CURRICULUM VITAE

Joseph I. Satterfield

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Professional Experience

Angelo State University (Fall 2014 – present): Professor of Geology

Angelo State University (Fall 2008 – Spring 2014): Associate Professor of Geology

Angelo State University (Fall 2003 – Spring 2008): Assistant Professor of Geology

San Jacinto College North (Fall 1996 – Spring 2003): Geology Instructor

Rice University (Spring 1996): Part-time Lecturer

Lee College (Fall 1994 - Spring 1996): full- and part-time geology instructor

Lamar University (Fall 1993 – Fall 1994): Lecturer in Geology

Marathon Oil Company (1982 – 1986): Exploration Geologist

Education

Rice University (1987 – 1995): Ph.D., Geology, May 1995
Dissertation: Mesozoic Geology of the Sand Springs Range, West-central Nevada

University of Missouri-Columbia (1980 – 1982): M.A., Geology, August 1982
Thesis: Geology of a portion of the Trap Mountains, Arkansas

Rice University (1976 – 1980): B.A., Geology, May 1980

University of Houston (Fall 1986)

Most Significant ASU Course Taken

Culturally Responsive Approaches to Serving Hispanic Students (CRASH; August 2022 – May 2023): A three-day workshop held in August and the completion of a systematic teaching project during the academic year based on self-assessment and Scholarship of Teaching and Learning principles..

Teaching Background

Geology courses I teach at ASU: Field Geology (Summer Field Camp), Structural Geology, Sedimentology, Field Methods in Geology, Physical Geology, Historical Geology, and Research (Geology). I have also taught Physical Science Labs and Solar System Astronomy.

At ASU I have organized and led several weekend geology field trips each semester to central and West Texas localities, including Big Bend National Park, Enchanted Rock, and the Davis Mountains. I also organize field trips run during lab times at San Angelo State Park and at several other local outcrops.

Teaching Interests

Approaches I like to use: a) involving students in my structural geology and geologic mapping research, b) solving geologic problems on field trips, c) using West Texas examples and examples from my own research in courses, d) including hands-on group projects in all courses, d) making and showing computer-drafted figures.

Current Research Projects

Polyphase folds and faults in the Big Bend region, West Texas and northern Chihuahua (2006 – present)

Collaborators: Aldo R. Piñón-Villarreal, Angelo State University, James Ward, Mesa Geologicals, Alejandro Villalobos Aragon, Vanessa Espejel-García, and Michel Montelongo Flores, Universidad Autónoma de Chihuahua, Jessica M. Kelsch, Thomas Shiller, and Kevin Urbanczyk, Sul Ross State University

Folds and faults in Mesozoic and Cenozoic rocks in the Big Bend region experienced many deformations: Chihuahua trough rifting, Laramide/Chihuahua tectonic belt transpression, forceful Tertiary pluton emplaceme nt, caldera doming and collapse, and Rio Grande rift transtension. To work out geometries of structures and the sequence of events undergraduate students and I make 1:12,000-scale geologic maps, describe map units in detail, construct cross-section grids, and collect outcrop-scale fold and fault orientations. Areas mapped: northern Sierra del Carmen, southeast Marathon uplift, Glass Mountains, and Sierra Rica caldera complex in Santa Elena Canyon Protected Area.

Work funded by grants from the Texas Academy of Science, West Texas Geological Society, Southwest Section, American Association of Petroleum Geologists, Chesapeake Energy Corporation, Geological Society of America, and Angelo State University.

Mesozoic structure and stratigraphy of the Sand Springs lithotectonic assemblage, west-central Nevada (1988 – 2002, 2011- present)
Collaborators: John Oldow, Chris Pluff, Taylor Newton, Big Sky Engineering, Sean Czarnecki, Arizona State University

Well-exposed yet little-studied Mesozoic rocks in western Nevada contain Mesozoic regional metamorphic and mylonitic fabrics and syn-metamorphic folds and faults overprinted by two generations of Luning-Fencemaker thrust belt structures. I have concentrated on mapping Mesozoic rocks in the boundary zone between the transtensional Walker Lane belt and the westernmost Basin and Range province. ASU undergraduate students and I map Cretaceous plutons and dikes cross-cut by diverse Cenozoic extrusive and intrusive igneous rocks. Mesozoic and Cenozoic rocks are offset, but not significantly reoriented by Walker Lane strike-slip faults and Basin and Range normal faults. I make 1:8000-scale geologic maps, measure orientations of outcrop scale folds, collect samples for isotopic dating, and describe structures and minerals observed under the polarizing microscope. Areas mapped: Sand Springs Range, southern Stillwater Range, northern Gillis Range, Copper Mountain, and Slate Mountain.

Work funded by grants from Geological Society of Nevada, Angelo State University, and the Southwest Section American Association of Petroleum Geologists.

