

Curriculum Vitae

Timothy M. Gallagher

Email: tgallag9@kent.edu; Phone: +1 330-672-7867

Address: 221 McGilvrey Hall, 325 S. Lincoln St., Kent, OH, 44242

EDUCATION

- Ph.D. University of Michigan, Geology, 2016
GPA: 4.0/4.0, Supervisor: Nathan Sheldon
- M.S. University of Michigan, Geology, 2013
GPA: 4.0/4.0, Supervisor: Nathan Sheldon
- B.Phil. University of Pittsburgh, Geology, 2010
- B.A. University of Pittsburgh, Anthropology, 2010
Magna cum laude, GPA: 3.5/4.0

PROFESSIONAL EXPERIENCE

- 2020 – Assistant Professor, Kent State University
- 2019 – 2020 Postdoctoral Fellow, Dept. Geological Sciences, University of Texas at Austin
- 2017 – 2018 NSF EAR Postdoctoral Fellow, University of Texas at Austin
- 2011 – 2016 Graduate Student Research Fellow, University of Michigan, Continental Environments Research Group, Stable Isotope Lab
- 2010 – 2011 Visiting Researcher, University of Gothenburg, Marine Geology Group

AWARDS AND FELLOWSHIPS

- 2017 National Science Foundation – Earth Sciences Postdoctoral Fellowship
- 2017 John Dorr Graduate Achievement Award, University of Michigan
- 2011 National Science Foundation – Graduate Research Fellowship (3 years)
Henry Pollack Fellowship, University of Michigan
- 2010 Fulbright Grant to Sweden
Phi Beta Kappa

GRANTS AND FELLOWSHIPS

*Total Funding to Date: **\$1,111,613***

- 2023 NSF Biodiversity on a Changing Planet Program: “Collaborative Research: BoCP-Design: US-South Africa: Turning CO₂ to stone: the ecosystem service of the oxalate-carbonate pathway and its sensitivity to land use change” Start Date: 1/2023, Award #: 2224993 (Lead PI: \$349,676)

- 2022 ACS-PRF Doctoral New Investigator Grant: "Understanding organic matter linkages across a Cretaceous terrestrial-marine interface." Grant #: 65866 Start Date: 9/2022 (Sole PI: \$110,000)
- 2021 Funding Supplement to: EAGER SitS: Studying soil biotic and abiotic processes through continuous, high precision monitoring of soil CO₂ and O₂ concentrations. (\$10,319)
- 2019 NSF EAGER SitS: Studying soil biotic and abiotic processes through continuous, high-precision monitoring of soil CO₂ and O₂ concentrations," Award #: 1841641 (\$298,057) (Co-written as postdoctoral PI)
- 2016 NSF Earth Sciences Postdoctoral Fellowship: "Developing a process based understanding of the factors controlling the seasonal formation of pedogenic carbonate," Award #: 1625146 (\$174,000)
- 2015 Geological Society of America Graduate Student Research Grant (\$1,250)
Scott Turner Award in Earth and Environmental Sciences (\$1,800)
Rackham Conference Travel Grant (\$800)
- 2014 American Association of Petroleum Geologists Grant (\$3,000)
Scott Turner Award in Earth and Environmental Sciences (\$1,800)
Rackham Conference Travel Grant (\$1,050)
Geochemical Society Travel Grant (\$450)
Geological Society of America Travel Grant (\$100)
- 2013 Rackham Graduate Research Grant (\$1,500)
Geological Society of America Graduate Student Research Grant (\$2,061)
Rackham Conference Travel Grant (\$950)
- 2012 Lewis and Clark Exploration and Field Research in Astrobiology Grant (\$5,000)
Scott Turner Award in Earth and Environmental Sciences (\$2,100)
Rackham Conference Travel Grant (\$700)
- 2011 NSF Graduate Research Fellowship (\$126,000)
U.S. Science Support, IODP Travel Grant (\$1,000)
- 2010 Fulbright Fellowship to Sweden (\$20,000)

PUBLICATIONS (*Denotes Student Advisee)

