

Curriculum Vitae

ANTHONY R. LOWRY

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DEGREES

B.S. Hons, 1986, Geophysics, University of Wyoming.

M.S., 1988, Geophysics, University of Wyoming. Thesis: Numerical Modeling Approach Employing Singularity Removal Applied to the Evaluation of the Bristow Interpretive Technique for the Detection of Cavities. Advisors: Myron Allen, Leon Borgman, and Peter Shive (Chair)

Ph.D., 1994, Geophysics, University of Utah. Dissertation: Flexural Strength and Stress in the Cordillera, Western United States. Advisors: Ron Bruhn, Dave Chapman, Gerry Hohmann, John Mathews, and Robert B. Smith (Chair)

EMPLOYMENT HISTORY

Jul 2000–Present: *Research Associate, Department of Physics, University of Colorado, Boulder, Colorado.*

May 1999–Jul 2000: *Visiting Scientist, University Corporation for Atmospheric Research (UCAR), Boulder, Colorado.*

Apr 1997–Jul 2000: *Post-doctoral Research Associate, Department of Geological Sciences, Indiana University, Bloomington, Indiana (Supervisor: Michael Hamburger).*

Dec 1995–Mar 1997: *Post-doctoral Research Fellow, Research School of Earth Sciences, Victoria University of Wellington, New Zealand (Supervisor: Dick Walcott).*

May 1994–Nov 1995: *Post-doctoral Associate, Department of Geology and Geophysics, University of Utah, Salt Lake City, Utah (Supervisor: Bob Smith).*

FIELD EXPERIENCE

- Prototype 1-hertz continuous GPS installation for atmospheric sensing in San Diego, California
- Continuous GPS network installation on Taal Volcano, Philippines
- Recon, permitting and installation of a continuous GPS network in the Rio Grande Rift
- GPS campaign network design, recon and installation in Wabash Valley (IN-IL-KY, midcontinent U.S.)
- GPS geodetic campaigns in southern Mexico, the Philippines, Wabash Valley, North Island New Zealand, South Island New Zealand, Wasatch fault Utah, Snake River Plain Idaho, and Yellowstone
- Precision measurement of time-variable gravity in Yellowstone

GRANTS**Funded, Principal Investigator:**

NSF Earth Sciences/Geophysics, Collaborative Research: Seismic and Aseismic Slip Interactions on a Subduction Megathrust, Guerrero, Mexico, Sep 2002–Aug 2005, with John Anderson at University of Nevada-Reno, \$139,543.

Funded, Co-Principal Investigator:

NSF Earth Sciences/EarthScope Science, Collaborative Research: Crustal Deformation Measurements and a Multidisciplinary Geophysical Investigation of the Rio Grande Rift, with Anne Sheehan at CU and Mousumi Roy at the University of New Mexico, Jul 2005–Jun 2010, \$481,069 to CU.

NSF Earth Sciences/Geophysics, Hybrid measurements of crustal deformation in Guerrero, Mexico, Jan 2002–Dec 2004, with Kristine Larson at CU, \$304,824.

NASA Mars Global Surveyor Data Analysis Program, Investigating the formation of the Tharsis Rise and crustal dichotomy by modeling the MGS data and mantle dynamics, Aug 2001–Jul 2004, with Shijie Zhong at CU, \$150,000.

Office of Naval Research, Determination of vertical refractivity structure from ground-based GPS observations, Jul 2000–Jul 2003, with Chris Rocken at UCAR, \$559,000.

NSF Earth Sciences/Geophysics, GPS measurement of tectonic and volcanic deformation in an active arc, Luzon, Philippines, Sep 1998–Aug 2001, with Michael Hamburger at IU and Chuck Meertens at UNAVCO, \$189,903.

NASA NAG5-7619, Lithospheric rheology and geodynamic processes from integration of geodetic, gravity and topography data, Sep 1998–Aug 2000, with Michael Hamburger at IU, \$100,000.

