David R. Shelly

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EDUCATION

2000 – 2007	**Stanford University,** Stanford, CA *Ph.D.*, Geophysics, March 2007 • Dissertation title: "The Mechanics of Subduction Zone Tremor and Transient Slip in Japan" • Ph.D. advisor: Dr. Gregory C. Beroza
1996 – 2000	**Whitman College,** Walla Walla, WA *Bachelor of Arts,* Mathematics-Physics, Summa Cum Laude, with Honors in major study • Honors Thesis: "Polarization Correlations in Pulsed, Vertical-Cavity, Surface-Emitting Lasers."
7/1998 – 11/1998	**Otago University,** Dunedin, New Zealand • Semester-long study-abroad program coordinated through Whitman College

RESEARCH AND TEACHING EXPERIENCE

2010-present	**Research Seismologist,** Long Valley and Yellowstone Volcano Observatories, U.S. Geological Survey, Menlo Park, CA
2008-2010	**Mendenhall Postdoctoral Fellow,** U.S. Geological Survey, Earthquake Hazards Team, Menlo Park, CA
2007-2008	**Miller Postdoctoral Fellow,** University of California, Berkeley, Department of Earth and Planetary Science
6/2005 – 8/2005	**East Asia and Pacific Summer Institutes, Tokyo, Japan** • Eight-week program funded by the National Science Foundation and the Japan Society for Promotion of Science sponsoring foreign research experience • Host Institution: University of Tokyo, Hongo campus • Host Researcher: Dr. Satoshi Ide, Department of Earth and Planetary Science
2004 – 2006	**Instructor**, Outdoor Education Program, Stanford University • Responsible for teaching a portion of GES 7, Wilderness Skills, a 1-credit course offered quarterly through the Geological and Environmental Sciences department
6/2004	**Mathematical Geophysics Summer School**, hosted by Colorado School of Mines, Golden, CO
2005	**Teaching Assistant**, Geophysics 287, Earthquake Seismology
2002	**Teaching Assistant**, Geophysics 3, Earthquakes and Volcanoes

INVITED PRESENTATIONS

6/2010	Plenary Speaker, 2010 Workshop on Crustal Deformation, Golden, CO (upcoming)
5/2010	Scripps Institution of Oceanography, Earth Section Seminar Series (upcoming)
4/2010	University of California, Santa Barbara, Distinguished Speaker series
9/2009	Plenary Speaker, Southern California Earthquake Center (SCEC) Annual Meeting
4/2009	Carnegie Institute of Washington, Dept. of Terrestrial Magnetism, Washington, D.C.
11/2008	Earthquake Research Institute seminar, University of Tokyo, Japan
10/2008	U.S.-Japan Joint Panel on Earthquake Research (UJNR) 7th meeting, Seattle, WA
10/2008	UC Santa Cruz Seismology Seminar, Santa Cruz, CA
9/2008	Caltech Tectonics Observatory Seminar, Pasadena, CA
8/2008	Presentation to the Scientific Earthquake Studies Advisory Committee (SESAC)
6/2008	USGS Earthquake Hazards Seminar, Menlo Park, CA
2/2008	Plenary Speaker, Earthscope Workshop on Non-volcanic Tremor, Aseismic Slip, and Earthquakes, Sidney, British Columbia, Canada
12/2007	Invited Speaker, AGU Fall Meeting, San Francisco, CA

9/2007	UC Berkeley, Seismological Laboratory Seminar, Berkeley, CA
3/2007	Plenary Speaker, Earthscope National Meeting, Monterey, CA
11/2006	Invited Speaker, U.S.-Japan Natural Resources Panel on Earthquake Research (UJNR) 6th Joint Meeting, Tokushima, Japan.
10/2006	USGS Earthquake Hazards Seminar, Menlo Park, CA
8/2006	UC Berkeley, Seismological Laboratory Seminar, Berkeley, CA
10/2005	California Institute of Technology, Seismological Laboratory Seminar, Pasadena, CA

