

David Donald Bowman

College of Science, Technology, Engineering, & Mathematics
Eastern Washington University

Current Position

Dean, College of Science, Technology, Engineering & Mathematics
Professor of Geology
Eastern Washington University

Education

PhD Geology 1999 - University of Southern California

Advisor: Charles G. Sammis

Thesis: "Intermittent Criticality and the Physics of Distributed Regional Seismicity" MS

Geology 1996 - University of Southern California

Advisor: Charles G. Sammis

*Thesis: "A Tectonic Model for the Formation of the Gridded Plains on Guinevere Planitia, Venus:
Implications for the Elastic Thickness of the Lithosphere"*

BS Geology 1993 - University of Southern California

Summary of Administrative Positions

Dean, College of Science, Technology, Engineering, & Mathematics, Eastern Washington Univ, 2016 – present
Interim Dean, College of Natural Sciences and Mathematics, California State Univ, Fullerton, 2014 – 2016
Chair, Dept of Geological Sciences, California State University, Fullerton, 2007 – 2013

Summary of Academic Positions

Professor, Dept of Geology, Eastern Washington University, 2016 – present
Professor, Dept of Geological Sciences, California State Univ., Fullerton, 2010 – 2016
Associate Professor, Dept of Geological Sciences, California State Univ., Fullerton, 2005 – 2010
Assistant Professor, Dept of Geological Sciences, California State Univ., Fullerton, 2001 – 2005
Physicien Adjoint, Laboratoire Tectonique, Institut de Physique du Globe de Paris. 2001 – 2016
Chateaubriand Postdoctoral Fellow, Lab Tectonique, Institut de Physique du Globe de Paris 2000 – 2001

Summary of Professional and Community Leadership

Fellow, UC Berkeley Executive Leadership Academy, 2020
Member, Washington MESA Board of Directors, 2016-present; Governance Chair 2018-present
Member, Mobius Spokane Board of Directors, 2017-present.
Member, Spokane STEM Network Executive Committee, 2016-2020; Co-Chair 2019-20.
Board of Directors, Southern California Earthquake Center, 2007-2011.

Administrative Experience

Dean, College of Science, Technology, Engineering & Mathematics, Eastern Washington University (EWU), 2016-present

Carnegie classification: Master's Colleges & Universities: Larger Programs

Duties include: Oversee all personnel, financial, curricular, and administrative activities for the College of Science, Technology, Engineering & Mathematics. Oversee hiring, retention, tenure, promotion, and discipline for the College. Oversee College outreach and fundraising activities, including creation of an integrated college development plan. Oversee Dean's Industry Advisory Board and Philanthropic Leadership Council. As a member of the university's senior leadership team, sit on Academic Affairs Council and President's Executive Council.

Interim Dean, College of Natural Sciences and Mathematics, California State University, Fullerton (CSUF) 2014-2016

Oversee all personnel, financial, curricular, and administrative activities for the College of Natural Sciences and Mathematics. Oversee hiring, retention, tenure, promotion, and discipline for the College. Oversee College outreach and fundraising activities, including creation of an integrated college development plan. Oversee Dean's Advisory Council. As a member of the university's senior leadership team, sit on Council of Deans and President's Advisory Board.

Chair, CSUF Department of Geological Sciences, 2007-2013

Oversee all personnel, financial, curricular, and administrative activities with the Department of Geological Sciences. Serve as Department liaison to College of Natural Sciences and Mathematics Executive Committee. Oversee Department outreach and fundraising activities.

Vice-chair, CSUF Department of Geological Sciences, 2006-07, 2013

Assist Department Chair in Department administration.

CSUF Philanthropic Foundation (CSFPF) Board of Governors, Faculty Representative, 2010-2014

Represent faculty interests in the administration, solicitation, and stewardship of funds donated to the university; represent the university at CSFPF fundraising and stewardship events; represent faculty in the development and implementation of the strategic fundraising initiatives of the Board.

Vice-Chair for Resource Development, CSFPF Board of Governors, 2012-2013

Partner with University Advancement to institutionalize the philanthropic process within the Board and its individual members. Actively participate in planning, executing, and evaluating CSUF's development efforts. Advise the University on philanthropic opportunities. Work with University to identify, cultivate, solicit, and recruit potential donors to the University. Oversee CSFPF Board's functions related to assuring fiscal health through fund development, real estate, and planned giving.

General Education Committee, 2008-2012; Chair 2010-11, Vice-Chair 2011-12 (CSUF)

Committee responsibilities include to review General Education (GE) course proposals and make recommendations for approval or rejection to the Academic Senate; periodically review and recertify existing GE courses; study, review, interpret, and recommend GE programs for approval by the Academic Senate; prepare GE program performance reviews; as well as other duties relating to the oversight of the University GE program.

Freshman Programs Advisory Board, 2007-2016 (CSUF)

Advise Director of Freshman Programs on curricular and co-curricular matters relating to CSUF's new student programs.

University Advancement Committee, 2006-08 (CSUF)

Committee responsibilities include formulating, reviewing, and recommending to the Academic Senate policies regarding fundraising; formulating, reviewing, and recommending policies regarding dispersal of unrestricted philanthropic funds; promoting faculty engagement in fundraising efforts; receiving and reviewing fundraising reports; making recommendations on gifts and naming of campus facilities; and acting as an advisory board to the Office of University Advancement.

Graduate Education Committee, 2005-06 (CSUF)

Committee responsibilities include formulating, reviewing, and recommending policies and criteria regarding graduate curricular programs; formulating, reviewing, and recommending policies and criteria regarding graduate courses; formulating, reviewing, and recommending policies and criteria regarding postbaccalaureate certificate and credential programs; reviewing and evaluating new graduate programs and changes to existing graduate curricular programs; reviewing and evaluating graduate course proposals.

Professional and Community Service

Member, Washington MESA Board of Directors, 2016-present; Governance Chair 2018-present

Represent the State of Washington's Higher Education sector in the statewide governing body for MESA (Mathematics, Engineering, Science Achievement). MESA is funded by a combination of state, federal, and private money and is committed to building a pathway to college and careers in science, technology, engineering & mathematics (STEM). Washington MESA oversees all K-14 MESA programs in the state. I also serve as Chair of the Governance Committee and co-Responsible Administrator for the Spokane K-12 MESA Center.

Member, Mobius Spokane Board of Directors, 2017-present.

Oversee the management and operation of the Mobius Spokane, a science center and children's museum in Spokane, Washington.

Member, Spokane STEM Network Executive Committee, 2016-2020; Co-Chair 2019-20.

Represent EWU in a regional partnership of leaders in K-12 education, community colleges, higher education, government, and industry dedicated to driving innovation and improvements in STEM teaching and learning at a systems level. I am currently serving as co-chair of the committee.

Board of Directors, Southern California Earthquake Center, 2007-2011.

The Southern California Earthquake Center (SCEC) coordinates fundamental research on earthquake processes using Southern California as its principal natural laboratory. The SCEC community includes over 1,000 researchers from over 75 institutions around the world and comprises one of the largest research collaborations in geoscience. The SCEC Board of Directors serves as the primary mechanism for SCEC core and participating institutional representation in the oversight and management of the Center.

Scholarly Activities

Student Theses Undergraduate Theses in **bold**.

Philo, Daniel, Seismic hazard assessment of McCarthy Hall on the California State University, Fullerton Campus: A comparison of UCERF2 and UCERF3, (co-advise with Harmony Colella, CSUF adjunct), May 2014.

Tarnowski, Jennifer, How barriers enable slip-partitioned, multi-fault, dynamic rupture in upward branching oblique fault systems, (co-advise with David Oglesby, UC Riverside), May 2011.
Reissman, Jeff, Observations of accelerating seismicity in California and Greece; Earthquake forecasting and false alarm rates from a grid-based search algorithm, August 2010.
Nunley, Melissa, Dynamic slip-partitioning in a branched oblique fault system, (co-advise with David Oglesby, UC Riverside) May 2009.
Colella, Harmony, Forward modeling of accelerating seismicity for scenario earthquakes in northern California, May 2006.
Beach, Alyssa, Fracture development on the Gridded Plains of Guinevere Planitia, Venus: implications for the thickness of the elastic lithosphere, Dec. 2004.
Ikeda, Nancy, A statistical evaluation of the likelihood of spurious accelerating moment release in synthetic earthquake catalogs, August 2004.
Clark, Julia, Forward modeling of accelerating moment release for scenario earthquakes in southern California, May 2004.
DeLeon, Ivan, The 1981 Corinth, Greece earthquake sequence: geodetic and Coulomb stress modeling, December 2002.

Relevant Publications

Nichols, K., E. Trevino, N. Ikeda, D. Philo, A. Garcia, and D. Bowman (2017), Interdependency amongst earthquake magnitudes in Southern California, *J. Appl. Statistics*, doi:10.1080/02664763.2017.1313965.

Blazevic, M. A., M. E. Kirby, A. D. Woods, B. L. Browne, D. D. Bowman (2009), A sedimentary facies model for glacial-age sediments in Baldwin Lake, Southern California, *Sed. Geo.*, 219, 151-168, doi: 10.1016/j.sedgeo.2009.05.003.

Tiampo, K. F., D. D. Bowman, H. Colella, and J. B. Rundle (2008), The Stress Accumulation Method and the Pattern Informatics Index: Complementary Approaches to Earthquake Forecasting, *Pure Appl. Geophys.*, 165, 693-709; doi: 10.1007/s00024-008-0329-5.

*Dolan, J. F., D. D. Bowman, and C. G. Sammis (2007), Long-range and long-term fault interactions in southern California, *Geology*, 35, 855-858; doi: 10.1130/G23789A.1.

* 2020 Recipient of Geological Society of America Outstanding Paper Award in Structural Geology and Tectonics. This award is given annually for a published work of exceptional distinction that clearly advanced the science of structural geology or tectonics.

Mignan, A., G. C. P. King, and D. Bowman (2007), A mathematical formulation of accelerating moment release based on the stress accumulation model, *J. Geophys. Res.*, 112, B07308, doi:10.1029/2006JB004671.

Sohn, M.F., S.A. Mahan, J.R. Knott, and D.D. Bowman (2007), Luminescence ages for alluvial-fan deposits in Southern Death Valley: Implications for climate-driven sedimentation along a tectonically active mountain front, *Quaternary International*, 166, 49-60, doi:10.1016/j.quaint.2007.01.002.

Mignan, A., D. D. Bowman, and G. C. P. King, (2006), An Observational Test of the Origin of Accelerating Moment Release Before Large Earthquakes, *J. Geophys. Res.*, 103, B11304, doi:10.1029/2006JB004374.

Mignan, A, G. King, D. Bowman, R. Lacassin, and R. Dmowska (2006), Seismic activity in the Sumatra-Java region prior to the December 26, 2004 (Mw=9.0-9.3) and March 28, 2005 (Mw=8.7) earthquakes, *Earth Planet. Sci. Lett.*, 244, 638-654, doi:10.1016/j.epsl.2006.01.058.

Levin, S. Z., C. G. Sammis, and D. D. Bowman (2006), An observational test of the stress accumulation model based on seismicity preceding the 1992 Landers, CA earthquake, *Tectonophysics*, 413, 39-52.

- King, G., Y. Klinger, D. Bowman and P. Tapponnier (2005), Slip partitioned surface breaks for the 2001 Kokoxilli earthquake (Mw 7.8), *Bull. Seismol. Soc. Am.*, 95, 731–738, doi: 10.1785/0120040101.
- Dolan, J. F., and Bowman, D. D. (2004), Tectonic setting and Coulomb modeling of the September 22, 2003 Puerto Plata, Dominican Republic, earthquake: Implications for earthquake hazard along the Septentrional fault, *Seismol. Res. Lett.*, 75, 582-592.
- Bowman, D.D. and C. G. Sammis (2004), Intermittent criticality and the Gutenberg-Richter distribution, *Pure Appl. Geophys.*, 161, 1945-1956, doi:10.1007/s00024-004-2541-z.
- Sammis, C. G., D. D. Bowman, and G. C. P. King (2004), Anomalous seismicity and accelerating moment release preceding the 2001 and 2002 earthquakes in northern Baja California, Mexico, *Pure Appl. Geophys.*, 161, 2369-2378, doi: 10.1007/s00024-004-2569-3.
- Bowman, D. D., G. C. P. King, and P. Tapponnier (2003), Slip partitioning by elastoplastic propagation of oblique slip at depth, *Science*, 300, 1121-1123.
- King, G. C. P., and D. D. Bowman (2003), The evolution of regional seismicity between large earthquakes, *J. Geophys. Res.*, 108(B2), 2096, doi:10.1029/2001JB000783.
- Bowman, D.D. and G. C. P. King (2001), Accelerating seismicity and stress accumulation before large earthquakes, *Geophys. Res. Lett.*, 28, 4039-4042.
- Bowman, D.D. and G.C.P. King (2001), Seismicity changes before large earthquakes, *C. R. Acad. Sci. Paris*, 333, 591-599.
- King, G.C.P., A. Hubert-Ferrari, S.S. Nalbant, B. Meyer, R. Armijo, and D.D. Bowman (2001), Coulomb interactions and the 17 August 1999 Izmit, Turkey earthquake, *C. R. Acad. Sci. Paris*, 333.
- Bowman, D.D., G. Ouillon, C.G. Sammis, A. Sornette, and D. Sornette (1998), An observational test of the critical earthquake concept, *J. Geophys. Res.* 103, 24359-24372.

Research Grants Funded proposals in **bold**

- Bowman, David D., “Building Opportunities for New Experiences in the Earth Sciences: Project BONES”, National Science Foundation Opportunities for Enhancing Diversity in the Geosciences Planning Grant, February 1, 2012 – February 1, 2013, \$39,086.**
- Bowman, David D., and Michele Cooke, “Testing Strain Partitioning Processes with Analog Models”, Southern California Earthquake Center, February 1, 2011 – February 1, 2012, \$19,298.
- Bowman, David D. (PI) and David Oglesby “The Dynamics of Complex Fault Branches: Continued Collaboration Between UC Riverside and Cal State Fullerton”, Southern California Earthquake Center, February 1, 2010 – January 31, 2011, \$10,300, CSUF portion = \$6,586.**
- Bowman, David D. (PI) and David Oglesby, “Collaborative Research - The Dynamics of Complex Fault Branches”, Southern California Earthquake Center, February 1, 2008 – January 31, 2009, \$21,000, CSUF portion = \$12,375.**
- Bowman, David D. and Thomas Jordan, “Formation and Evaluation of Fault- and Alarm- Based Earthquake Prediction Algorithms”, Southern California Earthquake Center, February 1, 2007 – January 31, 2008, CSUF portion = \$15,601.**
- Bowman, David D. (PI) and Charles G. Sammis, “Collaborative Research: An Observational and Theoretical Investigation of the Mechanical Properties Controlling the Duration of Accelerating Moment Release Before Large Earthquakes”, Southern California Earthquake Center, February 1, 2006 – January 31, 2007, CSUF portion = \$20,000.**
- Bowman, D. (PI) and Thomas Jordan, “Creating a Framework for Evaluating Earthquake Predictions Using Accelerating Moment Release”, Southern California Earthquake Center, Feb 1, 2005 – Jan 31, 2006, CSUF portion = \$17,000.**

Bowman, D. (PI) and K. Tiampo, "Collaborative Research - Integrating The Stress Accumulation Method And Pattern Informatics Technique", Southern California Earthquake Center, Feb 1, 2005 – Jan 31, 2006, CSUF portion = \$15,000.

Bowman, D., and D. Clemens-Knott, The Robert and Louise Lee Collaborative Teaching Award, 2005-2006, \$1500

Bowman, D. (PI) and K. Tiampo, "Collaborative Research – Analysis and Integration of the Earthquake Stress Cycle Evolution and Pattern Informatics Techniques", Southern California Earthquake Center, Feb 1, 2004 – Jan 31, 2005, CSUF portion = \$10,980.

Bowman, D. (PI) and S. Levin, "Adaptation of the Stress Accumulation Model of Accelerating Moment Release for Use in OpenSHA", Southern California Earthquake Center, Feb 1, 2004 – Jan 31, 2005. \$38,160.

Bowman, D.(PI), and J. Dolan, "Forward modeling of accelerating moment release for scenario earthquakes in southern California", Southern California Earthquake Center, Feb 1, 2003-Jan 31, 2004, CSUF portion = \$20,000

Dolan, J. (PI) and D. Bowman, "Paleoseismologically Constrained Kinematic Modeling of Holocene Strain Release in Southern California", Southern California Earthquake Center, Feb 1, 2003- Jan 31, 2004.

