KATHERINE DAMERON ALMQUIST RYKER

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EDUCATION

Ph.D. Geoscience Education, NC State University May 2014
Dissertation: An Evaluation of Classroom Practices, Inquiry and Teaching Beliefs in Introductory Geoscience Classrooms.
Advisor: Dr. David McConnell

M.S. Sedimentary Geology, NC State University May 2011
Thesis: The Weathering of Volcanic Ash and Resultant Clay Minerals in a Terrestrial and Marine Environment: North Island, New Zealand.
Advisor: Dr. Lonnie Leithold

B.S. Earth and Ocean Sciences, Duke University May 2007
Duke Program in Education: Secondary Teacher Licensure, Science

AWARDS & HONORS

For details on these awards, including videos from nominees, please see https://sites.google.com/site/katherineryker/home/teaching-awards

- Liggit Family and Friends Teaching and Learning Partnership Scholarship, 2017
- Multiple Thank-a-Teacher Awards: one in Fall 2013, two in Spring 2014 at NCSU; three in 2017 at EMU
- Eastern Michigan University Woman of Excellence, 2016
- Recognized Mentor, College of Education Celebration of Excellence, 2016
- Preparing Future Leaders Ambassador, 2012 – 2013
- Certificate in Geographic Information Systems, 2012
- National Association of Geoscience Teachers Outstanding Teaching Assistant Award, 2011
- NC State Certificate of Accomplishment in Teaching, May 2011
- NC State Outstanding Graduate Teaching Assistant, 2010

TEACHING EXPERIENCE

Eastern Michigan University (Ypsilanti, MI) *2014 – 2017*

- ESSC 110: The Dynamic Earth System
- ESSC 202: Earth Science for Elementary Teachers
- ESSC 312: The Geosphere for Elementary Teachers (online, face-to-face)
- ESSC 347: Secondary Methods for Earth Science Education
- ESSC 406: Nature of Science (online)
- ESSC 407: Nature of Science for Elementary Teachers (online)

North Carolina State University (Raleigh, NC) *2008 – 2014*

- MEA 110: Physical Geology (face-to-face, online and hybrid; standard and honors)
- MEA 101: Physical Geology
- Lab Coordinator for 25+ sections a semester of MEA 110: Physical Geology
- Exploring the Earth; camp for HS Juniors and Seniors
- MEA 592: Geology of North Carolina for Teachers; grad course

Northern High School, Durham Public Schools (Durham, NC) *2007 – 2008*

- District standardized testing material preparation consultant
- Teacher, AP Biology and Biology I (Standard, Honors, ESL)
- Long term substitute, Algebra I and Intro to High School Math
- Student teacher, Earth Sciences (ESL, Honors) and Astronomy (Standard, Honors)

Other

- Author, Macmillan online content development, 2016 – present
- Author, McGraw-Hill LearnSmart projects, 2012 – 2014
- Part time staff, North Carolina Museum of Natural Sciences, 2013 – 2014
- Lead Tutor for CORRAL, a program for at-risk girls ages 11-18 (math, science), 2010 – 2014
- NC State Geoscience Education Outreach Coordinator, 2010 – 2014
- Visiting geologist and science fair judge for grades K-12, 2010 – 2014

