

Department of Geology
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Education

Ph.D., Geosciences, University of Iowa, 2000
M.S., Earth & Planetary Science, University of New Mexico, 1995
B.A., Geology, Hamilton College, 1991

Professional Experience

Cornell College

William Harmon Norton Professor of Geology, 2016–present
Professor of Geology, 2013–2016; Associate Professor, 2006–2013; Assistant Professor, 2000–2006
Chair, Department of Geology, 2003–2006; 2009–2012; 2014–2015, 2023–present
Chair, Environmental Studies Program, 2001–present
Member, Archeology Program, 2001–present
Visiting Lecturer in Geology, 1999

External Appointments

Adjunct Scientist, Woods Hole Oceanographic Institution, 2022–present
Visiting Scientist, Earth and Planetary Sciences, University of New Mexico, 2006–2007
Adjunct Assistant Professor, Earth & Environmental Science, University Iowa, 2001–present
Affiliate Associate Professor, Geological & Atmospheric Science, Iowa State University, 2016–present

Fellowships & Awards

Fellowships

Campbell McConnell Sabbatical Fellowship, Cornell College, 2006, 2015, 2021
T. Anne Cleary Dissertation Research Fellowship, University of Iowa, 1999
Associated Western Universities Fellowship, Los Alamos National Laboratory, 1993–1994

Awards

Council on Undergraduate Research Undergraduate Mentoring Award, 2021
Outstanding Teaching Assistant Award, University of Iowa, 1998
Trowbridge Award for Outstanding Geology Doctoral Student, University of Iowa, 1997

Course Offerings

Dynamic Earth (GEO 111)	Climate Change (GEO 122)*	Hydrogeology (GEO 331)
Advanced Paleoclimatology (GEO 322)	Geology of New Zealand (or Utah) (GEO 329)	

* writing-intensive course in alternate years

Editorial Assignments and Executive Committees

Associate Editor, *Geosphere* (2015–2021)
Editorial Board, *Geology* (2019–2022) and *Scientific Reports* (2019–2021)
Executive Committee, Center for Global and Regional Environmental Research (2016–present)
Scientific Committee, PAGES Floods Working Group

Publications

Published Manuscripts (Undergraduate co-authors in red)

Argiriadis, E., Denniston, R.F., Ondei, S., Bowman, D., Genuzio, G., **Nguyen, H.Q.A.**, **Thompson, J.**, Baltieri, M., **Azenon, J.**, Cugley, J., Woods, D., Humphreys, W.F., and Barbante, C. (2024) Polycyclic aromatic

