

DR. KARL E. KARLSTROM – CURRICULUM VITAE (August 2021)

Dr. Karl E. Karlstrom is a Distinguished Professor in the Department of Earth and Planetary Sciences at the University of New Mexico. He has been at UNM since 1994. Dr. Karlstrom grew up in Flagstaff, Arizona and received his B.S. in Geology from Northern Arizona University in May 1973. He received his MS in Geology in 1977 from the University of Wyoming and Ph.D. from the University of Wyoming in May 1981. He conducted post-doctoral work at the University of New Brunswick, Canada (1981 -1982). He held professor positions at North Carolina State University (1983-1984) and Northern Arizona University (1984-1991) before coming to UNM in 1992, where he has been for the last 27 years. His research specialties are structural geology and tectonics. His current research topics span the geologic timescale and address: the formation and stabilization of continents, the supercontinent cycle, Paleoproterozoic to Cambrian Earth Systems, and neotectonics of ongoing uplift of the Colorado Plateau-Rocky Mountain region.

Research summary: Dr. Karlstrom has generated > \$5 million in external funding, with > \$3.4 million in the last 10 years. This includes continuous funding from the National Science Foundation. This CV lists ~200 published journal articles, 23 geologic maps, 87 technical reports and guidebook articles, and > 520 abstracts from professional meetings (most coauthored with students). He is an expert on: the Proterozoic assembly of North America and its position in the supercontinents of Nuna and Rodinia; the 2-billion-year geologic evolution of Grand Canyon region; and near surface hydrologic and geomorphic systems in the Colorado Plateau-Rocky Mountain region. He has worked on tectonic influences on water quality in groundwater systems in Australia, Egypt, and the American Southwest. In terms of research impact on his profession, Google Scholar lists ~13,000 citations of over 200 publications since 1979 and an H-index of 54 (54 publications have been cited at least 54 times).

Teaching summary: He teaches at all learning levels: Freshman Learning Communities (2007-2014), New Mexico Field Geology (every Fall), Structural Geology (every Spring), and the Advanced Summer Field Course. He has mentored 69 graduate students. Informal science education activities include, with his wife Laura Crossey, development of the Trail of Time Geoscience Education Exhibition at Grand Canyon which opened in 2010 and received the 2011 First Place award from National Association for Interpretation; this exhibit reaches ~6 million annual Park visitors. His teaching is entwined with his research.

Service summary and awards: Dr. Karlstrom's professional service includes local, national, and international service. He served as member of the Canadian Pan-Lithoprobe subcommittee (2000-2003), Trustee of the International Basement Tectonics Association (2005-2009), U.S. Member (one per continent) of the International Geologic Congress Rodina compilation, Australian Research Council (ARC) "expert of international standing", Founding member of the NSF Earthscope Science and Education Committee (2002-2005), Science Editor for the journal GSA Today (2000- 2003), and Science Editor for the Geological Society of America Bulletin (2005-2008). He received the 2009 Distinguished Service Award from Geological Society of America and was elected Geological Society of America Fellow in 2010. He was selected for the 2014 UNM 60th Distinguished Research Lecture, received a 2015 Career Achievement Award from the American Institute of Professional Geologists (joint with Laurie Crossey), was awarded the 2017 New Mexico Geological Society Honorary Member. He received the 2018 UNM Alumni Teaching Award. His UNM service includes numerous departmental, College, and University committees.

EDUCATION

Post-doctoral research, University of New Brunswick, Fredericton, N.B., Feb 1981 - Aug 1982.

University of Wyoming, Laramie, Wyoming - Ph.D. in Geology, May 1981, (8/77 – 2/81).

University of Wyoming, Laramie, Wyoming - M.S. in Geology, July 1977; 8/75 to 7/77.

Northern Arizona University, Flagstaff, Arizona - B.S. in Geology, May 1973; Awards: graduated Magna cum laude.

EMPLOYMENT

Distinguished Professor, University of New Mexico, August 2018- present.

Professor, University of New Mexico, August 1994 - 2018.

Sabbatical: visiting professor, University of Adelaide, South Australia, Spring, 1998

Crosby Visiting Professor, M.I.T., Cambridge, Massachusetts, Fall, 1997.

Associate Professor, University of New Mexico, Jan 1992 - Aug 1994.
Associate Professor, Northern Arizona University, May 1987 - Dec 1991.
Assistant Professor, Northern Arizona University, May 1984 - May 1987.
Assistant Professor, North Carolina State University, Jul 1983 - May 1984.
Research Associate, University of Arizona, Jan 1983 - Jul 1983.
Research Associate, University of Wyoming, Oct 1982 - Dec 1982.
Assistant Professor, University of New Brunswick, Oct 1981 - Mar 1982.
Post-Doctoral Fellow, University of New Brunswick, Feb 1981 – Aug 1982.
Research Associate, University of Wyoming, Jul 1978 - Feb 1981.
Graduate Research Assistant, University of Wyoming, Jul 1977 - Jul 1978.

GRANTS AND GRANT PROPOSALS

- 1978-1979 Uranium potential of Precambrian quartz-pebble conglomerates in southern Wyoming; Borgman: P.I.'s R.S. Houston, K.E. Karlstrom, L.T., Bendix Field Engineering Corporation contract to the University of Wyoming: \$212,062 awarded.
- 1980-1981 Geological support for diamond drilling of Precambrian quartz-pebble conglomerates; Borgman: P.I.'s R.S. Houston, K.E. Karlstrom, L.T., Bendix Field Engineering Corporation contract to the University of Wyoming: \$109,738 awarded.
- 1984 Tectonic styles in the northern Appalachians: P.I. K.E. Karlstrom, North Carolina State University Faculty Research and Professional Development Grant: \$3,500 awarded.
- 1984 Structural geology research in the northern Appalachians; P.I. K.E. Karlstrom: North Carolina State University Research Advisory Committee: \$2,500 awarded.
- 1984 Structural geology research in central Arizona; P.I. K.E. Karlstrom: Northern Arizona University Organized Research Fund: \$4,500 awarded.
- 1984-1986 Structural and sedimentologic studies of the Mazatzal Orogen and investigation of Proterozoic (1800-1600 m.y.) tectonic regimes in central Arizona: P.I.'s K.E. Karlstrom and L.T. Middleton: National Science Foundation: \$69,991 awarded.
- 1984-1986 Geometry and kinematics of thrust-related deformation in central Arizona: P.I. K.E. Karlstrom: Petroleum Research Fund: \$15,000 awarded.
- 1985 Microstructural studies of thrust-deformation in central Arizona: P.I. K.E. Karlstrom: Northern Arizona University Organized Research: \$23,400 awarded.
- 1985-1987 Collaborative research: Chronostratigraphic evolution of an Early Proterozoic orogenic belt in central Arizona - integrated U-Pb zircon geochronology and detailed structural geology: P.I.'s S.A. Bowring (Washington University, St. Louis), K.E. Karlstrom (NAU): National Science Foundation: \$113,324 awarded, \$13,324 to NAU.
- 1986 Project Seed, American Chemical Society: \$750 awarded to fund an economically disadvantaged high school student as a summer research assistant.
- 1986 Collaborative research: Thermal/tectonic evolution of continental crust in the Old Woman Mountains, southeastern California: P.I. K.E. Karlstrom (NAU): National Science Foundation: \$50,000 awarded to NAU as part of a \$311,627 grant to 10 P.I.'s at four universities and the U.S.G.S.
- 1986 Kinematic studies of shear zones and continental accretion in central Arizona: P.I. K.E. Karlstrom: Northern Arizona University Organized Research Fund: \$13,325 awarded.
- 1987 Structural studies of Proterozoic tectonic evolution of northwestern Arizona: P.I. K.E. Karlstrom: Northern Arizona University Organized Research Fund: \$23,140 awarded.
- 1987-1989 Collaborative research: Chronology and processes of deformation and metamorphism during Early Proterozoic (1.8-1.6 Ga) continental assembly, Arizona: P.I.'s S.A. Bowring (Washington University) and K.E. Karlstrom (NAU): \$168,000 awarded, \$55,392 to NAU.
- 1987-1988 Research Experiences for Undergraduates: \$4,000 awarded as a supplement to ongoing

grant entitled "Chronostratigraphic evolution..."

