

David Auerbach Colwyn

Curriculum Vitae

Address: Department of Geological Sciences
University of Colorado-Boulder
2200 Colorado Ave., UCB 399
Boulder, CO 80309-0399
Email: david.colwyn@colorado.edu
Web: <http://david-colwyn.appspot.com/>
Phone: +1 (202) 870-9032 (mobile)

| | |
|-------------------------|---|
| EDUCATION | <p>Ph.D., Yale University 2012-2018 Thesis: <i>Terrestrial paleoenvironmental reconstruction, from mountaintops to sea</i></p> <p>M.Sc., University of Rochester 2007-2009 Thesis: <i>Middle-late Miocene paleoelevation and paleoclimate of the southern Altiplano, Bolivia: Evidence for diachronous plateau uplift</i></p> <p>B.A. cum laude, Carleton College 2000-2004 Thesis: <i>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</i></p> |
| PROFESSIONAL EXPERIENCE | <p>NSF Postdoctoral Fellow, University of Colorado-Boulder 2018-present</p> <p>Teaching Fellow, Yale University (2012-2017) Co-taught Dynamic Earth and associated labs (2015). Assisted with Dynamic Earth (2012, 2013, 2014), Global Tectonics (2013), Paleoenvironments (2014, 2017), 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</p> <p>Adjunct Professor, University of Norwich (2011-2012) Taught Introduction to Geology & associated lab sections. Designed & co-led department Spring Break field trip to Oregon.</p> <p>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</p> <p>Subject Matter Expert, Second Avenue Software (2009-2010) Designed interactive geology explorations for high school earth science textbook. Assisted with software development.</p> <p>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 TAs.</p> <p>Research Intern, U.S. Geological Survey, Reston, VA (2005-2007)</p> <p>Interpretive Geologist, Walnut Canyon National Monument, AZ (2004)</p> <p>Teaching Assistant, Carleton College (2003-2004)</p> |

PUBLICATIONS PEER-REVIEWED ARTICLES

- Colwyn, D.A.**, Sheldon, N., Maynard, B.J., Gaines, R., Hofmann, A., Wang, X., Gueguen, B., Asael, D., Reinhard, C.T., and Planavsky, N.J., 2019, A paleosol record of the evolution of Cr redox cycling and evidence for an increase in atmospheric oxygen during the Neoproterozoic: *Geobiology*, v. 17, p. 579-593. DOI: 10.1111/gbi.12360.
- Colwyn, D.A.**, Brandon, M.T., Hren, M.T., Hourigan, J., Pacini, A., Cosgrove, M.G., Midzik, M., Metzger, C., and Garreaud, R., 2019, Growth and steady state of the Patagonian Andes: *American Journal of Science*, v. 319, p. 431-472. DOI: 10.2475/06.2019.01.
- Colwyn, D.A.** and Hren, M.T., 2019, Abrupt decrease in Southern Hemisphere terrestrial temperature during the Eocene-Oligocene transition: *Earth and Planetary Science Letters*, v. 512, p. 227-235. DOI: 10.1016/j.epsl.2019.01.052.
- Encinas, A., Folguera, A., Rizzo, R., Molina, P., Fernández, L., Litvak, V.D., **Colwyn, D.A.**, Valencia, V.A., Carrasco, M., 2019, Implications for the tectonic evolution of the Central Patagonian Andes from geochronology, stratigraphy, and geochemistry of Cenozoic sedimentary and volcanic successions in southern Chile: *Geoscience Frontiers*, v.10, n. 3, p. 1139-1165. DOI: 10.1016/j.gsf.2018.07.004.
- Garzzone, C.N., **Auerbach, D.**, 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.**, Garzzone, C.N., and MacFadden, B.J., 2009, New data on Miocene neotropical provinciality from Cerdas, Bolivia: *Journal of Mammalian Evolution*, v. 16, n. 3, p. 175-198. DOI: 10.1007/s10914-009-9115-0
- Meilan, R., **Auerbach, D.**, 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.