Bowman, D. (PI), "Forecasting large earthquakes using background seismicity", CSU Program for Research, Scholarship, and Creative Activity, Dec 5, 2001 – July 31, 2002. \$5,000

Bowman, D. (PI) and C. Sammis, "Stress transfer and accelerating seismicity before large earthquakes", National Science Foundation, Aug 1, 2001 – July 31, 2003. \$117,870

Li, Y.G. (PI), and D. Bowman, "Delineation of the San Jacinto fault zone near Rialto, San Bernardino, southern California, using fault-zone trapped waves", National Earthquake Hazards Reduction Program, March 1, 2002 – Feb 28, 2003.

Meeting Abstracts

Invited talks in **bold**. * indicates undergrads; # indicates grad students; † indicates postdocs.

Bowman, D.D. and D. Clemens-Knott (2012), Recruiting and retaining geoscience students at a large public university: Balancing the needs of first-time freshman and upper-division transfer students, Abstract ED53H-07 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Bowman, D.D., *Tarnowski, J., and Oglesby, D.D. (2011), The Effect of Barriers on Slip Partitioning in an Upward Branching Fault System, Abstract S43C-2264 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

*Tarnowski, J. M., D. D. Oglesby, and D. D. Bowman (2010), How Barriers Enable Multi-Fault Rupture in a Branched Fault System, Abstract S43A-2058 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.

*Nunley, M., *J. Tarnowski, D. Oglesby, and D. Bowman (2010), Dynamic Slip Partitioning in a Branched Oblique Fault System, 7th ACES International Workshop, October 3-8, Otaru, Japan.

*Nunley, M., D. Oglesby, and D. Bowman (2010), Slip Partitioning in Oblique Fault Systems, *Seismol Res Lett.*, 81(2), 324.

*Nunley, M., D. Oglesby, and D. Bowman (2008), Rupture Propagation and Slip Partitioning on an Oblique Upward-Branching Fault System, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract S44A-01.

Oglesby, D., Bowman, D., and *Nunley, M. (2008), Rupture Propagation and Slip Partitioning on an Oblique Upward-Branching Fault System, *SCEC Annual Meeting*, Palm Springs, CA, September 6-11, 2008, <http://www.scec.org/meetings/2008am/2008SCECAAnnualMeetingVolume.pdf>

*Nunley, M., Oglesby, D., and Bowman, D. (2008), Rupture Propagation and Slip Partitioning on an Oblique Upward-Branching Fault System, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract S13A-0208.

Bowman, D. (2007), Forecasting Earthquakes in Southern California Using Precursory Accelerating Moment Release, Conference on Earthquake Predictability and Time-Dependent Forecasting, January 28-31, Rschlikon, Switzerland.

*Mignan, A., King, G. C., and Bowman, D. D. (2006), A Mathematical Formulation of Accelerating Moment Release Based on the Stress Accumulation Model, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract S13A-0208.

King, G. C., *Mignan, A., Bowman, D. D., Dmowska, R., and Lacassin, R. (2006), Earthquake Risk Following the 17 July Java Earthquake, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract S21A-0133.

Tiampo, K. F., Rundle, J. B., Bowman, D. D., Holliday, J., Klein, W., Jimenez, A., and Chen, C. (2006), Pattern recognition of historic seismicity data and earthquake forecasting, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract S12A-03.

Bowman, D. D., #Reissman, J., *Colella, H., Mignan, A., *Robinson, J., and King, G. C. (2006), Accelerating Region Seismicity and Earthquake Forecasting, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract S12A-02.

*Robinson, J. and D. D. Bowman, Accelerating moment release along the Wasatch fault, Utah, *SCEC Annual Meeting*, Palm Springs, CA, September 10-13, 2006.

Bowman, D., *H. Colella, and K. F. Tiampo (2006), Seismicity Rate Changes and Earthquake Forecasting Beyond the San Andreas, *Seismol. Res. Lett.*, 77(2), 201.

*Colella, H., and D. Bowman (2006), Ongoing Accelerating Seismicity in California, *Seismol. Res. Lett.*, 77(2), 259.

Mahan, S. A., #Sohn, M. F., Knott, J. R., & Bowman, D. D. (2006). Slip Rates, Recurrence Intervals and Earthquake Event Magnitudes for the Southern Black Mountains Fault Zone, Southern Death Valley, California Using Optically Stimulated Luminescence, *Seismol. Res. Lett.*, 77(2), 245.

#Mignan, A., G. King, D. Bowman, R. Lacassin, and R. Dmowska (2006), Seismic Activity in the Sumatra-Java Region Prior to The December 26, 2004 (Mw=9.0-9.3) and March 28, 2005 (Mw=8.7) Earthquakes, *Seismol. Res. Lett.*, 77(2), 226.

Bowman, D., (2006) An Observational Test of the Origin of Accelerating Moment Release (AMR) Before Large Earthquakes, *5th ACES International Workshop: Simulating and Forecasting Earthquakes and Tsunamis with Information Technology*, April 4-6, Maui, HI.

*Colella, H., D. Oglesby, and D.D. Bowman (2005), An Oblique/Branching Fault System: Dynamic and Static Analyses, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract S51F-07.

†Levin, S.Z., K. F. Tiampo, and D. D. Bowman (2005), Spatial and Temporal Length Scales Characterizing the Evolution of Seismicity Rates., *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract S43D-02.

Bowman, D. D., H. Colella*, and G. King (2005), Accelerating Regional Seismicity and Earthquake Forecasting in California and Indonesia *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract S42B-05.

- #Fronterhouse Sohn, M., J. R. Knott, and D. D. Bowman (2005), Slip Rates, Recurrence Intervals and Earthquake Event Magnitudes for the southern Black Mountains Fault Zone, southern Death Valley, California, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract T51D-1377.
- King, G. C., A. Mignan#, D. D. Bowman, R. Dmowska, and R. Lacassin (2005), Could the December 26, 2004 and the March 28, 2005 Sumatra Earthquakes Have Been Anticipated Using Accelerated Moment Release?, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract U21C-03.
- #Reissman, J. and D. Bowman (2005), Grid-Search for Accelerated Moment Release (AMR) Precursors to California Earthquakes, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract S53B-1099.
- King, Geoffrey, Yann Klinger, David Bowman, & Paul Tapponnier (2005) Slip-Partitioned Surface Breaks Along a Releasing Bend in the Mw 7.8 2001 Kokoxili Earthquake, *China Tectonics of Strike-Slip Restraining & Releasing Bends in Continental & Oceanic Settings*, Geological Society of London, September 28 – 30, London, U.K.
- Bowman, David, Geoffrey King, & Paul Tapponnier (2005) Slip Partitioning and Regional Stress Fields from Geometrically Irregular Faults, *Tectonics of Strike-Slip Restraining & Releasing Bends in Continental & Oceanic Settings*, Geological Society of London, September, 28 – 30, London, U.K.
- #Reissman, J., and D. Bowman, Grid Search for Accelerating Moment Release (AMR) Precursors to California Earthquakes, *2005 SCEC Annual Meeting*, Palm Springs, California, September 11-14, 2005.
- *Martinez, L., and D. Bowman, Fault-Based Accelerating Moment Release Observations in Southern California, *2005 SCEC Annual Meeting*, Palm Springs, California, September 11-14, 2005.
- Bowman, D., A. Mignan#, G. King, R. Dmowska, and R. Lacassin, Seismic Activity in the Sumatra-Java region prior to the December 26, 2004 ($M_w=9.0-9.3$) and March 28, 2005 ($M_w=8.7$) earthquakes, *2005 SCEC Annual Meeting*, Palm Springs, California, September 11-14, 2005.
- #Fronterhouse Sohn, M., J. Knott, and D. Bowman, Slip rates, recurrence Intervals, and Earthquake Magnitudes for the southern Black Mountain Fault Zone, southern Death Valley, California, *2005 SCEC Annual Meeting*, Palm Springs, California, September 11-14, 2005.
- #Mignan, A., D. D. Bowman, and G. C. King, Accelerating Moment Release Before Large Earthquakes: Stress Triggering Versus Stress Accumulation, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract NG54A-03, 2004.
- †Levin, S. Z., N. Ikeda#, J. Reissman#, and D. D. Bowman, The False-Alarm Rate of Accelerating Moment Release, and its Relationship to Probabilistic Earthquake Rupture Forecasts, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract S23A-0301, 2004.
- #Reissman, J., S. Z. Levin†, and D. D. Bowman, OpenAMR - A JAVA-Based Computational Facility for Earthquake Rupture Forecasts Using Accelerating Moment Release, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract S23A-0295, 2004.
- Dolan, J. F., D. D. Bowman, and C. G. Sammis, Long-Range and Long-Term Fault Interactions in Southern California, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract G14A-05, 2004.**
- King, G. C., Friedrich, A., Armijo, R., Gaudemer, Y., and D. Bowman, Speculations on the Evolution of the East California Shear Zone and Associated Structures by Fault Propagation: Comparison with the Mechanics of Anatolia and the Aegean, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract T31A-1258, 2004.
- King, G., A. Friedrich and D. Bowman, Speculations on the evolution of the East California Shear Zone and associated structures by fault propagation: comparison with the mechanics of Anatolia and the Aegean, *2004 SCEC Annual Meeting*, Palm Springs, California, September 19-22, 2004.

†Levin, S., J. Reissman #, and D. Bowman, Adaptation of the Stress Accumulation Model of Accelerating Moment Release for Use in OpenSHA, *2004 SCEC Annual Meeting*, Palm Springs, California, September 19-22, 2004.

#Mignan, A., G. King, and D. Bowman, Accelerating Moment Release (AMR) Before Large Earthquakes: The Stress Accumulation Model (SAM) vs. the Epidemic-Type Aftershock Sequence Model (ETAS), *2004 SCEC Annual Meeting*, Palm Springs, California, September 19-22, 2004.

Bowman, D. and G. King, Slip partitioning along the San Andreas fault and the regional stress field in southern California, *SSA Annual Meeting*, 2004.

*Clark, J., N. Ikeda#, and D. Bowman, Forecasting earthquakes in southern California using the stress accumulation method, *SSA Annual Meeting*, 2004.

Dolan, J., D. Bowman, and S. Sammis, Long-range and long-term fault interactions in southern California, *SSA Annual Meeting*, 2004.

#Mignan, A., G. King, and D. Bowman, A Comparison of the ETAS and stress accumulation models for accelerating moment release: Which works better, ETAS or SAM?, *SSA Annual Meeting*, 2004.

David Bowman, Geoffrey King, Yann Klinger, and Paul Tapponnier, Slip Partitioning and the Regional Stress Field, *AGU Dec.* 2003.

*Julia Clark, Nancy Ikeda#, and David Bowman, Forecasting Earthquake in Southern California Using the Stress Accumulation Method, *AGU Dec.* 2003.

J. Dolan, D. Bowman, and C. Sammis, Paleoseismologic Evidence for Long Term and Long Range Elastic Interactions in Southern California, *2003 SCEC Annual Meeting*, Oxnard California, September 7-11, 2003.

David Bowman, Geoffrey King, Yann Klinger, and Paul Tapponnier, Slip Partitioning and the Regional Stress Field, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract S31A-02, 2003.

*Julia Clark, Nancy Ikeda#, and David Bowman, Forecasting Earthquake in Southern California Using the Stress Accumulation Method, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract NG41C-0067, 2003.

Geoffrey King, David Bowman, and Arnaud Mignan#, Which Works Best, ETAS or SAM?, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract NG32A-08, 2003.

#Shoshana Z. Levin, Charles G. Sammis, and David D. Bowman, An Observational Test of the Stress Recovery Model for Seismicity Preceding Landers, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract NG41C-0066, 2003.

Dolan, J. F., D. D. Bowman, and C. G. Sammis, Paleoseismologic Evidence for Long-Distance and Long-Term Elastic Interactions in Southern California, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract S12B-0390, 2003.

King, G. C., Manighetti, I., Sammis, C., Tapponnier, P., Armijo, R., Bowman, D., Fault and Rift evolution - All Features Great and Small, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract T21B-01, 2003.

Bowman, D., and G. King, Slip partitioning, *Geophys. Res. Abs.*, 5, 7102, 2003.

Bowman, D. and G. King, The evolution of regional seismicity between large earthquakes, *Geophys. Res. Abs.*, 5, 7165, 2003.

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- D. Bowman, J. Clark*, C. Sammis, and G. King, Forecasting Earthquakes Using Accelerating Moment Release, *2002 SCEC Annual Meeting*, September 7-11, 2002.
- Sammis, C. G., D. D. Bowman, and G. C. King, Anomalous seismicity and AMR preceding the 2001 and 2002 Calexico, Mexico earthquakes, 3rd ACES Workshop Proceedings, May 5-10, 2002. Maui, Hawaii <http://quakes.uq.edu.au/ACES/ACES-2002-workshop/online_proc.html>, 2002.**
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- Bowman, D. D., G. C. King, and C. G. Sammis, Stress accumulation and observations of accelerating seismicity before large earthquakes, *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., Abstract S12F-08, 2001.
- Sammis, C. G., D. D. Bowman, and G. C. King,, A simple analytic model for the formation and dissolution of stress shadows from large earthquakes, *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., Abstract S12F-08, 2001.
- Bowman, D., The evolution of regional seismicity between large earthquakes, 2001 SCEC Annual Meeting, Oxnard, California, September 23-26, 2001.**
- D. Bowman, G. King, and C. Sammis, Stress Accumulation and Seismicity Before Large Earthquakes: A New Model, *2001 SCEC Annual Meeting*, September 23-26, 2001.
- C. Sammis, D. Bowman, and G. King, A Simple Analytic Model for the Formation and Dissolution of Stress Shadows from Large Earthquakes, *2001 SCEC Annual Meeting*, September 23-26, 2001.
- Bowman, D. D. and G. C. P. King, Accelerating seismicity and stress accumulation before large earthquakes, *Seismol. Res. Lett.*, 72, 252, 2001.
- Bowman, D.D. and King, G.C.P., Observations of accelerating seismicity before large earthquakes, *Geophys. Res. Abs.*, 3, 1037, 2001.
- King, G.C.P. and Bowman, D.D., A physical model for accelerating moment release before large earthquakes, *Geophys. Res. Abs.*, 3, 1044, 2001.
- Bowman, D. D. and C. G. Sammis, Coulomb stress models and accelerating moment release: Merging space and time before large earthquakes, *Eos Trans. AGU*, 80 (46), Fall Meet. Suppl., Abstract T41B-03, 1999.
- Bowman, D. D., C. G. Sammis, D. Lockner and S. Stanchits, Experimental Observation of Temporal Clustering of Seismicity Due to Fractal Spatial Heterogeneity, *Eos Trans. AGU*, 79 (17), Fall Meet. Suppl., Abstract S32D-09, 1998.

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- Bowman, D. D. and C. G. Sammis, Observational evidence for temporal clustering of intermediate-magnitude events before strong earthquakes in California, *Seismol. Res. Lett.*, 68, 324, 1997.
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- Bowman, D.D. and C.G. Sammis, The observation of discrete scale invariance in regional fault networks: implications for the temporal clustering of regional seismicity, *EOS Trans. Am. Geophys. U.*, 76, F408, 1995.
- Bowman, D.D., C.G. Sammis, and W.B. Banerdt, Spacing Distributions and Intersection Angles for Kilometer Scale Lineations on the Plains of Venus (abstract), *Lunar and Planet. Sci. Conf.*, XXV, 155-156, 1994.
- Bowman, D.D., and C.G. Sammis, Determining the Thickness of Venus' Elastic Lithosphere Using Fracture Length Distributions (abstract), *EOS Trans. AGU*, 75, 413, 1994.

Presentations and Panels at Workshops and Symposia

- "Symposium on the Impact of Oil Extraction in North Orange County" (organizer and moderator), Cal State Fullerton, September 23, 2014.
- "Panel Discussion of Climate Change in Southern California" (moderator), *Cooper Center Public Lecture Series*, Old Orange County Courthouse, Santa Ana, September 26, 2013.
- "When the Ground Shakes: How an Earthquake in Southern California Could Impact You", *Orange County Red Cross Disaster Preparedness Academy*, Anaheim Convention Center, October 10, 2012.
- "When the Ground Shakes: How an Earthquake in Southern California Could Impact You", *Orange County Red Cross Disaster Preparedness and Recovery Alliance*, Santa Ana, CA, April 10, 2012.
- "Lessons Learned from Recent Large Earthquakes", *Red Cross California Legislative Conference*, Sacramento, March 12, 2012
- "Making the transition to Department Chair", *CSU New Department Chairs Workshop*, Chancellor's Office, CSU Long Beach, February 10, 2012.
- "Lessons Learned from Recent Large Earthquakes", *Red Cross of Orange County Disaster Preparedness Academy*, Anaheim Convention Center, October 26, 2011.
- "Making the transition to Department Chair", *CSU New Department Chairs Workshop*, Chancellor's Office, CSU Long Beach, October 15, 2010.
- "Medium-Term Prediction Experiments" (Reporter), *Earthquake Predictability and Time-Dependent Forecasting*, Swiss Re Center for Global Dialog, Zurich, Switzerland, January 28-30, 2007.
- "Lessons Learned About Earthquakes and Tsunamis in Southern California", *Red Cross of Orange County Disaster Preparedness Academy*, Anaheim Convention Center, May 10, 2006.