- Gallagher, T.M.**, Dahlberg, J., *Smart, K., Czwakiel, N., Mellum, M., Breecker, D.O. (In-Revision) 'Isolating seasonal soil biogeochemical signals from physical modifications using field-based paired CO₂ and O₂ measurements.' *JGR-Biogeosciences*.
- *Smart, K.E., Breecker, D.O., Blackwood, C.B., and **Gallagher, T.M.** (Accepted) 'A new approach to continuous monitoring of carbon use efficiency and biosynthesis in soil microbes from measurement of CO₂ and O₂' *Biogeosciences*, EGUSPHERE-2024-1757.
- Dal Corso, J., Newton, R.J., Zerkle, A.L., Chu, D., Song, H., Song, H., Tian, L., Tong, J., Di Rocco, T., Claire, M.W., Mather, T.A., He, T., Gallagher, T., Shu, W., Wu, Y., Bottrell, S.H., Metcalfe, I., Cope,

- H.A., Novak, M., Jamieson, R.A. & Wignall, P.B. (2024) 'Repeated pulses of volcanism drove the end-Permian terrestrial crisis in northwest China' *Nature Communications*, v. 15 a.7628.
- Nel, T., Clarke, C.E., Francis, M.L., Stone, W., Cowan, D.A., Botha, A **Gallagher, T.** (2024) 'Efficient Quantification of Soluble and Insoluble Oxalates in Clay Mineral Mixtures' *Communications in Soil Science and Plant Analysis*, v. 55 (13) p. 1985-1999.
- Cowan, D.A., Babenko, D., Bird, R., Botha, A., Breecker, D.O., Clarke, C.E., Francis, M.L., **Gallagher, T.**, Lebre, P.H., Nel, T. and Potts, A.J., (2024). Oxalate and oxalotrophy: an environmental perspective. *Sustainable Microbiology*, 1(1), p.qvad004.
- Joachimski, M., Müller, J., **Gallagher, T.M.**, Mathes, G., Chu, D., Mouraviev, F., Silantiev, V., Sun, Y., and Tong, J. (2022) 'Five million years of high atmospheric CO₂ in the aftermath of the Permian-Triassic mass extinction,' *Geology*, V. 50, p. 650-654.
- Gao, P., Nie, J., Breecker, D., **Gallagher, T.**, Serach, L., Alonso-Zarza, A. (2022) 'Similar magnetic enhancement mechanisms between Chinese loess and alluvial sediments from the Teruel Basin, NE Spain, and paleoclimate implications' *Geophysical Research Letters*, v. 49, e2021GL096977.
- Gallagher, T.M.**, Serach, L., Sekhon, N., Zhang, H., Wang, H., Ji, S., Chang, X., Lu, H., Breecker, D.O. (2021) 'Regional patterns in Miocene-Pliocene aridity across the Chinese Loess Plateau revealed by high resolution records of paleosol carbonate and occluded organic matter,' *Paleoceanography and Paleoclimatology*, v. 36, E2021PA004344.
- Gallagher, T.M.** and Breecker, D. O. (2020) 'The obscuring effects of calcite dissolution and formation on quantifying soil respiration,' *Global Biogeochemical Cycles*, 34, e2020GB006584.
- Kelson, J.R., Huntington, K.W., Breecker, D.O., Burgener, L.K., **Gallagher, T.M.**, Hoke, G.,D. Petersen, S.V., (2020) 'A proxy for all seasons? A synthesis of clumped isotope data from Holocene soil carbonates,' *Quaternary Science Reviews*, v. 234, 106259.
- Gallagher, T.M.**, Cacciatore, C.G, Breecker, D.O., (2019) 'Interpreting the difference in magnitudes of PETM carbon isotope excursions in paleosol carbonate and organic matter: Oxidation of methane in soils versus elevated soil respiration rates,' *Paleoceanography and Paleoclimatology*, v. 34, p. 2113-2128.
- Gallagher, T. M.**, Hren, M.T., and Sheldon, N.D., (2019) 'The effect of soil temperature seasonality on climate reconstructions from paleosols,' *American Journal of Science*, v. 319, p. 549-581.
- Rico, K.I., Sheldon, N.D., **Gallagher, T.M.**, and Chappaz, A. (2019) 'Redox chemistry and molybdenum burial in a Mesoproterozoic lake,' *Geophysical Research Letters*. v. 46, p. 5871-5878.
- Nordberg, K., Polovodova, I., **Gallagher, T.M.**, and Robijn, A., (2017) 'Recent oxygen depletion and benthic faunal change in shallow areas of Sannäs Fjord, Swedish west coast,' *Journal of Sea Research*. v. 127, p. 46-62.
- Gallagher, T.M.**, Sheldon, N.D., Mauk, J.L., Petersen, S.V. Guneli, N., and Brocks, J., (2017) 'Constraining the thermal history of the Midcontinent Rift System using carbonate clumped isotopes and organic thermal maturity indices,' *Precambrian Research*. v. 294, p. 53-66.
- Gallagher, T.M.** and Sheldon, N.D., (2016) 'Combining clumped isotopes and soil water balance to understand the nature and timing of pedogenic carbonate formation,' *Chemical Geology*, v. 435, p. 79-91.
- Cotton, J.M., Sheldon, N.D., Hren, M.T., **Gallagher, T.M.**, (2015) 'Positive feedback drives carbon release from soils to atmosphere during Paleocene/Eocene warming,' *American Journal of Science*, v. 315, p. 337-361.

