

Sarah R. Hall

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Education

University of California, Santa Cruz, Earth and Planetary Sciences Department, Santa Cruz CA

Ph.D., June 2009, Advisors: Daniel Farber, Elise Knittle

Thesis: *¹⁰Be geochronology of geomorphic features within the western Central Andean margin: Tectonic and climatic implications.*

Hamilton College, Geology Dept., Clinton, NY

B.A. Geology, May 2001, Advisor: David Bailey

Thesis: *Petrogenesis of xenoliths in Miocene basalts of northeastern Oregon*

Professional Experience

September 2014 *Faculty, Geology and Earth Science*

to present Anne M. and Robert T. Bass Chair of Earth Systems and Geoscience
College of the Atlantic, Bar Harbor, ME, USA

September 2012 *Visiting Professor of Earth Science*

to August 2014 College of the Atlantic, Bar Harbor, ME, USA

September 2009 *Assistant Professor*

to August 2012 Department of Earth & Planetary Sciences, McGill University, Montréal, QC, Canada

September 2003 *Graduate Student Researcher*

to September 2009 Earth and Planetary Science Department, University of California Santa Cruz, CA, USA
Ph.D. research with advisor Daniel L. Farber

September 2004 *Visiting Student Researcher*

to September 2009 Lawrence Livermore National Laboratory, CA, USA
Cosmogenic Radionuclide method development and PhD Research with Daniel L. Farber and Robert C. Finkel

September 2002 *AmeriCorps Team Member*

to June 2003 EcoWatch Program, Atlanta Outward Bound Center, GA, USA
Environmental education and conservation, community outreach and development.

July 2001 to *Staff Geologist*

March 2002 Atlanta Environmental Management, Inc., GA, USA
Groundwater monitoring during remediation of soil and groundwater contamination, field water sampling and sediment logging.

Teaching Experience

Course Instructor, College of the Atlantic

2012-2017 ES 1038 Geology of Mount Desert Island (introductory field methods)

2013, 2014, 2016 ES 580 Climate and Weather

2013, 2016 ES 578 Geology and Humanity

2013 HE 1010 Human Ecology Core Course

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2013, 2015, 2016 ES 1040 Natural Resources
2013, 2015 ES 5024 South American Earth Systems, *with 2-week field trip to Peru*
2013-2016 Independent Study – see “student advising” in the Research section
2014 ES 596 Critical Zone I
2014 ES 600 Critical Zone II
2014 Tutorial: Mineralogy and Petrology
2015, 2017 ES 3063 Seminar on Climate Change
2015 ES 2032 Rocks and Minerals
2016 ES 2031 Quantitative Geomorphology
2016 Tutorial: Advanced Geology of MDI (advanced field methods)
2017 ES4043: Environmental Geoscience Field Methods
2017 ES3074: Environmental STEM Professional Development Seminar

Course Instructor, Department of Earth and Planetary Sciences, McGill University

2010 EPSC 341 (co-taught) – Field School III – Owens and Death Valley, CA
2010, 2011 EPSC 666 (co-taught with EPSC faculty) – Current issues in Geosciences
2010-2011 Independent Study - see “student advising” in the Research section
2011 EPSC 331(co-taught) - Field School II – Bay of Fundy
2011, 2012 EPSC 181 Environmental Geology

Teaching Assistant, Earth and Planetary Sciences Dept, University of California, Santa Cruz

2004 EART 110B Earth as a Chemical System (Mineralogy)
2005-2007 EART 109 Field Geology
2006-2007 EART 188B Summer Field (Eastern Sierra Nevada, Owens Valley, CA)
2008 EART 5 California Geology

Teaching Assistant, Hamilton College, Clinton, NY

2000-2001 220F Mineralogy
2001 211S Sedimentology

Student Advising

Independent Study and Senior Projects with COA Students, 2014-present:

2017 Miguel Provencio: *An Assessment of the Effects of Fire on the Watersheds of Mount Desert Island*
Ky Osgothorpe: *Analysis of Transect Method for Measuring Benthic Macroinvertebrates*
2016 William Minogue: *Installation of Stream Discharge Monitoring Sites on Mount Desert Island, ME*
2016 Gemma Venuti: *Remote landscape analysis of fracture networks on Mt. Desert Island*
2015-2016 Alba Mar Rodriguez-Padilla: *How do glacial erosion and pre-existing fracture networks collaborate to create the iconic Acadia National Park landscape?*
2015-present Spencer Gray: *Bedrock and surficial mapping, geochemistry and geochronology of two Maine Islands: Great Duck and Mt. Desert Rock*
2015 Connor O’Brien: *Geology of Mt. Desert Island: Dorr Natural History Museum Exhibit*
2015 David Niemann: *Snow Survey of the Cox Property, MDI: A Maine state snow survey data collection site*
2015 Alba Mar Rodriguez-Padilla: *Assessing people’s perception of risk of volcanic eruptions*
2014 Bik Wheeler: “Mapping relationships between bird populations and Critical Zone parameters in the Northeast Creek Watershed of MDI”

Graduate and Undergraduate Independent Study, Senior Thesis and Graduate Thesis Projects with McGill University and University of California Santa Cruz Students: 2007-2012:

2012 Kasparas Spokas, *B.Sc.*, McGill University, Independent Study Project

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- GEOTOP Scholarship and NSERC *USRA* summer research grant recipient
Thermobarometric study of the Cordillera Blanca Batholith
At present: pursuing PhD in Earth Science at Princeton University
- 2012 Miriam Aczel, *B.Sc.*, McGill University, Independent Study Project
Drainage Basin Analysis of the Cordillera Blanca foothill region
At Present: pursuing MSc in Environmental Technology at Imperial College of London
- 2011-2012 Tyler Doane, *M.Sc. Candidate – transferred*, McGill University
Fluvial recovery of a moderate-relief post-glacial landscape, southern Quebec
At present: pursuing a PhD in Earth Science at Vanderbilt University
- 2010-2012 Keith Hodson, *M.Sc.*, McGill University, LeRoy Memorial Scholarship recipient
Spatial variation of erosion rates in the Cordillera Blanca, Peru
At present: pursuing PhD in Earth Science at University of Washington
- 2011-2012 Marc-Antoine Fortin, *B.Sc.*, McGill University, Senior Thesis Project
NSERC *USRA* summer research grant, GEOTOP Scholarship recipient
Knickpoint analysis from river profiles to reconstruct the glacial chronology of the Cordillera Blanca, Peru
At present: pursuing PhD in Earth Science at Rensselaer Polytechnic Institute
- 2011-2012 Philip Greene, *B.Sc.*, McGill University, Senior Thesis Project
McGill University *SURA* summer research grant recipient
Climatic and tectonic interactions in the active reworking of surfaces in the Atacama Desert, Southern Peru
At present: pursuing PhD in Earth Science at University of Washington
- 2010 David Serapins, *B.Sc. Candidate*, McGill University, Independent Study Project
Surface uplift in southern Peru recorded in strath terrace abandonment
- 2010 Dante Huff, *B.Sc.*, McGill University, Independent Study Project
Stream incision profiles as a measure of Andean uplift in southern Peru
At present: Environmental Scientist at Matrix Solutions, Inc., Calgary, Canada
- 2010 Mathieu Doucette, *B.Sc.*, McGill University, Independent Study Project
A tectonic-geomorphic study in southern Peru
At present: Exploration Geology, Montreal, Canada
- 2007-2008 Michael W. Davis, *B.Sc.*, University of California, Santa Cruz, Honors Thesis Project
Dean's Award recipient for senior thesis excellence
An assessment of Quaternary deformation in southern Peru through an analysis of geomorphic surfaces along the Rio Tambo
At present: completed Masters in Science Education at University of California, Santa Cruz, currently teaching middle-school science.

Funding

National Science Foundation Collaborative Proposal *GEOPATH-EXTRA: Field based professional development for ESTEM undergraduate students*, Co-PI with colleagues at University of San Francisco and Mt San Antonio College, (funded; \$340,783; 2015-2018). This grant is to develop a professional development program with field studies, targeted skill building, and networking for Environmental STEM students from all three participating colleges.

