

ANDREA L. LLENOS

US Geological Survey
Earthquake Science Center
345 Middlefield Rd. MS #977
Menlo Park, CA 94025
Phone: (650) 329-5562, Email: allenos@usgs.gov

EDUCATION

- Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography**, Woods Hole, MA 2004-2010
Ph.D. in Geophysics, Dissertation: *Controls on Earthquake Rupture and Triggering Mechanisms in Subduction Zones*
- Brown University**, Providence, RI 2000-2004
Sc.B. Geology-Physics/Mathematics (with honors), Sc.B. Engineering, *magna cum laude*

FELLOWSHIPS AND AWARDS

- USGS Mendenhall Postdoctoral Research Fellowship 2011-2013
National Defense Science and Engineering Graduate Fellowship 2005-2008
Hollister Fellowship (Woods Hole Oceanographic Institution) 2004-2005
Outstanding Student Award in Mechanical Engineering (Brown University) 2004
Undergraduate Research and Academics Award (Dept. Geo. Sci., Brown University) 2004

RESEARCH EXPERIENCE

- US Geological Survey, Earthquake Science Center**, Menlo Park, CA 2011-present
Research Geophysicist/Mendenhall Postdoctoral Fellow, Supervisor: Dr. Andrew Michael
- Statistical modeling of earthquake occurrence rates in Oklahoma and Arkansas
 - Detecting earthquake swarms in catalogs
 - Organized Earthquake Science Center seminar series from Sept 2011-March 2012
- Stanford University**, Stanford, CA 2010-2011
Postdoctoral Scholar, Supervisor: Prof. Paul Segall
- Developed joint inversion of seismicity and deformation data to image dike propagation in Kilauea volcano, Hawaii
- MIT/Woods Hole Oceanographic Institution**, Woods Hole, MA 2004-2010
Graduate Research Assistant, Postdoctoral Investigator, Advisor: Dr. Jeffrey J. McGuire
- Developed algorithm to detect stress rate transients in earthquake catalogs
 - Statistical modeling of earthquake swarms
 - Identified relationship between fore-arc structure and rupture of large earthquakes in subduction zones
- Institute of Statistical Mathematics**, Tokyo, Japan 2008, 2009
Visiting Researcher, Collaborator: Prof. Yoshihiko Ogata
- Investigated spatial variations in aftershock parameters in southern CA and northern Japan
 - Modeled earthquake swarms with Epidemic-Type Aftershock Sequence model
- Brown University, Dept. of Geological Sciences**, Providence, RI 2002-2004
Undergraduate Research Assistant, Advisor: Prof. Donald W. Forsyth
- Relative locations of a foreshock-mainshock sequence on a Pacific oceanic transform fault
 - Analyzed seafloor microseismicity off-axis of the southern East Pacific Rise
 - Participated in 35-day research cruise in the southern Pacific Ocean

University of Alaska Fairbanks, Geophysical Institute, Fairbanks, AK Summer 2003
NSF Research Experience for Undergraduates Intern, Advisor: Prof. Douglas H. Christensen
○ Used receiver function analysis to estimate crustal thickness in Alaska

Brown University, Dept. of Geological Sciences, Providence, RI Summer 2001
Undergraduate Research Assistant, Advisor: Prof. Peter Schultz
○ Constructed maps of the lunar surface using Clementine mission photos

TEACHING EXPERIENCE

Music for Minors, Mountain View, CA 2010-present
Volunteer docent

- Develop lesson plans and teach general music to kindergarten classes

MIT/WHOI Joint Program, Cambridge, MA 2006-2010
○ Mentored pre-generals MIT and WHOI graduate students

Brown University, Providence, RI Fall 2001
○ Assisted with labs and held office hours as a Curricular Advising Program Fellow for introductory planetary geology class

FIELD EXPERIENCE

FloodSafe Honduras, river flooding early warning system installation and testing in Honduras in 8/2005, 1/2006, 3/2007, and 1/2009 2005-2009

WHOI Geodynamics Field Trips – Canada ('05), Iceland ('06), Costa Rica ('08) 2005-2008

Gravity Lineations, Intraplate Melting, Petrology and Seismic Expedition, Nov 2002
35-day research cruise, R/V Melville, off-axis of the southern East Pacific Rise
Chief Scientist: Prof. Donald W. Forsyth

PROFESSIONAL SOCIETIES, MEMBERSHIPS, AND SERVICE

American Geophysical Union (2004-present)

Association of Women Geoscientists (2011-present)

GeoHazards International (2007-present)

Sigma Xi (2004-present)

Seismological Society of America (2007-present)

Reviewer for NSF, Journal of Geophysical Research, Geophysical Research Letters, Geophysical Journal International, Bulletin of the Seismological Society of America, Earth and Planetary Science Letters, Science, Earth Planets Space, Acta geodynamica et geomateria, Advances in Geophysics (2008-present)

PAPERS

Llenos, A. L., and A. J. Michael, 2012, Modeling seismicity rate changes in Oklahoma and Arkansas, in prep.

Llenos, A. L., and P. Segall, 2012, Time-dependent imaging of dike propagation from deformation and seismicity data, in prep.

Llenos, A. L., and J. J. McGuire, 2011, Detecting aseismic strain transients from seismicity data, *J. Geophys. Res.*, 116, B06305, doi:10.1029/2010JB007537.

Llenos, A. L., J. J. McGuire, and Y. Ogata, 2009, Modeling seismic swarms triggered by aseismic transients, *Earth Planet. Sci. Lett.*, 281, 59-69, doi:10.1016/j.epsl.2009.02.011.

