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Grand Valley State University
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EDUCATION

Ph.D. (2013) Mallinson Institute for Science Education, Western Michigan University
Advisor: Dr. Heather Petcovic
Thesis Title: An Embodied Perspective on Expertise in Solving the Problem of Making a Geologic Map

M.S. (2005) Earth and Planetary Sciences, University of New Mexico
Advisors: Dr. Jane Selverstone, Dr. John Geissman, Dr. Adrian Brearley
Thesis Title: Magnetic Properties of Mantle Xenoliths from the Rio Puerco Volcanic Necks, New Mexico

B.A. (2000) Mount Holyoke College, Cum Laude with High Honors in Geology
Advisor: Dr. Michelle Markley
Thesis Title: Structural Characterization of the Mount Waldo Pluton, Waldo County, Maine

PROFESSIONAL EXPERIENCE

2022 – Present	Associate Professor , Grand Valley State University, Geology Department
2015 – 2022	Assistant Professor , Grand Valley State University, Geology Department
2013 – 2015	Postdoctoral Fellow , Michigan State University, Department of Geological Sciences and CREATE for STEM Institute for Research on Mathematics and Science Education
2011	Teaching Assistant , <i>Exploring Earth Science: Geology</i> , Western Michigan University, The Mallinson Institute for Science Education (Two semesters)
2009 – 2013	Research Assistant , Western Michigan University, The Mallinson Institute for Science Education, “Learning across the Expert-Novice Continuum: Cognition in the Geosciences”
2003 – 2008	Research Assistant , University of New Mexico, Department of Earth and Planetary Sciences, “Mantle and crustal xenoliths of the Puerco Volcanic Necks, New Mexico: Constraints on lithospheric evolution at the transition between the Colorado Plateau and the Rio Grande Rift” and “Exhumation of the Colorado Plateau” (Five semesters)
2003 – 2008	Teaching Assistant , <i>Igneous and Metamorphic Petrology, Physical Geology Lab</i> , University of New Mexico, Department of Earth and Planetary Sciences (Five semesters)
2000 – 2003	Education Department Programs Assistant , American Geosciences Institute, Alexandria, VA

PROFESSIONAL ACTIVITIES

2023 – Present	Faculty Fellow , Office of Undergraduate Research and Scholarship, Center for Undergraduate Research and Scholar Engagement, Grand Valley State University
2023 – Present	Vice President , Geoscience Education Research Division, National Association of Geoscience Teachers (NAGT)
2023 – 2024	Committee Member , University Assessment Committee, GVSU
2023	External Reviewer , Tenure and Promotion Review, Western Washington University
2023, 2020	Panel Reviewer , National Science Foundation
2022	K-12 Chair , Local Organizing Committee, Geological Society of America (GSA) Annual Meeting
2021 – 2024	Committee Member , Post-Secondary Committee, National Science Teaching Association (NSTA)
2021 – Present	Committee Member (Chair) , Student Academic Career Prep Fund, NAGT
2019 – 2022	Committee Member , Professional Development Planning Committee, NAGT
2019 – 2021	Committee Member , MiSTEM Network Advisory Board for the Greater West Michigan Region
2018, 2014	Reviewer , GSA North Central Section, Undergraduate Research Grants
2017 – 2022	Committee Member , Equity and Inclusion Committee, GVSU
2017 – 2019	National Co-Chair for 2018 and 2019 Earth Educators’ Rendezvous , NAGT
2017 – 2018	Volunteer , Lake Michigan Academy, Grand Rapids, MI
2017 – 2018	Co-Leader for “Grand Sciences: Bridges to Learning” program , GVSU College of Education and College of Liberal Arts and Sciences
2017	Search Committee for Publisher , <i>Journal of Geoscience Education</i>
2016 – 2017	Planning Committee for 2017 Earth Educators’ Rendezvous , NAGT
2016 – 2017	Search Committee for Editor-in-Chief , <i>Journal of Geoscience Education</i>
2015 – 2018	Associate Editor , <i>Journal of Geoscience Education</i>
2014 – 2015	Museum Docent , Impression 5 Science Center, Lansing, MI
2013 – 2015	Executive Counselor , The International Association for Geoscience Diversity, Executive Committee (Term: 2013–2015)
2013 – Present	Peer Reviewer , <i>Journal of Geoscience Education</i> ; <i>Solid Earth</i> , <i>GSA Today</i> , <i>Geosphere</i> , <i>Earth Science Systems and Society</i>
2012	Session Co-Chair , Geoscience Education Session, <i>Seeing through the Eyes of the Geologist: Eye Tracking, Video, and Image Analysis in Geoscience Education and Geocognition Research (Digital Posters)</i> GSA Annual Meeting
Summer 2002	Science and Special Education Resource , Access Earth, University of Southern Maine

