

Erin R. Burkett, Ph.D.

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CURRENT POSITION

Geophysicist U.S. Geological Survey (USGS) February 2013-present
Natural Hazards Mission Area
Science Application for Risk Reduction (SAFRR) Project
<https://profile.usgs.gov/eburkett>

Currently working to facilitate partnerships and projects to improve the translation of science into products and communication tools that are accessible and applicable by users and stakeholders.

EDUCATION

Ph.D., Geology/Geophysics University of California, Davis June 2010
*Thesis: An Investigation of the Rheologic Controls and Dynamics
Associated with the Detachment of Subducted Tectonic Lithosphere
Using Two- and Three-Dimensional Numerical Models
Advisor: Magali I. Billen*

B.S., Physics University of Delaware 2004
*Undergraduate Research: Electron Trap Experiment Construction
Advisor: Travis B. Mitchell*

RESEARCH EXPERIENCE

Earthquake Early Warning Alert Sound Research & Design, USGS 2015-present

- Melding Earthquake Early Warning (EEW) science & U.S. system (ShakeAlert) development needs with social and behavioral science understanding to develop recommendations for most effective communication elements to incorporate into EEW education campaigns and the design of a unique EEW alert sound to optimize effective behavioral responses by users during earthquakes. See poster: http://scecinfo.usc.edu/meetings/2015am/presentations/SCEC2015_poster066.pdf

Cascading Disasters Research, USGS 2012-present

- Project aimed toward understanding the interconnections between hazards and their cascading consequences during and after disasters, linked especially to the complex interdependencies between modern lifelines and systems. Includes mapping of connections visually by creating Influence Diagram illustrations that might be useful for emergency and planning purposes. See abstract and request poster if interested: <http://adsabs.harvard.edu/abs/2013AGUFMNH43B1746B>

Post Doctoral Scholar in Geophysics, California Institute of Technology 2010-2012

- Performing geodynamic numerical modeling studies of the dynamics and stalling of subduction to address current questions and conceptual models arising in response to complex mantle structures revealed by recent unprecedented high-resolution seismic data, particularly beneath western North America.

Graduate Research Assistant, University of California, Davis 2004-2010

- Performing numerical studies to better understand plate tectonic driving forces, particularly the dynamics of subduction and slab detachment (due to ridge-trench collision), and comparing model results with geologic and geochemical/volcanic data and observations in Baja California.

Undergraduate Research Assistant, University of Delaware 2002-2004

- Helped design and build a Penning electron trap experiment to study ion plasma behavior, useful for understanding starquakes, conditions within white dwarfs and neutron stars, or possible applications in advanced clocks and computers.

PUBLICATIONS

Burkett, Erin R., Douglas D. Given, and Lucile M. Jones (2014), *ShakeAlert—An earthquake early warning system for the United States West Coast*. U.S. Geological Survey Fact Sheet 2014–3083, 4 p., <http://dx.doi.org/10.3133/fs20143083>.

Burkett, Erin R., and Michael Gurnis (2012), *Stalled Slab Dynamics*. *Lithosphere*, doi:10.1130/L249.1 . Online source: <http://authors.library.caltech.edu/37776/>

Burkett, Erin R., and Magali I. Billen (2010), *Three-dimensionality of slab detachment due to ridge-trench collision: Laterally simultaneous boudinage versus tear propagation*. *Geochemistry Geophysics Geosystems*, Vol. 11, Q11012, 21 PP., <http://dx.doi.org/10.1029/2010GC003286>.

Burkett, Erin R. (2010), *Dynamics of the Detachment of Subducted Tectonic Plates: Rheologic Controls and Ridge-Trench Interactions*, Doctoral Dissertation (UC Davis), ProQuest/UMI, Publication number 3422705. Online source: <http://gradworks.umi.com/34/22/3422705.html>

Burkett, Erin R., and Magali I. Billen (2009), *Dynamics and Implications of Slab Detachment Due to Ridge-Trench Collision*. *J. Geophys. Res.*, 114, B12402 <http://dx.doi.org/10.1029/2009JB006402>.

