast): [ShakeOut.org/colleges](http://ShakeOut.org/colleges)

# TsunamiZone.org

The screenshot shows the homepage of TsunamiZone.org. At the top is a navigation bar with links: Home, TsunamiZone Regions, Other Languages, Contact Us, Search, and Login. Below this is a large banner image featuring the Golden Gate Bridge and a person running, with text for 'California Tsunami Preparedness Week March 25-31, 2017'. A secondary navigation bar includes links like 'Register Here!', 'Know Your Zone', 'Who is Participating?', 'How to Participate', 'Resources', 'News & Events', and 'Partners & Sponsors'. A green status bar indicates 'There is No Tsunami Warning, Advisory, Watch, or Threat in effect.' The main content area is divided into several sections: 'WELCOME TO THE TSUNAMIZONE!' with language options (ESPAÑOL | FRANÇAIS) and a video titled 'Staying Safe Where the Wave...'; a '2017 CALENDAR' listing events such as 'March 19-25 Puerto Rico, U.S. Virgin Islands, CARIBE WAVE 2017' and 'March 25-31 Alaska, California, Guam'; a 'PARTICIPATE AND SHARE' section with links for 'How to Participate', 'Tsunami Resources', 'Who is Participating?', and 'Share Your Activities'; a 'CHECK THE STATS' section showing 'Global Total for 2017: 485' and 'Global Total for 2016: Over 400,000'; and a 'TSUNAMI TALK' section featuring a Facebook post from 'The TsunamiZone' with 540 likes. The footer contains logos for NOAA, National Tsunami Hazard Mitigation Program, USGS, Cal OES, and SC/EC, along with a comprehensive list of site links.

- **Know Your Zone:** Maps for all coastal areas to know if you are in a tsunami inundation zone
- **Tsunami Preparedness Week:** Register your activities to be counted
- **Event Calendar:** Learn about drills, presentations, and other events near you
- **Resources:** Movies, manuals, posters, etc.
- **2017:** California (138K); Caribbean (470K)



# *Quake Heroes Documentary*

- Interviews and reenactments of people who experienced the 1994 Northridge earthquake; how they helped others
- Earthquake science and its value/ application highlighted with comments from Tom Jordan, Lucy Jones, and Ken Hudnut
- Key learning moments tied to the *Seven Steps to Earthquake Safety*
- Encourages everyone to become trained (CERT, CPR, etc.) and prepared

## *RETROSPECTIVE INTERVIEWS*



## *ARCHIVAL FOOTAGE*



## *CINEMATIC RE-ENACTMENTS & MOTION GRAPHICS*



- **Broadcast-quality documentary**  
Interviews, live action re-enactments, archival news footage, and 3D motion graphics
- **Classroom toolkit**  
Earthquake science lesson plans, take-home preparedness guides, and Teen CERT materials
- **Outreach campaign**  
Social media, website, and additional video content
- **Funding**  
FEMA, State Farm, Simpson Strongtie, Safe-T-Proof, and other sponsors





# *Experiential Learning & Career Advancement*

## **Undergraduate Studies in Earthquake Information Technology (USEIT)**

- Continued NSF REU support, \$120K/yr for 3-years, 12 interns/year
- Expanded focus on applications of high performance computing
- 25,000 hours on Blue Waters secured by Scott Callaghan
- Additional support from USC (\$41K) and local community colleges (\$30+K)
- Extensive involvement of all SCEC staff
- **2017:** 22 Interns

# *2017 USEIT Interns*

## Cohort

- 22 interns
- Gender: 12 female/10 male
- Minority: 11
- 1<sup>st</sup> Generation: 11
- Community college: 7

## Majors (some double major)

- Computer Science: 9
- Mathematics: 4
- Engineering: 7
- Geology: 5



[scec.org/demo/useit](https://scec.org/demo/useit)

# *2017 USEIT Grand Challenge*

Develop a computational system for the probabilistic forecasting of earthquake sequences using RSQSim simulated seismicity catalogs generated on the Blue Waters supercomputer.