PRESENTATIONS WITH ABSTRACTS

- Colwyn, D.A.**, Snell, K.E., Benowitz, J., Porter, T.J., Sepúlveda, J., 2019, A preliminary Cenozoic record of terrestrial polar amplification in south-central Alaska: AGU Annual Meeting.
- Hren, M.T., Brandon, M.T., Fennell, L., Chang, Q., Smolen, J., **Colwyn, D.A.**, Super, J.R., Fosdick, J.C., 2019, Water isotope evidence for steady Cenozoic topography in the southern Andes (~50 to 35°S): AGU Annual Meeting.
- Colwyn, D.A.**, Hren, M.T., and Brandon, M.T., 2018, The effect of time-averaging on water isotope-temperature relationships: AGU Annual Meeting.
- Colwyn, D.A.**, Brandon, M.T., and Hren, M.T., 2018, The effect of time-averaging on paleo-water isotope records: GSA Abstracts with Programs.
- Colwyn, D.A.**, Brandon, M.T., Hren, M.T., Hourigan, J., Pacini, A., Cosgrove, M.G., Midzik, M., Metzger, C., and Garreaud, R., 2017, A Cenozoic water isotope record of the evolution of the Patagonian Andes: AGU Annual Meeting.

- Colwyn, D.A.**, Brandon, M.T., Hren, M.T., Hourigan, J., Pacini, A., Cosgrove, M.G., Midzik, M., Metzger, C., and Garreaud, R., 2017, New evidence for long-lived Cenozoic topography in the Patagonian Andes: GSA Abstracts with Programs.
- Brandon, M.T., and **Colwyn, D.A.**, 2017, High-resolution model of orographic precipitation and water isotope fractionation, as applied to the Patagonian Andes, with implications for understanding paleotopography and climate-tectonics feedbacks: GSA Abstracts with Programs.
- Auerbach, D.**, Hren, M.T., and Pacini, A., 2016, Abrupt terrestrial cooling at the Eocene-Oligocene Transition in the Southern Hemisphere: AGU Annual Meeting.
- Auerbach, D.**, Hren, M.T., and Pacini, A., 2016, A global terrestrial climate shift at the Eocene-Oligocene transition: Evidence from mid-latitude South America: GSA Abstracts with Programs, v. 48, n. 7.
- Auerbach, D.** and Planavsky, N., 2016, Constraining the evolution of atmospheric O₂ levels using the isotope geochemistry of paleosols: Goldschmidt Conference.
- Auerbach, D.**, 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.**, and Knudsen, A., 2015, Uranium isotope ratios in modern and Precambrian soils: AGU Annual Meeting.
- Cosgrove, M., Pacini, A., **Auerbach, D.**, 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.**, 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.**, 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.**, Brandon, M.T., and Hren, M.T., 2014, Resolving the influences of climatology and topography on water isotopes: AGU Annual Meeting.
- Auerbach, D.**, 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.**, Garzzone, 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, Fall Meeting Supp.
- Garzzone, C.N., **Auerbach, D.**, 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, Fall Meeting Supp.
- Auerbach, D.**, Garzzone, 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., Garzzone, C.N., **Auerbach, D.**, 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.**, 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.**, 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.**, 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.**, 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.**, 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.**, 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: 4th 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.**, 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.**, 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.**, 2004, Cambrian chitinophosphatic brachiopod shells yield a primary marine $\delta^{13}\text{C}_{\text{CARB}}$ signature and reveal terrestrial-marine paleoceanographic interaction: *GSA Abstracts with Programs*, v. 36, n. 5, p. 543.
- Auerbach, D.**, 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 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

RESEARCH GRANTS

2018-2020 NSF Postdoctoral Fellowship
 2016 YIBS Doctoral Dissertation Improvement Award
 2014 GSA Graduate Student Research Grant
 2014 AAPG Grants-in-Aid Award
 2014 SEPM Foundation Award
 2013 John F. Enders Fellowship, Yale
 2013 YIBS Ph.D. Pilot Grant
 2008 GSA Graduate Student Research Grant
 2003 Bernstein Student Research Endowment, Carleton College
 2003 Keck Consortium Grant