- hydrocarbons in tropical stalagmites: a framework for reconstructing paleofire activity. *Geochimica et Cosmochimica Acta*, 366, 250-266.
- Argiriadis, E., Denniston, R.F., Ondeï, S., and Bowman, D.M.J.S. (2023) Speleothems as a novel tool to elucidate human-fire-ecosystem dynamics in tropical Australian savannas. *PAGES Magazine*, 31(1), 14-15.
- Denniston, R.F., Ummenhofer, C.C., Emanuel, K., Ingrosso, R., Pausata, F.S.R., Wanamaker, A.D., Lachniet, M.S., Asmerom, Y., Polyak, V.J., Nott, J., Zhang, W., Villarini, G., Carr, K.T., Cugley, J., Brooks, D., Woods, D., and Humphreys, W.F. (2023) Sensitivity of northwest Australian tropical cyclone activity to ITCZ migration since CE 500. *Science Advances*, 9, eadd9832.
- Thatcher, D.L., Wanamaker, A.D., Denniston, R.F., Ummenhofer, C.C. Asmerom, Y., Polyak, V.J. Cresswell-Clay, N., Hasiuk, F., Haws, J., and Gillikin, D.P. (2022) Iberian hydroclimate variability and the Azores High during the last 1200 years: Evidence from proxy records and climate model simulations. *Climate Dynamics*, doi.org/10.1007/s00382-022-06427-6.
- Cresswell-Clay, N., Ummenhofer, C.C., Thatcher, D.L., Wanamaker, A.D., Denniston, R.F., Asmerom, Y., and Polyak, V.J. (2022) Unprecedented expansion of the Azores High due to anthropogenic climate change. *Nature Geoscience*, 15, 548-553.
- Huth, T.E., Passey, B.H., Cole, J.E., Lachniet, M.S., McGee, D., Denniston, R.F., Truebe, S., and Levin, N.E. (2021) A Framework for Triple Oxygen Isotopes in Speleothem Paleoclimatology. *Geochimica et Cosmochimica Acta*, 319, 191-219.
- Thatcher, D.L., Wanamaker, A.D., Denniston, R.F., Ummenhofer, C.C., Regala, F.T., Jorge, N., Haws, J., Chormann, A., Gillikin, D.P. (2021) Linking the karst record to atmospheric, precipitation, and vegetation dynamics in Portugal. *Chemical Geology*, 558, 119949.
- Lachniet, M.S., Asmerom, Y., Polyak, V.J., and Denniston, R.F. (2020) Great Basin paleoclimate and aridity linked to Arctic warming and tropical Pacific Sea surface temperatures. *Paleoceanography and Paleoclimatology*, 35, e2019PA003785.
- Thatcher, D., Wanamaker, A.D., Denniston, R.F., Asmerom, Y., Polyak, V., Ummenhofer, C.C., Gillikin, D., and Haws, J. (2020) Hydroclimate variability from western Iberia (Portugal) during the Holocene – insights from a composite stalagmite isotope record. *The Holocene*, 30, 966-981.
- Haws, J., Benedetti, M.M., Funk, C.L., Bicho, N.F., Daniels, J.M., Forman, S.L., Minckley, T.A., and Denniston, R.F. (2020) Late Pleistocene landscape and settlement dynamics of Portuguese Estremadura. *Journal of Field Archaeology*: 10.1080/00934690.2020.1733780.
- Argiriadis, E., Denniston, R.F., and Barbante, C. (2019) Improved polycyclic aromatic hydrocarbon and n-alkane determination in speleothems through cleanroom sample processing. *Analytical Chemistry*, 91, 7007-7011.
- Denniston, R.F., **Houts, A.N.**, Asmerom, Y., Wanamaker, Jr., A.D., Haws, J.A., Polyak, V.J., Thatcher, D.L., **Altan-Ochir, S.**, **Borowske, A.C.**, Breitenbach, S.F.M., Ummenhofer, C.C., Regala, F.T., Benedetti, M.M., and Bicho, N. (2018) A stalagmite test of North Atlantic SST and Iberian hydroclimate linkages over the last two glacial cycles, *Climate of the Past*, 14, 1-21.
- PAGES Flood Working Group Consortium: Wilhelm, B., Baker, V., Ballesteros, C.J.A., Barriendos, M., Benito, G., Brauer, A., Corella, J.P., Denniston, R., Glaser, R., Ionita, M., Kahle, M., Tao, L., Luetscher, M., Madonald, N., Macklin, M., Mudelsee, M., Manoz, Schulte, L., St. George, S., Markus, S., Toonen, W.H.J., and Oliver, W. (2018). Interpreting historical, botanical, and geological evidence to aid preparations for future floods. *WIREs Water*, 10.1002/wat2/1318.
- Denniston, R.F., Asmerom, Y., Polyak, V.J., Wanamaker, A.D., Ummenhofer, C.C., Humphreys, W.F., Cugley, J., Woods, D., and **Lucker, S.L.** (2017) Short Communication: Decoupling of monsoon activity across the northern and southern Indo-Pacific during the Late Glacial. *Quaternary Science Reviews*, 176, 101-105.
- Lachniet, M.L., Asmerom, Y., Polyak, V.J., and Denniston, R.F. (2017) Arctic cryosphere and Milankovitch forcing of Great Basin paleoclimate. *Scientific Reports*, 7:12955; doi: 10.1038/s41598-017-13279-2.
- Denniston, R.F. and Luetscher, M. (2017) Invited Review: Speleothems as high-resolution paleoflood archives.

Quaternary Science Reviews, 170, 1-13.