PUBLICATIONS

1. **Ryker, K.**, Bitting, K., Teasdale, R. (Accepted with Revisions). "Using Observation Protocols to Reliably Measure Teaching Practice in the Classroom: A Primer for Discipline-Based Education Researchers," CBE – Life Sciences Education.
2. Bitting, K., Teasdale, R. and **Ryker, K.** (November 2017). "Applying the GER Strength of Evidence Pyramid: Developing a Rubric to Characterize Existing Geoscience Teaching Assistant Training Studies," Journal of Geoscience Education, Special Issue on Synthesizing Results and Defining Future Directions of Geoscience Education Research.
3. McConnell, D., Chapman, L., Czajka, C.D., Jones, J.P., **Ryker, K.** and Wiggen, J. (November 2017). "Instructional Utility and Learning Efficacy of Common Active Learning Strategies," Journal of Geoscience Education, Special Issue on Synthesizing Results and Defining Future Directions of Geoscience Education Research.
4. **Ryker, K.**, McConnell, D. (February 2017). "Assessing Inquiry in Physical Geology Laboratory Manuals," Journal of Geoscience Education.
5. **Ryker, K.**, McNeal, K., Atkins, R., LaDue, N. and Clark, C., 2016. Facilitating Spatial Thinking with Augmented Reality Sandboxes. In the Trenches, October 2016.
6. Lukes, L.A., LaDue, N.D., Cheek, K.A., **Ryker, K.**, St. John, K., 2015, "Creating a Community of Practice Around Geoscience Education Research: NAGT-GER," Journal of Geoscience Education, 63(1-6).

7. **Ryker, K.**, D. McConnell, "Can Graduate Teaching Assistants Teach Inquiry-based Geology Labs Effectively?" Journal of College Science Teaching, September/October 2014.
8. McConnell, D., Bedward, J., Lukes, L., **Ryker, K.**, 2012, "Making student thinking about learning visible," *In the Trenches*, 2 (1).

Manuscripts in Preparation

1. **Ryker, K.**, R. Atkins, C. Clark, N. LaDue, and K. McNeal. "Play is Not Enough: Spatial Thinking and the Augmented Reality Sandbox".
2. Teasdale, R., **Ryker, K.** and Bitting, K. "Training Graduate Teaching Assistants in the Geosciences: Our Practices vs. Perceived Needs."

CONFERENCE PRESENTATIONS

*denotes undergraduate student who I supervised

1. **Ryker, K.,** McNeal, K.S., Giorgis, S., Whitmeyer, S.J., LaDue, N., Atkins, R.M. and Clark, C.M., 2017. A Multi-Institutional Study of Lab Activities Using the Augmented Reality Sandbox: Impacts on Learning. GSA Abstracts with Programs, Vol. 49, No. 6.
2. *Foreman, E.A.D. and **K. Ryker**, 2017. Understanding Paths to a Geoscience Major: A Closer Look at Academic Provenance. GSA Abstracts with Programs, Vol. 49, No. 6.
3. Bitting, K.S., **Ryker, K.**, and Teasdale, R., 2017. Graduate Teaching Assistant Pedagogical Preparation in the Geosciences: Community Values and Priorities, Guiding Research, and Next Steps. GSA Abstracts with Programs, Vol. 49, No. 6.
4. Bentley, C., Sundell, A., **Ryker, K.**, Lukes, L., Uhen, M., George, C.O., Lockwood, R. and Berquist, P.J., 2017. Using the Paleobiology Database to Explore Tectonic Events. GSA Abstracts with Programs, Vol. 49, No. 6.
5. Maas, B.J., **Ryker, K.,** Gomby, G., Jones, Z. and Kirkpatrick, C., 2017. The Development of Mental Maps Using Pokemon Go As a Twist on Geocaching. GSA Abstracts with Programs, Vol. 49, No. 6.
6. Lukes, L.A., **Ryker, K.**, Millsaps, C., Lockwood, R., Uhen, M., Bentley, C., Berquist, P.J., and George, C.O., 2017. Student Perceptions of Using the Paleobiology Database (PBDB) to Conduct Undergraduate Research. GSA Abstracts with Programs, Vol. 49, No. 6.
7. Viskupic, K., Teasdale, R., **Ryker, K.**, McFadden, R.R., Farting, D.J., Iverson, E., Bruckner, M.Z., Manduca, C., and McConnell, D., 2017. The Effects of Discipline-Based Professional Development on Teaching Practices Observed in Undergraduate Geoscience Classrooms. GSA Abstracts with Programs, Vol. 49, No. 6.
8. McConnell, D.A., **Ryker, K.**, Czajka, C.D., Chapman, L., Jones, J.P., and Wiggen, J., 2017. Assessing the Instructional Utility and Learning Efficacy of Common Active Learning Strategies. GSA Abstracts with Programs, Vol. 49, No. 6.
9. St. John, K., Cervato, C., Kastens, K.A., Macdonald, H., McDaris, J.R., McNeal, K., Petcovic, H.L., Pyle, E.J., Riggs, E.M., **Ryker, K.**, Semken, S. and Teasdale, R., 2017. Identifying and Prioritizing Geoscience Education Research Grand Challenges: Draft Plans for a Community Research Agenda. GSA Abstracts with Programs, Vol. 49, No. 6.