- 1988 Proterozoic tectonic assembly of continental crust in the Southwest. P.I. K.E. Karlstrom, NAU Organized Research Fund, \$7,700 awarded.
- 1989 Undergraduate field geology research in Arizona's Transition Zone, NSF Research Experiences for Undergraduates program, P.I. K.E. Karlstrom, \$30,000 awarded.
- 1989-1992 New Technologies in Geologic Mapping: NSF Instrumentation and Laboratory Equipment Program, P.I. K.E. Karlstrom, \$32,287 awarded from NSF with matching funds from NAU.
- 1989 Processes of granite emplacement during compressional deformation: NAU Organized Research Fund, \$10,000 award.
- 1989-1991 Collaborative Research: Interactions in time and space of thermal and mechanical processes during orogeny: the Old Woman Mountains, area southeastern California: National Science Foundation, \$57,674 awarded.
- 1990-1992 Collaborative Research: Processes of crustal assembly and growth: the Proterozoic of Arizona: National Science Foundation, \$40,831 awarded.
- 1990 Undergraduate Field Geology research in Northern Arizona, NSF Research Experiences for Undergraduates, P.I. K.E. Karlstrom, \$30,000 awarded.
- 1990-1991 Post-assembly uplift history of Proterozoic crustal blocks in central Arizona: NAU Organized Research Fund, \$6,800 awarded.
- 1992-1993 Evaluating the Early and Middle Proterozoic tectonic evolution of southwestern North America, P.I.'s J.A. Grambling and K.E. Karlstrom, National Science Foundation, \$154,672 awarded.
- 1992-1993 Research Experiences for Undergraduates Supplement to "Evaluating the Early and Middle Proterozoic tectonic evolution of southwestern North America; National Science Foundation, \$4,000 awarded.
- 1992-1994 Collaborative Research: Evaluating tectonic boundaries: Continuous transect of Proterozoic orogen in the Grand Canyon, P.I.'s K.E. Karlstrom and M.L. Williams (University of Massachusetts), National Science Foundation, \$99,444 awarded to UNM.
- 1993 Supplement: Evaluating tectonic boundaries: Continuous transect of a Proterozoic orogen in the Grand Canyon, \$10,000 awarded to purchase boats.
- 1993-1996 Middle Proterozoic tectonic regimes in the Southwest: Anorogeny or an orogeny: \$109,456 awarded.
- 1994-1996 Undergraduate Earth Sciences Research at the University of New Mexico: NSF-REU Site grant, 2-1-94 to 1-31-96, \$97,016 awarded: PI's K.E. Karlstrom and J. Geissman.
- 1994-1996 Paleomagnetic investigations of tectonostratigraphic terranes in northwest Mexico: further evaluation of the Mojave-Sonora megashear hypothesis (with R. Molina-Garza and J. Geissman). NSF Tectonics Program.

1995-1997	Collaborative Research: Nature of the middle crust during orogenesis: thermal, mechanical, and geodynamic properties inferred from Proterozoic rocks of the Southwest (\$96,437 awarded for 2 years, (7/1/95 to 1/31/98), NSF Tectonics panel) EAR-9508096.
1995	Workshop Grant: Lithospheric structure and evolution of cratonic western U.S., Wyoming to Mexico (\$18,000 granted for April 95 workshop - NSF CD panel)
1997-2000	Continental Dynamics proposal: Lithospheric structure and evolution of the Rocky Mountain transect of the western U.S.: an integrated geological/geophysical investigation (\$2,700,000 awarded). K.E. Karlstrom project leader 15 co- PIs at 13 institutions) \$335,000 to UNM, 10/1/97 - 9/30/2000, EAR-9614787.
1997-1999	Collaborative Research: (with M. Elrick and J.W. Geissman) An integrated study of Late Proterozoic (1.2-0.7 Ga) extensional tectonism, basin evolution, and biological evolution in the Grand Canyon, \$140,006 to UNM, EAR-9706541, 8-1-97 to 7-31-99.
1998	Supplement to Continental Dynamics Grant for additional Laramide studies, K.E. Karlstrom and E. Erslev, (\$29,999 awarded to UNM), 5/98 – 12/98, EAR-9614787-001.
1998	Supplement to Continental Dynamics Grant – for publication of results in “Rocky Mountain Geology” K.E. Karlstrom, (\$6,300 awarded).
1999-2002	Collaborative Research: Great Unconformity of the Southwestern U.S.A.: Ar-Ar K-feldspar thermochronologic and structural studies of a billion years of regional exhumation: K.E. Karlstrom and M. Heizler, \$76,866 awarded to UNM, 7-15-99 – 6-30-2002, EAR-9902955.
1999	Supplement to: Collaborative Research: An integrated study of Late Proterozoic (1.2 – 0.7 Ga) extensional tectonism, basin evolution, and biological evolution in the Grand Canyon, K.E. Karlstrom, NSF – EAR-9706541, \$10,000 awarded to UNM.
1999	Supplement to Continental Dynamics Grant for additional seismic reflection profiling in New Mexico: \$50,000 awarded for seismic reflection data acquisition, P.I. K.E. Karlstrom and Scott Smithson, NSF.
2001-2002	Collaborative Research: Contrasting styles of ca. 1.4 Ga tectonism in the southern Rockies: Evidence for a fossil rheologic transition in a deeply exhumed intracontinental orogen. \$90,242 awarded to UNM (1-1-2001 to 12-31-2002); PI K.E. Karlstrom, NSF Tectonics Program. EAR-0003500
2001-2002	Collaborative Research: Relationship between ultramafic rocks and crustal sutures in the North American Southwest, \$21,798 to UNM (1-1-2001 to 12-31-2002), PI K.E. Karlstrom, NSF Tectonics Program EAR-0003477
2001	Collaborative Research: Lithospheric structure and evolution of the Rocky Mountains--Phase 1B: Geodynamic processes; This project is coordinated by K.E. Karlstrom and is a collaborative project with 20 PIs at 13 institutions; \$79,880 to UNM (1-1-2001 to 12-31-2001), NSF Continental Dynamics Program EAR-.
2000	Supplement to Grand Canyon Research grants: acquisition of trailers: PI K.E. Karlstrom, \$5935 awarded to UNM, NSF Instrumentation and Facilities Program.2001-2002
2001-2002	Collaborative Research: Tectonic geomorphology of the Grand Canyon region: testing a hypothesis for differential incision due to Quaternary slip on the Hurricane-Toroweap

- fault system: P.I.s K.E. Karlstrom and J. Pederson (Utah State University), \$74,454 to UNM (06/01/01 to 05/31/02), NSF Tectonics Program.
- 2001-2002 The Trail of Time: Integrating Science and Education at Grand Canyon, Arizona: PIs L. Crossey and K.E. Karlstrom, \$96,426 awarded for 12/01/01 to 11/30/02, NSF Geoscience Education Program.
- 2002 Acquisition of an electron microprobe: PIs A. Brearley, J. Selverstone, L. Crossey, M. Spilde, K.E. Karlstrom, \$300,000 awarded to UNM, NSF Instrumentation and Facilities
- 2002-2004 Mesoproterozoic tectonics of inboard southwestern Laurentia: insight into assembly and configuration of Rodinia from study of sedimentary successions, NSF Tectonics Program (EAR-028463), \$114,888 (07/01/02 to 06/30/04), Southwestern USA, 0.5 months in 2003 and 2004.
- 2002-2003 REU supplement to Tectonic geomorphology of the Grand Canyon region: testing a hypothesis for differential incision due to Quaternary slip on the Hurricane-Toroweap fault system: support for T. Cleveland, \$4455.
- 2003 Supplement to Tectonic geomorphology of the Grand Canyon region: testing a hypothesis for differential incision due to Quaternary slip on the Hurricane-Toroweap fault system: support for further Ar-Ar dating: \$8,000.
- 2003-2005 Geoscience Education at the Grand Canyon: Integrating Science and Education Through the Trail of Time Exhibit, NSF Geoscience Education Program, \$49,997 (03/01/03 to 02/29/04), PIs L. Crossey and K. Karlstrom, 0.5 month in 2003. EAR- 0314133.
- 2003-2005 The Trail of Time at Grand Canyon: Planning and implementation, 09/15/03 to 08/31/04, PIs Karl Karlstrom and Laura Crossey, \$49,984, 0.5 months in 2004. ISE- 0314132-.
- 2003-2005 Post-doc grant: Continental Dynamics of the Rocky Mountains: structure, evolution, and geodynamics of the continental lithosphere: NSF Continental Dynamics Program, \$40,000 (07/01-/03 to 06/30/04); S. Whitmeyer.
- 2004-2006 Organizational structure for Rocky Mountain EarthScope: Science and education planning: NSF EarthScope Program, \$60,412 (02/01/04 to 01/31/06).
- 2005 Supplement to "Mesoproterozoic tectonics..." : \$35,000 for upgrading Grand Canyon research equipment: NSF Instrumentation and Facilities Program.
- 2005-2007 Collaborative Research: CO₂ springs and travertines of the southwestern U.S.: Hydrologic pathways linking tectonism and water quality: NSF Hydrologic Sciences Program (01/01/2006-12/31/2007), L. Crossey, K. Karlstrom, T. Fischer, and A. Springer, \$149,795 to UNM. , EAR- 0538304
- 2006-2010: Collaborative Research: The Trail of Time: A Geoscience Exhibition at Grand Canyon National Park: \$1,834,740 to UNM (06/01/2006 to 05/31/2010); NSF Informal Science Education Program: Karl Karlstrom, Laura Crossey, Steve Semken (ASU). ISE-0610393
- 2007-2010 Collaborative Research: CREST: Colorado Rockies Experiment and Seismic Transects; \$299,457 to UNM (01/01/2007-12/31/2010); NSF Continental Dynamics Program EAR-0607808, Ken Dueker, Rick Aster, Eric Kirby, L. Crossey, and others.