COURSES TAUGHT at GVSU (As of November 2023)

Geology 111, Exploring the Earth

Geology 175, Research Tools for Geosciences

Geology 202, Hydrosphere for K-8 Teachers

Geology 214, Solid Earth Materials and Systems

Geology, 485, Geology Seminar (Writing Intensive)

Geology 486, Geology Reading Seminar

Pedagogical Content Knowledge, 495, Elementary Capstone (Writing Intensive)

Science 225, Integrated Life Science for K-8 Teachers

GRANTS

- 2015 \$481,795 The Impact of Social Capital and Mentoring in Earth System Science Workforce Development (Co-Principal Investigator), **National Science Foundation**, 1535011. *Funded*. Sub-award to Grand Valley State University, \$41,304.
- 2014 \$500 **MSU Postdoc Association Travel Fellowship**, Michigan State University
- 2012 \$700 **Graduate College Travel Grant**, Western Michigan University

CONSULTING EXPERIENCE AS EXTERNAL REVIEWER

- 2023 **Submitted, Not funded:** NSF, Division of Undergraduate Education, Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program (Track 2): Scots in STEM Scholar/Mentor Program, College of Wooster, Wooster, OH.
- 2018 **Funded, \$650,000:** NSF, Division of Undergraduate Education: Geo-Engineering Innovations through Undergraduate Scholarship (Award 1741971), Triton College, River Grove, IL. As a five-year grant, the Geo-Engineering Innovations through Undergraduate Scholarship (GENIUS) project at Triton College is designed to address the regional need for more and better-prepared geoscience and engineering technology graduates.
- 2017 **Submitted, Not funded:** NSF, Division of Undergraduate Education, Improving Undergraduate STEM Education, GEOPATHS-IMPACT: Engaging Underrepresented Students in Geoscience through an Icelandic Classroom Environment (EngageUs), Grand Rapids Community College and Grand Valley State University, Grand Rapids, MI.

AWARDS and HONORS

- 2020 \$500 **Distinguished Early Career Scholar Award**, Grand Valley State University
- 2016 \$200 **Best Paper of the Year (Callahan et al., 2015)**, *Journal of Geoscience Education*
- 2013 \$250 **Best Graduate Oral Presentation Award**, GSA North Central Section Annual Meeting
- 2012 N/A **Department Scholar Award**, Western Michigan University
- 2008 \$500 **Caswell Silver Scholarship Fund**, University of New Mexico
- 2008 \$600 **Jerry Harbour Memorial Scholarship**, University of New Mexico
- 2007 \$900 **Geology Alumni Scholarship**, University of New Mexico
- 2006 \$2000 **Regents Fellowship**, University of New Mexico
- 2006 \$450 **Wengerd Traveling Scholarship**, University of New Mexico
- 2006 \$450 **Jerry Harbour Memorial Scholarship**, University of New Mexico
- 2005 \$950 **Geology Alumni Scholarship**, University of New Mexico
- 2004 \$900 **Geology Alumni Scholarship**, University of New Mexico

MANUSCRIPTS IN PREPARATION

- Bitting, K.S., Callahan, C.N., & Roselle, L., Do STEM faculty's system narratives correspond in consistent ways with their self-described teaching practices? For submission to *Teaching and Learning Inquiry (TLI)*.

