

## Megan L. Anderson

### CONTACT INFORMATION

Washington Geological Survey

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WGS site: <https://www.dnr.wa.gov/programs-and-services/geology/contact-us>

Personal Web site: <https://quantitativeinquiries.com>

### EDUCATION

2005 Ph. D., Geosciences, concentration in Geophysics, Department of Geosciences,  
University of Arizona, Tucson, AZ

1998 B.A., Geology, Carleton College, Northfield, MN

### PROFESSIONAL EXPERIENCE

2018-present **Earthquake Geologist/Geophysicist**, Washington Geological Survey  
\* Conducting research on Pacific Northwest earthquake hazards and fault mapping.  
\* Assisting construction of two geological maps per year.  
\* Conducting field geophysical surveys of ground magnetic and gravity anomalies.

2013-2017 **Associate Professor**, Colorado College  
\* Taught 6 Geology Department classes per year  
\* Advised 2-4 undergraduate student independent research projects per year  
\* Conducted geophysical/mapping studies of subduction zones with seismologic, gravity, and magnetic data

2007-2013 **Assistant Professor**, Colorado College

2005-2006 **Mendenhall Postdoctoral Fellow**, USGS, Menlo Park, CA.

\* Conducted research utilizing potential fields, seismology, structural geology principles and modeling to construct structural models of the Seattle fault in the Pacific Northwest.

2003-2004 **Teaching Assistant**, University of Arizona.

2003 **Summer Intern**, Lawrence Livermore Laboratory.

\* Evaluated multiple event relocation algorithms for location errors utilizing a dataset from the Nevada Test Site.

2001-2005 **NSF Graduate Research Fellow**, University of Arizona.

\* Primary project: evaluating seismic data to image the structure of the subducting plate and mantle of the Nazca subduction zone, Chile and Argentina.

2000-2001 **Graduate Research Assistant**, University of Arizona.

1998-2000 **Geophysics Intern**, USGS, Menlo Park, CA.

\* Primary project: imaging the Rialto-Colton fault, part of the San Jacinto fault zone, and the San Bernardino basin for seismic hazards evaluation in southern California.

1996-1998 **Geology Lab Assistant and Mathematics Tutor**, Carleton College.

## RESEARCH INTERESTS

I have a variety of interests in structure, kinematics, and dynamics of active tectonic regions from the upper mantle through the crust, particularly subduction zones and convergent settings. Many of my activities center around quantitative assessment of structural and kinematic tectonic models using many types of geophysical data in conjunction with geological constraints. Field mapping of potential field anomalies alongside geologic mapping projects forms the core of my investigations. For other projects, I predominantly use the collection and analysis of seismic data. I also use data and results from my tectonic investigations to evaluate neotectonics and seismic hazards for urban areas, particularly in the Pacific Northwest. My typical projects are integrative and cross-disciplinary, because I believe collaboration of colleagues with complementary expertise is an essential approach that leads to many of the strongest, most lasting geological discoveries.

## RESEARCH PROJECTS

2018-present **7.5' Quadrangle Mapping for Earthquake Hazards and Natural Resource Management, USGS StateMap Funding, Yearly**

\* Primary Collaborators: A. Steely, M. Polenz, A. Sadowski, T. Lau, R. Cakir, (WA State DNR)

\* Mapping quadrangles in Washington State. The team integrates geologic, potential field, seismic, geomorphic, cosmogenic, petrologic and geochemical analyses to constrain interpretations.

\* Interpreting aeromagnetic and isostatic gravity maps and ground magnetic data to constrain structural interpretations of faults and other geologic structures. Quantitatively modeling all datasets with geological constraint to test cross-section hypotheses.

2018-present **Earthquake Hazards in the Chehalis Basin Region, State of Washington Capitol Budget, Funded March, 2018**

\* Primary Collaborators: A. Steely, T. Lau, R. Cakir, W. von Dassow, T. Reedy (WA State DNR); L. Staisch (USGS)

\* Investigating the seismic hazard potential of faults near a proposed flood-control structure site on the Chehalis River, in particular, the Doty and associated faults.

\* Interpreting aeromagnetic maps, isostatic gravity maps and ground magnetic data to constrain structural interpretations of faults. Quantitatively modeling all datasets with geological constraint to test structural hypotheses.