2007-2009 Collaborative Research: Dating sedimentary sequences: In situ U/Th-Pb microprobe dating of early diagenetic monazite in Neoproterozoic black shales: NSF Sedimentary Geology and Paleobiology Program, 105,920 to UNM (1/01/07 to 12/31/08); Laura Crossey, John Bloch, Karl Karlstrom, Mike Williams., EAR-

2007-2010 Collaborative Research: Testing models for incision and neotectonics of the Grand Canyon region: field studies, Ar-Ar dating of Neogene basalts, and detrital zircon and monazite analysis of quartzite cobbles: NSF Tectonics Program, \$159,964 to UNM (7/15/07 to 6/30/10); Karl Karlstrom and Laura Crossey EAR- 0711546

2009-2011 "Continental Smokers"-- evaluating mantle-to-surface hydrologic connections, CO₂ flux, geomicrobiology, and water quality in continental rifts. NSF Hydrological Sciences Program, L.J. Crossey, K.E. Karlstrom, and others, 01-2009 to 12-2011, 300,000 to UNM, EAR- 0838575

2010 Supplement to: The Trail of Time: A Geoscience Exhibition at Grand Canyon National Park: \$200,000 to UNM (06/01/2006 to 05/31/2010); NSF Informal Science Education Program: Karl Karlstrom, Laura Crossey

2010-2011 Workshop grant for the opening of the Trail of Time: A Geoscience Exhibition at Grand Canyon National Park: \$49,560 to UNM; NSF GeoScience Education Program: Karl Karlstrom, Laura Crossey EAR 1028432

2010- 2012 US Egypt Cooperative Research: Comparisons between New Mexico and Egyptian travertines and tufas, NSF OISE, \$46,560 10/01/2010-9/30/2012, PIs KarlKarlstrom, Laura Crossey. 1004276

2011-2014 Collaborative Research: Testing Hypotheses for Neotectonic Mantle-Driven Surface Uplift of the Colorado Plateau Region: \$341,810.00 awarded to UNM, PIs Karl Karlstrom, Laura Crossey; 8/1/11 to 7/31/14, EAR- 1119629 and 1242028 supl.

2013-2016 NSF-NM EPsCOR— NSF- NM EPsCOR - Track 2R4, Energize New Mexico; Geothermal Energy in New Mexico PI L.J. Crossey and co-PI K.E. Karlstrom 7/1/2013-6/30/2018; \$772,198 awarded to EPS

2012-2015 Collaborative Research: Resolving the nature and extent of Archean (and other pre-1.8 Ga) crustal components in southwestern Laurentia using Hf and U-Pb analysis of zircon and baddeleyite. NSF Tectonics EAR-1145247- \$201,030 to UNM, 06/01/12-05/31/15 .

2014-2016 Collaborative Research: The age of Grand Canyon: applying new tests to resolve the 150-year-old debate: NSF Tectonics, \$154,081 to UNM 05/2014 to 04/2016 (with Dave Shuster, Berkeley) EAR-1348007.

2016-2019 Collaborative Research: Reconstructing the Origins of the Colorado River: An integrative Study of the Miocene-Pliocene Bouse Formation Source of Support: UNM PI is Laura Crossey; Karlstrom is UNM co-PI; NSF Sedimentary Geology and Paleobiology Total Award Amount: \$194,176 to UNM, 07/01/2016 to 6/30/2019, EAR- 1545986.

2016-2019 Collaborative Research: Helium-isotope systematics along seismic profiles in Tibet to study geometry of Indian and Tibetan lithosphere beneath the Lhasa and Qiangtang terranes, Lead PI is Simon Klemperer (Stanford), UNM PI is Laura Crossey; Karlstrom is UNM co-PI; \$83,464 for UNM, July 15, 2016-June 30, 2019. EAR-1627930.

2020-2023 Collaborative Research: Constraining the tempo and dynamics of Cambrian Earth systems in western Laurentias, Lead PI Mark Schmitz (Boise State University), UNM PI is Karl Karlstrom, Laura Crossey is UNM co-PI; \$262,998 for UNM, June 1, 2020-May 31, 2023; EAR- 1955078

INVITED PAPERS, TALKS, AND MEETINGS

- 1983 Invited to participate as co-author of the Decade for North American Geology (DNAG) volume on the Precambrian of North America (Wyoming Province Chapter).
- 1984 Invited to participate in a GSA Penrose Conference on "Melanges of the Appalachians, in Newfoundland."
- 1984 Invited to read a paper at the Ogden Tweto Memorial Symposium on "Precambrian rocks of the Southwest", GSA meeting, May, 1984, Durango, Colorado.
- 1985 Invited to attend a conference on "Heat and detachment in crustal extension on continents and planets, October, 1985, Sedona, Arizona.
- 1985 Co-sponsor (with Clay Conway of the USGS and Lee Silver of Cal Tech) of a workshop entitled "Early Proterozoic Geology of Arizona", October, 1985, at the USGS, Flagstaff, Arizona.
- 1986 Coordinator and convener of a symposium and field trip on "Early Proterozoic orogenic history in the Southwest", Spring GSA Rocky Mountain Section Meeting, May, 1986, Flagstaff, Arizona.
- 1987 Convener of a symposium and field trip on "Early Proterozoic continental assembly of southwestern North America", GSA Annual Meeting, Fall, 1987, Phoenix, Arizona.
- 1987 Invited to attend Penrose Conference on Cordilleran Metamorphic core Complexes, September, 1987, Elko, Nevada.
- 1987 Steering Committee member: CACTIS - California to Arizona Crustal Transect -Interim Synthesis - Meeting, May 1988.
- 1988 Convener of a symposium on Pre-Cenozoic crustal evolution of the eastern Mojave Desert: Cordilleran Section Meeting, Las Vegas, Nevada.
- 1988 Invited to be a panel member for "Workshop on the search for unconventional ore deposits in Arizona", co-hosted by the USGS, Arizona Geological Survey, and U.A. Geosciences Dept.
- 1988 Invited to attend a Penrose Conference on "Criteria for establishing the relative timing of pluton emplacement and deformation.
- 1989 Leader of field trip for GSA Cordilleran Section Meeting, Tucson, AZ.
- 1991 Leader of Arizona Geological Society Fieldtrip - Proterozoic Geology and Ore Deposits of Arizona.
- 1992 Convener of symposium for Spring AGU (Montreal) entitled Early and Middle Proterozoic evolution of Laurentia - Baltica.
- 1994 Leader of POMP (Proterozoic orogenesis and metallogenesis project) fieldtrip to northern New Mexico, 55 participants.