Grant Proposal in Progress

National Science Foundation Grant Proposal to Tectonics and Hydrologic Sciences Programs by J.I. Satterfield, A.R. Pinyon Villarreal, and Manuel J Garcia Ruiz (Angelo State University), J.M. Kelsch, K.M. Urbanczyk, and T.A. Shiller (Sul Ross State University), and Hatim M. Geli (New Mexico State University): Collaborative Research: RUI: New Tectonic - Hydrogeologic Model for Continental Rift Transform Zones: Border Corridor Transform Zone, Rio Grande Rift, ($913,176). Submitted September 2022. Declined May 2023.

Grants Received

Angelo State University Provost's Scholars Program, Geologic mapping in the Santa Elena Canyon Protected Area in the Big Bend Region, August 2021 – May 2022 (course release time for research)

National Science Foundation Grant to J.I. Satterfield, J.W. Ward, C. Purkiss, K.P. Blount, C. Youker, and S. Minzenmayer: OEDG Track 1: Pathways for Inspiring, Educating, and Recruiting West Texans in the Geosciences (PIER): September 2011 – July 2015 ($164,839)

Angelo State University Research Enhancement Grant to J.I. Satterfield Geologic Map of Sierra del Carmen, January 2011- August 2012 ($11,000)

Chesapeake Energy Corporation Grant to J.I. Satterfield: Geologic mapping in the southern Marathon uplift: June 2010 – September 2010 ($16,475)
Chesapeake Energy Corporation Grant to J.I. Satterfield: Geologic mapping of a portion of the Marathon uplift: July 2009 - 2010 ($12,000)

Angelo State University Research Enhancement Grant to J.I. Satterfield: Geologic mapping in the Slaughter Ranch, Big Bend region January 2009 – August 2009. ($9000.00)

Angelo State University Research Enhancement Grant to J.I. Satterfield and C.A. Poppeliers: Geologic mapping in Sierra del Carmen, Big Bend National Park, January 2007 – August 2007. ($9645.00)

Angelo State University Research Enrichment and President's Circle Grants to J.I. Satterfield: Research Enrichment and President's Circle Grant: Mapping folds in Sierra del Carmen, Big Bend National Park: A project involving an undergraduate Earth Science Minor, April 2006 – August 2007. ($4000.00)

National Science Foundation grant to Christian Poppeliers, J.I. Satterfield, and G.P. Blount: MRI: Acquisition of a High Performance Computing System for Undergraduate Geoscience Research ($51,000.00; awarded 2007, transferred to Augusta State University, September 2007)

National Science Foundation grant to J.I. Satterfield and John Oldow, University of Idaho: Collaborative Research, RUI: Geodetic and geologic study of the kinematics of late Cenozoic displacement transfer, central Walker Lane, western Great Basin, 2002-2006 ($29,719.25; Grant transferred to ASU March 2004; No Cost extension granted December 2004)

Recent Student Research Projects Advised

Ashton Dirner (Spring 2023 – present), GEOL 4191, Western Nevada Volcanic Belt Petrology

David Johnston (Summer 2023 – present), GEOL 4191, Sombrero Peak Ranch Stratigraphy

Matthew Hernandez (Fall 2021 – Spring 2023), GEOL 4391, Cañon de Santa Elena Volcanics. ASU Undergraduate Research Scholarship Project

Collin Goulart (Fall 2020 – Spring 2022), GEOL 4391, Santana Caldera Mapping. ASU Undergraduate Research Scholarship Project

Anton Reed (Fall 2019 – Spring 2021), GEOL 4391, Santa Caldera Geology. ASU Undergraduate Research Scholarship Project.

Shane Flint (Fall 2020), GEOL 4391, Llano Uplift Geologic Mapping

Chris Pluff (Fall 2019 – Spring 2020), W. Nevada Geologic Mapping, ASU Undergraduate Research Scholarship Project

Jonathan Criner, (Fall 2019 - Spring 2020) GEOL 4391, Glass Mountains Geologic Mapping (Spring 2020)
Harrison Richardson (Spring 2018 – December 2019), GEOL 4391, Santa Caldera Geology. ASU Undergraduate Research Scholarship Project.

José Hermosillo (Spring 2018 – December 2019), GEOL 4391, Santana Caldera Geology. ASU Undergraduate Research Scholarship

Dillon Hughes (Fall 2017 – Spring 2018), GEOL 4391, Big Brushy Graben Map. ASU Undergraduate Research Scholarship Project

Taylor Newton (Spring 2017 – Spring 2018), GEOL 4391, Western Nevada Metamorphism, ASU Undergraduate Research Scholarship Project

Austin Hafner (Spring 2017 – Fall 2017), GEOL 4391, Big Bend Geologic Mapping, ASU Undergraduate Research Scholarship Project

William White (Fall 2016 – Summer 2017): GEOL 4191, Western Nevada Igneous Petrography and Geochemistry, ASU Undergraduate Research Scholarship Project, SW AAPG research grant.