\* Working towards defining a new 3-D regional fault system in the Chehalis Basin area.

2016-17 **Geothermal Play-Fairway Analysis of Washington State Prospects, DOE Proposal for Phase 3 Funded July, 2017**

\* Primary Collaborators: C. Forson, A. Steely (WA State DNR); B. Ritzinger, J. Glen (USGS)

- \* Co-led design and implementation of a plan to gather new gravity and ground magnetic datasets for 4 distinct locations of geothermal favorability within the Cascades of Washington State. Locations include the Wind River Valley, Mt. St. Helens, and Mt. Baker.
- \* Interpreting and modeling gravity and magnetic data to create upper crustal structural representations in conjunction with a range of other data types including magnetotelluric, geologic and seismic data. Greatest leadership for analyzing data associated with the Mt. St. Helens Seismic zone.
- \* Writing reports about our data and analysis and making recommendations based on our interdisciplinary interpretations for geothermal favorability modeling to Department of Natural Resource project leaders.

**2005-2017 Seismic Hazards of the Puget Lowland, WA. Funding from Colorado College Natural Science Division, USGS Mendenhall Postdoctoral Program**

- \* Primary Collaborators: J. Dragovich (WA State DNR); R. Blakely, R. Wells, T. Brocher, T. Pratt, R. Haugerud (USGS)
- \* Led new gravity data collection to fill gaps in data coverage in the Puget lowland; supported undergraduate student research projects designed to better understand crustal fault structure and seismic hazards.
- \* Collaborated with scientists from the Washington State Department of Natural Resources and others in mapping quadrangles for the eastern portion of the Puget Sound area. The team integrated geologic, potential field, seismic, geomorphic, cosmogenic, petrologic and geochemical analyses to constrain interpretations. This collaboration was funded for many years as the #1 StateMap proposal in the U.S. as a result of the multi-disciplinary approach.
- \* Interpreted aeromagnetic and isostatic gravity maps and quantitatively modeled both datasets to constrain structural interpretations of faults and other geologic structures.
- \* Quantitatively assessed the structure and kinematics of existing and new 2-D models of the Seattle and other fault zones based on all available geophysical, geologic and geomorphic datasets.
- \* Developed a new 3-D regional fault system and Seattle basin structural interpretation, including its implication for known seismic hazard.

**2014-15 Geophysical Imaging of the Water Table, U.S. Air Force Academy, Colorado Springs, CO. Funded by Mellon-Foundation Grant for Civil-Military Academic Cooperation**

- \* Primary Collaborator: C. Tewksbury-Christle (USAFA)
- \* Gathered small-scale seismic refraction and electrical resistivity data in support of USAFA engineering faculty-identified questions about the water table on the USAFA grounds.
- \* Much field work focused on finding the water table depth below a new USAFA building with a geothermally-heated foundation, and tracking the water table to its intersection with a local creek.

**2012-13 Geophysical prospecting in Pueblo Viejo, Costa Rica, Funding from Colorado College Natural Science Division**

- \* Primary Collaborator: E. Gomez (Colo College)
- \* Gathered ground magnetic and electrical resistivity data in support of pre-excavation activities.

- \* Advised sophomore and junior students in assembling maps of data to assist identification of buried architectural elements at Pueblo Viejo.

2009-present **Collaborative Research: Formation of basement-involved foreland arches: An integrated EarthScope experiment**, Bighorn Mountain region, WY. **NSF EarthScope Project #0843889**

- \* Primary Collaborators: E. Erslev (UW-Laramie); A. Sheehan (CU-Boulder); K. Miller (Texas A&M); C. Siddoway (Colo College); L. Worthington (U Albuquerque); H. Ford (U California Riverside)
- \* Led a portion of the work proposed: siting, installing and maintaining an array of 27 broadband seismic stations across the Bighorn Mountain Range. Assisted implementation of other portions of the seismic work for this project in the summer of 2010.
- \* Building a high resolution structural model of the Bighorn Mountain Range from surface to upper mantle, by integrating a series of seismic analyses with geologic mapping.
- \* Primary data analysis responsibility: advising undergraduate students investigating seismic anisotropy with shear wave splitting analysis aimed at imaging cratonic mantle structure.
- \* Advising and assisting gravity and aeromagnetic data analysis and modeling of range-scale structures.
- \* Co-advised Keck consortium undergraduate research project for 9 students working on structural and geophysical problems related to the larger NSF project.