INVITED TALKS

University of Colorado INSTAAR Seminar, 11 Nov 2019. "Terrestrial polar amplification during the Cenozoic."
 Yale Institute for Biospheric Studies, 20 April 2018. "Descent into the icehouse on land: A terrestrial record of the Eocene-Oligocene transition in Patagonia."
 University of Adelaide, 27 Mar 2018. "Are the Patagonian Andes old or young? Insights into surface uplift from terrestrial paleoclimate records."
 Australian National University, 15 Mar 2018. "Are the Patagonian Andes old or young? Insights into surface uplift from terrestrial paleoclimate records."
 University of Melbourne, 13 Mar 2018 "Using paleoclimate records to understand the growth of mountain ranges: An example from the Patagonian Andes."
 Amherst College, 14 Feb 2018. "Using paleoclimate records to understand the growth of mountain ranges: An example from the Patagonian Andes."
 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 "

SYNERGISTIC ACTIVITIES

Mentor for 12 undergraduate earth science majors in paleoclimate research (8 women, 4 men), two of whom (both women) have gone on to graduate school (2008-present)
 Taught rock and mineral identification and deductive reasoning to primary school classrooms in California, Vermont, and Connecticut (2012-2017)
 Developed public education curriculum on the geology of Horse Island (CT) for the Yale Peabody Museum (2017)
 Leader for integrative undergraduate research program, including mentoring students, project design, field teaching, lab work, data interpretation, and presentation of results at conferences and in papers. (2014-2015)
 Leader for undergraduate field trips to Vermont, Oregon, the Adirondack Mountains, Death Valley, Barbados, Sicily, and Tenerife (2008-2016)

| | |
|---------------------------|---|
| SERVICE | <p>Reviewer for Geology, Science Advances, Earth & Planetary Science Letters, and American Journal of Science.</p> <p>Yale Geology & Geophysics departmental colloquium committee, 2012-2016 (chair 2014-2015)</p> |
| PROFESSIONAL AFFILIATIONS | <p>Geological Society of America</p> <p>American Geophysical Union</p> <p>Association of Women Geoscientists</p> <p>International Association for Geoscience Diversity</p> <p>Sigma Xi</p> |
| SELECTED FIELD EXPERIENCE | <p>Alaska Range and Matanuska Valley, Alaska (2018-2019) – measuring and sampling stratigraphic sections for paleoclimate reconstruction</p> <p>Snowy Mountains, Australia (2018) – measuring and sampling stratigraphic sections for paleoclimate reconstruction</p> <p>Central Patagonia, Chile & Argentina (2013-2015) – measuring stratigraphic sections and sampling paleosols, paleosol carbonates, and tuffs</p> <p>Tenerife, Canary Islands (2014) – teaching volcanology and geomorphology</p> <p>Barbados, Lesser Antilles (2013) – teaching field mapping and tectonic history</p> <p>Oregon, USA (2012) – teaching geomorphology, volcanology, and climatology</p> <p>MacDonnell Ranges and Reynolds Range, Northern Territory, Australia (2010) – teaching field mapping and interpretation course</p> <p>Flinders Ranges, South Australia (2010) – teaching undergraduate field mapping course</p> <p>Southern Altiplano, SW Bolivia (2007-2008) – measuring stratigraphic sections, sampling for paleosol carbonates and fossils</p> <p>Minnesota and Wisconsin, USA (2003-2004) – sampling phosphatic brachiopods in outcrop and core for geochemical analysis</p> <p>Vatnsdalsfjall, NW Iceland (2003) – mapping and sampling Neogene igneous rocks</p> <p>Dolomiti, central Apennines, and Alpi Apuane, Italy (2003) – field mapping, paleoenvironmental interpretation, event stratigraphy, and basin analysis</p> <p>San Salvador, Bahamas (2002) – field course in carbonate sedimentology</p> |
| SELECTED LAB EXPERIENCE | <p>Yale Earth Science Center for Stable Isotopic Studies – carbonate clumped isotope and conventional carbonate stable isotope analyses</p> <p>Yale Organic Geochemistry Lab – structural and isotopic analysis of lipids</p> <p>Yale MC-ICP-MS Clean Lab – trace metal and metal isotope analyses</p> <p>University of Rochester SIREAL stable isotope laboratory – conventional carbonate stable isotope analyses</p> <p>USGS SEM laboratory</p> <p>USGS surface area analysis (physisorption) laboratory</p> <p>USGS XRD laboratory</p> |