Pending, Principal Investigator:

NSF Earth Sciences/Tectonics, Collaborative Research: Toward Measuring Subsurface Tectonic Mass Flux— An Assessment of Geodetic Methods, Jan 2006–Dec 2008, with Dennis Harry and Bill Sanford at Colorado State University, \$89,981 to CU.

Pending, Co-Principal Investigator:

NSF Earth Sciences/Tectonics, Collaborative Research: Deformation Processes in the Central Andaman Islands, Jan 2006–Dec 2008, with Roger Bilham at CU, \$420,257.

PATENTS**U.S. Patent Office:**

Belen’kii, M.S., E.J. Holder, S.F. Dugas, C. Rocken, and **A.R. Lowry**, Method of Compensating for Atmospheric Effects While Using Near Horizon Radar Utilizing a Doppler Signal, Patent No. US 6,853,331 B1, Feb. 8, 2005.

PUBLICATIONS

Papers in Refereed Journals

- [19] Pérez-Gussinyé, M., **A.R. Lowry**, A.B. Watts, and I. Velicogna, On the recovery of effective elastic thickness using spectral methods: examples from synthetic data and from the Fennoscandian Shield, *J. Geophys. Res.*, 109(B10), 10.1029/2003JB002788, #B10409, 2004.
- [18] Yoshioka, Y., T. Mikumo, V. Kostoglodov, K.M. Larson, **A.R. Lowry**, and S. K. Singh, Interplate coupling and a recent aseismic slow slip event in the Guerrero seismic gap of the Mexican subduction zone, as deduced from GPS data inversion using a Bayesian Information Criterion, *Phys. Earth Planet. Int.*, 146, 513–530, 2004.
- [17] Iglesias, A., S.K. Singh, **A.R. Lowry**, M. Santoyo, V. Kostoglodov, K.M. Larson, S.I. Franco-Sanchez and T. Mikumo, The silent earthquake of 2002 in the Guerrero seismic gap, Mexico ($M_w=7.4$): inversion of slip on the plate interface and some implications, *Geofísica Internacional*, 43(3), 309–317, 2004.
- [16] Larson, K.M., **A.R. Lowry**, V. Kostoglodov, W. Hutton, O. Sánchez, and K. Hudnut, Crustal deformation measurements in Guerrero, Mexico, *J. Geophys. Res.*, 109(B4), doi:10.1029/2003JB002843, #B04409, 2004.
- [15] **Lowry, A.R.**, and S. Zhong, Surface versus internal loading of the Tharsis rise, Mars, *J. Geophys. Res.*, 108(E9), doi:10.1029/2003JE002111, #5099, 2003.
- [14] Bartel, B.A., M.W. Hamburger, C.M. Meertens, **A.R. Lowry**, and E. Corpuz, Dynamics of active magmatic and hydrothermal systems at Taal Volcano, Philippines, from continuous GPS measurements, *J. Geophys. Res.*, 108(B10), doi:10.1029/2002JB002194, #2475, 2003.
- [13] Kostoglodov, V., S.K. Singh, J.A. Santiago, S.I. Franco, K.M. Larson, **A.R. Lowry**, and R. Bilham, A large silent earthquake in the Guerrero seismic gap, Mexico, *Geophys. Res. Lett.*, 30(15), doi:10.1029/2003GL017219, 2003.
- [12] **Lowry, A.R.**, C. Rocken, S.V. Sokolovskiy, and K.D. Anderson, Vertical profiling of atmospheric refractivity from ground-based GPS observations, *Radio Sci.*, 37(3), doi:10.1029/2000RS002565, 2002.
- [11] Hamburger, M.W., V. Rybakov, **A. Lowry**, B. Shen-Tu, and J.A. Rupp, Preliminary results from a GPS geodetic network in the southern Illinois basin, *Seismol. Res. Lett.*, 73, 762–775, 2002.
- [10] **Lowry, A.R.**, K.M. Larson, V. Kostoglodov, and R. Bilham, Transient fault slip in Guerrero, southern Mexico, *Geophys. Res. Lett.*, 28, 3753–3756, 2001.
- [9] **Lowry, A.R.**, M.W. Hamburger, C.M. Meertens, and E.G. Ramos, GPS monitoring of crustal deformation at Taal volcano, Philippines, *J. Volc. Geotherm. Res.*, 105, 35–47, 2001.
- [8] Sokolovskiy, S.V., C. Rocken, and **A.R. Lowry**, The use of GPS for estimation of bending angles of radio waves at low elevations, *Radio Science*, 36, 473–482, 2001.
- [7] Wannamaker, P.E., J.M. Bartley, A.F. Sheehan, C.M. Jones, **A.R. Lowry**, T.A. Dumitru, T.A. Ehlers, W.S. Holbrook, G.L. Farmer, M.J. Unsworth, D.A. Okaya, B.E. John, and J.A. Wolfe, The Great Basin–Colorado Plateau transition in central Utah: An interface between active extension and stable interior, in *The Geological Transition: Colorado Plateau to Basin and Range*, Erskine, M.C., J.E. Faulds, J.M. Bartley, and P. Rowley (Eds.), *UGA/AAPG Guideb.* 30/GB78, 1–38, 2001.
- [6] **Lowry, A.R.**, N.M. Ribe, and R.B. Smith, Dynamic elevation of the Cordillera, western United States, *J. Geophys. Res.*, 105, 23,371–23,390, 2000.
- [5] **Lowry, A.R.**, and R.B. Smith, Strength and rheology of the western U.S. Cordillera, *J. Geophys. Res.*, 100, 17,947–17,963, 1995.
- [4] **Lowry, A.R.**, and R.B. Smith, Flexural rigidity of the Basin and Range–Colorado Plateau–Rocky Mountain transition from coherence analysis of gravity and topography, *J. Geophys. Res.*, 99, 20,123–20,140, 1994.