Andrews (Burkett), Erin R., and Magali I. Billen (2009), *Rheologic controls on the dynamics of slab detachment*. *Tectonophysics*, 464, 60-69, <http://dx.doi.org/10.1016/j.tecto.2007.09.004>.

TEACHING, OUTREACH, & HAZARDS COMMUNICATION

Earthquake Early Warning: User Education & Designing Effective Messages 2012-present

- Applying multi-disciplinary research and collaborations between social scientists, designers, and earth scientists to more effectively communicate scientific information, particularly during the on-going development of the Earthquake Early Warning system and communication/education plan for the West Coast. See poster presented at the 2014 American Geophysical Union Fall Meeting: <https://agu.confex.com/agu/fm14/meetingapp.cgi#Paper/17958>

Earthquake Early Warning: USGS-LAUSD ShakeAlert Pilot Project 2015-present

- Currently serving as project lead for the LAUSD-ShakeAlert Pilot Project, a collaboration between the USGS and Los Angeles Unified School District (LAUSD) to test the ShakeAlert (www.shakealert.org) earthquake early warning system in classrooms, starting with Eagle Rock High School. This collaboration applies expertise from fields including risk communication, user-based product design, and geoscience to help inform the improvement of the ShakeAlert prototype currently under development, as well as provide recommendations for training materials.
- See article by the LA Mayor announcing the project initiation in Oct 2015: http://www.lamayor.org/mayor_garcetti_announces_first_in_the_nation_early_warning_system_pilot_at_laUSD_school

Volunteer for Caltech Seismological Laboratory, Caltech 2011-2012

- Organization, acquisition, and assembly of demonstration ‘slinky’ and Lehman-type seismometers for Seismo Lab Earthquake Exhibit and USGS/Caltech Media Center. Also designed informational plaque for exhibit.
- Writing, editing, and advising of content and narration in Earthquake Exhibit presentations giving laboratory overview and introduction to seismology (see: <http://exhibit.gps.caltech.edu> or <https://www.youtube.com/watch?v=6qMluuSiXrk>).
- Hosting students from nearby schools or other public audiences, ~50-90 min each: tours of the Earthquake Exhibit and USGS/Caltech Media Center, describe seismometers, seismic waves, basic earthquake mechanics, awareness, preparedness.

Volunteer for Tours of Caltech (Tectonics Observatory Outreach), Caltech 2011-2012

- Hosting 4th or 6th grade groups (>6 occasions) from local schools, ~30 min each
- Showing animations of continental drift, mid-ocean-ridge spreading, subduction, and involving kids in interactive demonstrations: rock properties using silly putty, and ‘earthquake machine’

Scientific Content Expert for Geoscience Video Game 2011-2012

- Working with GameDesk design team as a scientific content expert to help design an interactive educational Geoscience video game for middle-high school students

Invited Guest, 8th Grade Earth Science, Gilford Middle School, New Hampshire Dec. 22, 2010

- Presenting to four 1-hour classes (teacher: Nancy Allen)
- Overview of geoscience research, plate tectonic, earthquake preparedness exercises, and hands-on activities: ‘earthquake machine’ and building response to earthquakes

Volunteer for Teachers Partners Program, Caltech 2010

- Presentations (three visits) to a 6th grade Earth Sciences class at McKinley
- Plate tectonics overview, ‘earthquake machine’ & building shaking demonstrations

Graduate Teaching Assistant, University of California, Davis 2004-2009

- Led discussion classes for introductory & planetary geology undergraduate courses.
- TA for Geophysics and Neotectonics summer field courses held at White Mountain Research Station and local field sites (Owens Valley, CA). Assisted students with field mapping exercises and gravity, magnetic, and resistivity surveys.