Llenos, A. L., and J. J. McGuire, 2007, Influence of fore-arc structure on the extent of great subduction zone earthquakes, *J. Geophys. Res.*, 112, B09301, doi:10.1029/2007JB004944.

SELECTED ABSTRACTS AND CONFERENCE PROCEEDINGS

Llenos, A. L., and A. J. Michael, 2012, Modeling seismicity rate changes in Oklahoma and Arkansas, Southern California Earthquake Center Annual Meeting (poster).

Llenos, A. L., and A. J. Michael, 2012, Statistical modeling of seismicity rate changes in Oklahoma, Seismological Society of America Annual Meeting (poster).

Ellsworth, W. L., S. H. Hickman, **A. L. Llenos**, A. McGarr, A. J. Michael, J. L. Rubinstein, 2012, Are seismicity rate changes in the midcontinent natural or manmade?, Seismological Society of America Annual Meeting (poster).

Llenos, A. L., P. Segall, C. H. Thurber, E. M. Syracuse, and D. E. Peterson, 2011, Modeling time-dependent dike propagation during the 2007 Father's Day intrusion from seismicity and deformation data, AGU Fall Meeting, Abstract V22A-06 (invited talk).

Llenos, A. L., J. J. McGuire, and P. Segall, 2011, Using earthquake rate changes to image aseismic slip and dike intrusions, 7th International Workshop on Statistical Seismology, Santorini, Greece.

Llenos, A. L., P. Segall, C. H. Thurber, and E. M. Syracuse, 2010, Time-dependent imaging of dike propagation from deformation and seismicity data: Application to the 2007 Kilauea intrusion, AGU Fall Meeting, Abstract V31E-08 (oral presentation).

Llenos, A. L., and J. J. McGuire, 2010, Detecting aseismic transient fault slip from seismicity data, Earthscope Institute on The Spectrum of Fault Slip (poster).

Llenos, A. L., J. J. McGuire, and Y. Ogata, 2009, Detecting seismicity rate transients in the Hokkaido corner, AGU Fall Meeting, Abstract T13E-05 (oral presentation).

Llenos, A. L., and J. J. McGuire, 2009, Seismicity-based transient detection in the Salton Trough, Southern California Earthquake Center Annual Meeting (poster).

Llenos, A. L., and J. J. McGuire, 2009, Identifying stressing rate transients in space and time from seismicity data, 6th International Workshop on Statistical Seismology (poster).

Llenos, A. L., J. J. McGuire, and Y. Ogata, 2009, Detecting aseismic transients in space and time from seismicity data, Seismological Society of America Annual Meeting (oral presentation).

Llenos, A. L., J. J. McGuire, and Y. Ogata, 2008, Combining stochastic and physical models of seismicity rate to detect aseismic stress rate transients, European Science Foundation Research Conference on New Challenges on Earthquake Dynamics (poster).

Llenos, A. L., J. J. McGuire, and Y. Ogata, 2008, Modeling and detection of seismic swarms triggered by aseismic transients, Southern California Earthquake Center Annual Meeting (poster).

Llenos, A. L., and J. J. McGuire, 2007, Detecting aseismic fault slip and magmatic intrusion from seismicity data, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract T12C-08 (oral presentation).

Llenos, A. L., and J. J. McGuire, 2007, Detecting aseismic stressing-rate changes using a combined ETAS/rate-state model, 5th International Workshop on Statistical Seismology (poster).

Llenos, A. L., and J. J. McGuire, 2005, Examining structural control on earthquake rupture directivity in subduction zones, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract S12A-04 (oral presentation).

Llenos, A. L., D. W. Forsyth and S. C. Webb, 2003, Microearthquakes near Matua seamount, GLIMPSE study area, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract V12B-0583 (poster).

Llenos, A. L., and D. H. Christensen, 2003, Determination of crustal thickness in Alaska using receiver functions, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract ED41B-1163 (poster).

Harmon, N., D. Forsyth, D. Scheirer, **A. Llenos**, D. Weeraratne, S. Webb and R. Duncan, 2003, The GLIMPSE experiment: Recent intraplate volcanism at the eastern ends of gravity lineations in the South Pacific, *Geophys. Res. Abstr.*, v. 5, EGS 28th General Assembly, 03905.

INVITED TALKS

- 3/2012: International Symposium on Statistical Modeling and Real-Time Probability Forecasting for Earthquakes, Institute of Statistical Mathematics, Tachikawa, Japan, "Statistical modeling of seismicity rate changes in Oklahoma"
- 11/2011: Harvard University Solid Earth Physics Seminar, "Modeling time-dependent dike propagation from seismicity and deformation data"
- 10/2011: University of the Pacific student chapter of the American Society of Civil Engineers, "Earthquake hazards: An interdisciplinary challenge"
- 6/2011: USGS Earthquake Science Center Seminar, "Using earthquake rate changes to detect aseismic slip and dike intrusions"
- 6/2011: UCERF3 Time-dependent Models Workshop, "Modeling swarms: A path toward determining short-term probabilities"
- 1/2011: UC Santa Cruz IGPP Winter Seminar, "Earthquake rate changes and transient deformation: Using seismicity as a stress change sensor"
- 6/2009: Institute of Statistical Mathematics, Tokyo, Japan, "Detecting aseismic transients in space and time from seismicity data"
- 2/2008: Institute of Statistical Mathematics, Disaster Prevention Research Institute (Kyoto University), "Investigating earthquake swarm triggering using data assimilation algorithms"
- 11/2007: Brown University Tectonophysics Lunch seminar, "Subduction zone earthquakes and their relationship to overriding plate structure"