HONORS AND AWARDS

11/2008	First recipient of the Keiiti Aki Young Seismologist Award, Am. Geophysical Union
12/2006	MARGINS Student Prize Honorable Mention, AGU Fall Meeting
6/2006	Shell Fund Award
6/2005	Selected to participate in the National Hazards Mitigation in Japan program, a 10-day study of earthquake engineering related sites in Kobe, Osaka, Shizuoka, Yokohama, and Tokyo, sponsored by the National Science Foundation
1996-2000	Richard Eells Full Tuition Scholarship, Whitman College

ADDITIONAL INFORMATION

- Reviews provided for Science, Nature, Nature Geoscience, National Science Foundation, Geophysical Research Letters, Journal of Geophysical Research, Bulletin of the Seismological Society of America, Earth Planets Space, Annals of Geophysics, Seismological Research Letters, and USGS internal review.
- Session chair: 2009 American Geophysical Union Fall Meeting, 2009 Seismological Society America Annual Meeting, 2008 Asian Seismological Commission Annual Meeting, 2006 Joint U.S.-Japan Natural Resources Panel on Earthquake Research (UJNR), 2005 American Geophysical Union Fall Meeting.
- Extensive computer skills: daily use of Mac OS X, experience in Linux (including system admin.), programming skills in Matlab, Fortran, Unix c-shell, Perl, and Awk.

PUBLICATIONS

Journal Publications (Peer-reviewed):

Shelly, D. R. (2010)**,** Periodic, chaotic, and doubled earthquake recurrence intervals on the deep San Andreas Fault, *Science*, in press.

Shelly, D. R. (2010), Migrating tremors illuminate deformation beneath the seismogenic San Andreas fault, *Nature*, 463, 648-652. doi:10.1038/nature0875.

Rubinstein, J. R., **D. R. Shelly**, and W. L. Ellsworth (2010), Non-Volcanic Tremor: A Window into the Roots of Fault Zones, in *New Frontiers in Integrated Solid Earth Sciences,* Springer.

Shelly D. R. (2009), Possible deep fault slip preceding the 2004 Parkfield earthquake, inferred from detailed observations of tectonic tremor, *Geophys. Res. Lett.*, 36, L17318, doi:10.1029/2009GL039589.

Shelly, D. R., W. L. Ellsworth, T. Ryberg, C. Haberland, G. S. Fuis, J. Murphy, R. M. Nadeau, and R. Bürgmann (2009), Precise location of San Andreas Fault tremors near Cholame, California using seismometer clusters: Slip on the deep extension of the fault?, *Geophys. Res. Lett.*, 36, L01303, doi:10.1029/2008GL036367.

Brown, J. R., G. C. Beroza, S. Ide, K. Ohta, **D. R. Shelly**, S. Y. Schwartz, W. Rabbel, M. Thorwart, and H. Kao (2009), Deep low-frequency earthquakes in tremor localize to the plate interface in multiple subduction zones, *Geophys. Res. Lett.*, doi:10.1029/2009GL040027.

Brown, J. R., G. C. Beroza, and **D. R. Shelly** (2008), An autocorrelation method to detect low frequency earthquakes within tremor, *Geophys. Res. Lett.*, 35, L16305, doi:10.1029/2008GL034560.

Ide, S., K. Imanishi, Y. Yoshida, G. C. Beroza, and **D. R. Shelly** (2008), Bridging the gap between seismically and geodetically detected slow earthquakes, *Geophys. Res. Lett.*, 35, L10305, doi:10.1029/2008GL034014.

Shelly, D. R., G. C. Beroza, and S. Ide (2007), Complex evolution of transient slip derived from precise tremor locations in western Shikoku, Japan, *Geochem. Geophys. Geosyst.*, 8, Q10014, doi:10.1029/2007GC001640.

Shelly, D. R., G. C. Beroza, and S. Ide (2007), Non-Volcanic Tremor and Low Frequency Earthquake Swarms, *Nature*, 446, 305-307, doi:10.1038/nature05666

Ide, S., G. C. Beroza, **D. R. Shelly**, and T. Uchide (2007), A scaling law for slow earthquakes, *Nature*, 447, 76-79, doi:10.1038/nature05780.

Ide, S., **D. R. Shelly**, and G. C. Beroza (2007), Mechanism of deep low frequency earthquakes: Further evidence

that deep non-volcanic tremor is generated by shear slip on the plate interface, *Geophys. Res. Lett.,* 34, L03308, doi:10.1029/2006GL028890.