- "The Academic Job Search", *Caltech PhD/Postdoc Career Conference*, September 10, 2004.
- "Seismic hazards in southern California", *Red Cross of Orange County Disaster Preparedness Academy*, Cal State Fullerton, June 2, 2004.
- "Observations of Accelerating Moment Release in the Salton Trough, Coachella Valley and Imperial Valley", by D. Bowman, *Scientific Advisory Meeting of the California Earthquake Prediction Evaluation Council to consider the prediction made by V. Keilis-Borok et al.*, SCEC Headquarters, February 20, 2004.
- "Accelerating Seismicity as a RELM Earthquake Rupture Forecast (ERF) Model", by D. Bowman, 2004 RELM Workshop, UCLA Conference Center, Lake Arrowhead, February 17-19, 2004.
- "Seismic hazards in southern California", *Red Cross of Orange County Disaster Preparedness Academy*, Cal State Fullerton, June 4, 2003.
- "Can we apply statistical physics to earthquakes?", *Symposium on Non-Equilibrium Statistical Mechanics in the New Millennium*, Boston University, March 29-30, 2003.
- "The Evolution of Regional Seismicity Between Large Earthquakes" – *Fourth Joint Meeting of the Panel on Earthquake Research, United States-Japan Conference on Development and Utilization of Natural Resources*, Morioka, Japan, November 6-8, 2002.
- "Building a Successful Research Lab", *Caltech PhD/Postdoc Career Conference*, September 5, 2002.

Public Lectures

- "The 2017 Mexico City Earthquake: What Happened, and Could it Happen Here?", *MOBIUS Science Center*, September 23, 2017.
- "The Montana Earthquake: Fact and Fiction", *Eastern Washington University*, July 7, 2017.
- "The Real Earthquakes of the OC: The March 28 La Habra Earthquake and Implications for Earthquake Preparedness", *Orange County Water District*, October 20, 2014.
- "The Real Earthquakes of the OC: The March 28 La Habra Earthquake and Seismic Hazards in Southern California", *Osher Lifelong Learning Institute, Cal State Fullerton*, September 18, 2014.
- "Real Earthquakes of the OC: The March 28 La Habra Earthquake", *Fullerton Public Library Town & Gown Series*, April 15, 2014.
- "Accelerating Seismicity before Large Earthquakes: Life and Death of an Earthquake Prediction", *San Bernardino Natural History Museum*, March 27, 2013.
- "Accelerating Seismicity before Large Earthquakes: Life and Death of an Earthquake Prediction", *Osher Lifelong Learning Institute, Cal State Fullerton*, March 19, 2013.
- "When the Ground Shakes: How an Earthquake in Southern California Could Impact You", *Leisure World Earthquake Preparedness Seminar*, September 13, 2012.
- "When the Ground Shakes: How an Earthquake in Southern California Could Impact You", *Fullerton Public Library Town & Gown Series*, June 12, 2012.
- "The March 11, 2011 M=9.0 Japan Earthquake: What Happened? Are we next?" (with Greg Childers, CSUF Physics and Binod Tiwari, CSUF Civil Engineering), *Fullerton Public Library Town & Gown Series*, March 30, 2011.
- "The March 11, 2011 M=9.0 Japan Earthquake: What Happened? Are we next?", *Leisure World Earthquake Preparedness Seminar*, March 23, 2011.

- "The March 11, 2011 M=9.0 Japan Earthquake: What Happened? Are we next?" (with Greg Childers, CSUF Physics), *Cal State Fullerton*, March 16, 2011.
- "Seismic Hazards in southern California: lessons learned from recent earthquakes", *Landmark Town Hall Meeting, City of La Mirada*, September 23, 2010.
- "Seismic Hazards in southern California: lessons learned from recent earthquakes", *Leisure World Emergency Preparedness Workshop (keynote)*, March 23, 2011.
- "M=7.2 Mexicali Earthquake: What Happened? Are we next?" (with Phil Armstrong), *Fullerton Public Library Town & Gown Series*, April 27, 2010.
- "The 2010 Earthquakes in Haiti & Chile: Are we next?", *Fullerton Public Library Town & Gown Series*, April 27, 2010.
- "The 2010 Earthquakes in Haiti & Chile: Are we next?", *Fullerton Sunrise Rotary*, March 4, 2010.
- "The 2010 Haiti Earthquake: Are we next?", *Discovery Science Center*, January 19, 2010.
- "Earthquakes in southern California: ShakeOut, Don't Freak Out!", *Fullerton Public Library Town & Gown Series*, October 8, 2009.
- "The great Indonesian earthquake and tsunami: What happened? Could it happen here?" – D. Bowman, B. Rhodes, and M. Kirby, CSUF Continuing Learning Experience Program, Feb. 2, 2005.
- "The great Indonesian earthquake and tsunami: What happened? Could it happen here?" – D. Bowman and B. Rhodes, NSM Inter-Club Council Symposium, April 13, 2005.
- "The great Indonesian earthquake and tsunami: What happened? Could it happen here?" – D. Bowman, B. Rhodes, and M. Kirby, NSM Colleagues Colloquium, April 20, 2005.
- "Current 'Scientific Earthquake Prediction(s)' in southern and eastern California", NSM Inter-Club Council Symposium, May, 2004.

Department Seminars

- "Accelerating Moment Release Before Large Earthquakes: Life and Death (and Rebirth?) of an Earthquake Prediction Scheme", *EWU Geology Colloquium*, January 31, 2017.
- "Accelerating Moment Release Before Large Earthquakes: Life and Death (and Rebirth?) of an Earthquake Prediction Scheme", *Boston University Physics Colloquium*, November 15, 2011.
- "Slip Partitioning in Continental Lithosphere", *University of Massachusetts at Amherst Geosciences Lecture Series*, November 11, 2011.
- "Fault Propagation and Slip Partitioning in Continental Lithosphere", *Cal State Northridge Geology Speakers Series*, March 2, 2010.
- "Earthquakes in southern California: ShakeOut, Don't Freak Out!", *Fullerton College Natural Sciences Seminar*, October 7, 2009.
- "Seismic Hazards in Southern California", *CSUF Physics Colloquium*, October 30, 2009.
- "Some Problems in Statistical Seismology", *CSUF Statistics Colloquium*, May 8, 2009.
- "Accelerating Seismicity Before Large Earthquakes: Life and Death of an Earthquake Prediction Scheme", *SDSU Geology Seminar*, March 18, 2009.
- "Accelerating Seismicity Before Large Earthquakes: Life and Death of an Earthquake Prediction Scheme", *Association of Engineering Geologists Inland Empire Section Meeting*, December 19, 2007.
- "Accelerating Seismicity Before Large Earthquakes: Life and Death of an Earthquake Prediction Scheme", *Berkeley Seismology Lab Seminar*, November 13, 2007.

- "Getting ready for an earthquake: Accelerating seismicity and earthquake rupture forecasts", *UC Davis Geology Seminar Series*, October 18, 2006.
- "Getting ready for an earthquake: Accelerating seismicity and earthquake rupture forecasts", *USGS Earthquake Hazards Team Seminar Series*, June 14, 2006.
- "Getting ready for an earthquake: Accelerating seismicity and earthquake rupture forecasts", *USC Earth Sciences Department Seminar Series*, August 29, 2005.
- "Accelerating Moment Release and the Prediction of Large earthquakes", *Geophysical Laboratory Seminar, Aristotle University of Thessaloniki*, Thessaloniki, Greece, June 22, 2005.
- "Slip partitioning and the heterogeneous regional stress fields in continental lithosphere", *UCLA Tectonics Seminar Series*, May 23, 2005.
- "The art and science of seismic hazard analysis in southern California", *Fullerton College Natural Sciences Seminar*, April 21, 2005.
- "Fault Propagation in Continental Lithosphere: Cheddar vs. Camembert", *UC Riverside Hewitt Club Seminar Series*, March 8, 2005.
- "Earthquake Predictability and the Physics of the Earthquake Cycle", *Center for Earthquake Analysis and Prediction, China Earthquake Authority*, Beijing, China, July 15, 2004.
- "Fault propagation and strain partitioning in continental lithosphere", *San Diego State University Geological Sciences Seminar*, March 10, 2004.
- "Fault propagation and slip partitioning in continental lithosphere", *Scripps Institute of Oceanography Geophysics Seminar*, October 10, 2003.
- "Fault propagation and strain partitioning in continental lithosphere", *Harvard University Solid Earth Physics Seminar*, April 1, 2003.
- "Strain accommodation in continental lithosphere", *Cal State Fullerton Geological Sciences Seminar*, March 12, 2003.
- "Stress Accumulation Before Large Earthquakes and the Physics of the Seismic Cycle", *UCSB Geology Department Seminar*, November 21, 2002.
- "Strain Accommodation in Continental Lithosphere" - *USC Earth Sciences Department Seminar* April 22, 2002.
- "L'Évolution de Seismicité et la Cycle Seismique" - *Institut de Physique du Globe de Paris Seminaire Tectonique* Jan 17, 2002.
- "The Evolution of Regional Seismicity Between Large Earthquakes" - *USC Earthquake Physics Seminar* Oct. 23, 2001.
- "Accelerating Seismicity and Stress Accumulation Before Large Earthquakes" - *UCLA Geophysics Seminar* Oct. 17, 2001.
- "L'Évolution de Seismicité et la Cycle Seismique" - *Université de Savoie* July 2001.

Carmen Bustos-Works

Professor and Chair of Chemistry, Sonoma State University
Director of Liberal Studies, Sonoma State University
Associate Dean of The School of Science and Technology

Department of Chemistry
Sonoma State University

Professional Objective

Leader of a dynamic university team that fosters the teacher-scholar model in creating innovative and inclusive programs for a diverse group of students.

Education

Ph.D. Chemistry University of California, Santa Barbara	2001
M.S. Chemistry University of California, Santa Barbara	1998
B.A. Chemistry and B.A. Psychology San Francisco State University Cum Laude	1996

Administrative Appointments

- Associate Dean for the School of Science and Technology at Sonoma State University 2021
- Chair of the SSU Chemistry Department at Sonoma State University. 2015-2021
- Director of Liberal Studies at Ukiah and Napa/Solano through Sonoma State University 2019-Current
- Co-PI of California Learning Lab Grant. 2019-Current
- Director of NSF grants. 2012-Current
- Director of the Faculty Learning Program at Sonoma State University 2015-2019
- Chair of the Academic Senate and Faculty at Sonoma State University 2016-2017

Academic Appointments

- Professor Chemistry Sonoma State University 2012
- Associate Professor Chemistry Sonoma State University 2007-2012
- Assistant Professor Chemistry Sonoma State University 2001-2007
- Adjunct Professor Biology Sonoma State University 2002
- Adjunct Professor Chemistry Santa Barbara City College 1999-2001

Accomplishments

- Research advisor to over 55 undergraduate students and two graduate students over 20 years at Sonoma State, resulting in over 100 posters, and 10 peer-reviewed publications with undergraduate co-authors. Many of these students have continued their education and three are currently professors.
- Implementation of a sustainable assessment plan for general education program at SSU
- Sonoma State's Excellence in Teaching Award
- Created and launched successful programming for inclusive learning in STEM via First Year Learning Communities (FYCs) and research experiences for Chemistry and Biochemistry majors

Additional Administrative and Leadership Roles

- Member of the Senate Executive Committee. 2009-2018
- Member of the University RTP Committee. 2018-2021
- Mentor for Faculty and Students at SSU. Ongoing
- Vice-Chair of the Academic Senate. 2014-2016
- Chair Structure and Functions. 2015-2016
- Chair of the Educational Policy Committee. 2009-2010

Strategic Planning and Budget

- Co-Chair of the SSU Strategic Planning Committee where we developed and implemented a 5-year strategic plan, 2025. 2017-2018
- Member of the President's Budget Advisory Committee. 2015-2019

Accreditation and Assessment

- Member of the GE assessment team at SSU. 2020
- Co-Chair of the WASC Steering Committee. 2018
- Participated in GE assessment institute through AACU. 2018
- Member of the GE Program Review Team for SSU. 2009

Communication and Collaboration

- Work with multiple departments on the SSU campus and stakeholders at Mendocino College to coordinate and direct a Liberal Studies degree completion from SSU at Mendocino College.
- Member of the GE implementation team at SSU.
- Coordinated multiple faculty retreats for both the Chemistry Department and the University which have resulted in curriculum revisions in GE.
- Coordinated University Convocation. 2016
- Work with a diverse group of faculty and students to help foster student success, cultivate leadership and create transformative experiences at SSU.
- Serve the Chemistry Department as a representative to the Counsel of Department Chairs for the School of Science and Technology. 2015-current
- Served the University by contributing to hiring committees for administrators, faculty and staff members.
- Contribute regularly to freshman and transfer advising and orientation.

- Contribute regularly to Seawolf Decision day where I communicate with both prospective students and their families.

Teaching Experience

Courses Taught

- Thinking Like a Scientist
- General Chemistry I & II
- Honors General Analytical Chemistry I & II
- Advanced Inorganic Chemistry
- Research Methods in Chemistry
- Structural Biochemistry
- Instrumental Analysis and Chemical Synthesis
- Advanced Synthesis and Instrumental Analysis
- Biochemical Methods – Protein purification
- Chemistry Elective Bioinorganic Chemistry and Chemistry Pedagogy
- Research Seminar
- Undergraduate Research

Curriculum Development and High Impact Practices

- Member and Chair of the Educational Policy committee which is the university curriculum committee -creating pathways for departments to implement good curriculum. 2004-2013.
- Created a frame work for the Chemistry and Biochemistry First Year Experience at SSU and implemented a course in critical thinking in the department of chemistry. 2011
- Institutionalized Undergraduate Research into the Chemistry Department – spearheaded the redesign of SSU’s chemistry undergraduate research course and experience. 2010
- New Chemistry Curriculum-spearheaded the development of the chemistry curriculum for the BA in chemistry and the BS in both chemistry and biochemistry. Worked with the faculty to draft the curriculum for department, school and university approval. 2010
- Honors General and Analytical Chemistry-was responsible for the development and initial implementation. 2008

Research Experience

Principal Investigator

Fall 2001 - present

1. Investigation into the photochemistry of the reactivity of μ -(1,3-propanedithiolato)-hexacarbonyldiiron. This compound is a structural and functional model for the active site of iron-only hydrogenase. The photochemical experiments in this project could lend insight into how bacteria use hydrogen as a fuel.

2. Increasing equity and diversity in STEM through the creation of online materials for both students and faculty. These efforts are aimed to disrupted narratives of what determines scientific brilliance and foster an inclusive set of practices that redefine

scientific competence.

3. Investigation of the importance of proteins in the role of detoxification of chromium(VI). My research at SSU has shown that chromium (III) can form protein complexes.