- 1994 Attended Southern Sierra Nevadas Continental Dynamics workshop, Mammoth Lakes, CA.
- 1994 Invited speaker for 1994 Illiad workshop of the Iris Consortium, Taos New Mexico.
- 1994 Invited to join IGCP project 376 Pre-Pangea analysis of Middle Proterozoic and Paleozoic interaction of Laurentia and Gondwana.
- 1995 Organized Continental Dynamics Workshop: Lithospheric Evolution of the western U.S., Albuquerque, New Mexico, April 1995.
- 1996 Invited speaker - GSA symposium on "Tectonic Development of Southern Rocky Mountains.
- 1996 Theme session coordinator - GSA - Middle Crustal Processes.
- 1998 Co-convener and invited speaker of GSA National meeting Pardee Symposium entitled: Tectonic Evolution of Precambrian North America: I. A Synthesis of Recent Results.
- 1999 Keynote speaker for GAC-MAC meeting on "Precambrian Terrane Boundaries", Sudbury Ontario.
- 1999 Co-convener and invited speaker for GSA National meeting theme session: Origin of orogenic plateaus: Interactions of plate convergence, mantle processes, and surficial processes in continental tectonics: Denver, Colorado.
- 1999 Co-convener and invited speaker for GSA National meeting theme session. Cenozoic tectonics of the southern Rocky Mountains in Colorado and New Mexico: Connections with global processes: Denver, Colorado.
- 1999 Co-convener of special session: Lithospheric structure and evolution of the Rocky Mountain region: AGU Fall meeting, San Francisco.
- 2000 1999 Invited speaker for special session: Characterization of small-scale crustal heterogeneity: AGU Fall meeting, San Francisco.
- 2000 Convener of Theme Session: Proterozoic evolution of western Laurentia: Continental Accretion to breakup of Rodinia, GSA National Meeting, Reno NV; delivered opening talk.
- 2000 Convener of Theme Session: Lithospheric Structure and Evolution of the Rocky Mountains: AGU Fall meeting, San Francisco.
- 2001 GSA Rocky Mountain Section meeting in Albuquerque: session chair for 1) Paleoproterozoic tectonics of the southwestern United States; 2) Mesoproterozoic tectonics of the southwestern United States; 3) Meso to Neoproterozoic of the western U.S.: Record of supercontinent assembly and breakup, and a snowball Earth?; 4) Continental lithosphere of the Rocky Mountain region- from Proterozoic accretion to present structure.
- 2002 GSA National Meeting, Denver Colorado, Convener of two theme sessions: on Rocky Mountains, field trip leader for Colorado shear zones fieldtrip.
- 2003 Seattle GSA, convener of Rodinia session for IGCP 440
- 2003 Durango GSA—symposium convener and fieldtrip leader

2004 Invited speaker for two sessions at the IGC meeting, Florence, Italy

2004 Keynote speaker for PanLithoprobe final conference

2005 Meeting coordinator and invited speaker for EarthScope National meeting, Santa Ana Pueblo

2005 Invited speaker EarthScope in the Northern Rockies Workshop, Bozeman

2004 Invited speaker for Supercontinents and Earth Evolution workshop, Perth Australia

2005 Invited speaker for topical session on accretionary orogens—GSA national meeting

2005 Invited speaker Northern Arizona University seminar series

2005 Invited speaker Arizona State University seminar series

2006 Invited speaker for mini-symposium at Syracuse University on Precambrian of Laurentia

2006 Gunnison GSA—topical session convener and fieldtrip leader

2006 Aspen workshop convener (CREST and LANL as sponsors)

2006 Convener for Trail of Time workshop—South Rim, Grand Canyon

2006 Invited speaker for topical session on Continental Dynamics Program —20 years later—GSA

2007 Invited speaker for 3 GSA Topical Sessions:

2007 Fieldtrip leader and Technical session coordinator for UNESCO IGCP Symposium On Paleoproterozoic supercontinents and global evolution: Ores and Orogenesis, a symposium honoring the career of William R. Dickinson, Tucson Arizona: Arizona Geological Society, p 24.

2008 6-25: NSF Informal Science Education PI Summit in Washington DC

2008 9-17: Presented EarthScope Science Café at Aztec NM

2009 Invited to give joint departmental seminar (with Laura Crossey) at U. of Oklahoma (Oct. 29).

2009 Invited to give joint departmental seminar (with Laura Crossey) at U. of Montana (Feb. 24).

2010 Invited to give joint departmental seminar (with Laura Crossey) at Cal. Berkeley (Feb. 4), NSF Geoprisms workshop (Nov. 5), University of Nebraska (Nov. 19), and New Mexico Tech (Dec. 9).

2010 Member of Nominating Committee for EarthScope Science Committee (2010-present)

2010 Member of USArray Advisory Committee (USAAC) (2010- present)

2010 Coordinated Grand Opening of the Trail of Time at South Rim of Grand Canyon and workshop entitled: “Advances in Geoscience Education in the National Parks”

- 2011 Invited to give keynote talk for 11th Australasian Environmental Isotope Conference and 4th Australasian Hydrogeology Research Conference, Cairns, Australia,
- 2012 Technical Program Chairman, Rocky Mountain Section, Geological Society of America, May, 2012, Fieldtrip leader, T9. Cenozoic Landscape Evolution in the Rocky Mountains and Colorado Plateau: Interplay between Mantle Buoyancy and Surface Processes
- 2012 Guest speaker for: "North Rim of Grand Canyon National Park's 1st Annual Geology Festival July 20, 2012
- 2012-2014 Invited speaker for annual Colorado River Guides Association Guides Training Seminar and river trip (GTS)
- 2013 Organized and convened a 2-day special theme session at the National GSA in Denver on the Evolution of the Colorado River system and age of Grand Canyon and co-led a pre-meeting fieldtrip
- 2014 Speaker at New Mexico Museum of Natural History: Age of Grand Canyon (March 27)
- 2014 Collegiate Peaks Forum: Debate with Rebecca Flowers on Age of Grand Canyon (April 11)
- 2014 Keynote speaker for the joint meeting of the American Institute of Professional geologists and the Arizona Hydrological Society: IPG/AHS National Conference: Water & Rocks - the Foundations of Life, September 13-16, 2014, Prescott, Arizona
- 2014 Invited to give Departmental seminar at Stanford University: "How old is the Grand Canyon?" October 7, 2014
- 2014 Invited to give the October 16, 2014 Sigma Xi Science & Society Distinguished Public Talk: "How Old is The Grand Canyon: Resolution of a 140-Year-Long Debate"
- 2015 University of Delaware October 29, 2015 seminar series (joint with Laura Crossey)
- 2015 University of Nevada, Reno, Discover Science Series lecture, Nov 19, 2015
- 2016 Colorado State University Department seminar Feb 11
- 2016 Consortium of Chemistry Teachers keynote talk for National Meeting Nov 4-5
- 2016 3 invited talks at 2016 GSA National Meeting in Denver (see abstracts)
- 2017 University of Calgary Galagher Symposium invited public lecture
- 2017 NM Museum of Natural History docent lecture, November 2017
- 2019 Grand Canyon Historical Society Meeting:
- 2019 Mapping Grand Canyon meeting at ASU
- 2019 Grand Canyon Geology and Geoscience Education Public Symposium 2019

- 2019 GSA Thompson Field Forum I- Age and Carving of Grand Canyon: Towards a resolution of 140 years of debate
- 2019 Geological Society of America National Meeting in Phoenix, Pardee session P2: Grand Ideas, Grand Events: Geoscience Research, Geoscience Education, and Human Connections to Grand Canyon at its Six Millionth, 150th, and 100th Anniversaries
- 2019 Theme session T1. Grand Canyon, Colorado Plateau, and Rocky Mountain Debates and Their Global Reverberations, 150 Years after Powell.
- 2022 2 Invited talks at GSA Denver, convened a theme session, and had 14 coauthored abstracts
2 invited talks at IUGS 60th anniversary meeting in Zumaia Spain

PROFESSIONAL SERVICE AND HONORS

- Member of Editorial Board for GEOLOGY magazine, 1-88 to 1-91
- Vice President for field trips, Arizona Geological Society, 1991
- Panelist for National Science Foundation Instrumentation and Laboratory Improvement Program, Jan. 1990.
- Member of Editorial Board for PRECAMBRIAN RESEARCH, 1-90 to present
- Panelist for NSF-ILI Program, Jan. 1991
- Panelist for the NSF Post-doctoral Program. Earth Science, January, 1992
- Panelist for the NSF Tectonics Program, Earth Science Division, 1992-1995
- Panelist for NSF Continental Dynamics Program, 1993-1996
- Member New Mexico Geologic Mapping Advisory Board, 1995-present
- Crosby visiting Professor at M.I.T. for Fall, 1997
- Steering Committee and workshop coordinator for U.S. Array (1999- 2002)
- Science editor for GSA Today, January 2000-2003
- Panelist for NSF special panel to evaluate IRIS proposal (2000)
- Member Pan-Lithoprobe subcommittee (2000-2003)
- Member Earthscope Science and Education Committee (2002 – 2005)
- Compiler of southern Laurentia map for IGCP 440- Rodinia map project
- Australian Research Council (ARC) “expert of international standing”
- Science editor for GSA Bulletin, July 2004- December 2008
- Co-organizer of first EarthScope National meeting, March 29-32, 2005, Santa Ana Pueblo
- Trustee of the International Basement Tectonics Association, 2005 to 2009
- Distinguished Service Award from Geological Society of America (October, 2009)
- Fellow of the Geological Society of America, 2010- present
- Recipient of the 2011 National Association for Interpretation Media Awards Competition—Ist place award for Wayside Exhibits: Grand Canyon’s Trail of Time Geoscience Exhibition