Shelly, D. R., G. C. Beroza, S. Ide, and S. Nakamula (2006), Low-frequency earthquakes in Shikoku, Japan and their relationship to episodic tremor and slip, *Nature, 442,* 188-191, doi:10.1038/nature04931.

Shelly, D. R., G.C. Beroza, H. Zhang, C.H. Thurber, S. Ide (2006), High-Resolution Subduction Zone Seismicity and Velocity Structure in Ibaraki, Japan, *J. Geophys. Res.,* 111, B06311, doi:10.1029/2005JB004081.

Segall, P., E. K. Desmarais, **D. R. Shelly**, A. Miklius, and P. Cervelli (2006), Earthquakes triggered by silent slip events on Kilauea volcano, Hawaii, *Nature, 442,* 71-74, doi:10.1038/nature04938.

Zhang, H., C. H. Thurber, **D. R. Shelly**, S. Ide, G. C. Beroza, and A. Hasegawa (2004), High-resolution subducting slab structure beneath Northern Honshu, Japan, revealed by double-difference tomography, *Geology, 32,* 361-364, doi: 10.1130/G20261.1.

Submitted manuscripts:

Shelly, D. R. and J. L. Hardebeck, Precise tremor source locations and amplitude variations along the lower-crustal San Andreas Fault, *Geophys. Res. Lett*., submitted.

Shelly, D. R., Tectonic Tremor, *Encyclopedia of Natural Hazards*, Springer, submitted.

Ryberg, T., C. Haberland, G. S. Fuis, W. L. Ellsworth, and **D. R. Shelly,** Locating non-volcanic tremor along the San Andreas Fault using a multiple array source imaging technique, *Geophys. J. Int*., submitted.

Conference Abstracts:

Shelly, D. R., D. P. Hill, and A. M. Pitt, Tracking Long Period Earthquakes Beneath Mammoth Mountain California, *Seismol. Res. Lett.,* Annual Meet. Abstracts, 81(2): 380.

Shelly, D. R., The Background Hum of a Plate Boundary: Developing a Detailed Catalog of Tremor Activity Along 150 Kilometers of the South-Central San Andreas Fault, *Seismol. Res. Lett.,* Annual Meet. Abstracts, 81(2): 298.

Shelly, D. R. (2009), Deciphering tectonic tremor beneath the San Andreas Fault near Parkfield, California: Repeating events, migration, and possible deep slip preceding the 2004 M 6.0 earthquake, Eos Trans. AGU, Fall Meeting Suppl., Abstract T23E-07.

Shelly, D. R. , W. L. Ellsworth, T. Ryberg, C. Haberland, G. Fuis, J. Murphy, R. M. Nadeau, R. Bürgmann (2008), Precise relative location of San Andreas Fault tremors near Cholame, CA using seismometer clusters: slip on the deep extension of the fault?, Eos Trans. AGU, *89*(53), Fall Meeting Suppl., Abstract U31B-07.

Ide, S., G. C. Beroza, **D. R. Shelly**, K. Ohta, J. R. Brown, and K Imanishi (2008), Are slow slip events more than the cumulative sum of slip in tremor?, Eos Trans. AGU, *89*(53), Fall Meeting Suppl., Abstract U31B-03.

Brown, J. R., G. C. Beroza, S. Ide, **D. R. Shelly,** H. Kao, and S. Y. Schwartz (2008), Comparing Observations of Low Frequency Earthquakes From Tremor at Three Subdution Zones, Eos Trans. AGU, *89*(53), Fall Meeting Suppl., Abstract U33A-0023.

Ryberg, T., C. Haberland, G. Fuis, W. L. Ellsworth, and **D. R. Shelly** (2008), Moving, Deep Non-volcanic Tremor at San Andreas Fault, CA, Imaged by Small-aperture Seismic Arrays, Eos Trans. AGU, *89*(53), Fall Meeting Suppl., Abstract U31A-0048.

Shelly, D. R. , W. L. Ellsworth, T. Ryberg, C. Haberland, G. Fuis, J. Murphy, R. M. Nadeau, R. Bürgmann (2008), Precise relative location of San Andreas Fault tremors near Cholame, CA using seismometer clusters: slip on the deep extension of the fault?, 7th General Assembly of Asian Seismological Commission and Seismological Society of Japan 2008 Fall Meeting abstract.

