SHANE D. SCHOEPFER

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Department of Geosciences and Natural Resources,
Western Carolina University
Cullowhee, NC

EDUCATION:

University of Washington — **Seattle, WA**
Doctor of Philosophy in Earth and Space Sciences — August 2014
Dissertation Title: *Nutrients, Productivity, and Redox Conditions during Greenhouse Extinctions in the Panthalassic Ocean*
Advisor: Dr. Peter D. Ward

Brown University — **Providence, RI**
Bachelor of Arts in Geology-Biology - magna cum laude — May 2009
Master of Science in Geological Sciences — May 2009
Thesis Title: *Stable Isotopes of Inorganic Nitrogen Nutrients in Narragansett Bay*
Advisor: Dr. Warren L. Prell

PROFESSIONAL EXPERIENCE:

Associate Professor, Western Carolina University — **2023 - Present**

Assistant Professor, Western Carolina University — **2017 – 2023**

Sedimentation and Stratigraphy
Environmental Geochemistry
Climate Change and Water Resources
Earth History and Prehistoric Life
Earth: Geology, Resources, Hazards, and Environment
Methods in Geology
Investigations in Environmental Geology
Topics in Geology: Paleoclimate
Geology Field Trip: Kentucky
Geology Field Trip: Great Smoky Mountains
Geology Field Trip: NC Piedmont
The Nature of Science
Geology, Landscapes, and the Human Psyche
Geology Senior Research Capstone

Field Geology Instructor, Dillon Montana
University of Washington — **Summer 2015 - 2021**
University of Calgary — **Summer 2015**
Western Washington University — **Summer 2014**

Postdoctoral Scholar, University of Calgary — **December 2014 – May 2017**
Supervisor: Dr. Charles M. Henderson

Teaching Assistant, University of Washington — **2013-2014**

Visiting Professor, Colorado College **Fall 2012**

GY210: block II: The Rocky Mountains as a Physical System,
GY210: block III: The Rocky Mountains as a Chemical System

NSF GK12 Ocean and Coastal Interdisciplinary Science **2011-2012**
teaching fellow, Ingraham High School, Seattle, WA

Developed teaching materials and taught lessons in Biology, Marine Biology, and Earth Science at a Seattle public high school.

Tidal Estuaries Monitoring and Assessment Program **Summer 2008**

Based at the National Ocean Service's Hollings Marine Lab, Charleston SC
Monitored anthropogenic nutrients and their impact on estuarine fauna throughout the southeast.

OTHER PROFESSIONAL ACTIVITIES:

Technical Program Co-chair,
Southeast Geological Society of America Meeting, Asheville, 2024

Guest Editor
Interrelated Climatic, Oceanic, and Biotic Events During the Triassic-Jurassic Transition: A Global Perspective*,* a special issue of *Earth Science Reviews*

The Palaeozoic-Mesozoic Transition in South China: Oceanic Environments and Life from the Late Permian to the Late Triassic*,* a two-part special issue of *Palaeogeography, Paleoclimatology, Palaeoecology*

Contributor to the Sedimentary Geochemistry and Paleoenvironments Project
International effort to compile data from marine sediments, to better understand long-term changes in ocean chemistry.

Session Organizer
Geological Society of America 2018 Annual meeting in Indianapolis
Session T119: Extinction and Survival across the Triassic-Jurassic Boundary

Grant Reviewer
Natural Environment Research Council (UK), Pushing Frontiers Fund
American Chemical Society Petroleum Research Fund

Peer Reviewer
AAPG Bulletin
Earth and Planetary Science Letters
Geology
Global and Planetary Change
Journal of Asian Earth Sciences
Marine and Petroleum Geology
Nature Geoscience
Palaeogeography, Paleoclimatology, Palaeoecology
Palaeoworld
Precambrian Research

HONORS & AWARDS:

Peter Misch Fellowship	2013
Inquisitive Graduate Student Support Grant	2013
Exxon Mobil Graduate Student Support Grant	2013
Robert and Nadine Bassett Fund Student Support Grant	2012
Best Oral Presentation in Geobiology - *UW ESS Research Gala*	2012
Best Oral Presentation by a Graduate Student - *UW ESS Research Gala*	2010
Phi Beta Kappa	2009
NOAA Ernest F. Hollings Scholarship	2007

FUNDED GRANT PROPOSALS:

The Cambrian Explosion in the Carolina Terrane: Undergraduate Field Research in Central NC
Funded by WCU Provost Scholarship Development Grant to Shane Schoepfer and Cheryl Waters-Tormey, November 2023

- Proposal for geochemical study of Albemarle Group metasediments in the Carolinas.
- Grant of $10,000 for student wages, fieldwork support, and geochemical analyses.