- Member of Nominating Committee for EarthScope Science Committee (2010-2013)
- Member of EarthScope USArray Advisory Committee (USAAC) (2010- 2014)
- Member of GSA Penrose metal nominating committee (2011-2014)
- Guest Associate Editor for Geosphere Themed Issue: CRevolutions 2: Origin and Evolution of the Colorado River System (papers reviewed 2012-2015)
- Recipient of the 2015 Award of Outstanding Achievement from the American Institute of Professional Geologists
- Selected as the 60th Annual Research Lecture honoree, one of the highest honors UNM bestows on its faculty members in recognition of research/creative activity of exceptional merit.
- Volume Editor and Fieldtrip leader for 2016 NMGS Fall Field Conference in Belen NM
- Guest Associate Editor: Geosphere CRevolutions 2: Origin and Evolution of the Colorado River System II themed issue (about 33 papers reviewed and accepted as of 09/2017).
- Volume Editor and Fieldtrip leader for 2017 NMGS Fall Field Conference in Ouray CO

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ABSTRACTS (* = graduate student; ** = undergraduate student)

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575. Williams, M.L., Hillenbrand, I., and Karlstrom, K.E., 2023, Full-crustal (P-T-t-D-Z) Tectonics: Combining metamorphic P-T paths, in-situ petrochronology (t) and mohometry (Z) to reveal the evolution of ancient mountain belts: Geological Society of America *Abstracts with Programs*, v. p.
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STUDENT THESES AND MENTORING

BS Senior Honors Theses Supervised

1. Raszewski, Doug, 1999. Polyphase tectonics and metamorphism and their relation to movement on the Monte Largo shear zone in the Manzona Mountains, Central New Mexico (co-supervised with Jane Selverstone).
2. Stickland, Diana, 2000. Proterozoic evolution of the Zuni Mountains. New Mexico: Peridotites, granites, rhyolites, shear zones, and a reactivation history through the present (co-supervised with Jane Selverstone). Current position: USGS, Menlo Park.
3. Ray, Jason, 2000. Analysis of the Cabin Canyon shear zone in the Virgin Mountains: Implications for an early accretionary province boundary and a later transpressional zone.
4. Rogers, Steve, 2001, New structural interpretation, microstructural analysis, and preliminary monazite geochronology of Proterozoic rocks in the central Manzano Mountains, New Mexico.
5. Doran, Linda, 2002, Banded metarhyolites in Trigo Canyon: The story they tell about the Proterozoic deformational history of the Manzano Mountains.
6. Abrams, David, 2005, New Mexico Trail of Time: Conceptual Development of a Geoscience Education Exhibit at the University of New Mexico Main Campus. cum laude
7. Rose-Coss, Dylan, 2008, Terrace mapping of the Rio Salado and compilation of Quaternary incision rates in northern New Mexico; Current position: MS Program at NM Tech.
8. Thomas Sowers, 2008, Incision History of the Rio Salado and Implications for Uplift History of the Jemez Mountains. Current position: Mine geologist, Nevada
9. Brandon Dixon, expected 2012, Precambrian Basement of the Defiance Uplift: Possible Correlation to the Uncompahgre Quartzite and Influences of Basement Fabric on Later Tectonism
10. Kolomaznik, Miela, 2013, U-series dating and stable isotope analysis of Quaternary travertine's with implications for incision rates in western Rio Grande rift, Carrizo Arroyo, New Mexico: BS thesis (co-supervised with Laura Crossey)
11. Mike Channer, 2014, Using the Longitudinal River Profile of the Rio San Jose and $^{40}\text{Ar}/^{39}\text{Ar}$ Dating of Late-Cenozoic Basalts to Test Models for Mantle-Driven Uplift Across the Jemez Lineament, New Mexico. Current position: PhD Program at USU.
12. Racheal Price, 2014, Detrital zircon of the Crooked Ridge paleoriver; Current position: MS program at UNM
13. Tyler Grambling, 2016, A Geochronologic view of the Yavapai-Mazatzal transition zone: Evidence of multiple orogenies and ongoing crustal mixing from the Proterozoic rocks of north-central New Mexico: PhD Program U Tennessee.
14. Anderson, Jordan, 2016, Marine signature of the Neoproterozoic upper Chuar Group based on Sr isotopic data: MS Program at UNM
15. Rodriguez, Benjamin, 2023, Detrital sanidine dating of river incision of the Jemez River

Masters Theses Supervised (* = Co-advisor)

1. Argenbright, Dean N., 1986. Geology and Structure of Proterozoic Rocks of the Yavapai Supergroup in Crazy Basin, Central Arizona, 81 p. (also Arizona Geological Survey Contributed Map Series 91-D). Current position: Geologist with North Carolina Dept of Transportation
2. Puls, Davis D., 1986. Geometric and Kinematic Analysis of a Proterozoic Foreland Thrust Belt, Northern Mazatzal Mountains, Central Arizona, 102 p. (also Arizona Geological Survey Contributed Map Series 91-B). Current position: Exxon senior management.
3. Sherlock, Sean M., 1986. Structure and Stratigraphy of Early Proterozoic Rocks, McDonald Mountain-Breadpan Mountain Area, Northern Sierra Anchas, Gila County, Arizona, 81 p. (Also Arizona Geological Survey Contributed Map Series 91-C).
4. Brady, Timothy B., 1987. Early Proterozoic Structure and Deformational History of the Sheep Basin Mountain Area, Northern Sierra Anchas, Gila County, Arizona, 122 p. (Also Arizona Geological Survey Contributed Map Series 91-E).
5. Roller, Julie A., 1987. Geometric and Kinematic Analysis of the Proterozoic Upper Alder Group and the Slate Creek Movement Zone, Central Mazatzal Mountains, Central Arizona, 105 p. (Also Arizona Geological Survey Contributed Map Series 91-F).
6. Darrach, Mark E., 1988. A Kinematic and Geometric Structural Analysis of an Early Proterozoic Crustal-Scale Shear Zone: the Evolution of the Shylock Fault Zone, Central Arizona, 82 p. (Also Arizona Geological Survey Contributed Map Series 91-G).
7. Fletcher, John M., 1989. Late Cretaceous Ductile Deformation, Metamorphism and Plutonism in the Piute Mountains, Eastern Mojave Desert, 89 p.; Current position: Professor at CICESE Research Institute, Mexico.
8. Wessels, Rick L., 1990. Re-Evaluation of the Slate Creek Shear Zone: Structure of Early Proterozoic Rocks, Northern Sierra Anchas, Gila County, Arizona 80 p. (Also Arizona Geological Survey Contributed Map Series 91-I). Current position: USGS, Anchorage
9. Nicholson, H.Tim, 1990. Structural Analysis of the Mesozoic Scanlan Shear Zone, California, 79 p.
10. Rothstein, David, 1990. Geology of the Scanlan Shear Zone, Central Old Woman Mountains, Southeastern California, 65 p. (co-supervised with T. Hoisch).
11. Burke, Kelley J., 1991. Tertiary Extensional Tectonism in the Northern Chief and Southernmost Highland Ranges, Lincoln County, Nevada 91 p. (co-supervised with G. Axen).
12. Kelly, Michael M., 1991. Geometric and Kinematic Structural Analysis of Late Cretaceous Ductile Thrust Zones in the Old Woman Mountains Region, Southeastern California, 128 p.
13. Labrenze, Mark, 1991. Structure of Early Proterozoic Rocks and Emplacement of the Young Granite, Pleasant Valley Area, Northern Sierra Anchas, Gila County, Arizona, 91 p. (Also Arizona Geological Survey Contributed Map Series 91-H).
14. Albin, Alton, L., 1991. Geology and Structure of the Gneiss Canyon Shear Zone in the Peacock Mountains and Southern Grand Wash Cliffs, Northwestern Arizona, 74 p. (Also Arizona Geological Survey contributed Map Series 91-K). Current position: Geologist with U.S. Bureau of Reclamation