2008-2017 **Collaborative Research: Structure of the Nazca slab and Sierras Pampeanas**, Cordoba, Argentina. **NSF Geophysics Project #0738935**

- \* Primary Collaborators: H. Gilbert (Purdue); P. Alvarado (UN de San Juan); L. Linkimer (U de Costa Rica); S. Beck (U Ariz)
- \* Designed and implemented an array of 12 broadband seismic stations across the Sierras de Cordoba, in collaboration with Hersh Gilbert of Purdue University.
- \* Defined the structure of the crust and Moho geometry of the basement-cored Sierras Pampeanas uplifts through receiver function analysis and location of crustal seismicity.
- \* Constrained the dynamics of the sinking Nazca plate and its interaction with the surrounding mantle through analysis of shear wave splitting and focal mechanism data.

2007-2012 **Rift Geometry of the Sunshine Basin**, San Luis Valley, NM.

- \* Primary Collaborators: C. Ruleman, B. Dreneth, T. Grauch (USGS)
- \* Advised students in class-based and small-scale independent study geophysical mapping projects designed to model the structure of small parts of the Rio Grande Rift.
- \* Collaborated with USGS scientists to contribute collected gravity data and analysis for constraining fault ages and offsets; integrated fault geometries revealed through geophysics with surface fault locations and ages from active mapping studies by USGS scientists.

May-Sept., 2007 **Technology Assistance with Implementation and Operation of Transportable Array Element of USArray and EarthScope**, CO. Funded by National Science Foundation (USArray)

- \* Supervised 6 students from Colorado College and other universities in Colorado and Utah in scouting and documenting sites for 53 seismic stations built in the state of Colorado for the USArray project.

2004-2008 **Southern California GPS Network Development.** Partial funding from **Colorado College Natural Science Division**

- \* Primary Collaborator: R. Bennett (U Ariz)
- \* Assisted development of new projects that constrain the spatial and temporal development of fault strands associated with the San Andreas fault zone.
- \* Co-designed and installed new campaign-style GPS network in Joshua Tree National Park (Joshua Tree Integrative Geodetic Network) that integrates with Plate Boundary Observatory stations within the park.
- \* Advised UA graduate student (Josh Spinler) utilizing the GPS data and local gravity data to improve tectonic block models, describing the most likely position of and past displacement along fault strands associated with the San Andreas fault and Eastern California shear zone within the western part of Joshua Tree National Park.

2000-2005 **Seismological Studies of the Central Chilean Subduction Zone** Graduate Research Project, University of Arizona, Tucson, AZ. Partial funding from **NSF Graduate Research Fellowship**

- \* Primary Collaborators: G. Zandt (Ph.D. adviser), S. Beck, P. Alvarado, L. Wagner (U Ariz); M. Fouch (Az State U)
- \* Assisted and lead field and database work in Chile and Argentina, maintaining a PASSCAL broadband seismic network (2000-2002).
- \* Located earthquakes and calculated focal mechanisms with first motions for earthquakes within the subducting Nazca slab to better resolve flat-slab structure and deformation. Applied these observations towards a better understanding of the dynamics of flat-slab subduction.
- \* Analyzed local and teleseismic earthquakes for evidence of anisotropy in the lithosphere and asthenosphere and applied this to the broader problem of constraining mantle flow and dynamics in subduction zones.

2003 **Assessing Earthquake Location Error,** Lawrence Livermore National Laboratory, Livermore, CA

- \* Primary Collaborator: S. Myers (LLNL)
- \* Utilized scripting languages and MatLab to develop a set of location accuracy statistics for clusters of test events in the Nevada Test Site using GMEL relocation code.
- \* Interpreted empirical quantification of location error in terms of the utility of multiple event location algorithms for producing accurate event locations.