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Davis Educational Foundation: *Transforming ecology education through interdisciplinary landscape-level research*, submitted with colleagues at COA (funded; \$146,032; 2012-2015). This grant provides funds to develop and implement five new field-based courses that together make up a new program in Landscape Ecology.

McGill University GPSO, Graduate Student Travel Grant, Co-PI (funded; \$10,500; 2011)

Canadian Foundation for Innovation (CFI), Leaders Opportunity Fund: *Quantitative Earth Surface Processes Research Center: Cosmogenic Radionuclide and Surface Processes Imaging Laboratories* (funded; \$180,000; 2009-2010)

Maine Space Grant Consortium: *Enhancing collaboration between faculty and students in a new professional development program for Environmental-STEM (ESTEM) undergraduates*, supplemental funding for work with a minority serving institution (\$5000, 2016-2017).

Friends of Acadia Research Grant: MDI Streams Research Collaboration: Water Monitoring of multiple MDI watersheds. This grant provides funding for ~2 student interns to collect field data during summer 2017 as well as provides partial funds for field equipment (\$8173, 2017)

External Activities

Public Awareness/Synergistic Activities:

Geological Society of Maine, **Vice-President**, (Fall 2016-present)

Involvement with NSF sponsored project: *Geodesy tools for societal issues (GETSI)*, **co-author** (2015-present), prepared introductory teaching module on Surface Processes: Mass Wasting Hazards

Highland Lake Association, Warren Center, PA, **Advisor/Committee Member** (2011-2012), Groundwater monitoring pre and post local hydraulic fracturing activities.

Professional Development:

Teaching Controversial Issues: Climate and Energy, **workshop participant**, GSA, Oct. 2014

Teaching Critical Zone Science and Observatories, **workshop participant**, GSA, Oct. 2014

Critical Zone Evolution, **field trip participant**, GSA, Oct. 2014

Communicating Local Impacts of Climate Change, **workshop participant**, Islands Institute, Aug. 2013

Getting Started in Undergraduate Research, Council on Undergraduate Research (CUR), **workshop participant**, AGU, Dec. 2012

Climate & Energy Book Club Webinar, “On the Cutting Edge”, NAGT, **participant**, Dec. 2010

Teaching About Energy in Geoscience Courses: Current Research and Pedagogy, “On the Cutting Edge”, NAGT, **workshop participant**, GSA, Nov. 2010

Teaching Geoscience in the Field in the 21st Century, “On the Cutting Edge”, NAGT, **workshop participant**, Bozeman, MT, Aug. 2010

Relevant Pre-Employment Activities:

May 2008 *Workshop Instructor*, **Expanding Your Horizons** (workshop for young women interested in science), Santa Cruz, CA

August 2006 to June 2008 *Guest Expert*, **GROW** (Graduate Students and Researchers offer Outreach Workshops), public secondary schools for topics in Earth Science, Santa Cruz, CA

Professional Affiliations:

American Geophysical Union

Association for Experiential Education

Association for Women Geoscientists

Geological Society of America

Geological Society of Maine

National Association of Geoscience Teachers

Invited Lectures

- October 2017, *Quaternary record of climate and tectonic processes preserved in Andean landscapes*, Climate Change Institute, University of Maine, Orono, ME
- February 2015, *Surface processes and the morphology of the Cordillera Blanca*, ISTerre, University of Grenoble, Grenoble, France
- April 2014, *Tectonic and climatic processes recorded in the ¹⁰Be chronology of low-relief surface abandonment in southern Peru*, University of Rochester, Rochester, NY
- August 2013, *Geology of MDI*, Somes Meynell Wildlife Sanctuary, Somesville, ME
- April 2013, *Active Tectonics in the Andes: A view from the Peruvian forearc*, Middlebury College, Middlebury, VT
- November 2011, Course SCT 8380, *Isotopes et chronomètres de la lithosphere, UQAM Cosmogenic Radionuclides: Methods and Applications*
- October 2011, *Paleo-glacier fluctuations in the tropical Andes of Peru*, University of Wyoming, Laramie, WY
- September 2011, *Climate and tectonic interactions in the Peruvian forearc and Glacial geochronology in the Andes of Peru*, CIFAR Conference, Montreal, QC
- April 2011, *Paleo-glacier fluctuations in the tropical Cordillera Huayhuash, Peru, and Climate, tectonics and mountain building in the forearc of southern Peru*, Cornell University, Ithaca, NY
- February 2011, *Quantification of Quaternary tectonic and climatic processes in the forearc of southern Peru*, GEOTOP Student Meeting, Mont-Orford, QC
- October 2010, *Climate, tectonics and mountain building in the forearc of southern Peru*, University of Toronto, Toronto, ON
- March 2010, *Climate, tectonics and mountain building in the forearc of southern Peru recorded in the ¹⁰Be chronology of low-relief surface abandonment*, Centre de Recherche en Géochimie et en Géodynamique (GEOTOP), Université du Québec à Montréal (UQAM), Montreal, QC
- February 2009, *California Geology*, Hamilton College, Clinton, NY
- February 2009, *The dynamic forearc of southern Peru*, Binghamton University, Vestal, NY

Refereed Publications

- Benavente, C., Zerathe, S., Audin, L., Hall, S.R., Robert, X., Delgado, F., Carcaillet, J., ASTER Team. 2017. Active transpressional tectonics in the Andean forearc of southern Peru quantified by ¹⁰Be surface exposure dating of an active fault scarp, *Tectonics*, 36, doi:10.1002/2017TC004523.
- Saillard, M., Audin, L., Rousset, B., Avouac, J.-P., Chlieh, M., Hall S.R., Husson L., Farber, D.L., 2017. From the seismic cycle to long-term deformation: linking seismic coupling and Quaternary coastal geomorphology along the Andean Megathrust, *Tectonics*, 10.1002/2016TC004156.
- Michalak, M.K., Hall, S.R., Farber, D.L., Audin, L., and Hourigan, J.K., 2015. (U-Th)/He Thermochronology records late Miocene accelerated cooling in the north-central Peruvian Andes, *Lithosphere*, L485.1, doi:10.1130/L485.1
- Margirier, A., Robert X., Audin, L., Gautheron, C., Bernet, M., Hall, S.R., and Simon-Labric, T., 2015. Slab flattening, magmatism, and surface uplift in the Cordillera Occidental (northern Peru), *Geology*, v. 43(11), p. 1031-1034.
- Rodríguez, M.P., Carretier, S., Charrier, R., Saillard, M., Regard, V., Hérail, G., Hall, S., Farber, D., Audin, L., 2013. Geochronology of pediments and marine terraces in north-central Chile and their implications for Quaternary uplift in the Western Andes, *Geomorphology*, 180-181, p.33-46.
- Hall, S.R., Farber, D. L., Audin, L., Finkel, R.C., 2012. Recent contractile deformation in the forearc of southern Peru, *Earth and Planetary Science Letters*, 337-338, 85-90, doi:10.1016/j.epsl.2012.04.007.
- Saillard, M., Hall, S.R., Audin, L., Farber, D.L., Regard, V., Hérail, G., 2011. Andean coastal uplift and active tectonics in southern Peru: ¹⁰Be surface exposure dating of differentially uplifted marine terrace sequences (San Juan de Marcona, ~15.4°S), *Geomorphology*, 128, 178-190, doi:10.1016/j.geomorph.2011.01.004.