Gallagher, T.M. and Sheldon, N.D., (2013) 'A new paleothermometer for forest paleosols and its implications for Cenozoic climate,' *Geology*, v. 41, p. 647-650.

INVITED LECTURES

- 2022 Department of Biology, Kent State University
2020 Department of Geology, University of Puerto Rico Mayaguez
Department of Geology, Kent State University
Department of Geological Sciences, University of Florida
2019 BEES Department, University of Southern Mississippi
EOAS Department, University of British Columbia
Department of Geological and Atmospheric Sciences, Iowa State University
Department of Earth and Atmospheric Sciences, University of Houston
Department of Geology, Kent State University
2018 AOES Department, George Mason University
Department of Geology and Geophysics, Texas A&M University
2017 Deford Lecture, Jackson School of Geosciences, University of Texas at Austin
2014 Department of Earth and Space Sciences, Central Michigan University

PRESS COVERAGE

Kent State Magazine, On Land and at Sea, Spring/Summer 2022.
Astrobiology Magazine, Travelogue from Young Researchers in the Field. June, 2013.

CONFERENCE ABSTRACTS (*Denotes Student Advisee)

- Da, J., Serach, L, **Gallagher, T**, Zhang, H., Lu, H., Sun, C., Huntington, K., Sharp, Z., Ji, S., Wang, H., Heitmann, E. Ji, J. Breecker, D. (2024) 'Summer drought over East Asia during the warm Pliocene: evidence from clumped isotope and triple oxygen isotope compositions of soil carbonate' Goldschmidt Conference, Chicago, IL.
- Gallagher, T.M.**, Dahlberg, J., *Smart, K., Czwakiel, N. and Breecker, D.O. (2023) 'Disentangling the Physical and Biological Controls on Soil Carbon Cycling with Soil Gases' AGU Annual Meeting, San Francisco, CA.
- Czwakiel, N., **Gallagher, T.M.**, Nie, J., Gao, P., Suc, J.P., and Breecker, D.O. (2023) "Applying a Multi-Proxy Approach to Understanding the Influence of Pliocene Global Cooling Events on the Iberian Peninsula" AGU Annual Meeting, San Francisco, CA.
- Gallagher, T.M.**, Dahlberg, J., *Smart, K., Czwakiel, N. and Breecker, D.O. (2023) 'Soil O₂ and CO₂ reveal controls on soil respiration and calcite formation in field-based experiments.' GSA Annual Meeting, Pittsburgh, PA.
- Smart, K*. Breecker, D.O., and **Gallagher, T.M.**, (2023) "Investigating the effect of soil respiration and microbial carbon use efficiency on soil CO₂ and O₂ concentrations". GSA Annual Meeting, Pittsburgh, PA.
- Stanevich, L.* and **Gallagher, T.M.**, (2023) "Understanding biogeochemical linkages across a Cretaceous terrestrial-marine interface." GSA Annual Meeting, Pittsburgh, PA.