The Permian-Triassic nitrogen cycle: from South China to North America
Funded by the Chinese State Key Laboratory of Modern Paleontology and Stratigraphy
May 2018

- Proposal for geochemical study of core and outcrop material from Permian-Triassic South China and British Columbia
- Valued at 80k yuan renminbi ($13,000) of research support.

Biostratigraphy and Geochemical characterization of Early Triassic Montney deposition
Funded by Progress Energy, December 2015

- Proposal for complete biostratigraphic and geochemical study of a 400 m core of the Early Triassic Montney Formation in northeastern British Columbia.
- Proposal based on preliminary geochemical results generated at the University of Calgary using handheld XRF.
- Valued at $120k of salary and in kind support.

Application for GK12 Ocean and Coastal Interdisciplinary Science teaching fellowship
Funded by NSF, Spring 2012

- Program provided graduate student support to active researchers who were helping to teach marine science in Seattle area public schools.
- Worked with science teachers at Ingraham High School to develop activity in support of the Biology, Earth Science, and Marine Biology curricula.

PUBLIC PRESENTATIONS:

University of North Carolina, Chapel Hill, NC	2022
Geological Survey of Canada McConnel Club, Calgary, AB	2022
University of Georgia, Athens, GA	2019
Sigma Xi Science Café, Sylva, NC	2019
University of Alabama, Tuscaloosa, AL	2019
Appalachian State University, Boone, NC	2018
Nanjing Institute of Geology and Paleontology, Jiangsu, China	2016
University of Calgary, Calgary, AB	2016
Arkansas Tech University, Russellville, AR	2015
UW Earth and Space Sciences Research Gala, Seattle WA	2014
Colorado College, Colorado Springs, CO	2012
UW Earth and Space Sciences Research Gala, Seattle WA	2012
UW Program on Climate Change, Graduate Climate Seminar, Seattle, WA	2011
UW Earth and Space Sciences Research Gala, Seattle WA	2010

PUBLICATIONS:

Hao Zhu, Guijie Zhang, Menghan Li, Yawen Cui, Dandan Li, Lilin Sun, **Shane D. Schoepfer**, Charles M. Henderson, and Yanan Shen. 2025. $\delta^{13}C_{org}$ record from the Latest Permian to Middle Triassic in the middle paleo-latitude Western Canada Sedimentary Basin: Global correlation and environmental implications. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 112741.

Eva E. Stüeken, Alice Pellerin, Christophe Thomazo, Benjamin W. Johnson, Samuel Duncanson and **Shane D. Schoepfer.** 2024. Marine biogeochemical nitrogen cycling through Earth's history. *Nature Reviews Earth & Environment*, Volume 160, Pages1-16.

Shane D. Schoepfer, Charles M. Henderson, Thomas F. Moslow and Chen Shen. 2024. Extremely high resolution XRF core scanning reveals the Early Triassic depositional history of the Montney Formation in northeastern British Columbia, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Volume 637, 112019.

Samantha R. Ritzer, **Shane D. Schoepfer**, Bella Bussian, Una C. Farrell, Tiffani Fraser, Charles M. Henderson, Junyao Kang, Chiza N. Mwinde, Austin Patch and Erik A. Sperling. 2024. The relationship between total organic carbon and bottom water redox state in North American black shales. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Volume 649, 112266.

Richard G. Stockey, Devon B. Cole, Una C. Farrell, Heda Agić, Thomas H. Boag, Jochen J. Brocks, Don E. Canfield, Meng Cheng, **et al.** 2024. Sustained increases in atmospheric oxygen and marine productivity in the Neoproterozoic and Palaeozoic eras. *Nature Geoscience*, Volume 17(7), Pages 667-674.

Shane D. Schoepfer, Thomas J. Algeo, Bas van de Schootbrugge, Jessica H. Whiteside. 2022. The Triassic-Jurassic transition – A review of environmental change at the dawn of modern life. *Earth Science Reviews,* Volume 224, 104099

Shane D. Schoepfer, Jun Shen, Thomas J. Algeo, Hiroyoshi Sano. 2022. Onset of environmental disturbances in the Panthalassic Ocean over one million years prior to the Triassic-Jurassic boundary mass extinction. *Earth Science Reviews,* Volume 224, 103870

Shane D. Schoepfer and Charles M. Henderson. 2022. Paleogeographic implications of open marine anoxia in the Permian-Triassic Slide Mountain Ocean. *SEPM Special Publication 113: Late Paleozoic Tectonostratigraphic Evolution of Western Pangea,* Pages 205-225.