4. Investigation of the role of bacteria in bioremediation of polluted soil and water from chromium(VI).

Selected Funded Grants

1. California Learning Lab. Developing Student Identity and Self-Perception as Capable STEM Thinkers and Learners 1.3 M. 2019-2022
2. NSF-RUI Funding for Iron-Iron Hydrogenase Project. \$180K. 2011-2021
3. Koret Scholar Award for Iron-Iron Hydrogenase Project. \$5,800. 2017
4. Proven Course Redesign CSU, Adopting High Impacted Practices for General Chemistry, \$17,000. 2016
5. SSU – Mini Grant: Photochemical and Toxicity Studies of an Iron Based CO Releasing Molecule \$3,400. 2015
6. SSU –SOURCE AWARDS- funding for undergraduate research \$4,000. 2015
7. CSUPERB Program Development: Thinking Like a Scientist-creation of a Learning Community in Chemistry and Biochemistry and Critical Thinking, \$13,454. 2014
8. NSF-MRI- Acquisition of a high field NMR \$349,058. 2011
9. NSF RUI Funding for Iron-only hydrogenase project. \$129,754. 2011
10. Faculty Mentor - SSU student stipends in the amount of \$750 to support undergraduate research. 2010
11. Faculty Mentor - SSU student stipends in the amount of \$750 to support undergraduate research. 2010
12. Faculty Mentor - SSU student stipends in the amount of \$500 to support undergraduate research. 2009
13. Faculty Mentor - SSU student stipends in the amount of \$500 to support undergraduate research. 2008
14. Faculty Seed Grant CSUPERB for \$15,000. 2005
15. Faculty Mentor - SSU student stipends in the amount of \$500 to support undergraduate research. 2005
16. Collaborator, “Acquisition of a MALDI-TOF MS System for the College of Natural Sciences and Mathematics, California State University Long Beach.” Keck Foundation. \$724,13. 2005
17. RSCAP mini grant sponsored programs for support of undergraduate research. SSU. \$2,000. 2005
18. Faculty Mentor - Howell-CSUPERB young investigator Award for undergraduate research. \$2,500. 2005
19. RSCAP mini grant SSU office of sponsored programs for support of undergraduate research during the summer. \$4,200. 2003
20. CSUPERB grant for curriculum development in the amount of \$15,000. 2003
21. Faculty Mentor - Howell-CSUPERB young investigator Award for undergraduate research. \$2,500. 2003

Peer-Reviewed Publications

1. "Teaching Upper Division Chemistry and Biochemistry Capstone Lab Courses During a Pandemic." Lillig, J.; Fukuto, J.; Lares, M.; Negru, B.; **Works, C.** *Journal of Chemical Education*, June 2020.
2. The chemical Biology of Hydrogen Sulfide and Related Hydropersulfides: Interactions with Biologically Relevant Metals and Metalloproteins. Fukuto, J.M.; Vega, V.S.; **Works, C.**; Lin, J. *Current Opinion in Chemical Biology* 55, 2020, 52-58.
3. Photoinduced Terminal Hydride of [FeFe]-Hydrogenase Biomimetic Complexes. Niu, S; Nelson, A.E.; De La Torre, P.; Li, H.; **Works, C.F.**; Hall, M.B. *Inorganic Chemistry* 58, 2019, 13737-13741.
4. Photochemical Reactivity of a Binuclear Fe (I)-Fe (I) Hydrogenase Model Compound with Cyano Ligands. Hunt, A.; Barrett, J.; McCurry, M.; **Works, C.** *Polyhedron* 114, 2016, 306-312.
5. The chemistry, biology and design of photochemical CO releasing molecules and the efforts to detect CO for biological applications. Marhenke, J., Trevino, K., **Works, C.** *Coordination Chemistry Reviews.* 2016, 306, 533-543.
6. Advanced Inorganic Lab Experiment: Synthesis and Characterization of μ -S₂Fe₂(CO)₆. Barrett, J.; Spentzo, A.; **Works, C.** *Journal of Chemical Education* 2015, 92 (4), 719-722.
7. Flash Photolysis and Continuous Photolysis of an Iron-Iron Hydrogenase Model (μ -pdt)[Fe(CO)₃]₂ in Different Solvents; Insight into the Inhibition by CO. Marhenke, J.; Pierri, A.; Lomotan, M.; Ford, P.C. *Inorganic Chemistry* 2011, 50(23) 11850-11852.
8. Oxidation of Chromium(III) Binding Proteins and Implications for Insulin Activity in Glucose Metabolism. White, S.A., **Works, C.F.** *Journal of Undergraduate Chemistry Research* 2010, 9(2) 36-38.
9. Photochemical studies of iron-only hydrogenase model compounds Brown-McDonald, J., Berg, S., Peralto, M., **Works, C.** *Inorganica Chimica Acta* 2009, 362, (2) 318-324.
10. Isolation of a Novel Chromium(III) Binding Protein from Bovine Liver Tissue After Chromium(VI) Exposure. Ryan L. Peterson, Kelly J. Banker, Thelma Y. Garcia, and **Carmen F. Works.** *Journal of Inorganic Biochemistry.* 2008 (102)833-841.
11. Synthesis, Purification and Characterization of a μ -(1,3-propanedithiolato)-hexacarbonyldiiron: Laboratory Experiment or Mini-Project for Inorganic Chemistry or Integrated Laboratory. **Works, C.F.** *J. Chem. Ed.* 2007 (84) 836.
12. Purification of a chromate reductase from a pseudomonad. Skarra, D.V. and **Works, C.** *Preprints of Extended Abstracts, American Chemical Society, Division of Environmental Chemistry* 2005, 45(1), 461-466. Presented at the ACS National Meeting in San Diego.
13. Photochemical Nitric Oxide Precursors: Synthesis, Photochemistry, and Ligand Substitution Kinetics of Ruthenium Salen Nitrosyl and Ruthenium Salophen Nitrosyl Complexes **Works, C. F.**; Jocher, C. J.; Bart, G. D.; Bu, X.; Ford, P. C. *Inorg. Chem.* 2002, 41(14), 3728-3739.
14. Reactions of Nitrogen Oxides with Heme Models. Characterization of NO and NO₂ Dissociation from Fe(TPP)(NO₂)(NO) by Flash Photolysis and Rapid Dilution Techniques: Fe(TPP)(NO₂) as an Unstable Intermediate. Lim, M.D.; Lorkovic, I.M;

- Wedeking, K; Zanella, A.A.; **Works, C.F.**; Massick, S.M.; Ford, P.C. *J. Am. Chem. Soc* **2002**, 124(33), 9737-9743.
15. Photoreactivity of the Ruthenium Nitrosyl Complex, Ru(salen)(Cl)(NO). Solvent Effects on the Back Reaction of NO with the Lewis Acid Ru(III)(salen)(Cl) **Works, C. F.** and C. Ford, P.C. *J. Am. Chem. Soc.* (**2000**), 122(31), 7592-7593

Selected Conference Contributions

1. "Developing Students Identity and Self-Perception as Capable STEM Thinkers and Learners." Paul Daubenmire, Hien Nguyen, Cory Antonakos, Erin Palmer, Jennifer Whiles-Lillig, Carmen Works, and Angy Stacy. Equity in STEM, Berkeley CA. 2019.
2. "Analyzing the Photochemistry Product of Trimethylphosphine Hydride a Common [FeFe]-Hydrogenase Model Compound". Karina Cruz and Carmen Works Science Symposium. Rohnert Park CA. 2019
3. "Kinetics and Quantum Yields of [Fe-Fe] hydrogenase model complexes". Brandon Jolly and Carmen Works Science Symposium, Rohnert Park, 2019.
4. "Kinetics and Quantum Yields of [Fe-Fe] hydrogenase model complexes." Brandon Jolly and Carmen Works N. California Undergraduate ACS Meeting. Santa Clara CA. 2019
5. "Photochemical and Thermal Analysis of Phosphine Modified Hydrogenase Model Compounds". Carmen Works, National ACS Meeting. Orlando Fl. 2019
6. "Temperature and solvent dependent kinetics and quantum yield of [Fe-Fe] hydrogenase model complexes" Brandon Jolly and Carmen Works National ACS Meeting. Orlando Fl. 2019
7. "Synthesis and Cell Protection Studies of the Dithiolate- Bridged Diiron Hexacarbonyl Complex". Anna Thompson and Natalie Asemi and Carmen Works Science Symposium. Rohnert Park CA. 2019
8. "Synthesis and Photochemistry study of Novel [FeFe]Hydrogenase Model Complexes". Valentino Perez, Luis Esquivel and Carmen Works Science Symposium. Rohnert Park CA. 2019
9. "Synthesis and Photochemistry study of Novel [FeFe]Hydrogenase Model Complexes". Valentino Perez and Carmen Works N. California Undergraduate ACS Meeting. Santa Clara CA. 2019
10. "Investigation of Photochemical Products from Fe-Fe Hydrogenase Model Complexes." Anne E. Nelson, Patricia De La Torre and Carmen Works, ACS National Meeting, San Francisco, 2017.
11. "Synthesis and Characterization of Cobalt (II) Salen and its Possible Interactions with Persulfide Species". Lucia Alvarez, Annika Holms, Jon Fukuto, Valeria Suarez and Carmen Works, 253rd ACS National Meeting, San Francisco, 2017.
12. "Diiron Carbonyl; Carbon Monoxide Releasing Compound" Christopher Stephenson, Elizabeth Duran and Carmen Works, 253rd ACS National Meeting, San Francisco, 2017.
13. "Photochemical Studies of Fe(I)-Fe(I) Hydrogenase Model Complex". Anne E. Nelson, Andrew Hunt and Carmen Works, CSUPERB 29th Annual CSU Biotechnology Symposium, 2017.
14. "Synthesis and Characterization of Cobalt(II) Salen and its Possible Interactions with Persulfide Species, CSUPERB 29th Annual CSU Biotechnology Symposium, 2017.
15. "Photochemical Studies of an [FeFe]-Hydrogenase Model Complex". Anne Nelson and Carmen Works, 251st ACS National Meeting, San Diego, 2016.
16. "Synthesis and Characterization of a Novel PhotoCORM" Meghan McCurry and

- Carmen Works, CSUPERB 28th Annual CSU Biotechnology Symposium, 2016.
17. "Binding of Chromium(III) to Transferrin" Patricia De La Torre and Carmen Works, CSUPERB 28th Annual CSU Biotechnology Symposium, 2016.
 18. "Chromium(VI) Reduction by a Novel Bacteria" Alex Staidle and Carmen Works, CSUPERB 28th Annual CSU Biotechnology Symposium, 2016.
 19. "Photochemistry of Iron-Iron Hydrogenase Model Compounds; Potential Hydrogen Catalysts" Andrew Hunt, Anne Nelson and Carmen Works, CSUPERB 28th Annual CSU Biotechnology Symposium, 2016.
 20. "Chemistry and Biochemistry Learning Community for First Year Students" Jennifer Lillig, Jared Wiltse, Jon Fukuto and Carmen Works, AACU, Seattle 2015.
 21. "Quantification of Carbon Monoxide from a Photochemical Carbon Monoxide Releasing Molecule (PhotoCORM) using a Binuclear Rhodium(II) Compound" Kim Trevino and Carmen Works, CSUPERB 27th Annual CSU Biotechnology Symposium, 2015.
 22. "Chemistry and Biochemistry Learning Community for First Year Students" Jennifer Lillig, Jared Wiltse, Jon Fukuto and Carmen Works, CSUPERB 27th Annual CSU Biotechnology Symposium, 2015. Santa Clara
 23. "Quantification of Carbon Monoxide from a Photochemical Carbon Monoxide Releasing Molecule (PhotoCORM) using a Binuclear Rhodium(II) Compound" Kim Trevino and Carmen Works, Faculty Expo Sonoma State University, 2015.
 24. "Chromium(III) binding to glutathione and transferrin." Hank Seeley and Carmen Works, CSUPERB 26th Annual CSU Biotechnology Symposium, 2014.
 25. "The Synthesis and Characterization of Iron-iron Hydrogenase Model Compounds for use as Potential Photo-CORMs" Jacob Barrett and Carmen Works, CSUPERB 26th Annual CSU Biotechnology Symposium, 2014.
 26. "Photochemical studies of possible photo-induced CO releasing molecule μ -(1,3-pdt)-[Fe(CO)₃]₂" Jaimey Homen, Carmen Works, CSUPERB 26th Annual CSU Biotechnology Symposium, 2014.
 27. "Photochemical Studies of Iron-Iron Hydrogenase Model Compounds in Various Solvents." Talk- Carmen Works, 245rd National ACS Meeting, New Orleans, LA., 2013.
 28. "The Synthesis and Characterization of Iron-iron Hydrogenase Model Compounds for use as Potential Photo-CORMs" Jacob Barrett and Carmen Works, NCUAC –talk Spring 2013.
 29. "Binding Studies of Chromium(III) to glutathione and transferrin." Hank Seeley and Carmen Works, NCUAC –talk Spring 2013.
 30. Photochemical studies of possible photo-induced CO releasing molecule μ -(1,3- pdt)-[Fe(CO)₃]₂" Jaimey Homen, Carmen Works, NCUAC –poster Spring 2013.
 31. "Photochemical Studies of Iron-Iron Hydrogenase Model Compounds in Various Solvents." Poster -Heidi van de Wouw, Peter Damon and Carmen Works, 243rd National ACS Meeting, San Diego CA, 2012.
 32. "Quantum Yield Determinations of Iron-Iron Hydrogenase Model Compounds" Heidi van de Wouw and Carmen Works, talk, NCUR Symposium, Spring 2012.
 33. "Isolation and Characterization of a Novel Chromium Binding Protein" J. Bernard and C. Works, CSU Student Research Competition, 2011.
 34. "Isolation and Purification of Chromate Reductase from Novel Pseudomonas veronii." M. Lomotan and C. Works. CSU Student Research Competition, 2011.
 35. "Photochemical Studies of Iron-Only Hydrogenase." M. Pope and C. Works. ACS 23rd Annual Northern California Undergraduate Research Symposium. 2011.
 36. "Isolation and Purification of Chromate Reductase from Novel Pseudomonas veronii." M. Lomotan and C. Works. ACS 23rd Annual Northern California Undergraduate Research Symposium. 2011.

Selected Shared Governance

- Department RTP Committee – member and chair
- Chair of Department Search Committee
- Member, Curriculum Committee
- Academic Advisor, Chemistry Majors and Minors
- Member, Scholarship Committee.
- Member, Radiation Safety Committee
- Member, Darwin Transition Committee
- Member, Strategic Planning Committee
- Member, MESA
- Chair of the Faculty and Academic Senate
- Co-Chair of the WASC Steering Committee
- Member of the President Diversity Council
- Member of Structure and Functions
- Member of search committee for the Associate Vice President for Academic Affairs
- Member of search committee for the Director of the Faculty Center
- Chair of Structure and Functions
- Vice Chair of the Academic Senate
- Member of screening committee for the Director of Undergraduate Studies
- Member of the Dean Review Committee for Dean Rahimi
- Executive Committee - member
- GE subcommittee – liaison
- Contributor to GE program Review and the development of GE area Learning Outcomes
- Contributor to WASC coordination and visitation
- Member and Chair, Educational Policies Committee (EPC). Educational policy decisions worked on program review policy, course withdrawal policy, course outline policy, the freshman year experience proposal, and service learning.
- Member, Faculty Standards and Affairs (FSAC). Contributed to the development of several faculty policies: course outline policy, the endowed chairs policy, and excellence in teaching award policy.

Professional Development

Coordinated and led Workshops

- Socrative and ShowMe – SSU Technology Show Case in the Faculty Center 2016
- ShowMe Demo – Moodle demonstration day SSU - 2016
- General Education for the 21st century – SSU faculty retreat 2016
- How Learning Happens – SJSU 2016
- Embracing Change – SSU faculty retreat 2015

- Using Apps in the Classroom – SSU Faculty Center 2015
- General Education student learning outcomes – SSU Senate 2009

Honors and Awards

- Sabbatical Award.
- Educational Enhancement Award
- Excellence in Teaching Award
- Graduate Opportunity Fellowship
- Women and Minority Program for Graduate Education

Professional Affiliations

- American Chemical Society
- Counsel of Undergraduate Research

CURRICULUM VITAE

ERIC M. RIGGS

RESEARCH STATEMENT

The Riggs Group studies many related aspects of teaching, learning and cognition in the geosciences. His research is in understanding how people learn and develop expertise in complex geological settings through the lens of embodied cognition and culturally mediated cognition, including international or cross-cultural learning situations. Recent work includes studies of academic field choice in geology as a function of gender, and the role of gendered experience in field-based learning environments and the resulting influence on career paths.

EDUCATION

<u>Institution</u>	<u>Years Attended</u>	<u>Degree</u>	<u>Major Field</u>
Pomona College	1985-1989	B.A.	English Literature
Pasadena City College	1991-1992	--	Geology
University of California at Riverside	1992-1993	--	Geology (undergraduate coursework at PCC and UCR equivalent to a B.S. in Geology)
Indiana University	1995		Advanced field geology training
University of California at Riverside	1994-2000	Ph.D.	Geological Sciences

Ph.D. dissertation

Transformation-Induced Faulting in Magnesium Germanate: Nucleation of Shear Failure, Implications for Brittle Failure, Transformation Kinetics and Reaction Interface Morphology, University of California, Riverside, June 2000.