- Smith, C., Smart, K., Harner, E., **Gallagher, T.M.**, and Tessin, A. (2023) "From surface to sediment: investigating the spatial variability of carbon stabilization in Arctic lake sediments." GSA Annual Meeting, Pittsburgh, PA.
- Fernandez Perez, T, Tessin, A., and **Gallagher, T.M.**(2023) "Phosphorus sources and cycling during Oceanic Anoxic Event 3 in the Western Interior Seaway." GSA Annual Meeting, Pittsburgh, PA.
- Joachimski, M., Müller, J., **Gallagher, T.M.**, Mathes, G., Chu, D., Mouraviev, F., Silantiev, V., Sun, Y., and Tong, J. (2023) 'Atmospheric CO₂ history of the late Permian and Early Triassic' EGU General Assembly, Apr 23-28, Vienna, Austria.
- Czwakiel, N., **Gallagher, T.M.**, Nie, J., Gao, P., Alonso-Zarza, A.M., and Breecker, D.O. (2022) "Applying a multi-proxy approach to the development and influence of a Mediterranean-type climate on the Iberian Peninsula" GSA Annual Meeting, Oct 9-12, Denver CO.
- Dahlberg, J., **Gallagher, T.M.**, *Smart, K., Czwakiel, N. and Breecker, D.O. (2022) 'Transient effect of calcite dissolution and steady state effect of soil moisture on the apparent respiratory quotient in pore space gas of experimental soils,' GSA Annual Meeting, Oct 9-12, Denver CO.
- Serach, L, **Gallagher, T.**, Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K., Sharp, Z., and Breecker, D. (2022), 'Oxygen isotope evidence for a warming-induced increase in soil water evaporation during the Pliocene on the Chinese Loess Plateau,' GSA Annual Meeting, Oct 9-12, Denver CO.
- *Smart, K and **Gallagher, T.M.** (2022) Investigating the Effect of Carbon Use Efficiency on Soil Respiratory Quotient Values through a High-Resolution Soil Incubation Study. ISME 18: Geneva, Switzerland
- Serach, L, **Gallagher, T.**, Lu, H., Zhang, H., Wang, H., Ji, S., Huntington, K. Breecker, D. (2020) Has eastern China always been summer-wet? Goldschmidt 2020, June 21-16, Virtual.
- Kelson, J., Huntington, K.W., Breecker, D.O., **Gallagher, T.M.**, Hoke, G.D. (2019) Season's greetings or annual averages from paleosol carbonates? Findings from numerical simulations of soil carbonate formation. AGU Fall Meeting, Dec. 9-13, San Francisco, CA.
- Gallagher, T.M.**, Sheldon, N.D., Chappaz, A., Hren, M.T. (2018) The Nonesuch Formation: a promising, albeit complicated, window into terrestrial environments during the Mesoproterozoic. **Invited oral presentation** at GSA Annual Meeting: Nov 4-7, Indianapolis, IN.
- Gallagher, T.M.**, Caldwell, T., Breecker, D.O. (2018) Tracking soil carbonate dissolution and precipitation through high-precision monitoring of soil pore space O₂ and CO₂. Oral presentation at GSA Annual Meeting: Nov 4-7, Indianapolis, IN.
- Serach, L., Zhang, H., Lu, H., Wang, H., Ji, S., Heitman, E., Gallagher, T.M., Xi, C. Breecker, D.O. (2018) Soil carbonate record of late Miocene and early Pliocene environmental change from the Jiaxian Red Clay section, Northern Loess Plateau, China: GSA Annual Meeting: Nov 4-7, Indianapolis, IN.
- Kelson, J.R., Huntington, K.W., Breecker, D.O., Hoke, G.D., Burgener, L., Gallagher, T.M. (2018) A synthesis of existing clumped isotope data reveals varied seasonal biases in soil carbonate accumulation: GSA Annual Meeting: Nov 4-7, Indianapolis, IN.
- Gallagher, T.M.**, Friedmann, E., Breecker, D.O. (2018) Toward non-destructive, semi-continuous monitoring of calcite precipitation/dissolution in soils. Oral presentation at Goldschmidt Conference: August 12-17, Boston, MA.