- [3] **Lowry, T.**, and P.N. Shive, An evaluation of Bristow’s method for the detection of subsurface cavities, *Geophysics*, 55, 514–520, 1990.
- [2] Shive, P.N., **T. Lowry**, D.H. Easley and L.E. Borgman, Geostatistical simulation for geophysical applications– Part II: Geophysical modeling, *Geophysics*, 55, 1441–1446, 1990.
- [1] **Lowry, T.**, M.B. Allen, and P.N. Shive, Singularity removal: A refinement of resistivity modeling techniques, *Geophysics*, 54, 766–774, 1989.

Submitted Papers

- Lowry, A.R.**, K.M. Larson, V. Kostoglodov, and O. Sánchez, The fault slip budget in Guerrero, southern Mexico, *Geophys. J. Int.*, *in review*, 2005.
- Lowry, A.R.**, Resonant slow fault slip in response to climatic load stress, *Nature*, *in review*, 2005.

Papers in Preparation

- Lowry, A.R.**, M.E. Tamisiea, and K. Latychev, Variability of Earth’s elastic response to mass loading, *in prep for Dec submission to Geophys. Res. Lett.*, 2005.
- Creati, N., **A.R. Lowry**, and I. Velicogna, Elastic thickness of the Mediterranean region, *in prep for Dec submission to J. Geophys. Res.*, 2005.