1998-2000 **Structure of the San Jacinto Fault Zone and San Bernardino Basin,** USGS, Menlo Park, CA

- \* Primary Collaborators: B. Jachens, J. Matti (USGS)
- \* Lead and assisted field work collecting gravity data in Southern California and Nevada.
- \* Processed data into isostatic gravity maps.
- \* Analyzed isostatic gravity and aeromagnetic maps in conjunction with geologic data to estimate fault locations for use in hydrologic models and produce 2-D and 3-D models related to pull-apart basin development along the San Jacinto fault, CA.

\* Basin structural model adopted as part of the Southern California Earthquake Center 3-D seismic model for hazard determination.

1997-1998     **Stratigraphy of the Crandall Conglomerate**, Senior Thesis, Greater Yellowstone Area, WY

\* Adviser: C. Cowan (Carleton College)

\* Proposed and implemented a research project plan to study a sedimentary conglomerate deposit.

\* Characterized stratigraphy of the Crandall conglomerate, interpreted the paleotectonic setting.

1996-1997     **Structure of the Appalachian Mountains**, Williams College, MA

\* Mapped surficial geology and made cross sections for an area of the Berkshire Mountains.

## **FUNDED RESEARCH PROPOSALS**

2017         Geothermal play-fairway analysis of Washington State prospects, **DOE Proposal for Phase 3 Funding**  
Awarded: July, 2017

2015         Hydrology of the U.S. Air Force Academy (USAFA) Campus Applied to Infrastructure Investigation, **Mellon-Foundation Grant Proposal for Civil-Military Academic Cooperation**  
Awarded: October, 2015

2008         Collaborative Research: Formation of basement-involved foreland arches: An integrated EarthScope experiment, **NSF EarthScope Proposal**  
Awarded: May, 2009

2007         Collaborative Research: Structure of the Nazca slab and Sierras Pampeanas, **NSF EAR-Geophysics Proposal**  
Awarded: January, 2008

2005         Quantitative Structural Analysis of the Seattle Fault: Three-Dimensional Constraints on Thrust Fault Structure, Kinematics, and Seismic Hazard, **USGS Mendenhall Postdoctoral Program Proposal**  
Awarded: January 2005

2004         Monitoring evolution of the Pacific-North America plate boundary through continuous GPS observations in Joshua Tree National Park, **Site permitting proposal to the National Park Service**  
Permitted, April, 2005

2000         Assessing seismic hazard related to the San Andreas fault zone in San Bernardino, California, **NSF Graduate Research Fellowship Proposal**  
Awarded, Spring, 2001

## **FUNDED COLORADO COLLEGE INTERNAL RESEARCH PROPOSALS**

- 2014-15 Finding Active Faults in the Puget Sound Urban Area, Washington State  
**Natural Science Division Funding Application**
- 2011-12 Archeological Prospecting of Pueblo Viejo, Costa Rica  
**Natural Science Division Funding Application**
- 2007-08 Monitoring evolution of Pacific-North American plate boundary through GPS observations in Joshua Tree National Park  
**Natural Science Division Funding Application**
- 2006-07 Structure of the Seattle fault zone, Seattle, Washington  
**Natural Science Division Funding Application**

## **GEOPHYSICAL FIELD EXPERIENCE**

- 2018** Led gravity and ground magnetic mapping in the Chehalis Basin area, Washington; we gathered >950 new gravity measurements and ~180 km of ground magnetic lines.
- 2016** Led gravity and ground magnetic mapping for four geothermally favorable field sites in the Cascades; the team gathered almost 2000 new gravity measurements in one month.
- 2007-2016** Advised small student field projects in active source refraction seismology, gravity, ground magnetics, electrical resistivity, and broadband seismology for my Introduction to Geophysics class.
- 2006-2017** Relative gravity measurement (~2000 measurements gathered) for mapping faults in the Puget lowland region, Washington.
- 2014-2015** Advised students collecting small-scale, active source refraction and electrical resistivity profiles of U.S. Air Force Academy sites for hydrologic imaging.
- 2012-2013** Led magnetic and electrical resistivity mapping of an archeological site in Pueblo Viejo, Costa Rica.
- 2009-2010** PI for field design, deployment and site servicing of 27 broadband seismic stations in the Bighorn Mountain region, WY.
- 2008-2010** PI for field design, deployment and site servicing of 12 broadband seismic stations in the Cordoba, Argentina region.
- Summer, 2007** PI for the portion of the USArray site identification in Colorado.
- 2007-2008** Relative gravity measurement (~100 measurements gathered) to support geologic mapping for the Sunshine Valley, NM.
- 2005-2008** Campaign GPS site installation and field deployment of instruments in Joshua Tree National Park (JOIGN network).