15. Doe, Michael F., 1991. Structural Geology of a Proterozoic Foreland Thrust-System in the Vicinity of Barnhardt Canyon, Central Mazatzal Mountains, Central Arizona, 91 p. (Also Arizona Geological Survey Contributed Map Series 91-J). Current position: PhD from Colorado School of Mines, now a consulting geologist.
16. Hoyt, C.R., 1992. Geology of the Cowpie Peak and Mercury Mountain areas, Northern Old Woman Mountains, Southeastern California, (co-supervised with T. Hoisch).
17. Ilg, Brad R., 1992. Early Proterozoic Structural Geology of the Upper Granite Gorge, Grand Canyon, Arizona, 54 p. Now the Science Advisor r Prime Minister of New Zealand
18. Villallos, Anita, 1993. Structural Analysis of the Northern Shylock Shear Zone, Central Arizona, p.
19. Owens, Matt., 1993. Structural Analysis of the Southwestern Scanlan Shear Zone, Old Woman Mountains, Southeastern California, 93 p.
20. Ring, Thomas, 1993. Geologic Evolution of Early Proterozoic Rocks, Piute Mountains, Southeastern California, 125 p.
21. Kirby, Eric, 1994. Tectonic setting of the Sandia pluton: an orogenic 1.4 Ga granite in New Mexico, 54 p.; current position: Professor at Oregon State University.
22. Hutchison, Jimmie, 1996. Relative timing of porphyroblast growth and peak metamorphism in the Lower Granite Gorge, Grand Canyon, Arizona, 59 p.
23. Read, Adam, 1997. A Mid-Crustal Cross Section From the Rincon Range, Northern New Mexico: Evidence for 1-68 Ga Pluton-Influenced Tectonism and 1.42 Ga Regional Metamorphism, p. 46. Current position: GIS specialist for New Mexico Bureau of Mines.
24. Timmons, J. Michael, 1998. Proterozoic multistage (~1.1 and ~0.8 Ga) extension in the Grand Canyon Supergroup and establishment of northwest and north-south tectonic grains in the southwestern US. Current position: Director of NM Statemap Program at New Mexico Bureau and NM Tech.
25. Brown, Cynthia L., 1998. Paleoproterozoic deformation, metamorphism, and $^{40}\text{Ar}/^{39}\text{Ar}$ thermal history of the 1.65 Ga Manzanita Pluton, Manzanita Mountains, New Mexico.
26. Simmons, M.C., 1998. Quartz-kyanite pods in Proterozoic rocks in northern New Mexico: Shear zone formation along an older hydrothermal alteration horizon.
27. McCoy, Annie, M., 2001, The Proterozoic ancestry of the Colorado Mineral Belt: ca. 1.4 Ga shear zone system in central Colorado, 140 p.; Current position: Senior Hydrogeologist, John Shoemaker & Associates, Inc
28. Tyson, Amanda, 2002, Proterozoic Farwell Mountain-Lester Mountain suture zone, northern Colorado: subduction flip and progressive assembly of arcs: MS thesis (with distinction), University of New Mexico, 144 p.
29. Quigley, Mark C., 2002, Tectonic development of Proterozoic structures and their influence on Laramide and Miocene deformation, north Virgin Mountains, SE Nevada and NW Arizona, 194 p.; Current position: Professor and Senior Lecturer in Active Tectonics and Geomorphology University of Melbourne.

30. Jessup, Mica H., 2003, A tectonic history of the Proterozoic rocks in the Black Canyon of the Gunnison, Colorado, 143 p.; Current position: Professor at University of Tennessee.
31. Baer, Sunny., 2004, Geologic and tectonic evolution of the Manzano Peak Quadrangle, Manzano Mountains, New Mexico: defended May, 2004.
32. Luther, Amy, 2006, History and timing of polyphase Proterozoic deformation in the Manzano thrust belt, central New Mexico; PhD from NMT, current position: Assistant Professor and Fieldcamp Director, Louisiana State University.
33. Zinsser, Austin, 2006, New stratigraphy, polyphase deformational history, and basement- involved thrust model for the Proterozoic Vallecito Conglomerate and Uncompahgre Group of the Needle Mountains of Colorado.
34. Sandoval, Magdalena, 2007, Quaternary incision history of the Black Canyon of the Gunnison, Colorado, 96 p., Current position: PhD student at UNM.
35. Crow, Ryan, 2008, Quaternary basalts and incision history of western Grand Canyon. Current position: Mendenhall post-doc at USGS in Flagstaff.
36. Darling, Andy, 2010, Evaluating Neogene uplift and denudational history of the Colorado Rockies using river profiles and incision records. Current position: PhD program at ASU.
37. Shufeldt, Owen, 2010, Crystal shear zone of Grand Canyon and detrital zircons of the turbidites in Grand Canyon. Current position: Senior Structural Geologist, Rio Tinto Iron Ore, Perth Australia.
38. McDermott, Jake, 2011, Microstructural, geochronological, and thermochronological evidence for both Paleo and Mesoproterozoic displacement across the Gniess Canyon shear zone, Lower granite Gorge, Grand Canyon, Arizona. Current position: Environmental firm in New Jersey.
39. Nereson, Alex, 2012, Dynamic topography of the western Great Plains: Geomorphic and $^{40}\text{Ar}/^{39}\text{Ar}$ evidence for mantle-driven uplift associated with the Jemez lineament of NE New Mexico and SE Colorado Current position: PhD program at UC Davis.
40. Robertson, Jesse, 2014, Geomorphology of the Surprise Valley Landslide in Grand Canyon
41. Holland, Mark, 2015, An imbricate mid crustal suture zone: the Mojave-Yavapai province boundary in Grand Canyon, Arizona: UNM MS thesis, 2014, now in PhD program at UNM
42. Warnecke, Nadine, 2015, Timing of erosional episodes in the Marble Canyon and Vermillion Cliffs region from apatite (U-Th)/He thermochronology, UNM MS thesis 2015, now working for consulting company Sundance consulting.
43. Repasche, Marissa, 2016, Differential incision and neotectonic faulting along the Rio Grande, New Mexico, 2016.
44. Hrcir, Jeffrey, expected 2019, Gold deposits and crustal evolution of the Black Hills orogeny
45. Walk, Cory, 2018, Birth and Evolution of the Virgin River
46. Holt, Benjamin, 2019, Geothermal potential of the Rico area, SW Colorado

47. Anderson, Jordan, 2020, Birth and Evolution of the Salt River, Arizona
48. Ferguson*, Christina, 2019, Geochemistry of the Bouse Formation
49. Young, Daniel, 2019, mapping the Mazatzal- Picuris orogeny unconformity
50. Micael Albonico, 2021, Birth and Evolution of the San Juan River
51. Cameron Reed, expected 2023
52. John Bailey, 2024, Proterozoic Tectonic Evolution of the Lower Granite Gorge, Grand Canyon, Arizona: a middle crustal record of multiple orogenic pulses:
53. Jason Boryzewski, 2026, Tectonic sliver of the 1.84 Ga Elves Chasm Gneiss assembled during 1.73 Ga suturing in the Grand Canyon.