Conference Abstracts (past five years)

- Lowry, A.R., A.F. Sheehan, M. Roy, E. Jones, and S. Nerem, A multidisciplinary investigation of Rio Grande Rift deformation, *Eos Trans. AGU*, 86(46), T33x–xx, 2005.
- Paul, J., R. Smalley, R. Bilham, A. Lowry, and A. Batacharjee, Postseismic deformation in the central Andaman Islands, *Eos Trans. AGU*, 86(46), xxx–xx, 2005.
- Yang, X., A.R. Lowry, A.L. Levshin, and M.H. Ritzwoller, Toward a Rayleigh wave attenuation model for Eurasia and calibrating a new M_S formula, 27th Seismic Research Review, Palm Springs CA, 20–22 September, 2005.
- Lowry, A.R., A.F. Sheehan, M. Roy, and S. Nerem, Toward a geophysical investigation of Rio Grande Rift extension, EarthScope National Meeting, Santa Ana Pueblo, NM, 29–31 March, 2005.
- Lowry, A.R., K.M. Larson, V. Kostoglodov, and O. Sánchez, The Stress/Strain/Fault Slip Cycle in Guerrero, southern Mexico, *Eos Trans. AGU*, 85(46), G32A–08, 2004.
- Lowry, A.R., A.F. Sheehan, S. Nerem, F. Blume, and M. Roy, Toward a GPS geodetic investigation of Rio Grande Rift Deformation, NSF-Sponsored workshop on “Rocky Mountain EarthScope”, Socorro, NM, 15–18 September, 2004.
- Creati, N., A.R. Lowry, I. Velicogna, and G. Lavecchia, Compositional control on the mechanical behavior of the lithosphere in the Mediterranean, 32nd Intl. Geology Congress, Florence, Italy, August 2004.
- Lowry, A.R., Modeling Great Basin lithospheric deformation: Applications of EarthScope data, NSF-Sponsored workshop on “Great Basin & Range Evolution and Kinematics”, Lake Tahoe, 21–23 June, 2004.
- Lowry, A.R., The role of temperature in lithospheric-scale deformation, NSF-Sponsored workshop on “Thermal processes in the context of EarthScope”, Salt Lake City, 18–20 March, 2004.
- Creati, N., A.R. Lowry, I. Velicogna, and G. Lavecchia, Elastic thickness estimation with improved deconvolution of surface and subsurface loads, *EGU Mtg.*, Nice, France, 2004.
- Kostoglodov, V., S.I. Franco Sanchez, S.K. Singh, K.M. Larson, J.A. Santiago, and A.R. Lowry, Reassessment of the 2001–2002 aseismic slow slip event in Mexico, *Eos Trans. AGU*, 84(46), G22D–05, 2003.
- Lowry, A.R., K.M. Larson, V. Kostoglodov, O. Sánchez, and K. Hudnut, Aseismic slip and stress transfer in Guerrero, southern Mexico, *Eos Trans. AGU*, 84(46), T42C–03, 2003.