Writing Fellow, University of Delaware Honors Program 2002-2004

- Trained and hired by UD to work with students in semester-long Honors writing courses; read and commented on drafts of student papers and met individually (~half-hour meeting) with students to help with their writing process.

PROFESSIONAL ACTIVITIES

Manager of SAFRR website content, news, and SAFRR Newsletters 2012-present
See SAFRR site and Newsletters at: http://www.usgs.gov/natural_hazards/safrr/

Selected Presentations/Public Speaking Engagements (over 36 presentations total)

- *Understanding Earthquakes: Science, Technology, & Impacts*, Invited presentation for the Southern California Area Crisis team (SC-ACMT), Los Angeles, CA, May 2, 2016.
- *Women's History Month*, Invited to present perspectives/story as a woman in the sciences for the US Citizenship and Immigration Services' Women's History Month annual event, Santa Ana Field Office, March 17, 2016.
- *Understanding Earthquakes!*, Invited speaker for over 400 6th graders at the Day Creek Intermediate school, Etiwanda, CA, February 11, 2016.
- *Understanding Earthquakes: Science, Technology, & Impacts*, Kick-off Presentation for the Los Angeles Area Continuity of Operations (COOP) Working Group Continuity Exercise, Joint Forces Reserve center, Bell, CA, December 2, 2015.
- *Understanding Earthquakes: Science, Technology, & Impacts*, Invited Speaker for Ventura Red Cross, Camarillo, CA, October 20, 2015.
- *Understanding Earthquakes: Science, Monitoring, & Impacts*, Keynote for LA County Disaster Healthcare Volunteer Surge Unit Annual Conf., Monterey Park, June 27, 2015.
- *Understanding Earthquakes: Science, Technology, & Resources*, Pub Science Night by the Columbia Memorial Space Center, Golden Road Brewery, Los Angeles, CA, June 9, 2015.
- *UCERF3: Forecasting California Earthquakes*, Earthquake Country Alliance, Southern California Regional Associates Meeting, Santa Fe Springs, CA, April 30, 2015.
- *Understanding Earthquakes: Science, Technology, & Resources*, CA Science Teachers Assoc. "CSTA Night," Aquarium of the Pacific, Long Beach, CA December 4, 2014.
- *ARkStorm: The Other Big One*, Kick-off presentation for the Los Angeles Area Federal Annual Continuity of Operations Preparedness Exercise/Workshop, Resilient Angel 2014, Joint Forces Reserve Center, Bell, CA, December 4, 2014.
- *If You Knew The Earthquake Was Coming...*, Exploring Your Universe Lecture Series, University of California, Los Angeles, November 16, 2014.
- *To Be Warned or Not Be Warned*, <https://www.youtube.com/watch?v=6nvUc4h4pbM>, TEDxRiverside "Ovation for Innovation" conference, Fox Performing Arts Center, Riverside, CA, October 16, 2014.
- *Earthquake Threat to Businesses & Society*, Southern California Earthquake 2014 Business Preparedness Summit, Riverside, CA, September 18, 2014.
- *SAFRR Projects & Scenarios for Risk Reduction*, Los Angeles Area COOP (Continuity of Operations Planning) Working Group, Los Alamitos, CA, August 27, 2014.
- *Understanding Your Earthquake Risk in Southern California*, "Summer of Safety" series for employees and safety team members of Capital Group, Los Angeles, CA, July 23, 2013.
- *Earthquakes: Science, Monitoring, & Impacts*, Annual meeting of the Council of State and Territorial Epidemiologists (CSTE), "Disaster Epidemiology: From Fukushima to Super Storm Sandy" session, Pasadena, CA, June 9, 2013.