Darren Garcia (Fall 2016 – Fall 2017): GEOL 4191, Big Bend Geologic Mapping, ASU Undergraduate Research Scholarship Project

Turner Doggett (Spring 2016 – Spring 2017): GEOL 4191, Turner Ranch Geology

Sean Czarnecki (Spring 2015 – Fall 2016): GEOL 4391, Western Nevada Mapping, ASU Undergraduate Research Project, research supported by SW AAPG Research Grant

Jacob Jarvis (Spring 2015 – Spring 2016): GEOL 4391, Western Nevada Mapping, ASU Undergraduate Research Project, research supported by SW AAPG Research Grant

Travis Sparks (Spring 2015 – Spring 2016): GEOL 4391, Llano Uplift Mapping, ASU Undergraduate Research Project

Laiza Valeria Vera-Lopez (Fall 2014 – Spring 2015): GEOL 4391, Big Bend Geologic mapping. ASU Undergraduate Research Scholarship Project

Publications

Thomas, W.A., Gehrels, G.E., Lawton, T.F., Satterfield, J.I., Romero, M.C., and Sundell, K.E., 2019, Detrital zircons and sediment dispersal from the Coahuila terrane of northern Mexico into the Marathon foreland of the southern Midcontinent: Geosphere, v. 15, p. 1102–1127.

Sparks, T., and Satterfield, J.I., 2016, New Mapping of Late Paleozoic Faults and Local Precambrian Aquifers, Llano Uplift: West Texas Geological Society Bulletin, v. 55.

Satterfield, J.I., editor, 2016, Eastern Shelf Sandstones and Carbonates: Surface Exposures and Subsurface Applications: Field Trip Guidebook for Southwest Section of the American Association of Petroleum Geologists 2016 Annual Meeting, 111 p.

Vera-Lopez L.V., Welch, B.L., and Satterfield, J.I., 2015, Map-scale folds in Big Brushy Canyon, Northern Sierra del Carmen, Big Bend Region, Texas: Crius, v. 3, p. 1 – 15. https://crius-ojs-asu.tdl.org/crius/index.php/crius/article/view/35

Cullen, J., Knox, N.K., Crouch, J., and Satterfield, J.I., 2013, Polyphase Laramide Structures and Possible Folded Tertiary(?) Sills at Dagger mountain, Big Bend National Park, Texas, The Compass: Earth Science Journal of Sigma Gamma Epsilon, v. 85, http://digitalcommons.csbsju.edu/compass/vol85/iss3/3

Cullen, J.D., Knox, N.K., Crouch, J., and Satterfield, J.I., 2013, Geology of Dagger Mountain, Big Bend National Park, Texas: Crius, v. 1, p. 67-83.

Satterfield, J.I., and Ashmore, R.A., 2009, Overview of recent mountain-building events in the Big Bend region, West Texas and northern Mexico: Journal of Borderland Studies, 35 p.

Satterfield, J.I., and Dyess, J.E., 2007, Polyphase folds and faults in a wrench fault zone, northern Big Bend National Park: West Texas Geological Society Bulletin, v. 46, p. 8 – 19.

Satterfield, J.I., 2002, Geologic map of the southern Sand Springs Range, Churchill and Mineral Counties, Nevada: Nevada Bureau of Mines and Geology Map 133, scale 1:24,000.

Manuszak, J.D., Satterfield, J.I., and Gehrels, G.E., 2000, Detrital zircon geochronology of Upper Triassic strata in western Nevada, *in* Soreghan, M.J. and Gehrels, G.E., eds., Paleozoic and Triassic paleogeography and tectonics of western Nevada and northern California: Geological Society of America Special Paper 347, p. 109-118.

Oldow, J.S., Satterfield, J.I., and Silberling, N.J., 1993, Jurassic to Cretaceous transpressional deformation in the Mesozoic marine province of the northwestern Great Basin, *in* Lahren, M.M., Trexler, J.H., Jr., and Spinoza, C., eds., Crustal evolution of the Great Basin and Sierra Nevada: Cordilleran/Rocky Mountain Section, Geological Society of America Guidebook, Department of Geological Sciences, University of Nevada, Reno, p. 129-166.

Recent Abstracts

Satterfield J., Dirner, A., Jones K., Hernandez M., Koeman-Shields, E., 2023, Igneous petrography tests Pre-Cenozoic Movement Hypothesis for active Great Basin Fault Zone, Nevada: Texas Academy of Science Annual Meeting.

Satterfield, J.I., Pluff, C.P., Goulart, C.P., and Hernandez, M.H., 2022, Crustal-scale, reactivated boundary between Walker Lane and Central Nevada Seismic Belt revealed by geologic mapping: Geological Society of America Abstracts with Programs. Vol 54, No. 5. doi: 10.1130/abs/2022AM-381832 .