- Pérez-Gussinyé, M., A.R. Lowry, A.B. Watts, and I. Velicogna, On the recovery of effective elastic thickness using spectral methods: examples from synthetic data and from the Fennoscandian Shield, *Eos Trans. AGU*, 84(46), S22A-0435, 2003.
- Yoshioka, S., T. Mikumo, V. Kostoglodov, K.M. Larson, A.R. Lowry, and S.K. Singh, Interplate coupling and a recent aseismic slow slip event in the Guerrero seismic gap of the Mexican subduction zone, as deduced From GPS data inversion using ABIC, *Eos Trans. AGU*, 84(46), T52A-0240, 2003.
- Singh, S.K., V. Kostoglodov, K.M. Larson, A.R. Lowry, R. Bilham, T. Mikumo, M. Santoyo, and A. Iglesias, The silent earthquake of 2002 in the Guerrero seismic gap, Mexico: Mapping of slip on the plate interface and the associated stress change, *IUGG Mtg*, 2003.
- Kostoglodov, V., A. Lowry, S.K. Singh, K.M. Larson, J.A. Santiago, S.I. Franco, and R. Bilham, A large silent earthquake and the future rupture of the Guerrero seismic gap, Mexico, *Joint EGS-AGU-EUG Mtg.*, 2003.
- Pérez-Gussinyé, M., A.B. Watts, and A.R. Lowry, The effective elastic thickness of Fennoscandia and its relationship to rheology, *Joint EGS-AGU-EUG Mtg.*, 2003.
- Zhong, S., J.H. Roberts, and T. Lowry, The origin of geoid and topography anomalies of the Tharsis rise, *Joint EGS-AGU-EUG Mtg.*, 2003.
- Lowry, A.R., and S. Zhong, Surface versus internal loading of the Tharsis rise, Mars, *Lunar Planet. Sci. XXXIV*, Abs. #1798, 2003.
- Lowry, A.R., V. Kostoglodov, K.M. Larson, W. Hutton, O. Sánchez, and K. Hudnut, Toward an aseismic slip budget in Guerrero, southern México, *Eos Trans. AGU*, 83(47), 2002.
- Pérez-Gussinyé, M., A.R. Lowry, A.B. Watts, and I. Velicogna, How accurately do spectral methods estimate effective elastic thickness? *Eos Trans. AGU*, 83(47), 2002.
- Kostoglodov, V., K.M. Larson, A.R. Lowry, W. Hutton, S.K. Singh, and O. Sánchez, New large aseismic slow slip event in Guerrero, Mexico, *Eos Trans. AGU*, 83(47), 2002.
- Lowry, A.R., (**Invited**) Silent slip and the earthquake cycle on major faults, *90th Journées Luxembourgeoises de Géodynamique*, 2002.
- Kostoglodov, V., K.M. Larson, A.R. Lowry, W. Hutton, S.K. Singh, and O. Sánchez, Recent large aseismic slow slip event in Guerrero, Mexico, *Unión Geofísica Mexicana*, 2002.
- Lowry, A.R., (**Invited**) Geophysical evidence for processes of Cordilleran uplift, *GSA Abstr. Prog.*, 34 (6), 2002.
- Lowry, A.R., K.M. Larson, V. Kostoglodov and R. Bilham, Transient fault slip in Guerrero, southern Mexico, *Eos Trans. AGU*, 82(47), F264, 2001.
- Hamburger, M.W., B.A. Bartel, C.M. Meertens, A. Aguilar, J. Sklar, W. Gelido, M. Menguito, and A.R. Lowry, GPS measurement of crustal deformation associated with the 2001 eruptions of Mayon volcano, Philippines, *Eos Trans. AGU*, 82(47), F1376, 2001.
- Bartel, B.A., M.W. Hamburger, C.M. Meertens, E. Corpuz, E. Gabinete, and A.R. Lowry, Time-varying deformation recorded by continuous GPS networks on Taal Volcano, Philippines, *Eos Trans. AGU*, 82(47), F264, 2001.
- Lowry, A.R., V. Kostoglodov, K.M. Larson, O. Sánchez, and W. Hutton, Fault Properties and Seismic Hazard in the Guerrero Gap, *Unión Geofísica Mexicana*, 2001.
- Kostoglodov, V., A.R. Lowry, K.M. Larson, W. Hutton, and R. Bilham, Silent Slip Event in NW Guerrero Seismic Gap, Mexico, *Unión Geofísica Mexicana*, 2001.
- Lowry, A.R., I. Velicogna, and B.J. Douglas, Lithospheric viscosity from isostatic response, geodesy and xenolith data, *Eur. Geophys. Soc.*, 2001.
- Lowry, A.R., C. Rocken, S.V. Sokolovskiy, and K.D. Anderson, Vertical profiling of atmospheric refractivity from ground-based GPS, *Int. Union Rad. Sci. Natl. Mtg. Abstr.*, 148, 2001.
- Sokolovskiy, S.V., C. Rocken, A.R. Lowry, T. Van Hove, and K.D. Anderson, The use of GPS for estimation of bending angles of radiowaves at low elevations, *Int. Union Rad. Sci. Natl. Mtg. Abstr.*, 149, 2001.