Continuing Education: Short Courses and Certificate Programs

Risk Analysis, Prospect Evaluation, and Exploration Economics, Rose & Associates, Houston, September 24-28, 2018

Integrated Basin Exploration: GSA/ExxonMobil Field Course, Bighorn Basin, Wyoming. May 17-22, 2009

The Hydrocarbon System of the Wessex Basin – Dorset Field Course, ExxonMobil International, June 21-27, 2009

AAPG 2010 Winter Education Conference, February 22-26, 2010, Houston, TX

- Principles of Reservoir Characterization
- Fundamentals of Siliciclastic Sequence Stratigraphy
- Seismic Stratigraphy and Seismic Geomorphology

Applied Management Principles Program, Krannert Executive Education Programs, May 17-28, 2010, Krannert School of Management, Purdue University, West Lafayette, IN

Basic Mediation Training – 40 hour Texas State Bar certified course – Center for Change and Conflict Resolution – Texas A&M University – January 2013

FACULTY AND ACADEMIC LEADERSHIP APPOINTMENTS

<u>Institution</u>	<u>Title</u>	<u>Date</u>	<u>Major Subject/Program</u>
Texas A&M University			
Dept. of Geology & Geophysics	Professor	2020 – present	Geoscience Education
Dept. of Geology & Geophysics	Associate Professor	2015 – 2020	
Dept. of Geology & Geophysics	Research Associate Professor	2011 – 2015	
College of Geosciences	Assistant & Associate Dean	2011 – 2018	Diversity and Climate Graduate Affairs
<p><i>Faculty responsibilities include teaching, research and service as befitting an academic appointment in an AAU University. Full time on the faculty since September 2018. Awarded tenure in Geology and Geophysics in 2015, effective 9/2015, along with appointment as Associate Dean. Administrative duties included oversight and management of College-level diversity and workplace climate and safety initiatives, and coordination with University and departmental programs to ensure accountability and program effectiveness. Responsible for workplace climate oversight and the vetting of faculty search candidate pools for diversity. Responsible for graduate affairs 2014-2016, including early implementation work for online professional programs. Implemented graduate student professional development programs and coordinated recruiting activities. Oversight of graduate scholarships and curricular management, as well as graduate student ombuds and other dispute-resolution services.</i></p>			
Purdue University			
CRESME	Co-Director	2006 – 2011	Center for Research and Engagement in Science and Mathematics Education
Earth and Atmospheric Sciences Curriculum and Instruction	Associate Professor <i>(tenured in both departments)</i>	2006 – 2011	Geoscience Education and Geology
<p><i>Founding Co-Director of a cross-college interdisciplinary research center dedicated to the advancement of science and mathematics education research in the Colleges of Science and Education. Responsible for developing synergistic research programs among Center faculty and improving graduate student training and research opportunities. Successful in attracting significant external funding for efforts in science and mathematics teacher education, collegiate-level science education research, and research in understanding the role of culture and diversity in science education.</i></p>			
Indiana University			
IU Geological Field Station Program, Cardwell, MT	Summer Faculty	Summer 2008-2011	Field Geology
San Diego State University			
Geological Sciences and CRMSE	Associate Professor <i>(tenured)</i> Assistant Professor	2005 - 2006 2000 – 2005	Geoscience Education and Geology
San Diego State University Division of Undergraduate Studies	Assessment Coordinator	2005 – 2006	pICT Project & WASC Reaccreditation campaign
<p><i>Responsible for working with departments across campus to envision, construct and implement student learning outcomes assessments for undergraduate curricula. Successful in implementing new assessment programs in eight academic departments across four colleges prior to our reaccreditation visits.</i></p>			
Pasadena City College			
	Adjunct Instructor	1997 – 1998	Geology Critical Thinking
University of California at Riverside, IGPP			
	NSF Graduate Research Fellow, RA & TA	1994 – 2000	Mineral Physics Rock Deformation
California Institute of Technology			
	Data Analyst, Timer Seismological Laboratory	1992 – 1994	Seismology

NATIONAL LEADERSHIP, ACADEMIC FELLOWSHIPS, LECTURESHIPS

2019 – present	Science Adviser for EOS, Education section, American Geophysical Union (AGU) and Member of the AGU Education Section Executive Committee
2019 – 2020	Interim Editor-in-Chief, <i>Journal of Geoscience Education</i> , National Association of Geoscience Teachers (NAGT), ex officio member of the NAGT Executive Committee
2016 – 2018	American Geosciences Institute (AGI) – working group Chair and lead Author, AGI Statement on Harassment in the Geosciences, ratified by member societies April 2018
2013 – 2016	American Geosciences Institute (AGI) President-Elect (2013/14)–President (2014/15)–Past President (2015/16)
2007 – 2011	NAGT representative to the American Geological Institute Government Affairs & Policy Committee
2008 – 2009	Past-President National Association of Geoscience Teachers (NAGT)
2007 – 2008	President National Association of Geoscience Teachers (NAGT)
2006 – 2007	First Vice President National Association of Geoscience Teachers (NAGT)
2005 – 2006	Second Vice President National Association of Geoscience Teachers (NAGT)
2004 – 2005	Councilor At Large, Executive Committee National Association of Geoscience Teachers (NAGT)
2004 – 2007	Distinguished Lecturer, National Association of Geoscience Teachers
1995 – 1998	National Science Foundation Graduate Research Fellowship

PUBLICATIONS AND RESEARCH

Authors in italics are graduate students under Riggs' supervision

Editorships

2019 – 2020: Interim Editor-in-Chief, *Journal of Geoscience Education*

Guest Editorships

- 2017 – 2019: Guest Associate Editor for special edition of the *Journal of Geoscience Education*, special issue on “New Developments in Diversity and Inclusiveness in Geosciences”
- 2016 – 2017: Guest Associate Editor for special edition of the *Journal of Geoscience Education*, special issue on the synthesis of geoscience education research, "Synthesizing Results and Defining Future Directions of Geoscience Education Research"
- 2005 – 2007: NAGT-designated guest editor for the joint NAGT/AGU special edition of *Journal of Geoscience Education* titled Broadening Participation in the Earth Sciences – Volume 55, Number 6, December 2007.

Research Articles in Review or Revision

- Fairchild, E., H. Newman, J.M. Sexton, Pugh, K.P and Riggs. E.M, 2021, 'Not to be Stereotypical, but'. Exclusive and Inclusive Gendered Discourses about Geology Field Experiences, revision in review at the *Journal of Gender Studies* 3/2021
- Sexton, J.M., Fairchild, E, Newman, H., Hinerman, K. Riggs, E.M., 2021, University Title IX Requirements have Chilling Effect on Gender Discrimination Research: A Call for a More Nuanced Approach" submitted 1/2021, in review at the *Journal of Interpersonal Violence*.

Articles, Book Chapters and Reports: Published or In-Press

- E.M. Riggs, 2020c, Ongoing innovation in geoscience education and transitions in JGE leadership [editorial], *Journal of Geoscience Education*, 68:4, 287-288, DOI: 10.1080/10899995.2020.1823758
- E.M. Riggs, 2020b, The road ahead: A renewed focus on student learning and community [editorial], *Journal of Geoscience Education*, 68:3, 185, DOI: 10.1080/10899995.2020.1782136
- E.M. Riggs, 2020a, New challenges, new relevance, and a new central role [editorial], *Journal of Geoscience Education*, 68:2, 95-96, DOI: 10.1080/10899995.2020.1748901
- Pugh, K, S.H. Paek, M. M. Phillips, J.M. Sexton, C.M. Bergstrom, S.M. Flores, E.M. Riggs, 2021, Predicting academic and career choice: The role of transformative experience, connection to instructor, and gender accounting for interest/ identity and contextual factors, *Journal of Research in Science Teaching*, DOI: DOI: 10.1002/tea.21680
- Sexton, J.M., Newman, H., Bergstrom, C., Pugh, K.P and Riggs. E.M, 2020, Multisite Investigation of Sexist Experiences Encountered by Undergraduate Female Geology Students, *International Journal of Gender, Science, and Technology*, [S.l.], v. 12, n. 3, p. 353-376, dec. 2020. ISSN 2040-0748. Available at: <http://genderandset.open.ac.uk/index.php/genderandset/article/view/669/1159>
- St. John, K, K. McNeal, H. Macdonald, K. Kastens, K. Bitting, C. Cervato, J. McDaris, H.r Petcovic, E. Pyle, E.M. Riggs, K. Ryker, S. Semken, and R. Teasdale, 2020, A Community Framework for Geoscience Education Research: Summary and Recommendations for Future Research Priorities, *Journal of Geoscience Education*, DOI: 10.1080/10899995.2020.1779569
- Van Boening, A. and E.M. Riggs, 2019 Geologic Gestures: A New Classification for Embodied Cognition in Geology, *Journal of Geoscience Education*, V68 N1 DOI:10.1080/10899995.2019.1624250
- Ricci, J. and E.M. Riggs, 2019, Making a Connection to Field Geoscience for Native American Youth through Culture, Nature and Community, accepted at *Journal of Geoscience Education*, special theme issues on Diversity in the Geosciences, V67 N4 DOI:10.1080/10899995.2019.1616273
- Pugh, K.P., Phillips, M. Sexton, J.M., Bergstrom, C. and Riggs. E.M, 2019. A quantitative investigation of geoscience department factors associated with the recruitment and retention of female students, *Journal of Geoscience Education*, DOI:10.1080/10899995.2019.1582924
- Sexton, J.M., Pugh, K.P., Bergstrom, C. and Riggs. E.M, 2018, Reasons Undergraduate Students Majored in Geoscience across Six Universities: The Importance of Gender and Department, *Journal of Geoscience Education*, DOI:10.1080/10899995.2018.1507546

- Riggs, Eric M.; Callahan, Caitlin; and Brey, Jim, 2018, "Research on Access and Success of Under-Represented Groups in the Geosciences". In St. John, K (Ed.) (2018). Community Framework for Geoscience Education Research. National Association of Geoscience Teachers. [DOI: 10.25885/ger_framework/6](https://doi.org/10.25885/ger_framework/6)
- Wolfe, B.A. and Riggs, E.M., 2017, Macrosystem analysis of programs and strategies to increase underrepresented populations in the geosciences, *Journal of Geoscience Education* special theme issue "Synthesizing Results and Defining Future Directions of Geoscience Education Research", November 2017, Vol. 65, No. 4, ppg. 577-593, DOI: 10.5408/17-256.1
- McNeal, K.S., St. John, K., Kortz, K., Nagy-Shadman, E., and E.M. Riggs, 2017, Editorial: Introduction to the Theme: Synthesizing Results and Defining Future Directions of Geoscience Education Research, *Journal of Geoscience Education*: November 2017, Vol. 64, No. 4, pp. 347-352. DOI: 10.5408/1089-9995-65.4.347
- St. John, K., Riggs, E.M., and D. Mogk, 2016, Sexual Harassment in the Sciences: A Call to Geoscience Faculty and Researchers to Respond. *Journal of Geoscience Education*: November 2016, Vol. 64, No. 4, pp. 255-257. doi: <http://dx.doi.org/10.5408/1089-9995-64.4.255>
- Balliet, R.N., Riggs, E.M., and Maltese A.V., 2015, Students' Problem Solving Approaches for Initiating and Developing Geologic Models in the Field, *Journal of Research in Science Teaching*, special issue on Disciplinary-Based Post Secondary-Education Research 52(8), DOI: 10.1002/tea.21236
- National Research Council: Committee on Trends and Opportunities in Federal Earth Science Education and Workforce Development (member and co-author), 2013, Preparing the Next Generation of Earth Scientists: An Examination of Federal Education and Training Programs, NRC Report #18369
- Herrera, J.S. and Riggs, E.M., 2013, Relating Gestures and Speech: An Analysis of Students' Conceptions About Geological Sedimentary Processes, *International Journal Science Education*, DOI:10.1080/09500693.2013.775609
- Herrera, J.S. and Riggs, E.M., 2013, Identifying Students' Conceptions of Basic Principles in Sequence Stratigraphy, *Journal of Geoscience Education*, 61(1), pp. 89-102. DOI: 10.5408/12-290.1
- Maltese, A.V., R.N. Balliet, and E.M. Riggs, 2013, Through their eyes: Tracking the eye gaze of students in a geology field course, *Journal of Geoscience Education* 61(1), 81–88, DOI: 10.5408/11-263.
- Unsworth, S.J., E.M. Riggs and M. Chavez, 2012, Creating pathways toward geoscience education for Native American youth: The importance of cultural relevance and identity, *Journal of Geoscience Education*, V60, N4, November, pg. 384
- Quardokus, K., S. Lasher-Trapp, and E.M. Riggs, 2012, *A Successful Introduction of Authentic Research Early in an Undergraduate Atmospheric Science Program*, Bulletin of the American Meteorological Society, V93, N11, November, pg. 1641, DOI:10.1175/BAMS-D-11-00061.1
- Alles, M. and Riggs, E.M., 2011, Developing A Process Model for Visual Penetrative Ability, in Feig, A. and Stokes, A., eds. *Qualitative Inquiry in Geoscience Education Research: Geological Society of America Special Paper 474*, p. 63-80
- Riggs, E.M., R.N. Balliet, Lieder, C.L, 2009, Effectiveness in Problem Solving During Geologic Field Examinations: Insights from Analysis of GPS Tracks at Variable Time Scales, *invited paper*: in Whitmeyer, S.J., Mogk, D.W., and Pyle, E.J., eds, *Field Geology Education: Historical Perspectives and Modern Approaches: GSA Special Paper 461*, p. 323-340

- Riggs, E.M., C.C. Lieder, and R.N. Balliet, 2009, Geologic Problem Solving in the Field: Analysis of Field Navigation and Mapping by Advanced Undergraduates, *Journal of Geoscience Education*, V57, N1 (January)
- Tretinjak, C.A. and Riggs, E.M., 2008, Enhancement of Geology Content Knowledge Through Field-Based Instruction for Pre-Service Elementary Teachers, *Journal of Geoscience Education*, V56, N5 (December) Special Edition on Preparing Future Teachers of Geoscience.
- Riggs, E.M., Robbins, E.I., and Darner, R, 2007, Sharing the Land: Attracting Native American Students to the Geosciences – Special Edition on Broadening Participation in the Earth Sciences, *Journal of Geoscience Education*, V.55, N. 6, 478-485
- Riggs, E.M., and Alexander, C.J., 2007, Broadening Participation in the Earth Sciences (editorial) – Special Edition on Broadening Participation in the Earth Sciences, *Journal of Geoscience Education*, V.55, N. 6, 445-446
- Riggs, E.M., 2005, “Field-Based Education and Indigenous Knowledge: Essential Components of Geoscience Education for Native American Communities”, *Science Education*, V89, 296–313
- Riggs, E.M. and H.W. Green, II, 2005, “A New Class of Microstructures Which Lead to Transformation-Induced Faulting in Magnesium Germanate”, *Journal of Geophysical Research*, 110, B03202-B03217
- Mellors, R.J., E.M. Riggs, J. Eakins and F. Vernon, 2003, “A Real-time Interactive Educational Seismology Exhibit”, *Seismological Research Letters*, V74, N5, 635-640
- Riggs, E. M. and Riggs, D. M, 2003, “Cross-cultural Education of Geoscience Professionals: The Conferences of the Indigenous Earth Sciences Project”, *Journal of Geoscience Education*, V51, N5, 527-535
- Riggs, E.M., 2003, “Global Science Literacy in an Indigenous Context – A Perspective from North America”, pg. 33-52, in *Implementing Global Science Literacy*, Victor Mayer (ed.), The Ohio State University Press
- Riggs, E.M. and Kimbrough, D.K., 2002, “Implementation of Constructivist Pedagogy in a Geoscience Course Designed for Pre-Service K-8 teachers: Progress, Pitfalls, and Lessons Learned”, *Journal of Geoscience Education*, invited article in the special issue on Geoscience Education Research, V50, N1, 49-55
- Riggs, E.M. and S.C. Semken, 2001, “Earth Science for Native Americans”, *Geotimes*, 49, 9, 14-17
- Riggs, E.M. and Green, H.W., 2001, "Shear Localization in Transformation-Induced Faulting: First-Order Similarities to Brittle Shear Failure", *Tectonophysics*, V340, 95-107
- Riggs, E.M. and Marsh, D.G., 1998, "The Indigenous Earth Sciences Project: Exploring the Synthesis of Southern California Native American Traditional Knowledge and the Earth Sciences", *GSA Today*, 8:12-13
- Riggs, E.M., 1998, "Toward an Understanding of the Roles of Scientific, Traditional, and Spiritual Knowledge in our "Demon-Haunted World", *American Indian Culture and Research Journal*, 22:213-226
- Green, H.W., II, L. Dobrzhinetskaya, E.M. Riggs, Z-M Jin, S. Wang., 1997, “Alpe Arami: a Peridotite Massif from the Mantle Transition Zone?”, *Tectonophysics*, V279,1-21