Satterfield, J.I., 2020, Extensional folds and reactivated Laramide thrusts in Sierra del Carmen, Eastern Big Bend: West Texas Geological Society Fall Symposium.

Flint, S.A., Shotton, G., Klausner, K., Woolf, T., Shields, S., and Satterfield, J.I., 2020, First detailed geologic map of San Angelo State Park: West Texas Geological Society Fall Symposium.

Satterfield, J.I., Williams, L.D., and Criner, J.J., 2019, New applications of detailed geologic mapping in the Glass Mountains: American Association of Petroleum Geologists Southwest Section Convention Program.

Hermosillo, J.L., Richardson, H.B., Reed, A.J., and Satterfield, J.I., 2019, Detailed geologic map of the Santana caldera, Santa Elena Canyon Protected Area, Chihuahua, Mexico: American Association of Petroleum Geologists Southwest Section Convention Program, p.96.

Newton, T.S., Satterfield, J.I., and White, W.J., 2018, Geologic map of the northern Sand Springs Range and southern Stillwater Range, Nevada: An analogue of Cenozoic Trans-Pecos volcanism?: 2018 Southwest Section American Association of Petroleum Geologists Annual Convention.

Hughes, D.D., Austin G. Hafner, José L. Hermosillo, and Joseph I. Satterfield, 2018, Detailed Geologic Map of Big Brushy Canyon Graben, Big Bend Region, Displays Extensional Monoclines: 2018 Southwest Section American Association of Petroleum Geologists Annual Convention

Satterfield, J.I., Newton, T.S., and White, W.J., 2017, Recent mapping in the southern Stillwater Range and northern Sand Springs Range, Nevada: Geological Society of America Abstracts with Programs, v. 49.

Satterfield, J.I., Doggett, T.A., and Satterfield, J.I., 2017, Geology of T* Ranch, Tom Green and Irion Counties, West Texas: Southwest Section American Association of Petroleum Geologists Annual Convention, p. 107-108.

Czarnecki, S.M., Jarvis, J.C., Garcia, D.G., and Satterfield, J.I., 2016, Slate Mountain and northern Sand Springs Range, Nevada geologic maps clarify key cross-cutting relations in the Cordilleran hinterland: Geological Society of America Abstracts with Programs, v. 48.

Thomas, W.A., Gehrels, G.E., Satterfield, J.I., and Romero, M.C., 2016, Detrital zircons and sediment dispersal across the Marathon foreland, West Texas, USA: Geological Society of America Abstracts with Programs, v. 48.

Recent Invited Talks

Abilene Geological Society, March 2021, Detailed, 1:12,000-scale Geologic Mapping Begins at San Angelo State Park

University of Texas at El Paso Department of Geological Sciences, Seminar talk, September 2020, Extensional folds and reactivated Laramide thrusts in Southern Rio Grande rift, West Texas

San Angelo Geological Society, February 2017, Proposed Fall 2017 field trip: Potential Big Bend analogs to Permian basin geology

San Angelo West Rotary Club, February 2017, ASU teaches geology outside: Big Bend, West Texas, and beyond

Abilene Geological Society, January 2017, Four field trip stops in Sierra del Carmen, Big Bend region: Potential Permian basin analogs?

Society of Independent Professional Earth Scientists, Midland Chapter, August 2016, Recent mapping in the Big Bend region: What I have learned that applies to petroleum geology

Short Course Taught

Texas Railroad Commission, San Angelo, March 2019, West Texas Petroleum Geology for Non-geologists: 25 Railroad Commission employees from Abilene, Midland, and San Angelo attended. ASU graduates Justin Cartwright and Andrea Brown Mayer attended and assisted in leading lab activities.

Membership in Professional Organizations

Texas Academy of Science: Academic Director, 2011 – 2013

Geological Society of America

American Association of Petroleum Geologists (AAPG), Advisor to GEO AAPG Student Chapter

West Texas Geological Society

San Angelo Geological Society

Sigma Gamma Epsilon, Theta Gamma Chapter, National Honor Society of the Earth Sciences

Sigma Xi, The Scientific Research Honor Society

Awards

2018 President's Award for Faculty Excellence in Research, Angelo State University

2016 Faculty Excellence in Teaching Award finalist, Angelo State University

2016 Distinguished Service Award, West Texas Geological Society, Midland

2015 Best Paper Award , West Texas Geological Society Fall Symposium, Midland

2015 West Texas Distinguished Educator, Southwest Section of the American Association of Petroleum Geologists

2015 Professorial Award for Excellence in the Teaching of Natural Resources in Earth Sciences, American Association of Petroleum Geologists Foundation

2013 President's Award for Faculty Excellence in Service, Angelo State University