- Weiss, T.L., Denniston, R.F., Wanamaker, A.D., Jr., Villarini, G., von der Heydt, A.S. (2017) ENSO-like variability at the Miocene/Pliocene transition recorded in a Caribbean coral. *Geology*; 45, 643-646.
- Denniston, R.F., Ummenhofer, C.C., Wanamaker, A.D., Jr., Lachniet, M.S., Villarini, G., Asmerom, Y., Polyak, V.J., Passaro, K.J., Cugley, J., Woods, D., Humphreys, W.F. (2016) Expansion and contraction of the Indo-Pacific tropical rain belt over the last three millennia. *Scientific Reports*, 6, 34485; doi: 10.1038/srep34485.
- Villarini, G. and Denniston, R.F. (2016) Contribution of tropical cyclones to extreme rainfall in Australia. *International Journal of Climatology*, 36, 1019-1025; doi: 10.1002/joc.4393.
- Denniston, R.F., Villarini, G., Gonzales, A.N., Polyak, V.J., Ummenhofer, C.C., Lachniet, M.S., Wanamaker, A.D., Jr., Humphreys, W.H., Woods, D., and Cugley, J. (2015) Reply to Nott: Assessing Biases in Speleothem Records of Flood Events. *Proceedings of the National Academy of Sciences of the United States of America*, 112.
- Denniston, R.F., Villarini, G., Gonzales, A.N., Wyrwoll, K-H, Polyak, V.J., Ummenhofer, C.C., Lachniet, M.S., Wanamaker, A.D., Jr., Humphreys, W.H., Woods, D., and Cugley, J. (2015) Extreme rainfall activity in the Australian tropics reflects changes in the El Niño/Southern Oscillation over the last two millennia. *Proceedings of the National Academy of Sciences of the United States of America*, 112:15, 4576-4581; doi/10.1073/pnas.1422270112.
- Sedlacek, A.R.C., Saltzman, M.R., Algeo, T.J., Horacek, M., Brandner, R., Foland, K, and Denniston, R.F. (2014) Strontium isotope stratigraphy from the Early Triassic of Zal, Iran: linking temperature to weathering rates and prolonged recovery. *Geology* 42, 779-782. doi:10.1130/G35545.1
- Lachniet, M.L., Denniston, R.F., Asmerom, Y., and Polyak, V.J. (2014) Orbital control of southwestern North America atmospheric circulation and climate over two glacial periods. *Nature Communications*, 5:3805; doi: 10.1038/ncomms4805.
- Denniston, R.F., Wyrwoll, K.-H., Polyak, Brown, J. Asmerom, Y., Wanamaker, A. Jr., LaPointe' Z., Ellerbroek, R., Barthelmes, M., Cleary, D., Cugley, J., Woods, D., Humphreys, W. (2013) A Stalagmite Record of Holocene Indonesian-Australian Summer Monsoon Variability from the Australian Tropics. *Quaternary Science Reviews* 78, 155-168; 10.1016/j.quascirev.2013.08.004.
- Denniston, R.F., Asmerom, Y., Lachniet, M., Polyak, V., Hope, P., An, N., Rodzinyak, K., and Humphreys, W. (2013) A Last Glacial Maximum Through Middle Holocene Stalagmite Record of Coastal Western Australia Climate. *Quaternary Science Reviews* 77 101-112; 10.1016/j.quascirev.2013.07.002.
- Denniston, R.F., Wyrwoll, K-H., Asmerom, Y., Polyak, V.J., Humphreys, W., Cugley, J., Woods, D., Peota, J. and Greaves, E. (2013) North Atlantic Forcing of Millennial-Scale Australian Monsoon Variability during the Late Glacial. *Quaternary Science Reviews* 72, 159-168.
- Polyak, V. and Denniston, R. (2011) Paleoclimate Records in Caves In Culver, D. and White, W. (Eds). *Encyclopedia of Caves*, 2nd edition, Elsevier.
- Haws, J. Funk, C., Benedetti, M., Bicho, N., Daniels, J., Minckley, T., Denniston, R., Jeraj, M., Gibaja, J. and Hockett, B. (2011) Paleolithic seascapes along the west coast of Portugal In Bicho, N., Haws, J., and Davis, L. (Eds) *Trekking the Shore: Changing Coastlines and the Antiquity of Coastal Settlement*. Springer, 450 p.
- Denniston, R.F., Penn, S.C., Carpenter, S.J., and Budd, A.F. (2008) Constraints on Late Miocene Shallow Marine Seasonality for the Central Caribbean using $\delta^{18}\text{O}$ and Sr/Ca Ratios in a Fossil Coral. In Nehm, R.H. and A. F. Budd (Eds). *Evolutionary Stasis: Species and Communities through Geological Time*. Springer: New York, pp. 47-52.
- Denniston, R.F., Asmerom, Y., Polyak, V., McNeill, D.F., Klaus, J.S., Cole, P., and Budd, A.F. (2008) Caribbean Chronostratigraphy Constrained with U-Pb and $^{87}\text{Sr}/^{86}\text{Sr}$ Analysis of a Miocene Coral. *Geology*, 36, 151-154.
- Denniston, R.F., DuPree, M., Asmerom, Y., Polyak, V. Dorale, J.A., and Carpenter (2007) Episodes of Increased Aridity in the Late Holocene Recorded by Stalagmites from Devils Icebox Cave, Central Missouri, USA. *Quaternary Research*, 68, 45-52.

