



Patricia Wood Dickerson
Visiting Research Fellow
Jackson School of Geosciences
& American Geosciences Institute

Current Research

Reconstructing the tectonic history of southwestern Laurentia is Dickerson's research focus: seeking the diagnostic evidence for Rodinia assembly and fragmentation (West Texas, Argentine Precordillera), Pangaea amalgamation (Marathon/Solitario fold-thrust belt, Ancestral Rocky Mts.), Laramide foreland deformation (Big Bend), and Rio Grande riftng/transform faulting. Research sponsors include NPS and NASA. She draws from those investigations in leading geological and natural history field seminars for students and professional scientists, as well as for Smithsonian groups. Pat has also served on task forces to develop scientific strategies for exploring the Moon and Mars. Based in the UT Walter Geology Library, her current professional service work is with the GeoRef geosciences database project of the American Geosciences Institute.

Relevant Publications (full list in Publications PDF)

RODINIA ASSEMBLY & FRAGMENTATION

Hanson, R. E., Roberts, J. M., Dickerson, P. W., and Fanning, C. M., 2016, Cryogenian intraplate magmatism along the buried southern Laurentian margin: Evidence from volcanic clasts in Ordovician strata, Marathon uplift, west Texas: *Geology*, v. 44, no. 7, p. 539-542. doi:10.1130/G37889.1

Dickerson, P. W., 2012, The circum-Laurentian carbonate bank, the Ouachita-Cuyania Basin, and the prodigal Llanoria landmass, *in* J. L. Wilson and J. R. Derby, *The Great American Carbonate Bank: American Association of Petroleum Geologists, Memoir 98*, chapter 38, p. 959-984.

PANGAEA AMALGATION & INTRAPLATE DEFORMATION

Dickerson, P. W., 2003, Intraplate mountain building in response to continent-continent collision – the Ancestral Rocky Mountains (North America) and inferences drawn from the Tien Shan (Central Asia): *Tectonophysics*, v. 365, p. 129-142.

RIO GRANDE RIFT & TRANSFORMS

Dickerson, P. W., 2013, Tascotal Mesa transfer zone – an element of the Border Corridor Transform System, Rio Grande rift of West Texas and adjacent Mexico, *in* Hudson, M. R., and Grauch, V. J. S., *New Perspectives on the Rio Grande rift: From Tectonics to Groundwater*: Geological Society of America, Special Paper 494, p. 475-500.

Collaborations

D. F. Stockli, I. W. D. Dalziel, E. W. Collins (Jackson School of Geosciences, University of Texas, Austin); R. E. Hanson (Texas Christian University); C. M. Fanning (Australian National University); P. Bauer (New Mexico Bureau of Geology); V. J. S. Grauch (U. S. Geological Survey); B. R. Hall (Texas Parks & Wildlife Department).

Education & Outreach

SMITHSONIAN INSTITUTION INSTRUCTION

On Smithsonian Journeys to Patagonia, Andes (Peru, Chile), Iceland, Galápagos

NASA ASRONAUT FIELD TRAINING

Dickerson, P. W., 2004, Field geophysical training of astronauts in Taos valley – A brief synopsis: New Mexico Geological Society, 54th field conference guidebook, p. 278-281

Dickerson, P. W., Reilly, J. F., and Muehlberger, W. R., 2003, Field and remote-sensing training for human exploration of the planets: American Association of Petroleum Geologists, Search & Discovery, <http://www.searchanddiscovery.net>

GRADUATE, UNDERGRADUATE RESEARCH COMMITTEE SERVICE (UT, TCU, SRSU)

TEXTBOOK CONTRIBUTIONS

Dickerson, P. W., 2012, Hotspots, rifts, reefs, deltas, and cratonic basins – Views from space, *in* Roberts, D. and Bally, A. W., editors, *Regional Geology and Tectonics: Principles of Geologic Analysis*: Elsevier, chapter 9, p. 246-295.

Muehlberger, W. R., and Dickerson, P. W., 2012, Geological methods, *in* Roberts, D. G. and Bally, A. W., editors, *Regional Geology and Tectonics: Principles of Geologic Analysis*: Elsevier, chapter 8, p. 217-244.

ROADSIDE GEOLOGIC EXHIBITS

Co-author (with J. C. Bones) of roadside geologic displays, Brewster Co., West Texas: Marathon folding, Paisano volcano, rifting in Big Bend NP, Terlingua mercury mining

NASA-JOHNSON SPACE CENTER

Instructor, JSC Distance Learning Center -- volcanoes on Earth and Mars

Web tutorials, Earth Sciences & Image Analysis Lab -- planetary analogues, tectonics

Employment History

American Geosciences Institute & University of Texas-Austin, Jackson School of Geosciences

Visiting Research Fellow

2003-present

Professional service: reviewing and indexing of Spanish-language geological literature and rare publications for AGI - GeoRef; recruiting/ training/mentoring new indexers. (Information Services Director, Ms. Sharon Tahirkheli, 703-379-2480) Research in Marathon orogenic belt and the Argentine Precordillera; deformational mechanisms in the Ancestral Rocky Mountains (New Mexico, Texas, Chihuahua, Coahuila). Field mapping in the Big Bend of the Rio Grande (funded in part by National Park Service). Astronaut training in field geological/ geophysical methods in New Mexico (funded by NASA-JSC). Public service: Planetary Sciences Sub-committee of NASA Advisory Council, appointed to advise the agency on scientific strategies for exploring the Moon, Mars and the Solar System at large.