Jun Shen, Runsheng Yin, Thomas J. Algeo, Henrik H. Svensen, and **Shane D. Schoepfer**. 2022. Mercury evidence for combustion of organic-rich sediments during the end-Triassic crisis. *Nature Communications,* Volume 13, Pages 1-8.

Lei Xiang, **Shane D. Schoepfer**, Dong-Xun Yuan, Quan-Feng Zheng, and Hua Zhang. 2021. Oceanic redox evolution across the end-Permian mass extinction at Penglaitan section, South China. *Palaeoworld*, Volume 31, Pages 93-102.

Sean M. Newby, Jeremy D. Owens, **Shane D. Schoepfer**, and Thomas J. Algeo. 2021. Transient ocean oxygenation at end-Permian mass extinction onset shown by thallium isotopes. *Nature Geoscience,* Volume 14, Pages 678-683.

Úna C. Farrell, Rifaat Samawi, Savitha Anjanappa, Roman Klykov, Oyeleye O. Adeboye, Heda Agic, Anne-Sofie C. Ahm **et al.** 2021. The Sedimentary Geochemistry and Paleoenvironments Project. *Geobiology,* Volume 19 Pages 545-556.

Alex G. Lipp, Oliver Shorttle, Erik Sperling, J.J. Brocks, Devon Cole, P. W. Crockford, Lucas Del Mouro, **et al.** 2021. The composition and weathering of the continents over geologic time. *Geochemical Perspectives Letters,* Volume 7, Pages 21-26.

Lei Xiang, Hua Zhang, **Shane D. Schoepfer**, Chang-qun Cao, Quan-feng Zheng, Dong-xun Yuan, Yao-feng Cai, Shu-zhong Shen. 2020. Oceanic redox evolution around the end-Permian mass extinction at Meishan, South China. *Palaeogeography, Palaeoclimatology, Palaeoecology,* Volume 544, 109626**.**

Lei Xiang, **Shane D. Schoepfer**, Hua Zhang, Zhen-wu Chen, Chang-qun Cao, and Shu-zhong Shen. 2020. Deep-water dissolved iron cycling and reservoir size across the Ediacaran-Cambrian transition. *Chemical Geology*, Volume 541, 119575.

Zhong-Qiang Chen, Thomas J Algeo, and **Shane D Schoepfer**. 2019. The Permian–Triassic transition in the eastern Paleo-Tethys and adjacent regions: Environmental and biotic changes in ocean and on land. *Palaeogeography, Palaeoclimatology, Palaeoecology,* Volume 519, Pages 1-7.

Shu-zhong Shen, Jahandar Ramezani, Chang-qun Cao, Jun Chen, Douglas H. Erwin, Lei Xiang, Hua Zhang, **Shane D. Schoepfer**, Charles M. Henderson, Quan-feng Zheng, Samuel A. Bowring, Yue Wang, Xiang-dong Wang, Dong-xun Yuan, Yi-chun Zhang, Lin Mu, Jun Wang, Ya-sheng Wu. 2018. A sudden end-Permian mass extinction in South China. *Geological Society of America Bulletin,* Volume 131, Pages 205-223.

Lei Xiang, Hua Zhang, **Shane D. Schoepfer**, Chang-qun Cao, Shu-zhong Shen. 2018. Evolution of primary producers and productivity across the Ediacaran-Cambrian transition. *Precambrian Research,* Volume 313, Pages 68-77.

Zhong-Qiang Chen, Thomas J. Algeo, Yadong Sun, **Shane D. Schoepfer**. 2017. The Paleozoic-Mesozoic transition in South China: Oceanic environments and life from Late Permian to Late Triassic. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Volume 486, Pages 1-5.

Shane D. Schoepfer, Thomas S. Tobin, James D. Witts, Robert J. Newton. 2017. Intermittent euxinia in the high-latitude James Ross Basin during the latest Cretaceous and earliest Paleocene. *Palaeogeography, Palaeoclimatology, Palaeoecology.* Volume 477, Pages 40-54.

Amanda L. Godbold, **Shane D. Schoepfer**, Charles M. Henderson. 2017. Precarious Ephemeral Refugia during the Earliest Triassic. *Geology.* Volume 45(7), Pages 607-610.