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- Rood, D.H., Hall, S.R., Guilderson, T.P., Finkel, R.C., and Brown, T.A., 2009. Challenges and opportunities in high-precision Be-10 measurements at CAMS. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 268, 730-732, doi: 10.1016/j.nimb.2009.10.016.
- Hall, S.R., Farber, D.L., Ramage, J.M., Rodbell, D.T., Finkel, R.C., Smith, J.A., Mark, B.G., Kassel, C., 2009. Geochronology of LLGM through Holocene glaciations from the tropical Cordillera Huayhuash, Peru. *Quaternary Science Reviews*, 28, 2991-3009, doi:10.1016/j.quascirev.2009.08.004.
- Saillard, M., Hall S.R., Audin, L., Hérail, G., Farber D.L., Finkel, R.C., Martinod, J., Bondoux, F., and Regard, V., 2008. Pleistocene marine terrace development and non-steady long-term uplift rates along the Andean margin of Chile (31°S). *Earth and Planetary Science Letters*, 277(1-2), 50-63, doi:10.1016/j.epsl.2008.09.039.
- Hall, S.R., Farber, D.L., Audin, L., Finkel, R.C., Mériaux, A-S., 2008. Geochronology of pediment surfaces in southern Peru: Implications for Quaternary deformation of the Andean forearc. *Tectonophysics*, 459,186-205, doi: 10.1016/j.tecto.2007.11.073.
- Audin, L., David, C., Hall, S.R., Farber, D.L., Hérail, G., 2006. Geomorphic evidences of recent tectonic activity in the forearc, southern Peru. *Revista de la Asociación Geológica Argentina*, 61(4), 545-554.

Other Peer-Reviewed Publications

- Hall, S.R., Lippert, P.C., Moore, C, 2010. Field Trip Example, “Paleoclimate Reconstruction: Walker Lake-Bloody Canyon Moraines of Mono Basin, California”, National Association of Geoscience Teachers, Teaching Resources website: <http://nagt.org/nagt/field/fieldtrips/48564.html>
- Michalak, M.J., Hall, S.R., Farber, D.L., Hourigan, J.K., and Rose, E.J. 2010. Evidence for a late Miocene-Pliocene pulse of exhumation from low-t thermochronology in the northern Peruvian Andes, Sociedad Geológica del Perú Publicación Especial No. 9.
- Hall, S.R., Farber, D.L., Audin, L., Finkel, R.C., 2006. Quaternary contractile deformation in the Andean forearc: Geochronology of pediment surfaces and strath terraces in Southern Peru. Sociedad Geológica del Perú Publicación Especial No.7.
- Hall, S.R., Farber, D.L., Audin, L., Mériaux, A.S., Torres, V., 2004. Forearc deformation along the Peruvian margin and the effects of changes in subduction style: Quantifying the rates of Quaternary deformation using insitu produced cosmogenic ¹⁰Be and ²⁶Al. Sociedad Geológica del Perú Publicación Especial No. 6.

Abstracts (last 5 years; bold indicates student author)

- Gray, S.E. III**, Hall, S.R., Michalak, M.J., and Bailey, D.G., A new look at the geologic history of Great Duck Island and Mount Desert Rock through high resolution aerial imagery, geologic mapping, geochemistry, and geochronology, 2017. Society of America *Abstracts with Programs*. Vol. 49, No. 2, doi: 10.1130/abs/2017NE-291262 (also presented at: Acadia National Park Science Symposium, Schoodic Educational & Research Center, 2016; Geological Society of Maine Spring Meeting, 2017).
- Hall, S.R., Schmidt, C.E., and Walker, R., 2017. Challenges and opportunities in the development of a multi-institution field-based professional development program for Environmental-STEM (ESTEM) undergraduates, Geological Society of America *Abstracts with Programs*. Vol. 49, No. 2, doi: 10.1130/abs/2017NE-290986
- Minogue, W.**, Hall, S.R., and Henkel, B., 2016. Stream discharge monitoring in seven watersheds on Mt. Desert Island, Maine, Acadia National Park Science Symposium, Schoodic Institute.
- Gray, S.E. III**, Hall, S.R., Michalak, M.J., and Bailey, D.G., 2016. A new look at the geological history of Great Duck Island and Mount Desert Rock through high resolution aerial imagery, geological mapping, geochemistry, and geochronology, Acadia National Park Science Symposium, Schoodic Institute.
- Walker, R., Hall, S.R., and Schmidt, C. Development of a field-based professional development program for E-STEM undergraduates, GSA, Paper No. 133-10, Denver, 2016.
- Gray, S.E. III** and Hall, S.R., Geology of Mt. Desert Rock and Great Duck Island, 2016. Geological Society of America *Abstracts with Programs*. Vol. 48, No. 2, paper no. 26-7.
- Rodriguez Padilla, A.M., Venuti, G.**, and Hall, S.R. 2016. Glacial erosion and pre-existing fracture networks