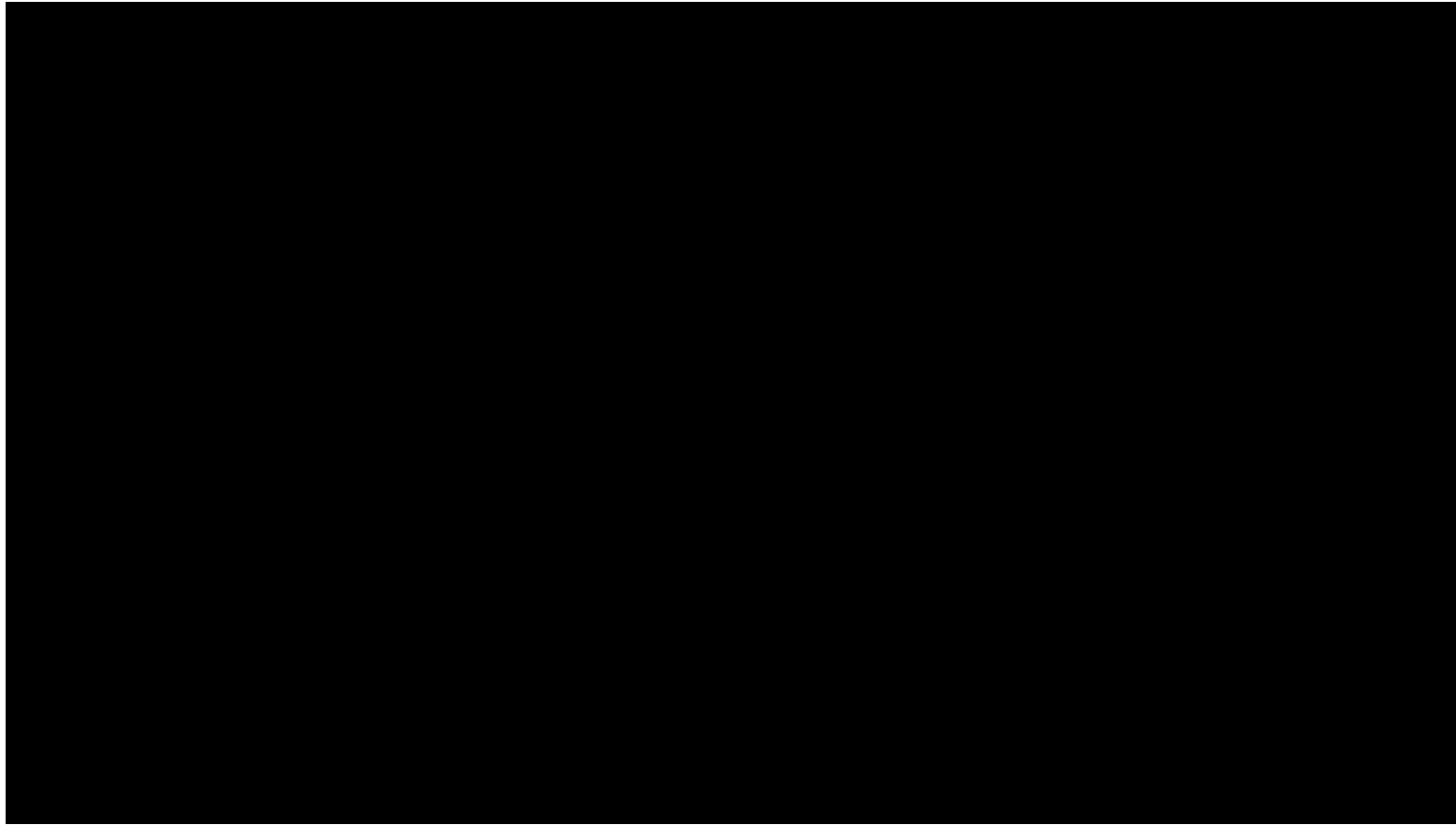
Compare simulator-based probabilities for large aftershocks ( $M \geq 7$ ) of for three scenarios (M6 Parkfield, M7 Mojave, M6 Bombay Beach) with the values given by UCERF3

Select multi-event scenarios that could threaten the Los Angeles region and illustrate their hazard and risk with sequence-specific maps of expected ground motions, economic losses, and human casualties.

**Learn more:** Visit Interns in Posters session or read article on SCEC.org



# *New SCEC-VDO Training Video*



**[Youtube.com/scecmovies](https://www.youtube.com/scecmovies)  
[scecvdo.usc.edu](http://scecvdo.usc.edu)**



# *Experiential Learning & Career Advancement*

## **Summer Undergraduate Research Experience (SURE)**

**2017:** Program postponed due to overall funding delay

**2018:** Describe a project for a summer intern as part of your 2018 SCEC proposal

- Full stipends and travel support to SCEC Annual Meeting awarded directly to student as supplement to SCEC awards
- Number of SURE internships will depend on available funding
- CEO will coordinate recruitment with potential mentors

# *Experiential Learning & Career Advancement*

## **SCEC Transitions Program**

- 2017-2018: Undergraduate → Graduate
  - Develop SCEC student network (e-mail list, webpage, other resources)
  - SCEC Annual Meeting Workshops and online webinars: advice for applying, info about SCEC institutions, SCEC research opportunities
  - Coordination with SCEC Core (2017) and Participating (2018) Institutions to learn about their diversity/transition programs
- 2019: Graduate → Post Doc / Early Career Opportunities

# *Experiential Learning & Career Advancement*

## **SCEC Transitions Program**

### **The Breakfast Club—It's Never too Early to Start**

**Beyond the Baccalaureate—Charting a  
Course for Grad School**

*Monday, September 11, 2017 (07:00-08:00)*

**Life After Graduate School—Now What?**

*Tuesday, September 12, 2017 (07:00-08:00)*





# *K-14 Education Initiative*

- Resources:
  - Quake Catcher Network (with IRIS and USGS)
  - SCEC Plate Tectonics Puzzlemap
  - *Quake Heroes* Educational Toolkit and Lesson Plans
- NSF INCLUDES “Earth Connections” San Bernardino Alliance
- Inclusion of EEW education in all the above (CA, OR, WA, etc.)
- Partnerships with IRIS, USGS, UNAVCO, etc. for educator professional development
- Booth at 2017 NSTA and CSTA Conferences