10. *Ervin, S. and **K**. **Ryker**, 2017. A Study of Pre-service Teachers' Opinions on Carbon Dioxide Emissions and Human Activity. Eastern Michigan University Undergraduate Research Symposium.
11. *Melnik, A. and **K. Ryker**, 2017. On Evolution & Assumptions: Pre-Service Teachers' Knowledge of Bird & Reptile Morphology & Evolution. Eastern Michigan University Undergraduate Research Symposium.
12. *Underwood, L. and **K**. Ryker, 2017. Anthropogenic Emissions, Climate Change, and Public Opinion. Eastern Michigan University Undergraduate Research Symposium.
13. *Porcari, S. and **K. Ryker,** 2017. The Influence of How We Think About Elementary Classrooms, Science, and Math on Learning. Eastern Michigan University Undergraduate Research Symposium.
14. *O'Dowd, C. **K. Ryker**, and C.M. Clark, 2017. A Scanning Electron Microscope Study of Volcanic Ash. Eastern Michigan University Undergraduate Research Symposium.
15. Teasdale, R., **K. Ryker**, and K.S. Bitting, 2016. Training Graduate Teaching Assistants in the Geosciences: Our Practices vs. Perceived Needs. American Geophysical Union, December 12-16, 2016.
16. Clark, C.M. and **K. Ryker**, 2016. Augmented Reality Sandboxes in the Online Environment. GSA Abstracts with Programs, Vol. 48, No. 7.
17. *O'Dowd, C.L., **K. Ryker**, and C.M. Clark, 2016. Comparative Analysis of Ash Deposits in New Zealand and Mount St. Helens. GSA Abstracts with Programs, Vol. 48, No. 7.
18. Lockwood, R., C.O. George, C. Bentley, P. Berquist, L. Park Boush, L. Lukes, **K. Ryker**, M. Uhen, 2016. Using Geoscience Databases to Provide Authentic Research Opportunities for Undergraduates. GSA Abstracts with Programs, Vol. 48, No. 7.
19. **Ryker, K.**, K. McNeal, R. Atkins, N. LaDue, and C. Clark. The Impact of an AR Sandbox on Map-Reading Skills Using a "Free-Play" Experience. GSA Abstracts with Programs, Vol. 48, No. 7.
20. **Ryker, K.** and B. Wylo, 2016. A Longitudinal Study of Science Teaching Efficacy and Math Anxiety in Pre-Service Teachers. Earth Educators' Rendezvous.
21. Clark, C. and **K. Ryker**, 2016. Incorporating an Augmented Reality Sandbox in an Online Geology Course. Earth Educators' Rendezvous.
22. George, C., C. Bentley, P. Berquist, R. Lockwood, L. Lukes, **K. Ryker**, and M. Uhen, 2016. Utilizing the Paleobiology Database to Provide Hands-On Research Opportunities for Undergraduates. Earth Educators' Rendezvous.
23. *Porcari, S. and **K. Ryker**, 2016. What is the Ideal Elementary Science Learning Environment? Eastern Michigan University Undergraduate Research Symposium.
24. *O'Dowd, C.L., **K. Ryker**, and C.M. Clark, 2016. Comparative Analysis of Ash Deposits in New Zealand and Mount St. Helens. Eastern Michigan University Undergraduate Research Symposium.
25. **Ryker, K.**, 2015. Connecting teaching beliefs and practices in post-secondary geoscience classrooms. GSA Abstracts with Programs, Vol. 47, No. 7.

