

Emily C Roland

Woods Hole Oceanographic Inst., MS #24, Woods Hole, MA 02543

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Education

Massachusetts Inst. of Technology/Woods Hole Oceanographic 2006 - Present
MIT-WHOI Joint Program in Oceanography, Applied Ocean Science and Engineering
PhD Student in Marine Geology and Geophysics
Thesis topic: Lithospheric structure and slip at oceanic transform faults
Advisor: Jeff McGuire **Co-advisors: Mark Behn, Dan Lizarralde, John Collins**

Colorado School of Mines 2001 - 2005
Bachelor of Science in Geophysical Engineering Graduated *Magna cum Laude*, With Honors
Minors in Geology and Public Affairs (- *McBride Honors Program*)
Undergraduate Advisor: Roel Snieder

Delft Technical University, Delft, The Netherlands Sept. 2004 - Jan. 2005
Visiting Student in Applied Geophysics Msc Program

Research Experience

Woods Hole Oceanographic Institution, Department of Geology and Geophysics
Jan, 2006 - present

- Frequency-Wavenumber (FK) seismogram modeling to determine source parameters of Gofar transform fault earthquakes using strong motion ocean bottom seismometer data. Advised by Jeff McGuire.
- Arrival time tomography for the p-wave seismic velocity structure surrounding the Quebrada and Gofar transform faults, East Pacific Rise. Advised by Dan Lizarralde.
- 3D finite element numerical modeling for the temperature structure and degree of mantle alteration possible along oceanic transform faults. Advised by Mark Behn and Greg Hirth.
- Determination of spatial and temporal characteristics of seismic swarms on oceanic and continental transform faults to infer swarm driving mechanism. Double difference and surface wave relative relocation and seismicity rate modeling. Advised by Jeff McGuire.

NSF Summer Student Fellowship, Woods Hole Oceanographic Institution
June - Aug., 2004

- Moment release rate determination and modeling of swarm seismicity from the Galapagos Ridge transform fault. Advised by Jeff McGuire.

Colorado School of Mines, Department of Geophysics
May, 2004- April, 2005

- Acquisition and interpretation of time domain electromagnetic data to characterize the groundwater in the Estancia Basin, New Mexico. Advised by Yaoguo Li.

Awards

Deep Ocean Exploration Institute Graduate - WHOI	2009-2010
NSF WHOI Summer Student Fellowship	2004
Society of Exploration Geophysicists Scholarship	2002-2005
Baker Atlas Scholarship	2002-2003
Outstanding Graduating Senior Award, Geophysical Engineering	2005
Other Colorado School of Mines Awards:	2001-2005
CSM Presidential Scholarship	
Robert F. Aldredge Memorial Award	
Hutchinson Memorial Scholarship	