- Gallagher, T. M.**, Hren, M.T., and Sheldon, N.D. (2017) The effect of soil temperature seasonality on climate reconstructions from paleosols. Poster presentation at AGU Fall Meeting: December 11-15, New Orleans, LA.
- Rico, K.I., Sheldon, N.D., and **Gallagher, T.M.** (2017) Biogeochemical pathways of nutrient and metal burial in Proterozoic lakes and implications for atmospheric oxygen levels. GSA Annual Meeting: October 22-25, Seattle, WA.
- Rico, K.I., Sheldon, N.D., and **Gallagher, T.M.** (2017) Biogeochemical pathways of nutrient and metal burial in Proterozoic lakes and implications for atmospheric oxygen levels. Geobiology Society Conference, June 11-14, Banff, Canada.
- Gallagher, T.M.**, Sheldon, N.D., Mauk, J.L., Gueneli, N., Brocks, J. (2015), Constraining the thermal history of the Midcontinent Rift System with Clumped Isotopes and Organic Thermal Maturity Indices. Poster presentation at AGU Fall Meeting: December 14-18, San Francisco, CA.
- Gallagher, T.M.** and Sheldon, N.D. (2015), Late Santonian–Campanian paleosols from southwest Utah: Implications for weathering and paleoclimate. Poster presentation at GSA Annual Meeting: November 1-4, Baltimore, Maryland.
- Gallagher, T.M.** and Sheldon, N.D. (2015), Terrestrial Biogeochemistry and Carbon Burial Processes in Mesoproterozoic Lakes of the Mid-Continental Rift System. Poster presentation at Astrobiology Science Conference: June 15-19, Chicago, Illinois.
- Gallagher, T.M.** and Sheldon, N.D. (2014), Redox controls on terrestrial carbon burial in Late Mesoproterozoic rift basin lakes. Oral presentation at GSA Annual Meeting: October 19-22, Vancouver, British Columbia.
- Gallagher, T.M.** and Sheldon, N.D. (2014) Terrestrial Life and Environmental Heterogeneity within the Late-Mesoproterozoic Nonesuch Shale. Poster presentation at Goldschmidt Conference: June 8-13, Sacramento, California.
- Gallagher, T.M.**, and Sheldon, N.D. (2013) Combining Δ_{47} and whole-rock geochemical proxies in paleosols to constrain temperature seasonality. Oral presentation at GSA Annual Meeting: October 27-30, Denver, Colorado.
- Gallagher, T.M.**, Sheldon, N.D., Xiao, S. (2013) Clumped isotope thermometry of Neoproterozoic cap carbonates from northwest and southeast China. Poster presentation at Goldschmidt Conference: August 25-30, Florence, Italy.
- Dick, G. J., Kinsman-Costello, L., Sheldon, N.D., Biddanda, B.A., Marcus, D.N., Voorhies, A.A., **Gallagher, T.M.** (2013), Anoxygenic Cyanobacterial Mats in Middle Island Sinkhole, Lake Huron: An Analogue of the Precambrian, Goldschmidt Conference: August 25-30, Florence, Italy.
- Kinsman-Costello, L., Dick, G., Sheldon, N., Burton, A., **Gallagher, T.**, Marcus, D., Balke, M., Snider, M., and Biddanda, B., (2013) Salty Fresh Water: Submerged sinkholes receiving high-conductance, low-oxygen groundwater inputs harbor unique microbial communities and function, Society for Freshwater Science Conference.
- Cotton, J. M., Sheldon, N.D., Hren, M.T., and **Gallagher, T.M.** (2012) Variable magnitude of carbon isotope excursions in organic and inorganic terrestrial carbon pools during the Paleocene/Eocene Thermal Maximum, Abstract PP34A-07 presented at 2012 Fall Meeting, AGU.

Gallagher, T.M. and Sheldon, N.D. (2012) A new paleothermometer for forest paleosols and implications for Cenozoic continental paleoclimate. Oral presentation at GSA Annual Meeting: November 4-7, Charlotte, North Carolina.

Gallagher, T.M. and Nordberg, K. (2011) Recent oxygen deficiency in shallow waters of fjords on the Swedish west coast: climatically induced or human impact? Poster presentation at Urbino summer school in paleoceanography: Urbino, Italy.

Gallagher, T.M. and Capo, R.C. (2010) Origin of Jurassic carbonate nodules in Southeastern Wyoming. Oral presentation at National Conference on Undergraduate Research: April 15-17, Missoula, Montana

TEACHING EXPERIENCE

Kent State University

- 2024 ESCI 43044/53044 Environmental Isotopes
 ESCI 60091: Geology Colloquium
- 2023 ESCI 11040 How the Earth Works (online)
 ESCI 40095/50095 Environmental Soil Science
 ESCI 44070/54070: Sedimentology and Stratigraphy
 ESCI 60091: Field Methods in the Earth Sciences
- 2022 ESCI 60095: Environmental Isotopes
 GEOL 44070/54070: Sedimentology and Stratigraphy
 GEOL 60091: Field Methods in the Earth Sciences
- 2021 GEOL 44070/54070: Sedimentology and Stratigraphy
 GEOL 40095/50095: Environmental Soil Science
- 2020 GEOL 60084: Graduate Student Orientation
 GEOL 60091: Geology Colloquium