Shelly, D. R., R. M. Nadeau, R. Bürgmann, W. L. Ellsworth, J. Murphy, T. Ryberg, C. Haberland, and G. Fuis (2008), Precise relative location of San Andreas Fault tremors near Cholame, CA using seismometer clusters: slip on the deep extension of the fault?, 7th U.S. Japan Natural Resources Panel (UJNR) abstract.

Shelly, D. R., R. M. Nadeau, R. Bürgmann, W. L. Ellsworth, J. Murphy, T. Ryberg, C. Haberland, and G. Fuis (2008), Repeating nature and relative location of San Andreas Fault tremors near Cholame, CA, IRIS 2008 Annual Meeting abstract.

Shelly, D. R., R. M. Nadeau, R. Bürgmann, W. L. Ellsworth, J. Murphy, T. Ryberg, and C. Haberland (2008), Repeating nature and relative location of San Andreas Fault tremors near Cholame, CA, *Seismol. Res. Lett.,* Annual Meet. Abstracts, 79(2): 291.

Shelly, D. R., G. C. Beroza, and S. Ide (2007), The complex evolution of of transient slip revealed by precise tremor locations in western Shikoku, Japan, *Eos Trans. AGU, 88*(52), Fall Meet. Suppl., Abstract T11F-01.

Beroza, G. C., **D. R. Shelly**, S. Ide, and T. Uchide (2007), The Mechanics of Deep Tremor and Slow Slip, *Eos Trans. AGU, 88*(52), Fall Meet. Suppl., Abstract G22A-02.

Brown, J. R., G. C. Beroza, and **D. R. Shelly** (2007), Extracting Low Frequency Earthquakes from Tremor, *Eos Trans. AGU, 88*(52), Fall Meet. Suppl., Abstract T21A-0355.

Shelly, D. R., G.C. Beroza, and S. Ide (2006), Low-Frequency Earthquake Swarms and Non-Volcanic Tremor under Shikoku, Japan, *Eos Trans. AGU, 87*(52), Fall Meet. Suppl., Abstract T41A-1546.

Ide, S., S. Nakamula, **D.R. Shelly**, and G.C. Beroza (2006), Estimation of the Mechanism of Deep Low-Frequency Earthquakes in Western Shikoku, Japan, *Eos Trans. AGU, 87*(52), Fall Meet. Suppl., Abstract V41A-1696.

Shelly, D. R., G. C. Beroza, S. Ide, and S. Nakamula (2005), Low-frequency earthquakes associated with nonvolcanic tremor in southwest Japan, *Eos Trans. AGU, 86*(52), Fall Meet. Suppl., Abstract T41F-08.

Shelly, D. R., G. C. Beroza, H. Zhang, C. H. Thurber, S. Ide (2005) Joint Inversion for High-Resolution Subduction Zone Seismicity and Velocity Structure in Ibaraki, Japan, *Seismol. Res. Lett.,* Annual Meet. Abstracts, *76*(2), 235.

Shelly, D. R., G. C. Beroza, H. Zhang, C. H. Thurber, S. Ide (2004), High-Resolution Subduction Zone Seismicity and Velocity Structure in Ibaraki, Japan, *Eos Trans. AGU, 85*(47), Fall Meet. Suppl., Abstract S43D-04.

Shelly, D. R., G. C. Beroza, S. Ide (2003), Cross-Correlation-Based Relocation of Subduction Seismicity in Japan, *Eos Trans. AGU, 84*(46), Fall Meet. Suppl., Abstract S21D-0320.

Zhang, H., C. H. Thurber, **D. R. Shelly**, S. Ide, G. C. Beroza, and A. Hasegawa (2003), High-resolution subducting slab structure beneath Northern Honshu, Japan, revealed by double-difference tomography, *Eos Trans. AGU, 84*(46), Fall Meet. Suppl., Abstract S22F-08.

Shelly, D. R., G. C. Beroza (2002), Downgoing Slab Seismicity in Japan Examined Through High-Precision Earthquake Hypocenters, *Eos Trans. AGU, 83*(47), Fall Meet. Suppl., Abstract T52B-1192.