26. **Ryker, K.**, 2015. Changing the Science Teaching Beliefs of Pre-service Teachers. Earth Educators' Rendezvous.
27. Czajka, C., D. McConnell, **K. Ryker**, A. Grissom, 2015. Evaluating and revising the inquiry level of physical geology labs and assessing the impact on student academic performance. Earth Educators' Rendezvous.
28. **Ryker, K.**, E. Iverson, M. Bruckner, D. McConnell, C. Manduca, K. Larsen, 2014. Connecting Beliefs to Action: How Geoscience Faculty Perceptions of their Professional Environment Impact Teaching. GSA Abstracts with Programs, Vol. 46, No. 6.
29. **Ryker, K.**, D. McConnell, 2014. The Assignment is Posted: Now What? Student Access to Online Resources and its Impact on Exam Performance. GSA Abstracts with Programs, Vol. 46, No. 6.
30. Fountain, J, **K. Ryker**, 2014. Computer-graded visualizations: enhancing reduction of formal lectures in online and seated classes. GSA Abstracts with Programs, Vol. 46, No. 3.
31. **Ryker, K.**, D. McConnell, M. Bruckner, E. Iverson, C. Manduca, 2013. Teaching is Believing: Pedagogical Beliefs, Practices, and Professional Development. GSA Abstracts with Programs, Vol. 45, No. 7.
32. **Ryker, K.**, D. McConnell, 2013. The Impact of Inquiry-Based Labs on Geoscience GTA Teaching Beliefs Over Time. Mid-Atlantic Association of Science Teacher Education Regional Meeting.
33. Grissom, A., D. McConnell, **K. Ryker**, 2013. Measuring the Level of Inquiry and its Impact on Student Performance, Perception of Relevance, and Situational Interest in Introductory Rock and Mineral Labs, GSA Abstracts with Programs, Vol. 45, No. 7.
34. Smith, H, D. McConnell, **K. Ryker**, 2013. Starting the Flip the Class: Quality of Student's Pre-Class Work Improves with the Use of Online Just-In-Time-Teaching Methods. GSA Abstracts with Programs, Vol. 45, No. 7.
35. *Gould, L., D. McConnell, **K. Ryker**, M. Pelch, 2013. A Comparison of Pedagogical Beliefs of Geoscience Faculty and Graduate Teaching Assistants. Wake Tech Community College Student Research Symposium.
36. **Ryker, K.** 2012. An Evaluation of Classroom Practices and Teaching Beliefs of Introductory Geoscience Faculty. NC State MEAS Graduate Seminar.
37. **Ryker, K.**, D. McConnell, J. Bedward, J. Fountain, 2012. Development of Virtual Physical Geology Labs. GSA Abstracts with Programs, Vol. 44, No. 7.
38. Lyons, N., **K. Ryker**, D. McConnell, 2012. Real-Time Assessment of Student Progress in the Lab: The Isostasy Model Example. GSA Abstracts with Programs, Vol. 44, No. 7.
39. **Ryker, K.**, D. McConnell, 2012**.** Reforming introductory geoscience labs. Presented at NC State's *Faculty Teaching and Learning Symposium* and the *Graduate Student Research Symposium*.
40. **Ryker, K.**, D. McConnell, A. Moyer, L. Green, 2011. Reforming introductory geoscience labs. GSA Abstracts with Programs, Vol. 43, No. 5.