- *Modeling Subduction Dynamics: Stalled Slabs and Ridge-Trench Interactions*, Department of Geosciences colloquium, University of Arizona, Tucson, Arizona, October 13, 2011.
- *Geodynamic Models of Ridge-Trench Collision*, SIO Earth Section Seminar, Scripps Institution of Oceanography, UC San Diego, La Jolla, CA, October 10, 2011.
- *Dynamics of the Detachment of Subducted Tectonic Plates: Rheologic Controls and Ridge-Trench Interactions*, UCLA, Seismology/Tectonics Seminar, February 16, 2011.
- *3D Dynamics of Slab Detachment Due to Ridge-Trench Collision*, American Geophysical Union 2010 Fall Meeting, San Francisco, CA, Abstract DI41B-07, December 16, 2010.
- *2D Numerical Models of Ridge-Trench Collision: Implications for Slab Detachment Beneath Baja, California*, Caltech Seismo Lab, Pasadena, CA, November, 2008.
- *2D Numerical Models of Ridge-Trench Collision: Implications for Slab Detachment Beneath Baja, California*, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Ensenada, Mexico, June, 2008.

Graduate Student Representative (2009-2010)

UC Davis Geology Department Structure/Tectonics Faculty Position Search, 2008

Vice President and Founding Member

Society of Physics Students, University of Delaware Chapter, 2004

ExxonMobile Short Course, Invited Participant

“Multi-Disciplinary Subsurface Integration in Exploration and Production, from Plates to Pores,” Houston, TX, March 18-21, 2009.

SELECTED HONORS AND AWARDS

Tectonics Observatory Outreach Honorarium, Caltech, 2010

Physics and Astronomy Scholarship, University of Delaware, 2003

SKILLS/ACTIVITIES

Computer: Extensive experience with CitcomS, CitcomCU, MATLAB, UNIX, GMT, 3-D Visualizer, LaTeX, Adobe Illustrator, Maple, Microsoft Excel, Powerpoint, Word.
Additional experience: C programming, AutoCAD LT, LabVIEW, Electronics Workbench.

Field work/study: Experience conducting gravity, magnetic, and resistivity field surveys (as Teaching Assistant for UC Davis), geologic data collection (fault scarp profiles) using a total station (Owens Valley, CA, 2008), installation of seismic stations (Peru, 2011).
Geologic mapping experience (Rainbow Basin, CA as assistant on UC Davis field trip; McGee Creek as TA for UC Davis undergrad Neotectonics field course). Ecology field study in Ecuador and the Galapagos (Study Abroad, UD, Jan-Feb 2004).

Laboratory work experience: High-pressure multi-anvil Bi calibration experiment (petrology lab project, UC Davis); electron trap assembly (see Research Experience: Undergrad RA)

Machining/fabrication: Metal machining, including milling, drilling, tapping, lathing, and spot-welding (physics undergraduate research). Construction of demonstration ‘slinky’ seismometers involving drilling, tapping, wiring, soldering of components (Caltech, 2012).

Languages: Spanish (extensive travel/practice in Spanish-speaking countries), survival French.

Art: Minor in Art, concentration in painting, University of Delaware, 2004. Hired to design logos and commissioned paintings. For exhibits, online galleries of works, and more information, see: <http://www.burkettart.com/erinart.htm>

Infographics: Worked closely with graphic designers for creation of images in USGS fact sheet (see publications); logos (see 'Art' & link); created infographics for capturing infrastructure interdependencies and effects of cascading disasters for use in a USGS earthquake scenario project (HayWired) for the San Francisco Bay Area (see contact info to request samples).

Music: Choir and solo performance (Chorale, Madrigals, and A cappella groups, Concord HS, 1996-2000; University Singers, University of Delaware, 2000-2004). Solo voice private study and performance (first soprano), University of Delaware, 2000-2004.

Equestrian: English and western riding styles; volunteer training and rehabilitation of rescued horses (particular Standardbred off-the-track harness racehorses), 2009-2010; ranch hand and assistant horseback tour guide (Dahana Ranch, Waimea, Hawaii, 2012)

First Aid and Survival: CPR and Wilderness First Aid training (latest course Oct, 2011), Wilderness Survival Field Course (7-day, BOSS, Escalante National Monument, June 2010)