Ph.D. Dissertations supervised (* = Co-advisor)

1. Ilg, Brad R., 1996. Tectonic evolution of Paleoproterozoic rocks in the Grand Canyon: Insights into middle crustal processes, 101 p. Current position: Science Advisor to the Prime Minister of New Zealand
2. Pedrick, Jane N., 1996. Polyphase Proterozoic tectonometamorphic history of the Taos Range, northern New Mexico (co-supervised with Jeff Grambling), 146 p. Current position: Instructor at University of Iowa.
3. Thompson, Amy 1996, Deformational and metamorphic history around the 1.4 Ga Priest pluton, Manzano Mountains, New Mexico (co-supervised with Jeff Grambling).
4. Shaw, Colin, 2001, Genesis and evolution of Proterozoic crustal boundaries in the southern Rocky Mountains. Current position: Research Professor and Geology Field Camp Director, Department of Earth Sciences, Montana State University, Director, Office of Undergraduate Research, Montana State University
5. Timmons, J. Michael, 2004, Mesoproterozoic tectonic evolution of southwestern North America: protracted intracratonic deformation, sedimentation, and differential exhumation in Grand Canyon and the Rocky Mountain region. Current position: Director of NM Statemap Program, Assistant Director of the New Mexico Bureau of Geology, and Associate Professor at NM Tech.
6. Salem, Tony, 2009, Tectonics and structural geology of the Big Maria Mountains, southern California. Current position: Shell Exploration & Production Company
7. Crow, Ryan, 2012, Neotectonic evolution of Grand Canyon: Interaction between volcanism, river incision, epeirogenic uplift, and faulting; Current position: Mendenhall post-doc at USGS in Flagstaff.
8. Ricketts, Jason, 2014, Updated models on the evolution of the Rio Grande rift: Embryonic core complexes, fluid-enhanced Quaternary extension, and apatite (U-Th)/He constraints for large magnitude 18-15 Ma fault slip. Current position: Research Professor at University of Texas El Paso.
9. Doe*, Michael, 2014, Reassessment of Paleo- and Mesoproterozoic basin sediments of Arizona: Implications for tectonic growth of southern Laurentia and global tectonic configurations: Colorado School of Mines PhD, co- supervised by KEK. Now a consultant.
10. Donahue, Magdalena Sandoval, 2016, Multi-stage uplift of the Rocky Mountains: new age constraints on the Telluride Conglomerate and regional compilation of apatite fission track ages;
11. Mulder*, Jacob, 2017, visiting scholar from Tasmania on Endeavor Scholarship: Correlating Tasmanian and western US Mesoproterozoic successions
12. Holland, Mark, PhD 2018, Hf isotopes of Grand Canyon and Death Valley.
13. Winn, Carmen – PhD 2019, Thermochronology of the Grand Staircase, expected 2018.
14. Thacker, Jacob, PhD 2020, Laramide orogeny, time and space progression and implications for mechanisms.
15. Reed, Cameron, PhD expected 2026,

Post-Doctoral students supervised

1. Dr. Stephan Bergh— 1991-1993, Current position: professor at the University of Tromso, Norway, Professor at University of Tromso
2. Dr. Mathew Nyman- 1994-95, UNM, Current position: Faculty at Oregon State University
3. Dr. Steven Whitmeyer 2004-2006, Current position: Professor at James Madison University
4. Dr. Moustafa Selmi- 2012; Current position: Lecturer/ professor at University of Suez Canal in Egypt.
5. Dr. Ryan Crow- 2012-2014, Current position: Mendenhall post-doc with USGS (2014-2016)

COURSES REGULARLY TAUGHT AT UNM

EPS 101 Physical Geology (once per year in Fall and part of the freshman Learning Communities Program)
EPS 310 New Mexico Field Geology (once per year in Fall)
EPS 307 and 307L Structural Geology and Lab (once per year in Spring)
EPS 523 Topics in Tectonics—(every other year in Fall)
EPS 526 Advanced Structural Geology (every other year in Spring)
EPS 420/520 Advanced Field Geology (most summers).

PROFESSIONAL SERVICE

Member of Editorial Board for PRECAMBRIAN RESEARCH, 1-90 to present
Member New Mexico Geologic Mapping Advisory Board, 1995-present
Steering Committee and workshop coordinator for U.S. Array (1999- 2002)
Science editor for GSA Today, January 2000-2003
Member Canadian Pan-Lithoprobe subcommittee (2000-2003)
Member Earthscope Science and Education Committee (2002 – 2005)
Compiler of southern Laurentia map for IGCP 440- Rodinia map project
Australian Research Council (ARC) “expert of international standing”
Science editor for GSA Bulletin, July 2004- December 2008
Co-organizer of first EarthScope National meeting, March 29-32, 2005, Santa Ana Pueblo
Trustee of the International Basement Tectonics Association, 2005 to 2009
Distinguished Service Award from Geological Society of America (October, 2009)
Fellow of the Geological Society of America, 2010- present
Recipient of the 2011 National Association for Interpretation Media Awards Competition—Ist place
award for Wayside Exhibits: Grand Canyon’s Trail of Time Geoscience Exhibition
Member of Nominating Committee for EarthScope Science Committee (2010-2013)
Member of EarthScope USArray Advisory Committee (USAAC) (2010- 2014)
Member of GSA Penrose metal nominating committee (2011-2014)
Guest Associate Editor for Geosphere Themed Issue: CRevolution 2: Origin and Evolution of the
Colorado River System (2012-2014)

Regular review of articles for numerous journals-3-10 per year
Regular review of NSF proposals- 2-5 per year
Served on numerous NSF panels
Frequent GSA and AGU session chair

UNIVERSITY SERVICE

Served on UNM Research Policy Committee
Served on A&S Senior Promotion and Tenure Committee
Served on A&S Curriculum Committee

DEPARTMENTAL SERVICE

Served on and acted as chair of Graduate admission committee
Served on Undergraduate committee
Served on Alumni Relations Committee
Served as Saw Room coordinator
Served as Vehicle coordinator
Co-Chair of Geophysics Search committee

OUTREACH ACTIVITIES AND BROADER IMPACTS

2005 BBC series on Grand Canyon by Jonathan Fildes:

domestic versions at BBC World Service:

<http://www.bbc.co.uk/radio4/science/earthmadeforlife.shtml>

<http://www.bbc.co.uk/cgi-bin/worldservice/psims/ScheduleSDT.cgi>

web broadcasts: <http://www.bbc.co.uk/worldservice/programmes/discovery.shtml>

<http://www.bbc.co.uk/radio4/science/madeforlife.shtml>

The program “Pick of the Week” selected the Karlstrom-Timmons interview as one of the week’s highlights of BBC Radio from among 8 BBC stations available in the UK

2007 Discovery Channel- Fearless Planet- Grand Canyon (filming in October 07 for release in December 07.

2008-[Naked Science: Grand Canyon \[TV-G Ratings N/A\]](#)

<http://channel.nationalgeographic.com/channel/ET/popup/200802112000.html>

<http://channel.nationalgeographic.com/channel/ET/popup/200802112000.html> film

ming in June 07 for release on Feb 11, 2008). *The Grand Canyon: Its one of the most famous natural wonders of the world, yet little is known about how it came to be. Now, NGC opens windows to the past to unearth some of this natural phenomenon's secrets. Join experts as they uncover theories about the canyons iconic rock layers, and go back in time to relive the first expedition to its floor. Naked Science: Grand Canyon goes beyond a guided tour to explore the history and formation of this extraordinary place.*

2008 [Naked Science: The Rockies \[TV-G Ratings N/A\]](#) filming in Aug/Sept 07 for release on February 12,

2008). [http://channel.nationalgeographic.com/channel/ET/popup/200802112100.](http://channel.nationalgeographic.com/channel/ET/popup/200802112100.html)

[http://channel.nationalgeographic.com/channel/ET/popup/200802112100.h](http://channel.nationalgeographic.com/channel/ET/popup/200802112100.html)
[tml](http://channel.nationalgeographic.com/channel/ET/popup/200802112100.html)

The Rocky Mountain range is the backbone of our continent, yet the forces that created it remain the cause of debate. Did the American Rockies rise at a faster rate than their Canadian counterpart? New evidence may suggest just that. And is glacier melt in the Canadian Rockies occurring at a faster rate than ever before? Naked Science: The Rockies meets with top scientists and examines a radical new theory to shed light on the mysteries of these ancient mountains.

2010—Karlstrom and Crossey were PIs for the Trail of Time Exhibition Grand Canyon National Park, which opened October 13-11, 2010. This project helped convey connections between uplift of the Rockies and history of the Colorado River, was the culmination of 15 years of work, benefitted from advocacy from the Continental Dynamics Program, and now reaches about 5 million annual Park visitors with hands on informal geoscience education. The Exhibition won the 2011 award for “best wayside exhibit” from the National Association for Interpretation.

2010- Karlstrom was filmed for the geologic component of the Grand Canyon National Park Visitor Center Movie which now is shown every 30 minutes at the Visitor Center.