Lei Xiang, **Shane D. Schoepfer**, Shu-zhong Shen, Chang-qun Cao, Hua Zhang. 2017. Evolution of oceanic uranium and molybdenum reservoir size around the Ediacaran-Cambrian transition at western Zhejiang, South China. *Earth and Planetary Science Letters*. Volume 464, Pages 84-94**.**

Hanlie Hong, Qian Fang, Lulu Zhao, **Shane Schoepfer**, Chaowen Wang, Nina Gong, Zhaohui Li, Zhong-Qiang Chen. 2017. Weathering and alteration of volcanic ashes in various depositional settings during the Permian-Triassic transition in South China: Mineralogical, elemental, and isotopic approaches. *Palaeogeography, Palaeoclimatology, Palaeoecology*. Volume 486, Pages 46-57.

Guijie Zhang, Xiaolin Zhang, Dongping Hu, Dandan Li, Thomas J. Algeo, James Farquhar, Charles M Henderson, Liping Qin, Megan Shen, Danielle Shen, **Shane Schoepfer**, Kefan Chen, Yanan Shen. 2016. Redox chemistry changes in the Panthalassic Ocean linked to the end-Permian mass extinction and delayed Early Triassic biotic recovery. *Proceedings of the National Academy of Sciences.* Volume 114(8), Pages 1806-1810**.**

Shane D. Schoepfer, Thomas J. Algeo, Peter D. Ward, Kenneth H. Williford, James W. Haggart. 2016. Testing the limits in a greenhouse ocean: Did low nitrogen availability limit marine productivity during the end-Triassic mass extinction? *Earth and Planetary Science Letters*, Volume 451, Pages 138-148.

Lei Xiang, **Shane D. Schoepfer**, Hua Zhang, Dong-xun Yuan, Chang-qun Cao, Quan-feng Zheng, Charles M. Henderson, Shu-zhong Shen. 2015. Oceanic redox evolution across the end-Permian mass extinction at Shangsi, South China. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Volume 448, Pages 59-71.

Eva E. Stüeken, Julien Foriel, Roger Buick, **Shane D Schoepfer**, 2015. Selenium isotope ratios, redox changes and biological productivity across the end-Permian mass extinction. *Chemical Geology*, Volume 410, Pages 28-39.

Alex H. Kasprak, Julio Sepúlveda, Rosalyn Price-Waldman, Kenneth H. Williford, **Shane D. Schoepfer**, James W. Haggart, Peter D. Ward, Roger E. Summons, Jessica H. Whiteside, 2015. Episodic photic zone euxinia in the northeastern Panthalassic Ocean during the end-Triassic extinction. *Geology*, Volume 43, Pages 307-310.

Shane D. Schoepfer, Jun Shen, Hengye Wei, Richard V. Tyson, Ellery Ingall, Thomas J. Algeo. 2015. Total organic carbon, organic phosphorus, and biogenic barium fluxes as proxies for paleomarine productivity. *Earth Science Reviews***,** Volume 49, Pages 23-52.

Hengye Wei, Jun Shen, **Shane D. Schoepfer**, Leo Krystyn, Sylvain Richoz, and Thomas J. Algeo, 2015. Environmental controls on marine ecosystem recovery following mass extinctions, with an example from the Early Triassic. *Earth Science Reviews*, Volume 49, Pages 108-135.

Jun Shen, **Shane D. Schoepfer**, Qinglai Feng, Lian Zhou, Jianxin Yu, Huyue Song, Hengye Wei, and Thomas J. Algeo, 2015. Marine productivity changes during the Permian-Triassic boundary crisis and Early Triassic recovery. *Earth Science Reviews*, Volume 49, Pages 136-162.

Gregory J. Barord, Fredrick Dooley, Andrew Dunstan, Anthony Ilano, Karen N. Keister, Heike Neumeister, Thomas Preuss, **Shane Schoepfer,** Peter D. Ward. 2014. Comparative Population Assessments of *Nautilus* sp. in the Philippines, Australia, Fiji, and American Samoa Using Baited Remote Underwater Video Systems. *PLoS ONE* 9(6): e100799.

Shane D. Schoepfer, Charles M. Henderson, Geoffrey H. Garrison, Julien Foriel, Peter D. Ward, David Selby, James C. Hower, Thomas J. Algeo, Yanan Shen. 2013. Termination of a continent-margin upwelling system at the Permian–Triassic boundary (Opal Creek, Alberta, Canada). *Global and Planetary Change*, Volume 105, Pages 21-35.

Shane D. Schoepfer, Charles M. Henderson, Geoffrey H. Garrison, Peter D. Ward. 2012. Cessation of a productive coastal upwelling system in the Panthalassic Ocean at the Permian–Triassic Boundary. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Volumes 313–314, Pages 181-188.