PEER-REVIEWED PUBLICATIONS

- McCallum, C., Libarkin, J., **Callahan, C.N.**, & Atchison, C. (2018). Mentoring, social capital, and Diversity in Earth System Science. *Journal of Women and Minorities in Science and Engineering*, 24(1), 17-41.
- Callahan, C.N.**, LaDue, N.D., Baber, L., Sexton, J., van der Hoeven Kraft, K., Zemani-Gallaher, E.M., (2017). Theoretical perspectives on increasing recruitment and retention of underrepresented Students in the Geosciences. *Journal of Geoscience Education*, 65(4), 563-576.
- Baker, K.M., Johnson, A.C., **Callahan, C.N.**, & Petcovic, H.L. (2015). Use of cartographic images by expert and novice field geologists in planning fieldwork routes. *Cartography and Geographic Information Science*, 43 (2), doi: 10.1080/15230406.2015.1072735.
- Hambrick, D.Z., Libarkin, J.C., Petcovic, H.L., Baker, K.M., Elkins, J., **Callahan, C.N.**, Turner, S.P., Rench, T.A., & LaDue, N.D. (2012). A test of the Circumvention-of-Limits hypothesis in scientific problem solving: The case of geological bedrock mapping. *Journal of Experimental Psychology: General*, 141(3), 397-403. doi: 10.1037/a0025927
- Callahan, C.N.**, & Markley, M.J. (2003). A record of crustal-scale stress: Igneous foliation and lineation in the Mount Waldo Pluton, Waldo County, Maine, *Journal of Structural Geology*, 25(4), 541-555.

EDITOR-REVIEWED ARTICLE

- Callahan, C.N.**, Libarkin, J.C., McCallum, C.M. & Atchison, C. (2015). Using the lens of social capital to understand diversity in the Earth Systems Sciences workforce. *Journal of Geoscience Education*, 63 (2), 98-104. doi: <http://dx.doi.org/10.5408/15-083.1>

EDITORIALS AND OTHER WRITINGS

- Riggs, E., **Callahan, C.N.**, and Brey, J. (2018). Research on access and success of underrepresented groups in the geosciences. In St. John, K. (Ed.) (2018), *A Community Framework for Geoscience Education Research*. National Association of Geoscience Teachers. Retrieved from https://doi.org/10.25885/ger_framework/6. (Note: While this article did not go through traditional peer review, the manuscript was reviewed multiple times through public comment opportunities.)
- Metzger, E.P., Blockstein, D.E. & **Callahan, C.N.** (2017) Interdisciplinary teaching and sustainability: An introduction. *Journal of Geoscience Education*, 65(2), 81-85.
- John, K. St., Petcovic, H., Stokes, A., Arthurs, L., **Callahan, C.**, Feig, A., ... & Nagy-Shadman, E. (2016). Un-packaging manuscript preparation and review guidelines for curriculum and instruction and research papers. *Journal of Geoscience Education*, 64(1), 1-4.
- Callahan, C.N.** (1999). Advice about being an LD student, in *Exceptional Children and Youth*, 2nd edition. Nancy Hunt and Kathleen Marshall, authors. Boston: Houghton Mifflin Co.

INVITED PRESENTATIONS

Earth Science Experiential and Indigenous Learning (EaSEIL) Initiative and Skylight Science Centre for Learning and Teaching, University of British Columbia (2024).

Guest Seminar Speaker: *Using the construct of novelty space to explore how experiences with disability intersect with experiences in science teaching and learning.* May 7.

Department of Earth and Planetary Sciences, Harvard University (2024).

Department Colloquium Speaker: *Reflecting on Sources of Belonging to Support Learning and Teaching in the Geosciences* (<https://eps.harvard.edu/event/eps-colloquium-caitlin-callahan-grand-valley-state-university>). April 1.

Department of Geological and Environmental Sciences, Western Michigan University (2019).

Department Seminar Speaker: *Using the Lens of Social Capital to Inform Efforts Aiming to Increase Diversity in the Geosciences.* March 25.

Incorporated Research Institutions for Seismology (IRIS) Internship (2016).

Program, www.iris.edu/hq/internship/. Online presentation during orientation week.
Guest Speaker: *Leveraging Relationships in Your Internship Experience.* June 2.

Grand Valley State University Council for Exceptional Children, Student Chapter (2016).

Guest Speaker. April 4.

Geo-Needs: Stakeholder Needs Assessments for Broadening Participation in the Geoscience Workforce (2016) (https://serc.carleton.edu/geoneeds/Education_Researcher_Agenda.html).

Education Research Focus Group, Guest Speaker: *Social Capital as a Framework.* August 9-11.

