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## Curriculum Vitae

### RESEARCH INTERESTS

I am intensely interested in how Earth's surface environment has developed on geologic time scales, both the evolution of landscapes in tectonically active areas and the co-evolution of the biosphere and the climate system. Integrating approaches from multiple disciplines, particularly geochemistry, and field work-driven research are both important to me.

### EDUCATION

**Ph.D. candidate, Yale University**, New Haven, CT 2012-present  
Thesis: *Reconstructing paleotopography from foreland basin deposits*  
Advisors: Mark Brandon, Michael Hren, & Mark Pagani

**M.Sc., University of Rochester**, Rochester, NY 2007-2009  
Thesis: *Middle-late Miocene paleoelevation and paleoclimate of the southern Altiplano, Bolivia: Evidence for diachronous plateau uplift*  
Advisor: Carmala Garziona

**B.A. cum laude, Carleton College**, Northfield, MN 2000-2004  
Thesis: *The Steptoean Positive Isotopic Carbon Excursion (SPICE) in siliciclastic facies of the Upper Mississippi Valley: Implications for mass extinction and sea level change in the Upper Cambrian* ([PDF](#))  
Advisor: Clint Cowan

### PROFESSIONAL EXPERIENCE

**Teaching Fellow**, Yale University (2012-present)  
Co-taught Dynamic Earth and associated labs (2015). Assisted with Dynamic Earth (2012, 2013, 2014), Global Tectonics (2013), Paleoenvironments (2014), Regional Perspectives (2015), and Earth Surface Processes (2016).  
Developed & led field-based undergraduate research program in Patagonia  
Helped plan & lead Spring Break field trips to Death Valley & Sicily

**Adjunct Professor**, University of Norwich (2011-2012)  
Taught Introduction to Geology & associated lab sections.  
Designed & co-led department Spring Break field trip to Oregon.

**Teaching Staff**, University of Adelaide, South Australia (2010)  
Co-taught Sedimentary Geology, teaching all labs and field excursions.  
Assisted with Igneous & Metamorphic Petrology II Lab and field excursions.  
Instructor at field camps for Structural Geology II and Field Geoscience III

**Subject Matter Expert**, Second Avenue Software (2009-2010)  
Designed interactive geology explorations for high school earth science textbook. Assisted with software development.

**Teaching Assistant**, University of Rochester (2007-2009)

Assisted with Introduction to Physical Geology labs. Designed substantial part of lab curriculum. Assisted with Sedimentology course and lab section. Planned and assisted with Geology of California field course. Participated in class for pedagogic growth of undergraduate teaching assistants.

**Research Intern**, U.S. Geological Survey, Reston, VA (2005-2007)

Conducted research on a variety of topics. Performed sample analysis, data reduction, drafting of figures, and preparation of results for publications.

**Interpretive Geologist**, Walnut Canyon National Monument, AZ (2004)

Led educational excursions in the backcountry. Designed interpretive materials for National Parks Service.

**Teaching Assistant**, Carleton College (2003-2004)

Assisted with lab sections for Mineralogy, Paleobiology, and Introduction to Geology.

PUBLICATIONS PEER-REVIEWED ARTICLES

- Auerbach, D.J.**, and Brandon, M.T., in prep, A record of the paleotopography of the Patagonian Andes reconstructed from volcanic glass, *Earth & Planetary Science Letters*.
- Auerbach, D.J.**, Hren, M.T., Pacini, A., and Breen, P., in prep., Implications of a southern hemisphere record of the Eocene-Oligocene transition: *Geology*.
- Auerbach, D.J.**, Brandon, M.T., and Hren, M.T., in prep., The signal and the noise: interpreting water isotope records: *Geophysical Research Letters*.
- Auerbach, D.J.**, Garzione, C.N., Smith, J.J., MacFadden, B., Anaya, F., and Croft, D.A., submitted, Middle-late Miocene paleoelevation and paleoclimate of the southern Altiplano, Bolivia: Evidence for diachronous plateau uplift: *GSA Bulletin*.
- Garzione, C.N., **Auerbach, D.J.**, Smith, J.J., Passey, B., Eiler, J., Rosario, J., Jordan, T., 2014, Clumped isotope evidence for diachronous surface cooling of the Altiplano and pulsed surface uplift of the Central Andes: *Earth & Planetary Science Letters*, v. 393, p. 173-181. DOI: 10.1016/j.epsl.2014.02.029
- Croft, D.A., Anaya, F., **Auerbach, D.J.**, Garzione, C.N., and MacFadden, B.J., 2009, New data on Miocene neotropical provinciality from Cerdas, Bolivia: *Journal of Mammalian Evolution*, v. 16, no. 3, p. 175-198. DOI: 10.1007/s10914-009-9115-0
- Meilan, R., **Auerbach, D.J.**, Ma, C., DiFazio, S.P., and Strauss, S.H., 2002, Stability of herbicide resistance and GUS expression in transgenic hybrid poplars (*Populus sp.*) during several years of field trials and vegetative propagation: *HortScience*, v. 37, n. 2, p. 1-4.