- Denniston, R.F., Asmerom, Y., Polyak, V. Dorale, J.A., Carpenter, S.J., Trodick, C. Hoye, B., and González, L.A. (2007) Synchronous millennial-scale climatic changes in the Great Basin and the North Atlantic during the last interglacial. *Geology*, 35, 619-622.
- Baker, R.G., Bettis E.A. III, Denniston, R.F., González, L.A., Strickland, L.E. and Krieg, J.R. (2002) Holocene paleoenvironments in southeastern Minnesota--chasing the prairie-forest ecotone. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 177, 103-122.
- Denniston, R.F., González, L.A., Polyak, V., Asmerom, Y., Reagan, M.K., and Saltzman, M.R. (2001) A high-resolution speleothem record of climatic variability during the Allerød-Younger Dryas transition in Missouri, central United States. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 176, 147-155.
- Baker, R.G., Bettis, E.A., III, Denniston, R.F., and González, L.A. (2001) Plant remains, alluvial chronology, and cave speleothem isotopes indicate abrupt Holocene climatic change in Midwestern USA. *Global and Planetary Change*, 28, 285-291.
- Denniston, R.F., González, L.A., Asmerom, Y., Sharma, R.H., and Reagan, M.K. (2000) Speleothem evidence for changes in Indian summer monsoon precipitation over the last ~2300 years. *Quaternary Research*, 53, 196-202.
- Denniston, R.F., González, L.A., Asmerom, Y., and Reagan, M.K. (2000) Speleothem records of Holocene paleoenvironmental change in the Ozark Highlands, U.S.A. *Quaternary International*, 67, 21-28.
- Denniston, R.F., Gonzalez, L.A., Semken, H.A., Jr., Baker, R.G., Recelli-Snyder, H., Reagan, M.K., and Bettis, E.A., III. (1999) Integrating stalagmite, vertebrate, and pollen sequences to investigate Holocene vegetation and climate change in the southern Midwest. *Quaternary Research*, 52, 381-387.
- Denniston, R.F., Gonzalez, L.A., Baker, R.G., Asmerom, Y., Reagan, M.K., Edwards, R.L., and Alexander, C.E. (1999) Speleothem evidence for a sharp and long-term prairie-forest ecotone at the northeast border of the middle Holocene prairie peninsula. *The Holocene*, 9, 671-676.
- Denniston, R.F., González, L.A., Asmerom, Y., Baker, R.G., Reagan, M.K. and Bettis, E.A. III. (1999) Evidence for increased cool season moisture during the middle Holocene. *Geology*, 27, 815-818.
- Denniston, R.F., Shearer, C.K., Vaniman, D.T., and Layne, G.D. (1997) Minor and trace element distributions in fracture calcites from Yucca Mountain, Nevada. *Geochimica et Cosmochimica Acta*, 61, 1803-1818.
- Hickmott, D.D., Herrin, J.M., Abel, R., George, M., Stimac, J., Gauerke, E.R., and Denniston, R.F. (1997) Environmental applications of the LANL nuclear microprobe. *Nuclear Instruments and Methods in Physics Research B*, 130, 564-570.