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collaborate to create the Acadia National Park Landscape, Geological Society of America Abstracts with Programs. Vol. 48, No. 2, paper no 58-2. **Selected as Outstanding Student Poster Presentation at Northeast GSA and the Geological Society of Maine meetings**

- Schmidt, C., Hall, S.R., and Walker, R., Field-based professional development experiences for Environmental-STEM undergraduates, NSF-EnFUSE conference, Washington D.C., April 2016.
- Hall, S.R., Hodson, K.R., Michalak, M.J., Farber, D.L., and Hourigan, J.K., 2016. Pliocene to present dedundation in the Cordillera Blanca, Peru: Interactions of climate and tectonics in a tectonically active glaciaded mountain range, Geological Society of America Abstracts with Programs. Vol. 48, No. 2, paper no. 15-7.
- Audin, L., Benavente, C., Zerathe, S., Saillard, M., Hall, S.R., Farber, D.L., 2015. Quaternary Tectonic and Climatic Processes shaping the Central Andean hyperarid forearc (southern Peru), Geophysical Research Abstracts, Vol. 17, EGU2015-8588.
- Benavente, C., Zerathe S., Audin L., Delgado F., Saillard M., Hall S.R., and the Aster Team, 2015. Using ^{10}Be cosmogenic surface exposure dating to determine the evolution of the Purgatorio active fault in the Andean forearc, southern Peru. Geophysical Research Abstracts, Vol. 17, EGU2015-12874.
- Hall, S.R., Anderson, J., Rajakaruna, N., and Cass, D., 2014, Watershed Landscape Ecology: Interdisciplinary and field-based learning in the Northeast Creek Watershed of Mt Desert Island, ME, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract ED21D-3475.
- Michalak, M., Hall, S.R., Farber, D., Hourigan, J.K., Audin, L., 2014, Cooling and Exhumation of the Coastal Batholith in the Peruvian Andes (5-12°S), *Eos Trans. AGU*, Fall Meet. Suppl., Abstract EP21A-3528.
- Prest, T., Strader, J., Galey, M.,** Hall, S. R., 2014, Assembling a teaching collection at COA: outcrop, hand-sample, and thin-section analysis of rocks from Mt. Desert Island and Mt. Desert Rock, Acadia National Park Science Symposium, Schoodic Institute, ME.
- Hall, S.R., Farber, D.L., Audin, L., and **Green, P.**, 2013, Tectonic and climatic processes recorded in the ^{10}Be chronology of low relief surface abandonment in southern Peru, Geological Society of America Abstracts with Programs, Vol. 45, No. 7., p. 550.
- Hodson, K.R.,** Hall, S.R., Michalak, M., Farber, D., Hourigan, J.K., 2012, Holocene denudation and landscape deformation in the Cordillera Blanca, Peru, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract T21E-2615.
- Michalak, M., Hall, S.R., Farber, D., Hourigan, J.K. 2012, Exhumation of the Western Cordillera of the “Flat-Slab” Peruvian Andes (5-12 °S), *Eos Trans. AGU*, Fall Meet. Suppl., Abstract T21E-2614.

Awards and Honors

Visiting Teacher Campaign, Visiting Scholar, 2017, ISterre, University of Grenoble, France

Travel Award, 2008, Graduate Student Association, UCSC

IGPP-CRS, 2007, Earth & Planetary Science Dept., UCSC – graduate research and travel award

Waters Award, 2006, Earth & Planetary Science Dept., UCSC - outstanding Ph.D. proposal

Outstanding TA Award, Runner-up, 2005, 2006, Earth & Planetary Science Dept., UCSC

University Education Partnership Program Fellowship (UEPP) 2005-2008, LLNL, CA

Emerson Grant, Scholar, 2000, Hamilton College, Clinton, NY

Payne’s Hill Prize, 2000, Geology Dept., Hamilton College, Clinton, NY – Field geology award