WORKSHOPS OR CONFERENCE SESSIONS

Callahan, C.N., (2024), *Ideas for Using Equity in the Science Classroom*, **Teaching for Equity Conference**, Grand Valley State University College of Education and Community Innovation.

Callahan, C.N., & Owen-De Schryver, J. (2024). *Mentoring from Different Perspectives*. Office of Undergraduate Research and Scholarship, Center for Undergraduate Research and Scholar Engagement, Grand Valley State University

Callahan, C.N., (2023). *Ideas for Using Equity in the Science Classroom*, **Teaching for Equity Conference: Inclusion, Accessibility, and Belonging**, Grand Valley State University College of Education and Community Innovation.

Callahan, C.N., & Atchison, C., (2019). *Mentoring for Diversity*, **Geoscience Alliance** (Tempe AZ).

Callahan, C.N. (2018). *Mentoring Practices, Roundtable Discussion*. **Earth Educators' Rendezvous**, Lawrence, KS.

Forbes, C., & **Callahan, C.N.** (2018). *Advancing Transdisciplinary Dialogue in Geoscience Education Research*, **Earth Educators' Rendezvous**, Lawrence, KS.

Libarkin, J., McCallum, C., Atchison, C., **Callahan, C.N.**, Kurz, S., Jaimes, P., Wiley, L., (2017). *Mentoring for Diversity*, Geological Society of America Annual Meeting (Seattle WA).

PROFESSIONAL PRESENTATIONS AT CONFERENCES

* *Denotes undergraduate student collaborator and presenter*

Markley, M., & **Callahan, C.N.** (2024). What Are the Ethics of Going into the Field? *Geological Society of America Abstracts with Programs*, 56(1), doi: 10.1130/abs/2024NE-397547

Callahan, C.N. (2023). Resetting My Relationship with Time: An Autoethnography of a Geoscience Professor with Learning Disability. *Geological Society of America Abstracts with Programs*, 55(6), doi: 10.1130/abs/2023AM-395900.

Petcovic, H., **Callahan, C.N.**, Foley, K., McNeal, P., Morris, N., Nyarko, S., Popoola, O., & Woodley, C. (2023). Turning Talk into Data: Methods for Eliciting Verbal Data in Qualitative and Mixed Methods Geoscience Education Research. *Geological Society of America Abstracts with Programs*, 55(6), doi: 10.1130/abs/2023AM-394509.

VanDeWeg, R.* & **Callahan, C.N.** (2023). A Tale of One Place from Two Perspectives: Comparing Undergraduate Students' Responses to Different Written Works about the Grand Canyon. *Geological Society of America Abstracts with Programs*, 55(6), doi: 10.1130/abs/2023AM-395922.

Callahan, C.N. (2023). My Fight with Time in the Struggle to Learn with a Disability as a Student and as a Professor in Geology. *Geological Society of America Abstracts with Programs*, 55(3), doi: 10.1130/abs/2023NC-387072.

DeSantiago, J. * & **Callahan, C.N.** (2023). Impacts of a Geocorps Internship as a Geology Interpreter at the Custer-Gallatin National Forest. *Geological Society of America Abstracts with Programs*, 55(3), doi: 10.1130/abs/2023NC-386996

Peterson, G., **Callahan, C.N.**, Kumpf, A., Mattox, S., Mattox, T., & Winklestern, I. (2023): Reflecting on Lessons Learned from Participation in the Unlearning Racism in the Geosciences (URGE) Program. *Geological Society of America Abstracts with Programs*, 55(3), doi: 10.1130/abs/2023NC-386993

Bitting, K.S., **Callahan, C.N.**, & Roselle, L. (2023), We Teach as We See the World: Exploring the role of personal and family narratives in pedagogical approach. X-DBER Online Conference, University of Nebraska-Lincoln, 3-5 April.

Callahan, C.N., (2022). How success and struggle coexist in my career as a scientist with a learning disability. In *AGU Fall Meeting Abstracts* (Vol. 2022, pp. ED45A-05).

Callahan, C.N. & Turner, S. (2022). No one person has all the answers: The importance of social capital in a successful STEM program (Invited). In *AGU Fall Meeting Abstracts* (Vol. 2022, pp. ED53B 01).