PUBLICATIONS, PRESENTATIONS WITH ABSTRACTS

continued

- Auerbach, D.J.** and Planavsky, N., 2016, Constraining the evolution of atmospheric O<sub>2</sub> levels using the isotope geochemistry of paleosols: Goldschmidt Conference.
- Auerbach, D.J.**, Hren, M.T., Pacini, A., and Breen, P., 2015, A terrestrial record of water isotopes reveals the Eocene-Oligocene transition in southern Argentina: AGU Annual Meeting.
- DeCorte, B., Planavsky, N., Wang, X., **Auerbach, D.J.**, and Knudsen, A., 2015, Uranium isotope ratios in modern and Precambrian soils: AGU Annual Meeting.
- Cosgrove, M., Pacini, A., **Auerbach, D.J.**, Brandon, M.T. and Hren, M.T., 2015, A paleoelevation history of the Patagonian Andes from hydrated volcanic glass: GSA Abstracts with Programs, v. 47, n. 7.
- Breen, P., Lichtin, S., Super, J., **Auerbach, D.J.**, and Brandon, M.T., 2015, Reconstructing Paleocene-Eocene Patagonian paleoclimate: Organic proxy data from the Ligorio Marquez Formation: GSA Abstracts with Programs, v. 47, n. 7.
- Auerbach, D.J.**, Planavsky, N., Reinhard C.T., Maynard, J.B., Hofmann, A., Alfimova N., Wang, X., Gueguen, B., and Asael, D., 2015, Measuring terrestrial Precambrian oxygen levels: An isotopic approach: GAC-MAC Joint Annual Meeting.
- Auerbach, D.J.**, Brandon, M.T., and Hren, M.T., 2014, Resolving the influences of climatology and topography on water isotopes: AGU Annual Meeting.
- Auerbach, D.J.**, Planavsky, N.J., Alfimova, N.A., Maynard, J.B., Hofmann, A., Reinhard, C.T., Gueguen, B., Wang, X., and Asael, D., 2014, A terrestrial Mesoarchean-Paleoproterozoic record of atmospheric oxygen levels: GSA Abstracts with Programs, v. 46, n. 6.
- Auerbach, D.J.**, Garzione, C.N., Smith, J.J., Rosario, J.J., Jordan, T.E., Passey, B.H., Eiler, J.M., 2013, Stable and clumped isotope evidence for a rapid but spatially variable surface uplift history of the Altiplano: Eos Trans. AGU, v. 95, n. XX, Fall Meeting Supp.
- Garzione, C.N., **Auerbach, D.J.**, Bershaw, J.T., Kar, N., Smith, J.J., 2013, Spatial-temporal evolution of topography of the central Andes and implications for deep tectonic processes: Eos Trans. AGU, v. 95, n. XX, Fall Meeting Supp.
- Auerbach, D.J.**, Garzione, C.N., Jordan, T.E., Passey, B.H., 2013, The spatial pattern of surface uplift in the Central Andes: GSA Abstracts with Programs, v. 45, n. 7.
- Smith, J.J., Garzione, C.N., **Auerbach, D.J.**, MacFadden, B.M., Croft, D., 2011, Middle to late Miocene plant respiration rates from the southern Altiplano indicate increasing aridity during surface uplift: Eos Trans. AGU, v. 93, n. 52, Fall Meeting Supp.
- Smith, J.J., Garzione, C.N., Passey, B., **Auerbach, D.J.**, Eiler, J., Jordan, T.E., Rosario, J.J., 2009, Clumped isotope paleothermometry of southern Altiplano paleosols: Implications for surface uplift of the Andean plateau: GSA Abstracts with Programs, v. 41, n. 7.
- Garzione, C.N., Smith, J.J., **Auerbach, D.J.**, 2009, Climate history in the Altiplano basin: A reflection of surface uplift or climate change?: GSA Abstracts with Programs, v. 41, n. 7.
- Auerbach, D.J.**, Garzione, C.N., Smith, J.J., MacFadden, B.M., 2008, Middle Miocene paleoaltimetry of the southern Altiplano, central Andes, Eos Trans. AGU, v. 89,