2010 Initiated at the 2010 Flagstaff workshop held at USGS, we are working on a Geosphere Special Volume entitled: "CRevolution 2: Origin and Evolution of the Colorado River System". Dennis Harry is acting as main Geosphere editor; Guest Associate Editors are Karl Karlstrom, Sue Beard, Dick Young, and Andres Aslan. So far there have been about 8 manuscript submittals and about 4 accepted papers, and we anticipate a nice volume of about 15-20 papers (deadline for submission is December 2012). We hope this volume will be as successful at promoting scientific dialog and

- new advances as the Young and Spamer (2001) volume that summarized the 2000 Grand Canyon workshop, also held in Flagstaff.
- 2012 “KNME Connect” PBS TV filming in Albuquerque about Grand Canyon and the Rio Grande rift, with Karl Karlstrom and Laura Crossey, March, 2012, <http://www.newmexicopbs.org/connect/>, now broadcast several times on public television and available through their website.
 - 2012 GSA Rocky Mountain section meeting—LJC was meeting chair, KEK was technical program chairman and fieldtrip leader. We held a session related to this grant entitled: T9. Cenozoic Landscape Evolution in the Rocky Mountains and Colorado Plateau: Deciphering the Interplay between Mantle Buoyancy and Surface Processes (GSA Geophysics Division; GSA Quaternary Geology & Geomorphology Division; GSA Sedimentary Geology Division; GSA Structural Geology & Tectonics Division). Conveners were Richard A. Young, Andres Aslan, Karl E. Karlstrom and Eric Kirby.
 - 2012 We submitted an NSF highlight entitled: “Uplift of the Colorado Plateau and the Rockies, and carving of a young Grand Canyon (six million years old) driven by a restless Earth’s mantle” (submitted May, 2012)
 - 2012/ 2013-- KEK, LJC, and Ryan Crow (KEK PhD student) were guest speakers for the March/April 2012 Grand Canyon Guides Training Session, an annual event designed to inform Grand Canyon boatman about current research and aid in their ongoing outreach efforts. KEK and LJC also participated in boatman training on the first half of the GTS training river trip.
 - 2012 Crossey was filmed in a PBS documentary entitled : “Valles Caldera, the Science” that aired in early 2013 on PBS channels and won two Emmy awards; she discussed mantle influences on groundwater chemistry: <http://vallescalderadocumentary.com/part-one-the-science/>
 - 2013 Geo Magazine (Germany) special issue on National Parks of USA, Grand Canyon photos by Karsten Peters, story by Lars Abromeit from our 2012 trip; GEO Special Nr. 1/2013 – National Parks USA, http://www.geo.de/GEO/heftreihen/geo_special/geo-special-nationalparks-usa-74126.html, and GEO, 2013, v. 11, p. 29-52, Nov 2013 (www.geo.de)
 - 2013 Karlstrom is a collaborator on an NSF- TUES type-2 project (NSF – 1225741) awarded to ASU (PIs Steve Semken and Ariel Anbar) that is creating virtual fieldtrips for use in geoscience education at the 101 Intro level and for open- access use in public interpretation (Bruce et al., 2013); <http://vft.asu.edu/>
 - 2013 co-convenor of a 2-day long GSA special session for Denver 2013 GSA, Oct 28,29, 2013; Title: CRevolution 2: Origin and evolution of the Colorado River system and Cenozoic landscape evolution of the Colorado Plateau-Rocky Mountain region: <http://community.geosociety.org/2013AnnualMeeting/sessions/special>
 - 2013- Karlstrom was filmed for a documentary on the growth and assembly of the North American continent entitled: “North America Inside Out” (Discovery Channel’s Curiosity Series, January 2014).
 - 2014 Feature article about our Colorado River work in Science News by Alexandra Witze: The Long and Winding Colorado: Science News, Jan 25, 2014, p. 22-26: <https://www.sciencenews.org/article/long-and-winding-colorado>
 - 2014 Karlstrom et al., 2014 Nature Geoscience article: *Formation of the Grand Canyon 5 to 6 million years ago through integration of older palaeocanyons*, v. 7, p. 239-244 is in the 99th percentile for “online attention”; it is ranked 205th of the 80,347 tracked articles of a similar age in all

journals (<http://www.nature.com/ngeo/journal/v7/n3/ngeo2065/metrics>) with >40 news postings, including the following links to interviews, press releases, and articles as of May 2014:

Nell Greenfieldboyce- [National Public Radio Morning Edition](#)

<http://www.npr.org/2014/01/27/265437261/grand-canyon-may-be-older-and-younger-than-you-think>

Alendra Witze – Nature News

<http://www.nature.com/news/grand-canyon-is-not-so-ancient-1.14584>

Ashley Yeager- ScienceNews magazine

<https://www.sciencenews.org/blog/science-ticker/grand-canyons-origin-dated-6-million-years-ago>

John Amos- BBC News Science and Environment

<http://www.bbc.co.uk/news/science-environment-25881953>

Joel Achenbach- Washington Post

http://www.washingtonpost.com/national/health-science/new-research-revives-debate-over-grand-canyons-age/2014/01/26/6da35f32-8539-11e3-9dd4-e7278db80d86_story.html

Sid Perkins- National Geographic Daily News

<http://news.nationalgeographic.com/news/2014/01/140126-grand-canyon-american-southwest-erosion-geology-geophysics/>

Richard Kerr- Science AAAS News

<http://news.sciencemag.org/earth/2014/01/grand-canyon-frankenstein>

Becky Oskin – Yahoo News

<http://news.yahoo.com/grand-canyon-39-age-mix-wild-west-180241469.html>

eScience Blurb- e! Science news

<http://esciencenews.com/sources/national.geographic/2014/01/26/unlocking.secrets.grand.canyons.age>

Phys.org Blurb- Phys.org

<http://phys.org/news/2014-01-grand-canyon.html>

Liz Fuller-Wright: Christian Science Monitor

[How old is the Grand Canyon? You might be surprised.](#)

Sarah Pruitt - [History.com](#)

<http://www.history.com/news/how-old-is-the-grand-canyon-that-depends-scientists-say>

Canadian Broadcast Company, CBC radio with host Bob McDonald—Quirks and Quarks—interview aired on CBC and Serious XM radio February, 22, 2014-- <http://www.cbc.ca/quirks/episode/2014/02/22/february-22-2014/>

Albuquerque Journal Front Page <http://www.abqjournal.com/346998/news/origins-of-the-grand-canyon.html>

History Channel: <https://m.youtube.com/watch?fbclid=IwAR1swvpYWh2QcJOlkukY8chjaRNTb-WwhXO1JBZz18UTsxTelQzoMtlQ4Kc&v=LaxaE7tcwu4&feature=youtu.be>

2015 The Making of North America

2019

February 21-23, 2019 Grand Canyon Historical Society Meeting (gave talk- 150 years of visualizing geology)

February 28-March 1, 2019 Mapping Grand Canyon

March 1-3, 2019 Bouse Fm. drilling workshop for Lower Colorado River age and origin

April 18-20, 2019 Grand Canyon Geology and Geoscience Education Public Symposium 2019

September 14-21, 2019 GSA Thompson Field Forum I- Age and Carving of Grand Canyon- river symposium

September 22-25, 2019, Geological Society of America National Meeting in Phoenix, Pardee and 2 theme sessions

2020

October 11-17, 2020 Virtual Grand Canyon Geology Festival on Facebook (Geofest 2020)

<https://youtube.com/playlist?list=PL34-ozNGa7CTvjuiu5-GeYEK5rrv33pDE>

2021

April 3-13, 2021 GC Field Forum II- The Grand Canyon Supergroup

September 11-21, 2021 GC Field Forum III- Vishnu basement rocks of Grand Canyon

November 9, 2021: AGI/NPS webinar speaker: Geoscience Research in National Parks: A Welcome and How-To. We had 310 registrants from higher education, government, consulting, research, and non-profit, and from about 23 countries around the world.

<https://www.americangeosciences.org/webinars/geoscience-research-national-parks>

<https://www.youtube.com/user/AmericanGeosciences/videos>

2022

April 1-11, 2022 GC Field Forum II- The Great Unconformity, Meso, Neoproterozoic and Grand Canyon Geology and Geoscience Education Second Public Symposium at the Park

September, 2022 GC Field Forum IV- Springs and Groundwater of Grand Canyon- river symposium

October 25-30 IUGS 60th anniversary meeting in Zumaia Spain: Two Grand Canyon sites approved as IUGS International Geoheritage Sites

Appeared in German TV documentary: <https://www.arte.tv/de/videos/097522-000-A/der-zauber-des-grand-canyon/>

2023