- 2000-2002** Field deployment, site servicing/data retrieval and archiving for CHARGE PASSCAL broadband array in Chile and Argentina.
- 1998-2000** Relative gravity measurement (~300 measurements gathered) for mapping portions of the San Jacinto Fault, in San Bernardino, California.

## AWARDS AND HONORS

- 2014 Geophysical Journal International **Outstanding Reviewer**
- 2014 **Exceptional Merit**, annual Colorado College employment review
- 2011 Lithosphere Journal **Exceptional Reviewer**
- 2010 **Exceptional Merit**, annual Colorado College employment review
- 2009 **Exceptional Merit**, annual Colorado College employment review
- 2005 ChevronTexaco Geology Summer **Fellowship**
- 2005 Honorable mention **AGU MARGINS Prize**
- 2004 **UA College of Science** Outstanding TA
- 2004 **Outstanding TA** in Geosciences
- 2003, 2004 **Best Talk** in Geophysics, Geodaze Student Colloquium
- 2003-2004 **WAIIME** Geosciences Scholarship
- 2001-2005 **NSF** Graduate Fellow
- 2000 **Geosciences Dept. Fellowship**, University of Arizona
- 1998 Graduated **magna cum laude**
- Spring, 1998 Departmental **distinction** on undergraduate thesis
- February 1998 **Sigma Xi** guest lecturer in geology
- 1997-1998 **Duncan Stewart Fellowship** in Geology, Carleton College

## PROFESSIONAL AFFILIATIONS

- American Association for the Advancement of Science (2017-present)
- American Geophysical Union (1999-present)
- Geological Society of America (1998-present)
- Sigma Xi (1998-present)
- Phi Beta Kappa (1998-present)

## TEACHING PHILOSOPHY

I seek to build a complete classroom environment that uses inquiry to effectively engage students in the joy of learning. My personal philosophy of teaching that underpins the mechanical operations of an inquiry-based classroom is to create activities that require students to be scientists, not just learn about science. I strongly believe that the goal of a liberal arts education is to prepare students for what matters in life. I find students are empowered by the responsibility of finding their own truth and feel the weight and significance of what they achieve by applying the scientific process to significant scientific questions. Therefore primary field geologic investigations and mapping form the core of my teaching strategy.



## **COURSES TAUGHT**

- GY101 **Catastrophic Geology**  
Fall 2009, Fall 2012 (FYE), Spring 2016
- GY130 **Introduction to Geology**  
Spring 2008
- GY140 **Physical Geology**  
Spring 2006, Fall 2008, Spring 2008, Spring 2010 (FYE), Fall 2012, Spring 2015,  
Fall 2015
- NS160 **FYE: Mathematics and Geology of the Great American Desert**  
Fall 2008, Fall 2011
- GY210 **Geologic Methods and Rocky Mountain Evolution**  
Fall 2009, Fall 2011
- GY212 **Investigating Earth as a Physical System**  
Fall 2014, Fall 2015
- GY240 **Tectonics**  
Fall 2008, Spring 2011, Spring 2013, Spring 2015
- GY250 **Geologic Evolution of South America**  
Spring 2007
- GY308 **Introductory Geophysics**  
Fall 2007, Spring 2009, Spring 2010, Spring 2011, Spring 2013, Fall 2014
- GY370 **Applied Potential Field Geophysics**  
Spring 2007
- GY370 **Seismology**  
Spring 2012, Spring 2016
- GY445 **Regional Geology: An in-depth study of an area of the earth with students preparing papers on various aspects of the region.**  
\*Geology of the Baja, California Region, Spring 2008  
\*Argentinean Andes and Sierras Pampeanas, Spring 2010  
\*The Cascadia Margin, Washington, Fall 2012  
\*California, From Subduction to Transform, Fall 2014
- GY405 **Research Topics**  
Yearly, Student participation in original research, typically advising 2-4 students per year.
- GS515 **Integrated Natural Science Institute: Mathematics and Science**  
Summer 2012

## **UNDERGRADUATE RESEARCH PROJECTS**

2010-2011 **Keck Consortium Research Project**, Bighorns Research Station, Wyoming

\* Geophysics adviser for undergraduate Keck component of the NSF Bighorns research project.