Invited Talks, Workshops, and Keynote Addresses

- Eos in the Classroom: Building Educational Resources with Science News, mini-workshop presented with Heather Goss (AGU, EOS) at the 2020 Earth Educator Rendezvous, virtual conference 7/16/2020
- Preparing for Tenure and Promotion, invited roundtable discussion and workshop at the 2020 Earth Educator Rendezvous, virtual conference, 7/17/2020
- Applying Models of Diversity to Improve Geoscience Curricula and Programs, Invited roundtable discussion and workshop at the 2019 Earth Educator Rendezvous, Nashville, TN, 7/16/2019
- Models of Diversity in Geoscience: Supporting a Diverse Workplace, Business of Applied Geophysics special session, Annual meeting of the Society for Exploration Geophysics, San Antonio, TX, 9/16/2019
- Plenary Speaker and Panelist, Plenary: Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine, AGU Fall Meeting, Washington, D.C., Dec.12
- Expertise, Experience, and Workflow Strategies Employed in Seismic Interpretation, Northern Illinois University, November 2018
- Becoming Sherlock: Why include observational data collection in your qualitative research and how to master the art of observation, CIRT Network, CIRT-Cast lecture contribution, May 2018
- Workflows and Expertise in Seismic Interpretation: Insights from Geoscience Education Research, University of Houston, April 2018
- Cultural Factors in Geoscience Thinking, Learning and Practice, March 2017, *invited talk*, Pomona College
- The Imperative for a Diverse Geoscience Workforce, March 2017, *invited talk*, Pomona College
- Geoscience education research at the post-secondary and professional level, March 2017, *invited talk and webinar*, Incorporated Research Institutions for Seismology (IRIS)
- Problem Solving and Workflows in the Geosciences: Insights from Seismic Interpretation and Field Geology, October 2017, *invited talk*, University of Illinois, Chicago
- Spatial Reasoning in the Geosciences, contributed two-day workshop, C. Ormand and E.M. Riggs, Earth Educators' Rendezvous, July 2016, University of Wisconsin, Madison
- Improving Workplace Climate for Retention and Diversity, *invited workshop*, Heads and Chairs Workshop, NAGT Geoscience Departments Series, American Geophysical Union annual meeting, San Francisco, CA, December 8, 2013
- Educating the Next Generation of Geoscientists: Recruitment, Retention & Student Success, *invited talk*, University of Nebraska, Omaha, September 5, 2013
- The Role of Embodied Cognition in Understanding Student Reasoning about Sedimentary Systems and Problem Solving Approaches in the Field, *invited talk*, University of Nebraska, Lincoln, September 6, 2013
- Educating the Next Generation of Geoscientists: Recruitment, Retention & Student Success, *invited keynote address*, 10th Meeting of the Saudi Society of Geosciences, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, April 15-17, 2013
- Thinking and Reasoning about Geology: Borrowing the Insights of Cognitive Science to Understand Visualization, Systems Thinking, Navigation and Problem Solving in Geology, *invited talk*, Temple University, February 2012

Thinking and Reasoning about Geology: Understanding Problem Solving and the Role Culture, Curriculum and Cognition, *invited talk*, University of California, Merced, November 2011

The Right Tools for the Job: The Challenges of Theory and Method in Geoscience Education Research, *invited talk*, American Geophysical Union, December 2011, abstract ED23E-03

Visualizing Sub-surface Geology: Characterizing Visual Penetrative Ability using Embodied Cognition, *invited talk*, 2011 Annual Meeting of the Cognitive Science Society, Boston, MA

Insights into Field-Based Learning from Geoscience Education Research, *invited talk*, Texas A&M Department of Geology and Geophysics, College Station, TX 3/12/2010

Student Learning and Understanding of Sequence Stratigraphic Concepts, *invited talk*, Indiana Geological Survey, Bloomington, IN, 12/3/09

A Role for Mental Rotations in Field-Based Problem Solving, *invited talk*, Session: Spatial Skills in the Geosciences, 2009 Annual Meeting of the Geological Society of America

Assessing Learning Outcomes in Field Geology Instruction, *invited talk*, Session: Field Geology Education—Historical Perspectives and Modern Approaches, 2009 Annual Meeting of the Geological Society of America

Effectiveness in Problem Solving During Geologic Field Examinations: Insights from Analysis of GPS Tracks at Variable Time Scales, *invited talk*, Indiana University, Department of Geological Sciences, March 26, 2009

Educational Technology in Undergraduate Earth Science Education, *invited keynote address*, Technology-integrated Science and Engineering Education III meeting, Hualien, Taiwan, October 2008

The Roles of Worldview, Realpolitik and Motivation in Studying the Earth Sciences: Perspectives Drawn from Working as a Geoscientist and Educator on Native American Reservations, *invited talk*, 2008 Annual Meeting of the Geological Society of America

Pre-College Research and Motivation in Science, *invited keynote address*, Pre-College Research symposium, Anna G. Mendez University System, San Juan, Puerto Rico, December 2007

Culture and Science: Science Education for Native Americans, *invited talk* at the 2007 Annual Meeting of the American Association for the Advancement of Science

Teaching in the Field: Opportunities for Geoscience Education Research and Broader Community Engagement, *invited talk* at the Indiana University Geologic Field Station Forum on the Future of Field Station Education, August 2006

Crossing Cultural Borders for Native American Students in the Earth Sciences, *invited oral presentation and associated workshop*, July 2006, University of Maine

Local Avenues to Success for Native American Students in the Earth Sciences, *invited talk* for the 2005 GSA Annual meeting, published in *GSA Abstracts with Programs*

Fostering Indigenous Earth Science: Increasing Native American Participation in the Earth Science Enterprise *invited talk* for the 2004 Fall meeting of the American Geophysical Union, special session on “Diversity and Equity in the Earth and Space Sciences: 1. Global Perspectives on the Issues and Obstacles”

Equity and Stability on Native American Reservations: The Impact of Geoscience in U.S. Domestic Dependent Nations, *invited Pardee Keynote Symposium talk* “The Role of the Earth Sciences in Fostering Global Equity and Stability”, 2002 GSA Annual meeting, *GSA Abstracts with Programs*, Vol. 34, paper 90-9

Process and Inquiry in the Earth Sciences: Research into the Design of Active, Inquiry-based Content Courses for Pre-service and In-service Elementary Teachers, *invited talk* at the conference, *Integrating Science and Mathematics Education Research into Teaching*, June 2002, University of Maine, Orono

Issues at the Intersection of Science and Culture: Lessons learned from teaching the Earth sciences in Southern California Native American communities, *invited talk* at the conference, *Integrating Science and Mathematics Education Research into Teaching*, June 2002, University of Maine, Orono

Invited Talks between 2004 – 2007 as a Distinguished Lecturer for the National Association of Geoscience Teachers

Arizona State University

American River College

Bowling Green State University

California State University, Fullerton

University of Texas, El Paso

Purdue University

Michigan State University

Western Michigan University

Other invited visits with multiple presentations and workshop/consulting interactions

University of British Columbia

Universidad Metropolitana, Puerto Rico

Universidad del Turabo, Puerto Rico

All Refereed Meeting Abstracts, contributed and invited, 2011-2021 (italics identify student authors)

- Sexton, J.M., E. Fairchild, H. Newman, K. Hinerman, and E.M. Riggs, 2020, Program practices and characteristics that enable sexism to persist in geology field programs, American Geophysical Union Fall Meeting, virtual conference
- McKay, J.*, E.M. Riggs, E. Fairchild, K. Hinerman, H. Newman, and J.M. Sexton, 2020, Understanding the impact of transformative experience on undergraduates in geologic field camps through the lens of gender and diversity, American Geophysical Union Fall meeting, virtual conference
- Riggs, E.M., 2020, Access and Success in Geoscience Education in the Age of COVID-19 (Invited), American Geophysical Union Fall Meeting, virtual conference, ED027-05
- Sexton, J.M., E. Fairchild, H. Newman, K. Hinerman, and E.M. Riggs, 2020, Normalization of sexism in geology field programs, Geological Society of America annual meeting, virtual conference
- Fairchild, E, H. Newman, J.M. Sexton, K. Hinerman, E.M. Riggs, *J. McKay*, 2020, Feminism stalled? Improving methodological strategies for identifying sexism in geology, Association for Applied & Clinical Sociology, virtual conference
- Hinerman, K. J.M. Sexton, E.M. Riggs, H. Newman, E. Fairchild, *J. McKay*, 2020, Diversity and inclusion in off-campus educational spaces: Lessons learned in researching complex, non-traditional learning environments, International Council of Professors of Educational Leadership, virtual conference
- Sexton, J.M., E. Fairchild, H. Newman, K. Hinerman, E.M. Riggs, 2020, Contextual and cultural practices that normalize sexism in geology field programs, 2020 Earth Educators' Rendezvous, Virtual conference
- Hinerman, K., E. Fairchild, *J. McKay*, E.M. Riggs, J.M. Sexton, H. Newman, 2020, Capturing the dynamics of non-traditional educational settings: Lessons learned in developing instrumentation for use in field-based career development research, 2020 Earth Educators' Rendezvous, Virtual conference
- Riggs, E.M, *J. McKay*, E. Fairchild, H. Newman, J. Sexton, 2020, Exploring the transformative experience of undergraduate geologic field camps through the lens of gender and diversity, 2020 Earth Educators' Rendezvous, Virtual conference
- Newman, H., Z. King, J.M. Sexton, K. Hinerman, E.M. Riggs, 2019, "Missing gender: Literature review of gender in Social Cognitive Career Theory, 1992-2018", Southwestern Social Science Association, San Diego, CA
- Jackson, M.A., J.P. Dobbs* and E.M. Riggs, 2018, Characteristics of Expert Behavior in Problem Solving and Workflow Strategy in Seismic Interpretation, American Association of Petroleum Geologists annual meeting, Student Research Poster Session IV, Weds, May 2018
- Riggs, E.M., Callahan, C.N., and J.A. Brey, 2018, Research on Access and Success of Under-Represented Groups in the Geosciences: Results from the Community Framework for Geoscience Education Research. Paper 159-5, Geological Society of America Abstracts with Programs. Vol. 50, No. 6, ISSN 0016-7592 doi: 10.1130/abs/2018AM-323834
- Van Boening, A.*, E.M. Riggs, 2018, Gestures In Situ: A Comparison of Gestures Used in Geologic Field and Non-Field Settings, Paper 91, Session 30 T71, Geological Society of America Abstracts with Programs. Vol. 50, No. 6, ISSN 0016-7592 doi: 10.1130/abs/2018AM-323036

- Van Boening, A.* and Riggs, E.M., 2017, From Hand to Mouth to Mind, Tracing the Co-Occurrence of Gesture and Speech to Conceptual Understanding, Geological Society of America Abstracts with Programs. Vol. 49, No. 6 doi: 10.1130/abs/2017AM-307718
- Jackson, M.A.* and Riggs, E.M., 2017, Documenting the Characteristics of Expertise, Experience and Workflow Strategies Employed in Seismic Interpretation, Geological Society of America Abstracts with Programs. Vol. 49, No. 6, doi: 10.1130/abs/2017AM-305562
- St. John, K., C. Cervato, K.A. Kastens, H. Macdonald, J.R. McDaris, K. McNeal, H.L. Petcovic, E.J. Pyle, E.M. Riggs, K. Ryker, S. Semken, R. Teasdale, 2017, Identifying and Prioritizing Geoscience Education Research Grand Challenges: Draft Plans for a Community Research Agenda, Geological Society of America Abstracts with Programs. Vol. 49, No. 6, ISSN 0016-7592 doi: 10.1130/abs/2017AM-298851
- Pugh, K, Phillips, M., Bergstrom, C, Sexton, J.M., Riggs, E.M., 2016, April. Support for Females in STEM: An Investigation of More and Less Successful Geoscience Departments, Paper presented at the 2015 annual meeting of the American Educational Research Association.
- Ellins, K., Riggs, E.M., Serpa, L.F., Stocks, E., Shapiro Ledley, T., McNeal, K.S., Libarkin, J.C., Lavier, L.L., Samsel, F., Smith, R., Mandal, A., 2016, Teaching with Online Educational Materials in the Geoscience Classroom: Examples from Texas and Jamaica (invited), Geological Society of America Abstracts with Programs. Vol. 48, No. 7 doi: 10.1130/abs/2016AM-286397
- Sexton, J.M., Newman, H., Bergstrom, C., Pugh, K., Riggs, E.M., Phillips, M., 2016, Mixed Methods Study to Investigate Sexist Experiences Encountered by Undergraduate Geoscience Students (invited), Geological Society of America Abstracts with Programs. Vol. 48, No. 7 doi: 10.1130/abs/2016AM-278443
- Jackson, M.A.* and Riggs, E.M., 2016, Workflow and Problem Solving in Seismic Interpretation, Geological Society of America Abstracts with Programs. Vol. 48, No. 7 doi: 10.1130/abs/2016AM-286444"
- Van Boening, A.* and Riggs, E.M., 2016, All Signs Point To: Styles and Functions of Geologic Gestures, Geological Society of America Abstracts with Programs. Vol. 48, No. 7 doi: 10.1130/abs/2016AM-282723
- Riggs, E.M., and Bowen, G.J., 2016, SPATIAL Short Course: Building Community and Expertise in the Graduate and Professional Workforce in Isotope Geochemistry, Geological Society of America Abstracts with Programs. Vol. 48, No. 7 doi: 10.1130/abs/2016AM-286287
- Pugh, K, Phillips, M., Bergstrom, C, Sexton, J.M., Riggs, E.M., 2015, April. Academic and Career Choice: Investigating the Roles of Motivation, Institution, Relationships, Transformative Experience, and Gender, Paper presented at the 2015 annual meeting of the American Educational Research Association.
- Pugh, K, Phillips, M., Bergstrom, C, Sexton, J.M., Riggs, E.M., 2015, April. Predicting Transformative Experience: The Role of the Student–Teacher Dynamic, Paper presented at the 2015 annual meeting of the American Educational Research Association.
- Van Boening, A.* and Riggs, E.M., Field Hands: Constructing Meaning from Student Gestures in the Field, Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.404
- Jacobs, B., Ellins, K., Pearce, T., Riggs, E.M., Serpa, L.F., Stocks, E, Rigorous Instruction in the Earth Science Classroom in the Wake of the NGSS: Implementing the DIG-Texas Blueprints, Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.186

- St. John, K., Macdonald, H, Feig, A., LaDue, N., Lukes, L.A., McNeal, K.S., Riggs, E.M., and McDaris, J.R., Shaping the Future of Geoscience Education Research: A Community Effort, Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.255
- Riggs, E.M. and Bowen, G., SPATIAL Short Courses Build Expertise and Community in Isotope Geochemistry, abstract ED11D-0869, 2015 Fall Meeting, AGU, San Francisco, CA, 14-18 Dec.
- Riggs, E.M., Understanding When and How Geoscientists Build Universal Skills and Competencies, *invited* abstract ED21E-02, 2015 Fall Meeting, AGU, San Francisco, CA, 14-18 Dec.
- McIver, H., Ellins, K., Bohls-Graham, C., O'Dell, D., Sergent, C., Jacobs, B., Stocks, E., Serpa, L.F., Riggs, E.M., Collaboration Among Educators: An Essential Step in Unifying STEM Teaching Resources, abstract ED34C-05, 2015 Fall Meeting, AGU, San Francisco, CA, 14-18 Dec.
- Jacobs, B., Bohls-Graham, C., Ellins, K., Riggs, E.M., Serpa, L.F., Stocks, E., McIver, H., Sergent, C., Supporting NGSS-congruent Instruction in Earth & Space Science Through Educator Impelementation and Feedback: Refining the DIG-Texas Blueprints, abstract ED34C-06, 2015 Fall Meeting, AGU, San Francisco, CA, 14-18 Dec.
- Jacobs, B., Bohls-Graham, E., Martinez, A., Ellins, K.K., Riggs, E.M., Serpa, L.F., Stocks, E., Fox, S., Kent, M., Evaluating Educational Resources for Inclusion in the DIG Texas Instructional Blueprints for Earth & Space Science, abstract ED51C-3450, 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
- Riggs, E.M. Sexton, J., Pugh, K., Bergstrom, C., Parmley, R., Phillips, M., Gender in the Geosciences: Factors Supporting the Recruitment and Retention of Women in the Undergraduate Major, abstract ED43A-3461, 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
- Jacobs, B.E., Ellins, K.K., Riggs, E.M., Serpa, L.F., Stocks, E., DIG Texas Instructional Blueprints: Supporting Rigorous and Relevant Instruction in High School Earth and Space Science, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.45, 2014
- Pugh, K, Phillips, M., Bergstrom, C, Sexton, J.M., Riggs, E.M., Supporting Transformative Learning in the Geosciences: Investigating the Relation Between the Teacher-Student Dynamic and Transformative Experience, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.189, 2014
- Pugh, K, Phillips, M., Bergstrom, C, Sexton, J.M., Riggs, E.M., Gender in the Geosciences: Factors Related to Academic and Career Choice, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.191, 2014
- Sexton, J.M., Bergstrom, C, Parmley, R., Riggs, E.M., Pugh, K, Gender in the Geosciences: Model of Departmental Practices Associated with the Recruitment and Retention of Female Undergraduate Students, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.191, 2014
- Sexton, J.M., Bergstrom, C, Parmley, R., Riggs, E.M., Pugh, K, Gender in the Geosciences: Departmental Gender-Equity Culture and the Recruitment and Retention of Female Undergraduate Students, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.191
- Van Boening, A.* and Riggs, E.M., Spatial and Object Visualization Ability and the (Lack of) Linkage to Geologic Reasoning, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.384, 2014