Callahan, C.N., (2022). Examining experiences in the geosciences as a student and as a professor with a learning disability: an autoethnography comparing the two perspectives. Earth Educators' Rendezvous: Minneapolis, MN.

Callahan, C.N., (2021). Seeking to Recreate Lightning in a Bottle: Reflecting on Assignments Used in an Integrated Science Course for Preservice Teachers. Earth Educators' Rendezvous: Online Conference.

Scherer, H.H., **Callahan, C.N.**, McConnell, D.A., Ryker, K., and Egger, A.E. (2019). How to write a literature review article for JGE: Key strategies for a successful publication. *Geological Society of America Abstracts with Programs*, 51(5), doi: 10.1130/abs/2019AM-333357.

- Wiley, L.* & **Callahan, C.N.** (2017). Exploring the importance of social capital for geoscientists with cognitive disabilities. *Geological Society of America Abstracts with Programs*, 49(6), doi: 10.1130/abs/2017AM-304362.
- Petcovic, H.L., Baker, K.M., & **Callahan, C.N.** (2017). How do they know where to go? Expert versus novice reasoning and navigation during bedrock geologic mapping. *Geological Society of America Abstracts with Programs*, 49(6), doi: 10.1130/abs/2017AM-305940.
- LaDue, N. D., **Callahan, C. N.**, Baber, L. D., Sexton, J., van der Hoeven Kraft, K. J., & Zamani Gallaher, E. M. (2017). Applying theoretical frameworks to the recruitment and retention of underrepresented students in the geosciences (Invited Presentation). *Geological Society of America Abstracts with Programs*, 49 (6), doi: 10.1130/abs/2017AM-302667.
- Callahan, C.N.** (2017). Sharing the idea of adaptations with pre-service teachers: Reflections on a professional development workshop related to inclusive education. *Geological Society of America Abstracts with Programs*, 49(6), doi: 10.1130/abs/2017AM-307784.
- Callahan, C.N.** & Sparks, A.* (2017). Comparing social comparisons in geoscience courses. Earth Educators' Rendezvous: Albuquerque, NM.
- Sparks, A.* & **C.N. Callahan** (2016). Measure for measure: Social comparison in introductory and advanced geoscience courses. *Geological Society of America Abstracts with Programs*, 48 (7), doi: 10.1130/abs/2016AM-287577.
- Lloyd, F.* & **Callahan, C.N.** (2016b). A snapshot of the future: An analysis of catalog descriptions for future Earth Science teachers. Midstates Consortium for Math and Science, *2016 Undergraduate Research Symposium in the Physical Sciences, Math, and Computer Science*. November 11-12.
- Lloyd, F.* & **Callahan, C.N.** (2016a). Judging a course by its cover: An analysis of catalog descriptions of Earth Science courses for future teachers. *Geological Society of America Abstracts with Programs*, 48 (7), doi: 10.1130/abs/2016AM-282320.
- Callahan, C.N.**, Petcovic, H., & Baker, K.M., (2016). Do actions speak louder than words? Comparing audio and video records of reasoning in the field. *Geological Society of America Abstracts with Programs*, 48 (7), doi: 10.1130/abs/2016AM-287638.
- Callahan, C.N.**, Libarkin, J.C., McCallum, C., and Atchinson, C.L. (2015). The relationship between trust in mentor and career satisfaction in the Earth System Sciences. *Geological Society of America Abstracts with Programs*, 47(7), 685.
- Callahan, C.N.**, Petcovic, H.L., & Baker, K.M. (2015). Rock, paper, hammer: Where do thoughts and actions count in making a geologic map? Earth Educators' Rendezvous: Boulder, CO.
- Callahan, C.N.**, Libarkin, J.C., Bomzer, D., & Smrecak, T.A., (2014). Jargon or gibberish: How does science read to undergraduate students? *Geological Society of America Abstracts with Programs*, 46(6), 245.
- Callahan, C.N.**, Petcovic, H.L., Libarkin, J.C., & Baker, K.M. (2013). What would Chamberlin think? Experts map without multiple working hypotheses. *Geological Society of America Abstracts with Programs*, 45(7), 471.