\* Advised 3 of 9 undergraduate students on seismology and shear-wave splitting centered research topics utilizing project data.

**RESEARCH STUDENTS ADVISED (Geo = Geology major; Phys = Physics major; SWS = Southwest Studies Major)**

- William Schermerhorn** 2016-17 Western Washington University undergraduate:  
Ground-based geophysical surveys of geothermal system at Mount Baker, WA, *Advised field activities, data analysis, and presentation of results*
- Grace Guryan (Geo)** 2016-17 Senior Thesis: A Ground Penetrating Radar Survey of Sediment Facies of the East River Floodplain Near Crested Butte, CO
- Rowan Kowalsky (Phys)** 2016-17 Sophomore Research Project: Geothermal Play-Fairway Analysis of Washington State Prospects
- Matt Tankersley (Geo)** 2016-17 Sophomore Research Project: Geothermal Play-Fairway Analysis of Washington State Prospects
- Katie Waters (Geo)** 2015-16 Senior Thesis: Seismic Wave Amplification Assessment in the Seattle Basin from Gravity Measurements and 3D Modeling, Washington State, USA
- Ben Justman (Geo)** 2015-16 Senior Thesis: Geophysical Mapping and Modeling of Subsurface Structures in the Granite Falls Quadrangle
- Matt Hess (Geo)** 2015-16 Senior Thesis: Investigating the Water Table on the Air Force Academy Grounds Beneath Jack's Valley
- Forest Corcoran (Geo)** 2015-16 Sophomore Research Project: Seismic and Electrical Surveying of the Water Table, U.S. Air Force Academy, Colorado Springs, Colorado
- Gray Ritger (Geo)** 2015 Independent Research: Geological and Geophysical Mapping of the Granite Falls 7.5' Quadrangle, Everett area, Washington
- Virginia Hill (Geo)** 2015 Independent Research: Geophysical Modeling of the Seattle Fault
- Carolyn Nuygen (Geo)** 2014-15 Senior Thesis: Wyoming lithospheric structure utilizing receiver function images with USArray data
- Nick Hall (Phys)** 2014-15 Senior Project: Seismic anisotropy of the east coast, U.S. utilizing shear wave splitting of USArray data
- John Swisher (Geo)** 2013-14 Sophomore Research Project: Geophysical prospecting in Pueblo Viejo, Costa Rica: using electrical resistivity data to constrain subsurface archeological architecture
- William Yeck** 2011-15 University of Colorado Boulder Ph.D.: The search for Moho structure beneath the sedimentary basins surrounding the Bighorn Mountains through receiver function analysis, *Member of Ph.D. Committee*
- Peter Levin (SWS)** 2012 Sophomore Research Project: Geophysical prospecting in Pueblo Viejo, Costa Rica: using magnetic data to constrain subsurface village architecture
- Ryan Armstrong (Geo)** 2012-13 Senior Thesis: Constraining fault afterslip utilizing repeating aftershocks for the 2010 Darfield earthquake, New Zealand
- Mike Curran (Geo)** 2012-13 Senior Thesis: Frequency-dependent shear wave splitting and mantle flow in the South American subduction zone
- Sarah Geisse (Geo)** 2012-13 Senior Project: Finding the Coast Range Boundary fault using gravity data in the Puget Lowland, Washington

**Nathan Villeneuve** 2012 Western Washington University undergraduate:  
Gravity mapping of the Lake Joy Quadrangle, Washington, *Advsied field activities and gravity data reduction and analysis*

**Fransiska Danneman (Geo)** 2011-12 Senior Thesis: Carbon and nitrogen in headwater catchments: temporal and spatial dynamics of a bi-modal precipitation system, Jemez Mountains, New Mexico

**Megan Hurster (Geo)** 2011-12 Senior Thesis: Spatial distributions of anisotropy using short period seismometers in the Bighorn Mountains, WY: Archean structures revealed