- Ricci, J.L.* and Riggs, E.M., Establishing a Sustainable and Culturally Appropriate Geoscience Field Course for Native American Youth, Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.669, 2014
- Ellins, K.K., Bohls-Graham, E., Riggs, E.M., Serpa, L.F., Jacobs, B., Martinez, A., Fox, S., Kent, M., Stocks, E., Pennington, D., Diversity and Innovation for Geosciences (DIG) Texas Earth and Space Science Instructional Blueprints, abstract ED51C-3448, 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
- Van Boening, A., and E.M. Riggs, Evidence for Increase in Spatial Visualization Skills as a Result of Geological Field Instruction, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.313, 2013
- Ricci, J., E.M. Riggs, and S.J. Unsworth, Transforming Native American Youths' Perception of their Relationship with Geoscience and Themselves Through Connection with Culture and Context, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.869, 2013
- Unsworth, S.J., J. Kien, J. Ricci, and E.M. Riggs, The Importance of Facilitating Relational Orientations Toward Nature in Earth Science Programs for Native American Adolescents, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.869
- Ellins, K.K., L. Serpa, E.M. Riggs, D. Pennington, S. Fox, K. Larsen, T. Ledley, S. Mosher, K. Miller, and E. Stocks, DIG Texas Earth and Space Science Instructional Blueprints, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.65, 2013
- Snow, E., K.K. Ellins, and E.M. Riggs, On the Challenges of Implementing a Capstone Geology Course in Texas High Schools, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.431, 2013
- Sexton, J.M., C. Bergstrom, R. Parmley, E.M. Riggs, K. Pugh, and M. Phillips, Gender in the Geosciences: What Attracts Students to a Geoscience Major?, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.874, 2013
- Bergstrom, C., J.M. Sexton, R. Parmley, E.M. Riggs, and K. Pugh, Gender in the Geosciences: What Students Like and Dislike about Courses and Faculty, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.874, 2013
- Parmley, R., J.M. Sexton, C. Bergstrom, E.M. Riggs, and K. Pugh, Gender in the Geosciences: Experiences of Female and Male Students in Two Geoscience Departments, Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.874, 2013
- Riggs, E.M. and J.S. Herrera, Gestures and Metaphors as Indicators of Conceptual Understanding of Sedimentary Systems, *invited* abstract ED11B-0730, 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Riggs, E.M., Texas A&M Geosciences and the Growing Importance of Transfer Students, abstract ED51C-0899, 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Balliet, R.N., and E.M. Riggs, Characterization of Geologic Tasks and Task Duration in the Field Through Analysis of Content and Frequency in Student Field Examination Notes, Geological Society of America *Abstracts with Programs*, Vol. 44, No. 7, p.113, 2012
- Maltese, A.V., R.N. Balliet, E.M. Riggs, Using Video to Analyze how Students Make Observations while in the Field, Geological Society of America *Abstracts with Programs*, Vol. 44, No. 7, p.114, 2012
- Riggs, Eric M., The Right Tools for the Job: The Challenges of Theory and Method in Geoscience Education, *invited* abstract ED23E-03 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

- Maltese, A.V., *Balliet, R.N.*, Riggs, E.M, Field Learning: Are Your Students Doing What You Think They Are While Out Mapping?, Geological Society of America *Abstracts with Programs*, Vol. 43, No. 5, p. 533
- Herrera, J.S.* and E.M. Riggs, Gesture and Conceptual Metaphor as a Window into Student Understanding of Sedimentary Systems, Geological Society of America *Abstracts with Programs*, Vol. 43, No. 5, p. 534
- Balliet, R.N.* and E.M. Riggs, Evidence for Distinct Temporal Signatures for Different Hypothesis Generation Styles in Field Geology Examinations, Geological Society of America *Abstracts with Programs*, Vol. 43, No. 5, p. 534
- Riggs, E.M, and *M. Alles*, Visualizing Sub-surface Geology: Characterizing Visual Penetrative Ability using Embodied Cognition, *invited talk*, 2011 Annual Meeting of the Cognitive Science Society, Boston, MA

GRANTSMANSHIP

Funded Grants at Texas A&M University

- Collaborative Research: How Science Fieldwork Experiences Impact Undergraduate Students' STEM Academic and Career Decisions: TAMU PI: Eric Riggs, Julie Sexton (U. Northern CO), Krystal Hinerman (Lamar Univ.), National Science Foundation, HRD Education Core Research, HRD 1760981, 1761190, 1761174 – total funding \$1,021,717: TAMU portion \$321,435, 10/1/18 – 9/31/21
- Development of Expertise in Seismic Interpretation in Petroleum and Scientific Exploration, Eric Riggs, Proposer, with Triad members Robert Reece, Khalil Dirani (TAMU CEHD), TAMU VPR Triads for Transformation (T3), project #432, \$35,195, 1/1/19 – 12/31/20
- Collaborative Research: Integrated Training for Continental Ecology (ITCE): Bridging scales and systems with isotopes, PI: Gabe Bowen, Co-PIs: James Ehleringer, Thure Cerling, Eric Riggs, Christopher Miller, National Science Foundation, Macrosystem Biology, NSF-EF 1137302, \$4,300,000, 6/1/2012 – 5/21/2017
- GSE/RES Collaborative Research: Recruitment and Retention of Women in Geosciences: An Investigation of Individual and Environmental Factors, PI: Julie Sexton, Co-PIs: Kevin Pugh, Eric Riggs, National Science Foundation, Research on Gender in Science and Engineering, NSF-HRD 1136238 - \$518,000, 6/1/2012 – 5/31/2015
- Collaborative Research: Diversity and Innovation for Geosciences in Texas (DIG TEXAS) - an Alliance for Earth Science Literacy, PI: Kathy Ellins, Co-PIs: Eric Riggs, Laura Serpa, Deana Pennington, National Science Foundation, Geoscience Education, NSF-GEO 1202745 - \$432,000, 7/1/2012 – 6/30/2015
- Sharing the Land: Fostering Further Success in Building Tribal Earth Science Expertise: Track 2, PI: Eric Riggs, Co-PIs: Sara Unsworth, Eleanora Robbins, National Science Foundation, Opportunities for Enhancing Diversity in the Geosciences program (OEDG), NSF-GEO 0914586 – subcontract to Texas A&M from Purdue for \$73,000, 6/1/2012 – 8/31/2013

Funded Grants at Purdue University

Funded Grants

- A Sustainable Energy Concepts Professional Development Model for Rural Schools and Its Extension to a Systemic Approach for Integrating STEM Research and Education, PI: Timothy Sands, Co-PIs: Gabriela Weaver, Eric Riggs, Maureen McCann, Peggy Ertmer,

National Science Foundation, Innovation through Institutional Integration (I3), NSF-DUE 0963621 - \$1,250,000, 9/15/2010 – 8/31/2015

Sharing the Land: Fostering Further Success in Building Tribal Earth Science Expertise: Track 2, PI: Eric Riggs, Co-PIs: Sara Unsworth, Eleanora Robbins, National Science Foundation, Opportunities for Enhancing Diversity in the Geosciences program (OEDG), NSF-GEO 0914586 - \$785,985, 10/01/2009 – 09/30/2012

Purdue Robert Noyce Scholars: Excellence in Preparation of Rural High School STEM Teachers, PI: Eric Riggs, Co-PIs: John Staver, Christie Sahley, Kamyar Haghighi, Mary Sadowski, National Science Foundation, Robert Noyce Teacher Scholarship Program, Division of Undergraduate Education, NSF - DUE 0833298 - \$749,996, 01/2009-12/2012 (48 months) + supplemental award of \$149,047, total award: \$899,043

The Application of a Successful Research-based Laboratory Model to Atmospheric Science, PI: Sonia Lasher-Trapp, Co-PIs: Jeff Trapp, Michael Baldwin, Gabriela Weaver, Eric Riggs, National Science Foundation, Course, Curriculum and Laboratory Improvement, Division of Undergraduate Education – NSF – DUE 0837272 - \$150,000, 01/2009-6/2011 (29 months)

Sharing the Land: Building Tribal Earth Science Expertise – Track 2, PI: Eric Riggs – 7/2006 – 8/2009, National Science Foundation, Opportunities for Enhancing Diversity in the Geosciences program (OEDG), NSF - GEO 0650532, \$689,553 over three years

Building on the Success of Discovery Park, Securing Preeminence for Purdue University, Lilly Endowment: 8/1/2007 – 12/31/2007, \$25,000

EAS 111: Lab and Lecture Curriculum Renovation, Physical Space Upgrade, and Modernization of Course Materials; E.M. Riggs and S. Haq – Internal Purdue College of Science instructional improvement grant, funded at \$16,000 for one year.

Funded Grants at San Diego State University

Funded Grants

Sharing the Land: Building Tribal Earth Science Expertise – Track 2, PIs: Eric Riggs and Eleanora Robbins – 7/2005 – 6/2008, National Science Foundation, Opportunities for Enhancing Diversity in the Geosciences program (OEDG), NSF GEO 0503630, \$773,223 over three years – moved to Purdue after Year 1

Show Me the Future: Enriching and Measuring Spatial Reasoning in Teacher Education, PIs: Robert Mellors, Eric Riggs – 1/2006 – 6/2007 – NASA - Inspiring The Next Generation of Earth Explorers: Integrated Solutions for K-16 and Informal Education. \$54,563 for one year pilot project.

Senior investigator on NSF GeoEd proposal with Purdue University collaboration
Eisenhower Grant to improve Professional Development – contributed and co-authored grant submitted by and awarded to the R.H. Fleet Science Center, San Diego, CA

Geoscience Education Research to Enhance Effective Professional Development for In-Service Teachers: New Research Opportunities in the San Diego Region, submitted to the National Science Foundation, Awards to Facilitate Geoscience Education, April 17, 2001, Riggs PI, funded at \$91,393

Development of a Service Learning component for Geology 200, submitted to the SDSU/CSU Center for Community-Based Service Learning, Riggs PI – funded at \$2,500

Expansion of the Indigenous Earth Sciences Project: Earth Science Outreach, Curriculum Development and Recruitment for San Diego Native American Communities, submitted Oct.2, 2000 to the SDSU Faculty Development Program , Riggs PI – funded at \$4,900

Past Funded Grants at University of California, Riverside

An Experimental Approach to Understanding Self-Organization of Mode I Defects and Nucleation of Shear Fracture, submitted to the National Science Foundation, Geophysics, December 1, 1998, Green PI, Riggs Co-PI, funded at \$123,000

Conference on the Synthesis of Southern California Native American Traditional Knowledge and the Earth Sciences, submitted to the National Science Foundation, Awards to Facilitate Geoscience Education, January, 1998, Trafzer PI, Riggs Co-PI, Marsh Co-PI, funded at \$21,000

Graduate Research Fellowship, National Science Foundation, stipend plus full tuition waiver for three years of graduate work, 1995-1998, funded at approximately \$90,000 over three years.

TEACHING AND RESEARCH MENTORSHIP

Student Theses Supervised

Ph.D. Dissertation projects at Texas A&M Geology & Geophysics, emphasis in Geoscience Education

Angela Van Boening, The role of gender and language in conceptual completeness and geological reasoning in the field and classroom (tentative), *completed Spring 2021*
Jessica McKay, *Transformative Experiences in Geological Field-Based Settings* (tentative), *anticipated completion Spring 2023*

M.S. Thesis projects at Texas A&M Geology & Geophysics, emphasis in Geoscience Education

James Dobbs, Eye Tracking Investigation of Geoscientists' Behavior and Pattern Recognition Throughout Seismic Interpretation, *Fall 2019*
Matthew Jackson, An assessment of problem solving and workflow strategies employed by geoscientists in seismic interpretation, *Summer 2017*
Jamie Ricci, Transforming Native American Youths' Perception of Geoscience through a Connection to Culture, Nature and Community, *Spring 2014*

Ph.D. Dissertation projects at Purdue Earth and Atmospheric Sciences, emphasis in Geoscience Education

Russell Balliet, Evaluation of Undergraduate Geologists' Problem Solving and Cognition During Field Exams Using a Mixed Methods Approach, *December 2012*
Juan Herrera, Student Learning and Understanding of the Principles of Sequence Stratigraphy, *December 2011*

M.S. Thesis projects at Purdue Earth and Atmospheric Sciences, emphasis in Geoscience Education

Heather Houlton, Academic Provenance: Investigation of Pathways that Lead Students into the Geosciences, *December 2010*
Kathleen Quardokus, Design and Evaluation of an Undergraduate Laboratory Course in Atmospheric Science Research, *December 2010*

Ph.D. Dissertation projects/co-advised in Science Education at other institutions

Rebekka Darner, The Use of Self-Determination Theory to Foster Environmental Motivation in an Environmental Biology Course, San Diego State University/University of California, San Diego Mathematics and Science Education Doctoral Program, *Spring 2007*
Julie Sexton, Research in Student Conceptions of Rivers and Fluvial Systems, Colorado State University, *Spring 2008*

M.S. Theses in Geological Sciences at SDSU, emphasis in Geoscience Education

Matthew Alles, Defining the Three-Dimensional Spatial Abilities of Introductory Geology Students, *Spring 2006*
Chris Lieder, Problem Solving Strategies and the Evolution of Field Skills of Geoscience Majors, *Spring 2005*

Julianne Browne, Learning Outcomes of Virtual Field Trips used for Geoscience Education, Spring 2005

Christina Tretinjak, Enhancement of Pre-Service Teachers Geological Content Knowledge As a Result of Fieldwork, Spring 2004

Senior Theses required for completion of the B.S. degree in Geological Sciences at SDSU

Robert Schumacher, Assessment of Student Learning Gains in High School Earth Science, Spring 2006

Russell Balliet, Tools for developing Geospatial reasoning for Pre-Service Teachers, Fall 2005

Joanna Jara, Cross-cultural Conceptions of Rivers and Fluvial Systems, Spring 2005 – **winner of Best Senior Thesis Award – SDSU Department of Geological Sciences, May 2005**

Brian Kettmann, Navigation Patterns of Advanced Geology Students in the Field, Fall 2003

Kori Truesdale, Learning Patterns of Spatial Abilities in the Perception of Geologic Structures, Spring 2003

Melissa Brittan, Prior Knowledge of Earth Sciences and Earthquakes: A Study of K-12 Teachers, Spring 2003

Chris Lieder, Concept Maps: A Study Investigating the Understanding of Earthquakes by Primary Teachers, Fall 2002

Cliff Knight, Phase 1 Assessments of Naturally Occurring Asbestos: A Case Study in El Dorado County, Spring 2002

Tina Tretinjak, Teaching and Learning Geology in the Outdoor Field Environment: A Case Study with In-Service Teachers, Fall 2001

Student Theses As Committee Member or External Advisor

Ph.D. Dissertations

Lauren Holder – Geology & Geophysics, Texas A&M University, Ph.D. Committee member, ongoing

Annie Tamalavage – Oceanography, Texas A&M University, Ph.D. Committee member

M.S. Theses in Geological Sciences

Christie Lindemann, Fractured Conglomerates: Implications of Brittle Deformation in the Titus Canyon Formation, Southwestern Nevada and Southeastern California, external advisor, Purdue EAS, Spring 2009

Daniel Lilly, Structural Geology of a Transitory Left Step in San Felipe Hills Fault, San Diego State University, Spring 2003

Junfeng Zhang, Experimental Investigation of the Rheology of Eclogite at High Pressure and its Implications for Deep Subduction, China University of Geosciences, Wuhan, PRC, Summer 2000

M.S. Thesis in Communication

Kimberly Bruch, Using a Proportional Diffusion Model to Examine the Impact of Broadband Connectivity Upon Environmental Monitoring, San Diego State University, Summer 2002

Curriculum Development, New or Renovated Courses at Texas A&M University

Geology 101 – Principles of Geology

Non-majors course that satisfies the science requirement for non-science majors at Texas A&M as a core curriculum course. Redeveloped the entire lecture section of the course in 2019-2020 to be more relevant to modern students and using modern classroom and online interactivity tools such as Top Hat and Pearson Mastering. Reworked the course to be more informed by earth science education research and inquiry-based teaching approaches. First offering Spring 2020.