# *Knowledge Implementation*

## **Desired Outcomes**

- ***Increased attendance and interactions*** at engineering meetings, webinars, etc
- ***Engaged engineers***: get them involved in working groups/projects
- ***Adoption of SCEC science*** for better building codes, insurance rate setting, response, etc.
  - UGMS/CyberShake
  - Simulations (High-F, Broadband, CyberShake)
  - UCERF (Uniform California Earthquake Rupture Forecast)
  - OEF (Operational Earthquake Forecasting)
- ***Improved articulation*** of science process and results by SCEC Community, both internally and externally

# *Knowledge Implementation*

## **Who to Involve**

- Engineers
- Building officials and their staff
- Public officials and their staff
- Media and public
- Social scientists

## **Approaches**

- Participate in ACSE / SEAOC / SEAOSC / AEG / CGS / EERI meetings
- Training webinars and in-person meetings for earthquake engineers, media, etc.
- Invite engineers and building officials to SCEC Annual Meeting
- Field Trips (also potential income source)



# *QuakeSmart Community Resilience Program*



## QuakeSmart Summits:

- April 16: Rancho Mirage
- May 16: Long Beach
- May 18: Los Angeles

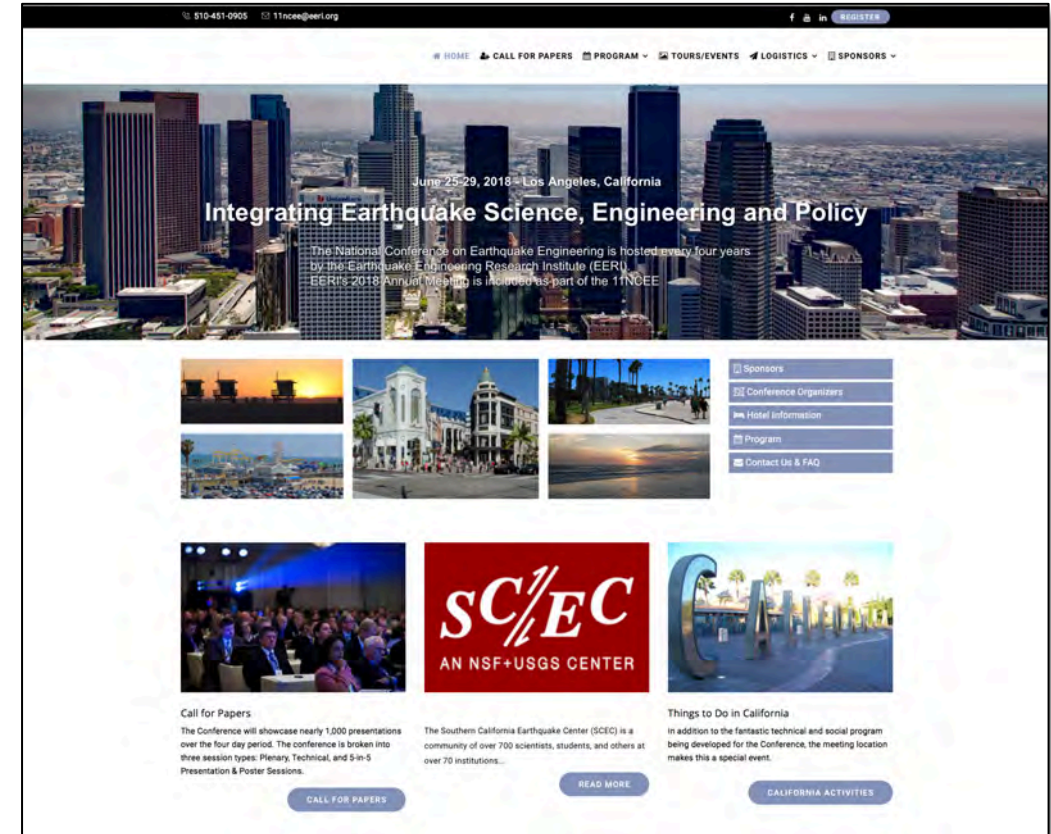
## QuakeSmart Mitigation Inspection Program

- Palmdale Pilot

**[QuakeSmartCommunity.org](http://QuakeSmartCommunity.org)**

# *11<sup>th</sup> National Conference on Earthquake Engineering*

- June 25-29, 2018
- Downtown Los Angeles
- *Integrating Earthquake Science, Engineering and Policy*
- SCEC is a technical co-sponsor with EERI
- Goulet is Program Co-Chair
- Benthien is Publicity Committee Co-Chair



[11NCEE.org](http://11NCEE.org)

**SC/EC**

AN NSF+USGS CENTER

***Southern California  
Earthquake Center***



*Southern California Earthquake Center*