**Wesley Paulson (Geo)** 2010-11 Senior Project: Shear-wave splitting and mantle flow under the eastern Sierras Pampeanas, Argentina

**Aaron Bandler (Geo)** 2010-11 Senior Thesis: Active seismicity and mid-crustal fault structure of the Sierras de Cordoba, eastern Sierras Pampeanas, Argentina

**Kira Olsen (Geo)** 2010-11 Senior Thesis: Dynamics of flat subduction: focal mechanisms, ridge buoyancy, and slab tear in central Argentina

**Drew Thayer (Geo)** 2010-11 Senior Thesis: Shear-wave splitting under the Bighorns Mountain Range, Wyoming: The effect of frequency and its interpretation for the depth of anisotropy

**John Hornbuckle** 2010-11 Wash & Lee University (Keck-associated Thesis): Shear wave splitting under the Bighorns Mountain Range, Wyoming: Determining the depth of anisotropy

**Triana Ufret Alonso** 2010-11 University of Puerto Rico (Keck-associated Thesis): Shear wave splitting analyses of the Bighorn Mountains: using mantle xenoliths to characterize anisotropy

**Tonya Richardson** 2010-11 Purdue University Master's: Seismicity within the actively deforming eastern Sierras Pampeanas, Argentina, *Member of Master's Committee*

**Tyler Doane (Geo)** 2009-10 Senior Thesis: Structural and gravitational characterization of the Bighorn Mountain range, Wyoming

**Leah Bedoian (Geo)** 2009-10 Senior Thesis: Gravity and magnetic analysis of subsurface deposits in the San Luis Hills, San Luis Valley, Colorado

**Felicity Wood (Geo)** 2008-10 Senior Thesis: Seismic anisotropy of the South American subduction zone, the Sierras de Cordoba, central Argentina

**Travis Haby (Phys)** 2009 Senior Project: Earth magnetic theory and application to the study of the Chama gap & dike, Gardner, Colorado

**Dan Woodell (Geo)** 2007-09 Senior Thesis: Analog modeling of the Juan Fernández Ridge, central Chile, and implications for flat-slab subduction dynamics

**Jeff Lyon (Phys)** 2007-08 Senior Project: Gravity physical theory and application to study of the Rio Grande Rift

**Melinda Solomon (Geo)** 2007-08 Senior Project: Anisotropy of central South America: A shear wave splitting analysis of a tectonically stable region and its implications for lithosphere-asthenosphere interaction on the continental scale

**Wiley Skewes (Geo)** 2007-08 Senior Project: The Seattle fault

**Jon Rotzein (Geo)** 2007 Senior Thesis: Magnetic Exploration and modeling of the Thumb, Navajo Volcanic Field

## **SERVICE**

### **Professional**

Fall, 2018-present ShakeAlert Joint Committee for Communication, Education and Outreach (JCCEO), co-chair of the Educational Resources Working Group

Fall-Spring, 2018-19 SSA Session Convener

Fall-Spring, 2018-19 GSA Cordilleran Session Convener

Fall, 2016 AGU Session Convener & Chair

April, 2015 IRIS/PASSCAL Webinar: “Your PASSCAL Instrument Center: How to get started planning your first (or next) experiment”

Fall, 2014 Pannelist: AGU-ESWN Workshop “Getting on the Tenure Track and Succeeding”

Fall, 2014 AGU Session Convener

February, 2014 Co-organizer of joint NSF-grant sponsored workshop: Modern and Ancient Basement Cored Uplifts and the Connection to Flat Slab Subduction

Fall, 2013 Co-organizer Pre-GSA EarthScope Workshop: Four-dimensional evolution of the conterminous US

2013-2015 Member of the IRIS PASSCAL Standing Committee

2010-2012, 2014, 2016 AGU “Outstanding Student Paper Awards” judge

Fall, 2006 AGU Session Convener

Fall, 2003 AGU Session Chair

Reviewer for:  
Geology, Geophysical Research Letters, Geophysical Journal International, Journal of Geophysical Research, Lithosphere, Geosphere, Nature, NSF (Geophysics, GeoPrisms and International Programs)