- n. 53, Fall Meeting Supp., Abs. 13009-08.
- Garzione, C.N., Beck, S.L., Zandt, G., Bershaw, J., **Auerbach, D.J.**, Smith, J.J., 2008, Comparison between spatial-temporal variations in paleoelevation and modern lithospheric structure of the Andean plateau, *Eos Trans. AGU*, v. 89, n. 53, Fall Meeting Supp.
- Smith, J.J., Garzione, C.N., Higgins, P., MacFadden, B.M., **Auerbach, D.J.**, Croft, D., 2008, Miocene surface temperature estimates of the Southern Altiplano and their implications for surface uplift, *Eos Trans. AGU*, v. 89, n. 53, Fall Meeting Supp.
- Garzione, C.N., **Auerbach, D.J.**, Bershaw, J., Croft, D.A., Higgins, P., Jordan, T.E., MacFadden, B., Rosario-Díaz, J., Smith, J., 2008, Long-term records of latitudinal climate gradients in the central Andes from stable isotopes in fossil and sedimentary carbonates: 4<sup>th</sup> Alexander von Humboldt International Conference, Santiago, Chile.
- Foley, N.K., Ayuso, R.A., **Auerbach, D.**, and Colvin, A., 2005, GIS database for modeling the geologic provenance, distribution, mineralogy, and chemistry of historical arsenic producers and smelters: Industrial Minerals Forum, Asheville, North Carolina, p. 81.
- Ayuso, R.A., Haeussler, P.J., Bradley, D.C., Farris, D.W., Colvin, A.S., **Auerbach, D.J.**, 2005, The effects of ridge subduction on chemical and isotopic zoning of the Kodiak batholith, southern Alaska: *GSA Abstracts with Programs*, v. 37, n. 7.
- Fox, D.L., Runkel, A.C., Saltzman, M.R., **Auerbach, D.J.**, Cowan, C.A., 2005, Geochemistry of chitinophosphatic brachiopod shells from Cambrian nearshore deposits of the cratonic interior of Laurentia: *GSA Abstracts with Programs*, v. 37, n. 5, p. 11.
- Cowan, C.A., Fox, D.L., Runkel, A.C., Saltzman, M.R., and **Auerbach, D.J.**, 2004, Cambrian chitinophosphatic brachiopod shells yield a primary marine  $d^{13}C_{CARB}$  signature and reveal terrestrial-marine paleoceanographic interaction: *GSA Abstracts with Programs*, v. 36, n. 5, p. 543.

#### OTHER PUBLICATIONS

- Foley, N.K., Ayuso, R.A., Wandless, G.A., Jackson, J., Colvin, A., Hetland, B., Schulte, R., and **Auerbach, D.J.**, 2010, Sulfide degradation and metal release from the abandoned Callahan Zn-Cu-Pb mine to estuary sediments of Goose Pond, Maine: Mineralogy and mineral reactions that pertain to degradation in a humid coastal environment: U.S. Geological Survey Scientific Investigations Report 2010-XXXX, 70 p.
- Auerbach, D.J.**, 2004, Volcanism in a dying rift zone: Vatnsdalsfjall, Iceland: Keck Geology Consortium Research Symposium Proceedings, v. 17, p. 119-122.