Publications	Roland, E., M. D. Behn, and G. Hirth (2010) Thermal-mechanical behavior of oceanic transform faults: Implications for the spatial distribution of seismicity, <i>Geochem. Geophys. Geosyst.</i> , 11, Q07001, doi:10.1029/2010GC003034.
	Roland, E., and J. J. McGuire, (2009) Earthquake swarms on transform faults, <i>Geophysical Journal International</i> , 178 3, p. 1677-1690.
Publications in Preparation	McGuire, J. J., J. Collins, E. Roland, D. Lizarralde, M. S. Boettcher, and M. D. Behn. "The End of a Seismic Cycle on the Gofar Transform Fault, East Pacific Rise", in preparation for Nature, anticipated submission: April 2011
	Roland, E., J. J. McGuire, J. Collins and D. Lizarralde. The seismic velocity structure of the East Pacific Rise oceanic transform faults, in preparation for JGR, anticipated submission: April 2011
	Roland, E., J. J. McGuire and J. Collins. Intermediate magnitude earthquakes on an East Pacific Rise transform fault: Source characteristics and depths from strong motion waveform modeling
Select Presentations	Roland, E. C., J. J. McGuire, J. A. Collins, D Lizarralde. "The seismic velocity structure of a foreshock zone on an oceanic transform fault: Imaging a rupture barrier to the 2008 Mw 6.0 earthquake on the Gofar fault, EPR", <i>EOS Trans. AGU</i> , Abstract S43A-2031, 2010
	Roland, E. C., J. J. McGuire, J. A. Collins. "Earthquake Swarms and Aseismic Slip on Transform Faults (Invited)", <i>EOS Trans. AGU</i> , 90(52), Fall Meet. Suppl., Abstract T23E-01, 2009
	Roland, E. C., J. J. McGuire, J. A. Collins, D Lizarralde. "Seismic Velocity Structure Across the Quebrada and Gofar Oceanic Transform Faults from 2D Refraction Tomography - A Comparison of Faults with High and Low Seismic Slip Deficits", <i>EOS Trans. AGU</i> , 90(52), Fall Meet. Suppl., Abstract S53A-1469, 2009
	Roland, E. C., J. J. McGuire. "Earthquake Swarms on Transform Faults - A Response to Aseismic Triggering Mechanisms", <i>EOS Trans. AGU</i> , 89(53), Fall Meet. Suppl., Abstract S51C-1754, 2008
	Roland, E. C., M. D. Behn, G. Hirth. "Thermal-Mechanical Behavior of Oceanic Transform Faults- Implications for Hydration of the Upper Oceanic Mantle", <i>EOS Trans. AGU</i> , 88(52), Fall Meet. Suppl., Abstract T32B-06, 2007
	Roland, E. C., J. J. McGuire, R. Lohman "Seismicity Characteristics and Swarm Migration As an Indication of Aseismic Creep in High Thermal Gradient Environments", <i>2006 SCEC Annual Meeting</i> , Kona, HI, Poster
	Roland, E. C., J. J. McGuire, R. Lohman "Does Aseismic Creep Trigger Migrating Earthquake Swarms?", <i>2007 SSA Annual Meeting</i> , Palm Springs, CA, Poster
Teaching Experience	WHOI Independent Activities Term Internship Course - Marine Geology and Geophysics Intern Instructor January 2011
	MIT-WHOI 12.521 Computational Geodynamical Modeling Teaching Assistant Spring 2009

Field and Sea Experience	Cascadia OBS Deployment <i>conducting OBS deployment, ship-board multibeam bathymetry, XBT</i> Cascadia Subduction Zone P.I.s: Jeff McGuire, John Collins RV Wecoma (OSU)	July 2010
	Salton Trough, Obsidian Creep project <i>acquisition of wide angle and high res. controlled source seismic data</i> Obsidian Buttes Fault, Southern California Joint USGS, WHOI, Cornell, Pascal P.I.s: Rowena Lohman, Jeff McGuire, USGS Team with Rufus Catchings	April 2010
	Quebrada, Discovery, Gofar Transform Fault Experiment <i>OBS deployment and recovery, ship-board multibeam bathymetry, XBT</i> <i>acquisition of wide-angle refraction marine seismic data</i> East Pacific Rise 4°S P.I.s: Jeff McGuire, John Collins RV Thomas Thompson (UW), RV Marcus G. Langseth (LDEO), RV Atlantis (WHOI)	2008-2009
	Transects to Investigate the Composition and Origin of the Central American Volcanic Arc (TICO-CAVA) <i>Deployment and recovery of geophones for seismic refraction/reflection data</i> Costa Rica P.I.s: Dan Lizarralde (WHOI), Steven Holbrook (U. Wyoming), Harm van Avendonk (U. Texas)	Aug. 2005
	Colorado School of Mines Geophysical Field Camp <i>Aquisition and processing of deep and shallow seismic, gravity, electromagnetics, self-potential, resistivity, and ground penetrating radar</i> Estancia Basin, New Mexico Advised by Yaoguo Li, Mike Batzle	June, 2004
Professional Societies	Delft Technical University Geological Field Session <i>Geological mapping and structural analyses</i> French Pyrenees Advised by Jan Kees Blom	September, 2004
	American Geophysical Union, Seismologic Society of America, Southern California Earthquake Center, Society of Exploration Geophysicists	
Technical Skills/Past Work Experience	Wildland Fire Fighter <i>Forestry Tech -</i> U.S. Forest Service	Summer 2001-2005
	<i>Ham Radio Operator - Licensed Technician KC7ABE</i>	1993-Present