Smithsonian Institution

Educational Tour Leader

2003-present

Lecture on geological processes and features, natural resources, and landscape evolution in the context of natural history tours to Iceland, Newfoundland and Labrador, the American Southwest, parks of western US; Andes, Patagonia, Machu Picchu, the Galápagos. Develop science instructional materials based upon ongoing research. (Smithsonian Journeys, Ms. Gloria Baxevanis, 202-633-5942) Likewise for Road Scholar (formerly Elderhostel), 2003-2008.

Lockheed Martin, NASA-Johnson Space Center

Scientist

1996-2002

Astronaut Training: Develop briefings on tectonics, planetary analogues and archaeology; help develop curriculum for ISS training. Serve as mission lead for Earth observations (created first electronic site manual; received Astronaut Office commendation). Develop first field geophysical training exercise in preparation for planetary and lunar exploration; awarded Exceptional Public Service Medal. (Cdr. Terrence Wilcutt, STS-89 & 106: NASA-JSC, 281-244-8715) Edit/co-produce CD tutorials and Office of Earth Sciences web publications on tectonics, planetary analogues. Programmatic Support: Represent Office of Earth Sciences on ISS and Space Shuttle imagery working groups — procedures, requirements, equipment, products, archives, databases, and retrieval. Research/ Education: Conduct research on Rio Grande and East African rifts, and Argentine Precordillera; publish results. Participate in international geological task forces. Serve on student doctoral research committee. Lecture.

Applied Geodynamics Laboratory, University of Texas at Austin

Postdoctoral Fellow

1995-1996

Regional structural/tectonic study of Paleocene sedimentation, Rio Grande embayment of South Texas and adjacent Mexico; salt-rafting tectonics; physical modeling.

University of Texas at Austin

Doctoral Studies

1990-1995

Dissertation: *Tascotal Mesa Transfer Zone, Rio Grande Rift of West Texas (Presidio, Brewster Counties) – A Structural, Mechanical and Thermal Characterization.*

Concurrent research 1) on absolute dating of Quaternary fault movements, 2) on physical modeling of strike-slip faults, 3) on basins and transverse structural zones in the southern Rio Grande rift, and 4) on SW US origins of the Argentine Precordillera. Fellowship support; research assistantships at Bureau of Economic Geology: a) Paleocene sedimentation in the Rio Grande embayment — response to Laramide tectonism in northern Mexico; b) geology and stratigraphic modeling of Falls City, Texas, uranium mill tailings remediation site. Ph.D. conferred December, 1995.

Independent Research Geologist

Midland, Texas

1986-1990

Executed applied field and office research projects in water, mineral and petroleum exploration for various clients (Newmont Gold, Burlington Resources, etc.). Aided clients in framing relevant projects and strategies; facilitated communication among corporate units/entities/divisions. Conducted regional structural/stratigraphic analyses and research on tectonic evolution of southwestern U. S. and northern Mexico; published and presented results at national/international meetings. Began Peregrine Guide to history, geology, archaeology and scenery of New Mexico.

Conoco

Senior Staff Geologist

1984-1986

Conoco (SW U.S.). Developed new regional exploration play. Mapped prospects using all available geological and geophysical data. Evaluated potential of Mesozoic section in Chihuahua tectonic belt and upper Paleozoic in Marfa basin. Coordinated, reviewed studies (reservoir facies, geochemistry, computer mapping) conducted for Conoco by outside contractors. (Ms. Lisa K. Goetz, Marathon Oil, 713-296-4374)

Gulf Research & Development Co.

Staff Geologist

1976-1984

Geologist through Staff Geologist (increasing technical scope and responsibility), Conducted independent geological/geophysical basin analyses utilizing outcrop and well samples, logs, seismic and potential field data. Furnished research support for London, Dublin, Bergen offices and international headquarters and for personnel engaged in foreign and domestic petroleum exploration and production. Supervised from three to

fifteen research professionals and support personnel. Provided technical review and edited maps, reports. Organized, led geological field seminars. Recipient of various awards, corporate appointments.

Prior History

Bell & Murphy Geophysical Consultants	1974-1976
Texas Bureau of Economic Geology	1973-1974
Geoscience Information Consultant	1971-1973
Exxon Production Research Co.	1969-1971
American Geological Institute	1968-1969
Oklahoma Geological Survey	1967-1968

Professional Affiliations

Geological Society of America, Fellow
New Mexico Geological Society, Member
West Texas Geological Society, Member
Austin Geological Society, Member/Officer/Field Trip Committee Chair

Awards

NASA – JSC Team Innovation Award, 2010
NASA Exceptional Public Service Medal, 2007
Jackson School of Geosciences, Guion Library Staff Award, 2007
NASA Advisory Council, Science Committee, Planetary Sciences Subcommittee
Kentucky Geological Survey – 2001 Distinguished Lecturer
NASA Group Achievement Awards, 1999 and 2001
West Texas Geological Society – Distinguished Scientist Award, 1999
NASA-JSC – Astronaut Office commendation and award, 1998

Formal Education

Postdoctorate Tectonics/Physical Modeling (1996), Applied Geodynamics Laboratory,
University of Texas at Austin
Ph.D. Structural Geology/Tectonics (1995), University of Texas at Austin
B.A. Geology and Classical Archaeology (1970), University of Texas at Austin