Geology 210 - Geological Communication

Newly developed (for 2015-2016), required 3-unit course in all aspects of written, quantitative, and graphical communications for geology and geophysics majors. Part of the new department-wide undergraduate curriculum revision, this course seeks to be a leveling in writing and numeracy skills as well as preparation for advanced scientific writing and description of data later in the curriculum.

Geology 311 - Principles of Geological Writing

Required majors course (1 unit) in geological writing for multiple audiences and purposes. Joined a team of faculty teaching this course - revamped for Summer 2016

Geology 617 – Introduction to the Petroleum Industry

Newly developed (for 2017-18) online course offered as an elective within the MGSc program and also for on-campus students. This course serves as an introduction to geoscience issues associated with the full petroleum cycle, from resource discovery to marketing of refined petroleum products. The course is focused on the role of geoscientists in all facets of the business and will maintain that focus throughout. The course provides an broad, non- technical overview of geologic principles, the origin of petroleum, exploration, drilling, production, transportation, refining, marketing, and petroleum economics.

Geosciences 677 – College Science Teaching

A team-taught graduate seminar offered jointly with the Colleges of Engineering and Science and managed by the Center for Teaching Excellence and coordinated with the CIRTL program at TAMU. Designed for senior doctoral students, post-docs and visiting scholars, this course is focused on evidence-based teaching practices, assessment of student learning, course and curriculum development strategies, and the scholarship of teaching and learning. Students generate the teaching and diversity statements typically contained in tenure-track job application packages and conduct a small-scale teaching intervention with measured assessment outcomes.

Curriculum Development, New or Renovated Courses at Purdue

Earth and Atmospheric Sciences 111 – Physical Geology

Non-majors course that satisfies the lab-science requirement for non-science majors at Purdue. Redeveloped the entire laboratory section of the course in 2007-2008 to be more relevant to modern students and more informed by earth science education research and inquiry-based teaching approaches. Redeveloped lecture section in 2008-09. Supervise the TAs and all lab sections and assist the classroom instructor in the redesign and coordination of his classroom work with the laboratory instruction. First offering Fall 2007. *Note: 4 out of 7 TAs for the course for Fall 2007 received course evaluations of 4.7/5.0 or higher, earning them places on the Purdue Teaching Honor Roll. This reflects their outstanding abilities as well as improvements in the lab materials they were able to work with. Instructor evaluation 4.1-4.3/5.0 for the last 4 semesters running*

Earth and Atmospheric Sciences 591Z – Geophysics and Active Tectonics Seminar

Graduate seminar for GAT students and faculty. Constructed with Andy Freed as a means to add coherence to the GAT research group through shared research literature, discussions of current research, and increased interaction among group faculty and students. Offered Spring 2008.

Earth and Atmospheric Sciences 59100 – Topics in Geocognition

Graduate seminar for science education researchers focused on understanding cognitive science and domain area knowledge related to cognition and instruction in spatial, temporal and scale-dependent aspects of geoscience education. First offering Spring 2009

Curriculum Development, New or Renovated Courses at SDSU, 2000-2006

Geological Sciences 104 – Earth Science

New course in first offering, Spring 2004, second offering expanded to 120 seats due to very strong student demand – Earth Systems Science course intended to satisfy the geoscience content requirements for introductory level pre-service teachers (Liberal Studies majors). Includes all aspects of Earth system science, including solid Earth science (geology/geophysics), planetary geology and solar system astronomy, oceanography, meteorology, and an emphasis on the interaction of all systems on Earth.
Most recent average student evaluation: 4.4 out of 5 possible

Geological Sciences 200, Geologic Inquiry and Problem Solving – sophomore seminar course for geoscience majors including geoscientific thinking and philosophy, has included a Service Learning component (first physical science course at SDSU to include service learning), and a major emphasis on field-based learning, integrated introduction to field and laboratory investigations, and the philosophy and ethics of science and scientific practice, as well as an exploration of geoscience careers.

Most recent average student evaluation: 4.6 out of 5 possible

Geological Sciences 306 – Structural Geology

Junior-level required course for geoscience majors including intermediate to advanced field techniques and examination of stress, strain, rock mechanics, and the behavior of rock material and rock formations under tectonic stresses. *First offered Fall 2005 in revised form.*

Natural Sciences 412D (now Geological Sciences 412), Process and Inquiry in the Earth Sciences – inquiry-based, hands-on geoscience course for pre-service elementary school teachers. General earth systems content taught via discovery-oriented teaching methods, ongoing development and formative evaluation and research using curricular units.
Most recent average student evaluation: 4.7 out of 5 possible

Geological Sciences 508, Advanced Field Geology (Summer Field) – capstone course for geoscience majors employing a new approach to field-based education which incorporates scaffolding of the difficulty of exercises, and more emphasis on individual problem solving and confidence.
Most recent average student evaluation: 4.1 out of 5 possible

Geological Sciences 611, Geoscience Education: Research and Practice – new graduate level course (formerly Geol 600, Topics in Geoscience Education) covering research literature and topics in teaching and learning research in the geosciences, gender and culture in science education, and geoscience education research design. Revised focus to serve the new Master of Science Education program and restructured the curriculum to include a greater activity and research component.
Most recent average student evaluation: 4.9 out of 5 possible

Curriculum and Professional Development for In-Service Teachers and Special Audiences

San Diego City Schools, 9th Grade Earth Science Curriculum Pilot, 2005-06 – developing a pilot curriculum with a teacher team from two high schools and accompanying lab and assessment materials. The earth sciences are not currently in the SDCS high school curriculum, so with school board approval we have launched a pilot currently running in three classrooms at two school sites. Major expansion of the pilot has been approved for 2006-07, district-wide implementation is likely in 2007-08.

West Ed K-12 Alliance, Earth Science Summer Institute, 2001, 2002 and 2003 – developed and co-taught a two week, intensive classroom and field based geoscience content and pedagogy training institute for K-12 public school teachers from San Diego County. Involved graduate researchers from the Geoscience Education research group at SDSU as additional lead instructors 2003 and 2004.

Earth Science Mini-Institutes for the K-6 teachers in the San Diego City Schools, 2001 and continuing – developed and taught 4 – day, intensive classroom and field based geoscience content and pedagogy training institute for K- 6 public school teachers from San Diego City School district

Indigenous Earth Sciences Project/Sharing the Land – 1998 to 2013 - ongoing on-reservation earth and environmental science instruction for tribal environmental professionals and other community members. Field-based curriculum development and technical education as required to assist tribes in making environmentally and scientifically sound resource management decisions.

Teaching and Research Awards

Geological Society of America, Fellow, elected Fall 2016 by the GSA Council
Purdue University, Excellence in Research “Seeds for Success” Award, November 2012 – recognizes faculty who have been awarded external grants over \$1M.
Purdue University, College of Science Leadership Award, 2010-2011 - recognizes excellence in faculty leadership that improves the environment for faculty, staff, and students and promotes diversity and inclusiveness in the College
Bighorn Basin Field Award – Geologic Society of America and ExxonMobil 5/2009
Nominee, Outstanding Undergraduate Advisor, San Diego State University, Spring 2005
Outstanding Teaching Assistant, University-wide award, University of California, Riverside, Spring 1994
Outstanding Faculty and Staff Award – SDSU Mortar Board chapter, 2001-2002

PROFESSIONAL SERVICE

Professional Associations

Geological Society of America
American Geophysical Union
National Association of Geoscience Teachers – President 2007-2008
American Geological Institute – President Elect 2013, President 2014
American Association of Petroleum Geologists – Active member
Houston Geological Society – Active member
Cognitive Science Society
Society for the Advancement of Chicanos and Native Americans in Science
American Indian Science and Engineering Society

National and International Professional Community Service not otherwise listed above

External Advisory Board, AGU-NCPRE Ethics and Equity Initiative, Alfred P. Sloan Foundation Grant # 2019-12294 - ongoing
External Advisory Board, PROGRESS (Promoting Geoscience Research, Education & Success) – NSF project to advance women in geoscience, <https://geosciencewomen.org> - ongoing
Chair, Ad Hoc Committee on Harassment in the Geosciences, American Geosciences Institute 2017-18. Statement ratified April 2018, available at <https://www.americangeosciences.org/content/agi-statement-harassment-geosciences>
Member, Natural Sciences and Engineering Research Council of Canada (NSERC) PromoScience program and The NSERC Awards for Science Promotion(NASP) review and award committee, 2017-2019
Member, Executive Director search committee, American Geosciences Institute - 2016
Member, National Research Council Committee on Trends and Opportunities in Federal Earth Science Education and Workforce Development, 2012-2013. Final report expected, Fall 2013
Associate Editor – Research Section: Journal of Geoscience Education 2008-2011
Editorial Board – Education: EOS, American Geophysical Union 2015-ongoing
Reviewer of educational research manuscripts for the *Journal of Geoscience Education*
Reviewer of educational research manuscripts for *Science Education*

Reviewer of educational research manuscripts for *The International Journal of Science and Mathematics Education*

Reviewer of scientific manuscripts for the *Journal of Structural Geology*

Reviewer of scientific manuscripts for the *Journal of Geophysical Research*

Reviewer of research manuscripts for the *American Indian Culture and Research Journal*

Reviewer of educational research manuscripts for *Cartography and Geographic Information Science*

External National Accreditation Review Committee member, King Fahd University of Petroleum and Minerals, Department of Earth Sciences, Dhahran, Saudi Arabia, May 2012 and July 2015

External Academic Review Committee member, Texas A&M University, Department of Geology and Geophysics, College Station, TX, January 2010

External Academic Review Committee member, King Fahd University of University of Petroleum and Minerals, Department of Earth Sciences, Dhahran, Saudi Arabia, 2009, 2012, 2014, 2016, 2021

External reviewer for the University of Maine system, reviewing a proposed degree program for the Master in Science Teaching, University of Maine, Office of the Chancellor, August 2002

Member of the NAGT Nominations committee – 2009 - 2011

Member and Chair of the NAGT Field Scholarship committee – 2009 - 2011

Member of the Executive Committee of the National Association of Geoscience Teachers (Councilor at Large, 2nd Vice President, Vice President, President, Past President) 2004-2009

NAGT representative to the American Geological Institute Government Affairs and Policy Committee. Active participant in Congressional Visit days organized by AAAS, and AGI on behalf of NAGT.

Search committee member for the Editor of the *Journal of Geoscience Education*, National Association of Geoscience Teachers, 2007-2008. Search was successful in 2008.

Search committee Chair for the Executive Director of the National Association of Geoscience Teachers, 2007. Led a successful national search for an Executive Director for the Association

Member, NAGT 2005 Neil Miner Award Selection Committee

GEOVision NSF working group – establishing the vision and direction for the Geoscience Directorate at NSF for the next 10 years, including the rising prominence of geoscience education research. Co-authored publication *GeoVision: Unravelling the Earth's Complexities through the Geosciences*, released October 2009

Panelist at the National Science Foundation on many separate occasions

Indiana University Future of Field-Based Geoscience Education Forum – planning and organizing the future of field based training and educational research opportunities with the geoscience community. Undergraduate field-based education, served as representative of geoscience education research

Workshop co-organizer and co-presenter, 2015 Earth Educators Rendezvous, *Synthesizing Geoscience Education Research: Where are we? What is the path forward?*, University of Colorado, Boulder

Session Proposer and Co-Chair at the Geological Society of America meeting, 10/2013, Denver, Colorado: Co-organized a session titled *The Future of the Geoscience Workforce: Preparing for Traditional and Non-Traditional Geoscience Careers*

Session Proposer and Co-Chair at the Geological Society of America meeting, 10/2008,
Houston, Texas: Co-organized a session titled *Research on Geoscience Teaching and Learning in Experiential Environments*

Session Co-Chair at the Geological Society of America meeting, 11/2004, Denver, Colorado
Co-organized a session titled *Current Research on Situated Teaching and Learning in Geoscience: Field-Based, Case-Based, Problem-Based, Place Based*

Member, Geological Society of America Geoscience Education Division 2004 Biggs Award Selection Committee

Session Chair at the international Geoscience Education IV meeting, Calgary, Canada, 8/2003.
Co-organized a session titled *Geoscience Education Partnerships with Aboriginal Communities*

Member of the American Geophysical Union Committee on Education and Human Resources, Subcommittee on Diversity, 2001 - 2003

Expert consultant – cross-cultural curriculum development – FETING project – GIS curriculum development at Salish-Kootenai Tribal College, Montana, September 2005

University Service – Texas A&M

Clarence Sasser Medal of Honor Planning Committee

Massive Open Online Course Exploration Committee – College of Geosciences representative

Diversity Operations Committee – College of Geosciences representative

Center for Teaching Excellence Advisory Board 2011-2012

TAMU AGEF Steering Committee 2011-present

College of Geosciences Graduate Curriculum Committee member - 2014 - 2016

Chair, College of Geosciences Workplace Climate task force - 2012

Chair and Member, College of Geosciences Distance Education task force - 2013-2017

Chair, Education Grand challenge initiative - 2016

Internal member, External Review of the Office of the Vice President of Student Affairs – 2016

College and departmental committees as assigned

University Service – Purdue

Faculty Advisor, American Indian Science and Engineering Society, Purdue Chapter, 2009-present – chapter hosted the 2010 AISES Region VI regional conference at Purdue, for which it earned a National AISES Professional and Chapter Development award for 2010

Academic Progress and Records Committee, Purdue University Senate subcommittee 2008 - current

University Learning Spaces Advisory Committee, 2007 - current

CoS Faculty Committee on Diversity, 2007 – 2009

EAS Faculty Committee on Diversity, 2009 – present

EAS Undergraduate Committee, 2009 – present, currently interim Co-Chair

EAS Peer Teaching committee, 2006-07

EAS Peer Teaching reviewer for professors Gurney, Haase, Gilbert and Flesh

CoS President and Provost's review, 2007 and 2008

College and departmental committees as assigned

University Service - SDSU

Department Committees/Service

Undergraduate Advisor and Undergraduate Programs Coordinator, Spring 2005 – Spring 2006
Chair of Geological Sciences Undergraduate Studies Committee, Spring 2004 – Spring 2006
Faculty Advisor, SDSU Associated Geology Students, 2002 – Spring 2006
Chair of Geological Sciences Assessment Committee, Spring 2001 – Spring 2006
Geological Sciences department representative approving human subjects research prior to submission to the Committee for the Protection of Human Subjects, Fall 2000 – Spring 2006
Allison Center Relocation Committee member, Fall 2000
Departmental FAR/SSI/FMI committee member, Fall 2000

College, University, System-wide Committees/Services

Student Learning Outcomes Research Fellow, special assignment to the Dean of Undergraduate Studies to develop student learning outcomes measures and assessments for the University-wide GE curriculum and to construct related portions of the WASC reaccreditation review response – assignment ends 12/2005
College of Sciences Public Relations Committee, 9/2005 – 9/2006
Member of the University Committee on Assessment, 5/21/2001 – 11/18/2002
Member of the College of Sciences Accountability and Assessment Advisory Group, Spring 2001 – Spring 2006
College of Sciences Scholarship and Lectureship Committee Member, Spring 2001
Portfolio reader, Liberal Studies Program, July 2000

Local Service Activities – San Diego

Science Olympiad Event Captain, Dynamic Planet, Feb. 2001
Advisor to The National Faculty and trainer of CSU Long Beach Geological Sciences faculty in effective professional development of Long Beach Unified School District teachers in the earth sciences
Advisor and trainer with the San Diego City Schools and the WestEd K-12 Alliance in effective earth science professional development for in-service teachers.
R.H. Fleet Science Center Science Scope Scientific Advisor, 2000 - 2006
Invited Community Talk: Volcanoes of the Deep – R.H. Fleet Science Center Public Lecture Series – October 23, 2004

PERSONAL INTERESTS/ACTIVITIES

Yoga – Vinyasa Flow, Forrest, all styles welcome
Cycling – road and mountain
Archery – traditional recurve and compound
Auto Racing – autocross and track
Sailing – anything, anywhere
Baking and gourmet cooking, vegan cooking
Camping and backpacking
Living, loving and laughing with my wife and kids