TEACHING**Courses Lectured:**

Geodynamics, a graduate-level course on processes, material properties, and observational metrics of the dynamic Earth (Indiana University)

Methods in Applied Geophysics, an introductory geophysical exploration course combining theory, computational methods and field data collection (Indiana University)

Earthquakes and Volcanoes, an introductory course in physical geology for non-majors (University of Utah)

Courses Co-Lectured:

Special Topics courses in *Crustal Deformation* and *GPS Data Processing and Analysis* at the graduate level (Indiana Univ.)

Undergraduate courses in *Tectonics* and *Methods in Geophysics* (Victoria Univ.)

Graduate Students Supervised:

Advisory Committee Member:

- Christine M. Puskas, *TBD*, Ph.D., Univ. Utah, continuing.
- Naia Suszek, *TBD*, M.S., Univ. Colorado, continuing.
- Nicola Creati, *Mechanical behaviour of the lithosphere in the Mediterranean*, Ph.D., Univ. Chieti (Italy), January 2005.
- Beth A. Bartel, *Magma Dynamics at Taal Volcano, Philippines from Continuous GPS Measurements*, M.Sc., Indiana Univ., May 2002.
- Lynda Lastowka, *The Uppermost Mantle Beneath the Southwestern United States*, M.Sc., Univ. Colorado, December 2001.
- Naomi L. Boness, *Determination of Effective Elastic Thickness in the North American Craton and Rheological Implications for the Intraplate Lithosphere*, M.Sc., Indiana Univ., August 2000.
- Catherine A. Thibault, *GPS Measurements of Crustal Deformation in the Philippine Island Arc*, M.Sc., Indiana Univ., August 1999.

External Dissertation Examiner:

- Anne Douglas, *A Geodetic Investigation of Slow Slip on the Hikurangi Subduction Zone Beneath Raukumara Peninsula, New Zealand*, M.Sc., Victoria University of Wellington, April 2005.
- Abera Tessema Zena, *Geophysical Interpretation of the East African Rift System*, Ph.D., University of the Witwatersrand, January 2002.

HONORS

Outstanding Ph.D. Student, University of Utah, 1994.

Amoco Fellowship, University of Utah, 1989-90.

Chevron Fellowship, University of Wyoming, 1987-88.

Outstanding Undergraduate Student, University of Wyoming, 1986.

PROFESSIONAL ACTIVITIES

- Developer and maintainer of the MECAIR fortran codes for Maximum Entropy Coherence Analysis of Isostatic Response, used by more than 20 researchers in 11 countries, and which has figured prominently in the theses/dissertations of at least 10 young scientists
- Invited lecturer at CICESE (Ensenada, Mexico), Colorado State University, OGS (Trieste, Italy), Southern Illinois University, University of Colorado, University of Florida, University of Leeds (UK), University of Nevada–Las Vegas, University of Nevada–Reno, University of New Mexico, USGS–Menlo Park, and Utah State University
- Participant in the Colorado Earthquake Hazards Mitigation Council
- Reviewer of proposals for the National Science Foundation, NASA, the National Nuclear Security Administration and New Zealand’s Earthquake Commission
- Referee of articles for *AGU Monographs*; *Earth and Planetary Science Letters*; *Earth, Planets and Space*; *Geological Society of America Bulletin*; *Geophysical Research Letters*; *Geophysical Journal International*; *Journal of Geophysical Research*; *Journal of Volcanology and Geothermal Research*; *Nature*; *Tectonics*; and *Tectonophysics*
- Judge of tectonophysics (‘T’) section student presentations at Fall AGU meetings
- Participant in the 2000 EarthScope-Plate Boundary Observatory (PBO) Workshop, the 2001 EarthScope Workshop, the June 2002 PBO Mexico Workshop, the March 2004 EarthScope Thermal Processes Workshop, the June 2004 GreatBREAK Workshop, and the Sept 2004 EarthScope Rocky Mountains Workshop
- Member of *American Geophysical Union*, *Seismological Society of America* and *Geological Society of America*