University of Texas at Austin

- 2017 GEO 388: *Environmental Isotope Geochemistry*, Guest Lecturer

University of Michigan

- 2015 EARTH 446: *Paleoclimatology*, Guest Lecturer
- 2014 EARTH 344: *Sustainable and Fossil Energy*, Graduate Student Instructor
 EARTH 120: *Geology of the National Parks*, Graduate Student Instructor
- 2013 EARTH 305: *Sediments*, Graduate Student Instructor
 HONORS 1540: *Wyoming Field Course*, Undergraduate Teaching Assistant

SUPERVISION AND SERVICE

PhD Student Supervision: K. Smart (2021-Present); A. Reinhardt (2023-Present)

M.S. Student Supervision: A. Reinhardt (2023), L. Stanevich (2022), S. Paul (2023-Present)

Undergraduate Supervision: L. Harner, (2022-Present), C. Bland (2019), E. Friedmann (2018), S. Leon (2013-2016), D. Boshers (2015), H. Sherman (2015),

Faculty Advisory Committee (2022)
Graduate Studies Committee (2021-2024)
Sub-Committee on Online Field Camp Offerings (2021)
Undergraduate Studies Committee (2020-2021,2024)
Guest Speaker, Gardeners of Greater Akron (2022)
Skype a Scientist (2023-2024)
Mentor, Michigan Undergraduate Research Opportunities Program (2013-2014)
Presentation Award Judge, Michigan Undergraduate Research Opportunities Program (2014)
Organizer, Michigan Geophysical Union Graduate Student Conference (2012-2015)
Development of a new exhibit on Terrestrial Life during the Mesoproterozoic, University of Michigan Natural History Museum (2014)
Manuscript Reviewer for: Science Advances; PNAS; Geology; Geochimica et Cosmochimica Acta; Climate of the Past; Palaeogeography, Palaeoclimatology, Palaeoecology; Journal of Geology, Earth and Planetary Science Letters; American Journal of Science; Geophysics, Geochemistry, and Geosystems; Science of the Total Environment
Funding Reviewer for: National Science Foundation; American Chemical Society
Convener for 2017 AGU session 'Past Atmospheric Variability Inferred from Paleoclimate Proxies'

PROFESSIONAL AFFILIATIONS

Geological Society of America; The Geochemical Society; American Geophysical Union

WORKSHOPS ATTENDED

2022 Carbonate Critical Zone Research Coordination Network, Gainesville, FL
2021 CLT Remote Instruction Workshop
2020 Carbonate Critical Zone Research Coordination Network, Virtual
2019 DUST-PIRE Workshop and Summer School; Kona, Hawaii
2019 NSF Signals in the Soil Awardees Meeting; Arlington, Virginia
2017 DUST-PIRE Workshop and Summer School; Xi'an, China
2016 Advanced Practices for Inclusive Teaching; University of Michigan CRLT
Canvas for GSIs: Pedagogies and Practicalities; University of Michigan CRLT
Enriching Scholarship: Getting Started with Digital Media Pedagogies; U. Michigan CRLT
2015 Preparing Future Faculty; U. Michigan CRLT
2011 Urbino Summer School in Paleoclimatology

FIELD EXPEDITIONS

2024 Sediment Coring, Gulf of Alaska, USA

- 2023 Quaternary Soils, Western Cape Region, South Africa
- 2019` Pliocene fluvial deposits, Teruel, Spain
- 2017 Permian-Triassic terrestrial sequences, Xinjiang Province, China
Chinese Loess Plateau Shaanxi Province, China
- 2015 Late Cretaceous terrestrial deposits, Utah, USA
- 2014 Morrison Formation, Late Jurassic, Wyoming, USA
- 2013 Midcontinent Rift System, Northern Michigan and Wisconsin, USA
- 2012 Midcontinent Rift System, Northern Michigan, Wisconsin, Minnesota, USA
- 2010 Morrison Formation, Late Jurassic, Wyoming, USA