External Grants

<i>Organization</i>	<i>Title</i>	<i>Date</i>	<i>Amount</i>
National Science Foundation	RUI: SG: Field and Laboratory Tests of Pyrogenic Organic Compounds in Australian Stalagmites as a Novel, High-Resolution Paleofire Proxy (sole PI)	2022-2024	\$199,785
National Science Foundation	Collaborative Research: Evaluating the Origins of Multidecadal Variability in Late Holocene Indian Summer Monsoon Rainfall in Nepal (lead PI; co-PI's C. Ummenhofer, A. Wanamaker, Y. Asmerom)	2021-2024	\$489,950 (Cornell \$141,930)
National Science Foundation	Collaborative Research: Bridging the Gap from Northern Iberia to Northwest Africa to Reconstruct Atmospheric Dynamics and Hydroclimate for the Last 2,500 Years (A. Wanamaker lead PI; co-PI's C. Ummenhofer, Y. Asmerom)	2018-2021	\$682,974 (Cornell \$57,932)
National Science Foundation	EAGER: Development of a High-Resolution, Multi-Century Paleofire Reconstruction from Tropical Australian Stalagmites (PI)	2018-2019	\$51,645

Center for Global & Regional Env. Research	The El Niño-Southern Oscillation in a Warming World: Developing Coral Records of Ocean Variability from Past Greenhouse Periods (sole PI)	2017-2018	\$26,550
National Science Foundation	Collaborative Research: Reconstructing Holocene Dynamics of the Indo-Pacific Tropical Rain Belt using Australian Stalagmites and Coupled Climate Models (lead PI; co-PI's C. Ummenhofer, A. Wanamaker, Y. Asmerom)	2016-2019	\$358,417 (Cornell \$104,085)
National Science Foundation	EAGER: Assessing the Viability of Pristine Fossil Corals from the Dominican Republic as Indicators of ENSO at the Miocene/Pliocene Boundary (PI)	2015-2016	\$21,531
National Science Foundation	RUI: Assessing the Influence of Extreme Rainfall Events on Australian Stalagmite Reconstructions of Tropical Cyclone Landfalls and the Indo-Australian Summer Monsoon (PI)	2015-2019	\$149,601
National Science Foundation	Collaborative Research: Great Basin Paleoclimate Back in Milankovitch's Pocket? Orbital Forcing of Southwestern North America Climate over the Past 500,000 Years (Lead PI M. Lachniet; co-PIs Y. Asmerom, V. Polyak)	2014-2017	\$496,023 (Cornell \$27,000)
Center for Global & Regional Env. Research	Development of a Late Holocene Decadal-Scale Proxy Record of the NAO from Portuguese Stalagmites (PI)	2013-2014	\$30,000
National Science Foundation	RUI: Reconstruction of Recent and Late Holocene Tropical Cyclone Landfalls in Northwestern Australia using Flood Deposits in Aragonite Stalagmites (PI)	2011-2014	\$98,000
Mellon Foundation	Enhancing the Integration of Humanities, Social Sciences, and Natural Sciences in Environmental Studies at Cornell College (one of two primary authors)	2009-2012	\$316,850
Center for Global & Regional Env. Research	Speleothem Evidence for the Influences of ENSO and Solar Variability on the Holocene Australian Summer Monsoon (PI)	2009-2010	\$27,000
Petroleum Research Fund	Dominican Republic Corals As High-Resolution Records Of Shallow Marine Paleoenvironmental Conditions Prior To Closure Of Panamanian Seaway (PI)	2004-2006	\$35,000
Center for Global & Regional Env. Research	A High-Resolution Paleoclimate Data Set from New Zealand using Speleothem Growth Banding and Stable Isotopes (PI)	2002-2003	\$16,140
National Science Foundation	Acquisition of Alpha Spec. System for Res. & Undergrad. Train. in Geol & Env. Sci. (lead PI; co-PI Greenstein)	2001-2002	\$97,826
National Science Foundation	SGER: Collaborative Research: Timing of Late Holocene Changes in Summer Indian Monsoon Intensity as Recorded in Mineralogic Changes in Speleothems, Pokhara Valley, Nepal (co-PI: L. Gonzalez)	2000-2003	\$50,000 (Cornell \$20,000)