Patrick A. Flight, **Shane D. Schoepfer**, David M. Rand. 2010. Physiological stress and the fitness effects of Mpi genotypes in the acorn barnacle Semibalanus balanoides. *Marine Ecology Progress Series* Volume 404, Pages 139-149.

Andres Aslan, Karl Karlstrom, William C. Hood, Rex D. Cole, Thomas W. Oesleby, Charles Betton, M. Magdalena Sandoval, Andy Darling, Sam Kelley, Adam Hudson, Bryan Kaproth, **Shane Schoepfer**, Mary Benage, Rachel Landman. 2008. River incision histories of the Black Canyon of The Gunnison and Unaweep Canyon: Interplay between late Cenozoic tectonism, climate change, and drainage integration in the western Rocky Mountains, *in* Raynolds, R.G., ed., *Roaming the Rocky Mountains and Environs: Geological Field Trips: Geological Society of America Field Guide 10*, Pages 175–202.

CONFERENCE PRESENTATIONS:

The Carolina Terrane as a Record of Redox Conditions and Nutrient Cycling in the Iapetus Ocean during Early Animal Evolution
Oral Presentation: Goldschmidt Conference 2024 - Chicago

The Ediacaran-Cambrian Transition in the Carolina Terrane: Preliminary Results and New Directions
Poster Presentation: Geological Society of America 2022 Annual Meeting – Denver

Environmental Stresses Preceding the End-Triassic Extinction in the Panthalassic Ocean
Oral Presentation: GSA 2022 Joint North-Central & Southeastern Section Meeting

Euxinia seen through Pyrite Framboids in Trapper Creek, Idaho, Leading up to the End-Permian Extinction
Oral Presentation: GSA 2022 Joint North-Central & Southeastern Section Meeting

Extremely High Resolution XRF Core Scanning Reveals the Early Triassic Evolution of the Western Pangaean Margin
Oral Presentation: Geological Society of America 2020 Annual Meeting – Online

Precursors: Environmental Disturbance in the Panthalassic Realm Prior To The TJB
Oral Presentation: Geological Society of America 2018 Annual Meeting – Indianapolis

Did Nitrogen Limitation Control Primary Productivity During Greenhouse Climates? How Can We Tell?
Invited Oral Presentation: Geological Society of America 2017 Annual Meeting – Seattle

High-Resolution Biostratigraphic and XRF-Geochemical Correlation of the Montney Formation, NEBC **w/ Charles Henderson**
Oral Presentation: Geoconvention 2017 – Calgary

Porcupine Creek – a Permian-Triassic Boundary Section from the Enigmatic Cache Creek Terrane, British Columbia
Oral Presentation: Geological Society of America 2016 Annual Meeting – Denver

Open Ocean Nitrogen Limitation Preceded the End-Triassic Mass Extinction: Evidence from Haida Gwaii, British Columbia
Oral Presentation: Geological Society of America 2015 Annual Meeting – Baltimore

Marine Environmental Responses to Volcanism in the latest Changhsingian: Evidence from Penglaitan, Guangxi
Oral Presentation: Geological Society of America 2014 Annual Meeting – Vancouver

Nitrogen Limitation and Productivity in the Permian-Triassic Greenhouse Ocean
Poster Presentation: American Geophysical Union 2014 Fall Meeting – San Francisco

Gradients in Nutrient Distribution and Productivity in Northeast Panthalassa across the PTB
Oral Presentation: Geological Society of America 2012 Annual Meeting – Charlotte

Extreme Nitrogen Limitation Corresponds with Marine Extinctions During the Triassic-Jurassic Transition
Oral Presentation: Geological Society of America 2011 Annual Meeting - Minneapolis

Increasing Nitrogen Limitation at the P/Tr Boundary: A Pan-Oceanic Phenomenon?
Oral Presentation: Geological Society of America 2011 Annual Meeting – Minneapolis

Termination of a Productive Upwelling System in Eastern Panthalassa at the P/T Boundary: Evidence from Opal Creek, AB
Oral Presentation: Geological Society of America 2010 Annual Meeting - Denver

Examination of Gunnison River influences on Cactus Park Lake Beds using Heavy Mineral and Geochemical Analyses
Poster Presentation: American Geophysical Union 2008 Fall Meeting – San Francisco

Quaternary Abandonment and Sedimentary Fill History of Cactus Park and Unaweep Canyon, Uncompahgre Plateau, Colorado
Poster Presentation: Geological Society of America 2007 Annual Meeting – Philadelphia