- Callahan, C.N.**, Petcovic, H.L., & Baker, K.M. (2013). How a geologist can get led astray: A video log study examining how errors in observations and interpretations yield errors in geologic maps. *Geological Society of America Abstracts with Programs*, 45(4), 70.
- Callahan, C.N.** (2012). Finding a path into the geosciences as a student with special needs. *Geological Society of America Abstracts with Programs*, 44(7), 513.
- Callahan, C.N.**, Petcovic, H.L., & Baker, K.M. (2012). Use of time and space in geologic mapping: A video log study. *Geological Society of America Abstracts with Programs*, 44(7), 115.
- Petcovic, H.L., Libarkin, J.C., Hambrick, D.Z., Baker, K.M., Elkins, J.T., **Callahan, C.N.**, Turner, S., Rench, T.A., & LaDue, N.D. (2011). Novice to expert cognition during geologic bedrock mapping. *American Geophysical Union Fall Meeting*, Abstract ED13C-0837.
- Callahan, C.N.**, & Petcovic, H.L. (2011). Using think-aloud audio recordings to understand patterns of thoughts during geologic mapping. *Geological Society of America Abstracts with Programs*, 43(5), 534.
- Callahan, C.N.**, Hayden, T.G, Sibert, R.J, & Ewald, S.K. (2011). An inquiry-based approach to teaching about the internal structure of the Earth. *Geological Society of America Abstracts with Programs*, 43(5), 134.
- Callahan, C.N.**, Petcovic, H.L., & Baker, K.M. (2010). Getting the inside track: Head-mounted cameras give new perspective on process of bedrock mapping. *Geological Society of America Abstracts with Programs*, 42(5), 191.
- Petcovic, H.L., **Callahan, C.N.**, Libarkin, J.C., Baker, K.M., Hambrick, H.D., Elkins, J.T., & Wisniewska, M. (2010). Thinking, skills, and strategies of novice to expert geologists during bedrock mapping. *International Geoscience Education Organization Quadrennial Conference*.
- Petcovic, H.L., Elkins, J.T., & **Callahan, C.N.** (2010). Do maps tell the whole story? Geologic mental models as expressed verbally and by maps. *Geological Society of America Abstracts with Programs*, 42(5), 189.
- Callahan, C.N.**, Petcovic, H.L., Baker, K.M., & Libarkin, J.C. (2009). Tracking expert and novice geocognition during field mapping. *Geological Society of America Abstracts with Programs*, 41(7), 250.
- Callahan, C.N.**, Roy, M., & Condie, K. (2007). Using xenoliths to explore variations in upper mantle composition and the relation of composition to seismic velocity structure beneath the Colorado Plateau. *Geological Society of America Abstracts with Programs*, 39(6), 278.
- Callahan, C.N.**, Roy, M., & Pederson, J. (2006). Rock uplift on the Colorado Plateau driven by erosion and flexural isostasy. *American Geophysical Union Fall Meeting*, Abstract S43A-1374.
- Callahan, C.N.**, Geissman, J.W., Selverstone, J. & Brearley, A. (2005). Magnetic properties of mantle xenoliths and evidence of localized modification of the mantle beneath the Rio Puerco volcanic field, New Mexico. *American Geophysical Union Fall Meeting*, Abstract T13A-0424.
- Callahan, C.N.**, Geissman, J.W., Selverstone, J. & Brearley, A. (2004). Characterization of magnetic properties and magnetic mineralogy of mantle xenoliths from the Rio Puerco Volcanic Field, New Mexico. *Geological Society of America Abstracts with Programs*, 36(5), 146.

Callahan, C.N., & Markley, M.J. (2002). Tectonic significance of igneous foliation and lineation in the Mount Waldo Pluton, Waldo County, Maine. *Geological Society of America Abstracts Annual Meeting*.

Callahan, C.N., Byerly, G.R., & Smith, M.J. (2001). The American Geological Institute Minority Participation Program (MPP): Thirty years of improving access to opportunities in the geosciences through undergraduate and graduate scholarships for under-represented minorities. *American Geophysical Union Spring Meeting*, Abstract ED21D-04 Invited.

PROFESSIONAL AFFILIATIONS

American Evaluation Association
Council on Undergraduate Research
Geological Society of America

International Association for Geoscience Diversity
National Association of Geoscience Teachers
National Science Teaching Association