#### AWARDS & HONORS

- 2015 Yale Award for Excellence in Teaching
- 2015 Karl K. Turekian Prize “for excellence in geochemical or cosmochemical studies”
- 2013 Outstanding Teaching Assistant, National Association of Geoscience Teachers (NAGT)
- 2008 Edward Peck Curtis Award for Excellence in Graduate Teaching, University

of Rochester  
2004 Elected to Sigma Xi  
2000 National Merit Scholar

RESEARCH  
GRANTS

2014 GSA Graduate Student Research Grant  
2014 AAPG Grants-in-Aid Award  
2014 SEPM Foundation Award  
2013 John F. Enders Fellowship  
2013 Ph.D. Pilot Grant, Yale Institute for Biospheric Studies  
2008 GSA Graduate Student Research Grant  
2003 Bernstein Student Research Endowment, Carleton College  
2003 Keck Consortium Grant

INVITED TALKS

Lamont-Doherty Earth Observatory, Columbia University, 22 April 2015.  
“Evidence for Miocene aridification and the growth of the central Andes”  
Norwich University, 17 April 2015. “Reconstructing ancient mountain ranges  
from the soil record ”

SELECTED  
FIELD  
EXPERIENCE

Central Patagonia, Chile & Argentina (2013-2015) – measuring stratigraphic  
sections, sampling paleosols, paleosol carbonates, and tuffs  
Tenerife, Canary Islands (2014) – teaching volcanology and geomorphology to  
undergraduate students  
Santa Lucia Mtns, California, USA (2013) – sampling modern waters and soils  
Barbados, Lesser Antilles (2013) – teaching field mapping and tectonic history  
MacDonnell Ranges and Reynolds Range, Northern Territory, Australia (2010) –  
teaching field mapping and interpretation course  
Oregon (2012) – teaching geomorphology, volcanology, and climatology to  
undergraduate students  
Flinders Ranges, South Australia (2010) – teaching undergraduate field mapping  
course  
Southern Altiplano, SW Bolivia (2007-2008) – measuring stratigraphic sections,  
sampling for paleosol carbonates and fossils  
Minnesota and Wisconsin, USA (2003-2004) – sampling phosphatic brachiopods  
for geochemical analysis  
Vatnsdalsfjall, NW Iceland (2003) –mapping and sampling of Neogene igneous  
rocks  
Dolomiti, central Apennines, and Alpi Apuane, Italy (2003) – field mapping,  
paleoenvironmental interpretation, event stratigraphy, and basin analysis  
San Salvador, Bahamas (2002) – field course in carbonate sedimentology

SELECTED LAB  
EXPERIENCE

Yale Earth Science Center for Stable Isotopic Studies  
Used Thermo MAT 253 to analyze isotopologues of CO<sub>2</sub> for clumped isotope  
studies. Sample prep sequence included using a vacuum line and GC.  
Used Thermo Delta Plus XP with GasBench and TC/EA to analyze H, C, and O  
isotope composition of water and carbonate mineral samples.  
Yale ICP-MS Clean Lab

Extracted and purified samples for Cr and U isotope analysis using ion exchange resin columns. Measured concentrations on a Thermo Element ICP-MS before measuring isotopic ratios on a Thermo Neptune MC-ICP-MS.

Yale Organic Geochemistry Lab

Extracted organic molecules from sediment and soil samples and assayed them using GC-FID prior to compound-specific isotope analysis and LC-MS

University of Rochester SIREAL stable isotope laboratory

Used Thermo Delta Plus XP with GasBench/PAL to analyze C and O isotope composition of hundreds of carbonate mineral samples, including sample prep, analytical (machine) time, and data reduction.

USGS SEM laboratory

Used JEOL 8900 electron microprobe with EDS to identify phases, make elemental maps, and otherwise characterize mineral and biological samples.

USGS surface area analysis laboratory

Primary lab operator – analyzed hundreds of samples and maintained Micromeritics ASAP 2020 physisorption instrument.

USGS XRD laboratory

Analyzed hundreds of powder samples to identify mineral phases.

Experience logging and sampling core

Experience with a variety of sample prep methods, working in a clean lab.

Command of Windows/Macintosh operating systems and widely used

Microsoft/Adobe software. Experience in ArcGIS, GMT, MATLAB, and R.