### **Colorado College**

2015-2016 College Committee Chair: Faculty Executive Committee, Budget

Fall, 2015 Cognate representative: Anthropology Search Committee

Spring, 2015 Cognate representative: Environmental Science Search Committee

2014-2016 New Faculty Mentor

2014-2015 College Committee: Faculty Executive Committee, Budget

Spring, 2012 Search Committee: Vice President for Advancement

2011-2013 College Committee: Advancement Advisory Board

Fall, 2011 Cognate representative: Math/CS Search Committee

August, 2011 Faculty Fall Conference Presenter (Focus on geology and geophysics of the Japan Earthquake)

2009-2010 College Committee: Natural Sciences Division Executive Committee, Committee on Instruction NS Representative

2007-2009 College Committee: Design Review Board

## Colorado College Geology Department

2015 Keck Consortium Assessment Subcommittee  
2007-2009, 2012-13 Geology Department: Seminar Series Organizer  
2014-2016  
2011-2016 Keck Geology Consortium Representative  
Spring, 2013 Department Assessment report revision & implementation

## INVITED LECTURES

- 2019 **USGS Western Region Geology and Geophysics Seminar Series:** Archean or Laramide age deformation? Inheritance of structural features under the Bighorns Arch
- 2019 **Centralia College, Centralia, WA:** The Doty fault: Are local earthquakes possible near Centralia?
- 2018 **Jefferson Land Trust, Port Townsend, WA:** Revelations about active faulting in the Puget Sound region from geology and geophysics
- 2018 **USGS Denver:** Boundaries and structure of Siletzia in the Puget Lowland: Imaging an obducted plateau with potential fields
- 2017 **Colorado State Department of Geosciences:** Archean or Laramide age deformation? Seismological structure of the Bighorns Arch at high resolution
- 2016 **St. Louis University:** Boundaries and structure of Siletzia in the Puget Lowland: Imaging an obducted plateau and accretionary salient with potential fields
- 2015 **Pikes Peak Environmental Forum:** What do earthquakes have to do with Earth's climate? How technological advances are fostering scientific collaboration across disparate fields
- 2014 **USGS Western Region Geology and Geophysics Seminar Series:** Boundaries and Structure of Siletzia in the Puget Lowland: An Obducted Terrane
- 2013 **Brown University Geophysics Seminar:** Wyoming crust and mantle structure...from Archean or Laramide age deformation? Results from the Bighorns Arch Seismic Experiment
- 2013 **Yale University Geophysics Seminar:** Wyoming crust and mantle structure...from Archean or Laramide age deformation? Results from the Bighorns Arch Seismic Experiment
- 2013 **Colorado College Voices from Japan Festival:** Behind the Scenes: Geology and Tectonics of the 2010 Tohoku Earthquake and Tsunami
- 2011 **Colorado College Geology Department Lunch Series:** Japan: What happened to the most earthquake-ready country in the world?
- 2011 **Washington and Lee University:** Subduction zone earthquakes, tsunamis and crustal faults in Seattle: What's the risk?
- 2011 **Colorado State Department of Geosciences:** Subduction zone earthquakes, tsunamis and crustal faults in Seattle: What's the risk?
- 2008 **Colorado College Faculty Lunch Series:** Earthquakes and Tsunamis, Why Seattle is the New San Francisco
- 2008 **Sigma Xi Science Lecture:** Earthquakes and Tsunamis, Why Seattle is the New San Francisco

- 2006 **USGS Earthquake Hazards Team Seminar Series**, Menlo Park, CA: New subducting slab geometry in central Chile and Argentina: Implications for the buoyancy of flat slabs
- 2006 **USGS Volcano Hazards Team Seminar Series**, Menlo Park, CA: Seismic anisotropy: What can it tell us about subduction zone mantle wedge flow?

## **MEDIA INTERVIEWS**

- 2018 **King 5 News**, Seattle WA: Geologists tracking faults in western Washington

## **PUBLICATIONS**

(\* = CC undergrad coauthor; + = student lead author)

### In Preparation

- \***Anderson, M. L.**, Blakely, R., Wells, R. E., Dragovich, J. D., Geisse, S. \*, in prep., Deep Structure of Siletzia in the Puget Lowland: Imaging an obducted plateau and accretionary salient with potential fields: for submission to *Tectonics*.
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