41. McConnell, D., J. Stempien, **K. Ryker**, 2011. Building successful self-regulated learners: What 2000+ students have to tell us. GSA Abstracts with Programs, Vol. 43, No. 5.
42. **Almquist, K.**, S. Gallen, S. Hughes, A. Lyda, N. Lyons, D. McConnell, K. Ross, and J. Whitley, 2010. The impact of lab style, course times, and teacher gender on course evaluations. GSA Abstracts with Programs, Vol. 42, No. 5, p. 532.
43. Leithold, E., N. Blair, B. Brulet, L. Childress, **K. Almquist**, and C. Hunt, 2010. Picking apart the organic geochemical stratigraphic record on continental margins – an approach to deciphering the signals of terrestrial environmental change. GSA Abstracts with Programs, Vol. 42, No. 5, p. 527.
44. McConnell, D. and **K. Almquist**, 2010. Assessment of the degree of active teaching in "active learning" Physical Geology labs. GSA Abstracts with Programs, Vol. 42, No. 5, p. 587.
45. **Almquist, K.**, E. Leithold, and N. Blair. Weathering of volcanic ash and the fate of organic carbon on the continental margin of New Zealand. AAPG, #90104, April 2010.

GRANTS

University Grants: Received

- Summer Research Award, 2017: Awarded $12,000 of summer pay.
- Faculty Development Center program grant, Winter 2017: Awarded $675 to create a university-wide Thank-A-Teacher program with Dr. Amy Johnson.
- Cohort of Research Excellence (CoRE) program fellowship, 2017: Awarded two course releases and a trip to Washington D.C.
- Faculty Research Fellowship, 2016-2017: Awarded 12 credit hours of release time.
- Summer Research Award, 2016: Received 1 course release and non-instructional pay worth $12,000.
- Provost's Research Support Award, April 2016: Developing Spatial Thinking Using the Augmented Reality Sandbox. Awarded $2,548.
- College of Arts and Sciences Dean's Faculty Travel Award, 2016: GSA Annual Meeting. Awarded $425.
- Faculty Development Center program grant, Winter 2016: Awarded $1,500 to assist with New Faculty Orientation and new faculty follow up with Amy Johnson.
- eFellows Award, 2015-2016: Augmented Reality Sandboxes: Hacking a Hand-On Experience. Awarded $3,000 by the FDC through the eFellows program.
- Provost's Research Support Award, April 2015: Internal Models of Science Learning Environments: The Impact of Physical Space, Attitudes and Beliefs. Awarded $3,000.
- College of Arts and Sciences Dean's Faculty Travel Award, 2015: GSA Annual Meeting. Awarded $425.
- Provost's New Faculty Award, 2014-2015. Awarded $4,735.

Total awarded: $40,308 and 21 credit hours of release time since Fall 2014.

External Grants: Applied for as PI, not awarded or are in review

- Spencer Foundation: A Quantitative Study of Learning Progressions in the Geosciences ($50,000; November 2016, February 2017).
- Spencer Foundation: Development of Spatial Thinking in Online Geoscience Courses using Augmented Reality Sandboxes ($50,000; August 2016)
- NSF: EAGER: Adaptively-Branching Video Tutorials ($50,000, July 2016)
- NSF STEM + Computing: Integrating Computational Thinking in Biological and Earth Science Teaching (ICT-BEST) ($1.25M, April 2015 and 2016).
- NSF IUSE: Expanding Pathways to Science Teaching Reforms through Curriculum Reform Teams (CRTs) ($300,000, November 2015 and October 2016)

INVITED PRESENTATIONS

Workshops (Self-led unless otherwise noted)

1. Becoming Highly Productive through Collaboration. 2017 Faculty Development Center and Center for E-Learning Brown Bag presentation.
2. Writing More with Less Stress workshop. 2017 CONNECT Mini-conference at EMU.
3. How to increase the level of inquiry in your lab activities workshop leader, 2016 Earth Educators' Rendezvous.
4. Online Teaching panelist, 2016 Earth Educators' Rendezvous. Co-led with D. McConnell, A. Egger, and M. Brudzinski.
5. Designing Scholarship of Teaching and Learning (SoTL) research questions and questionnaires. 2016 workshop for the SoTL Seminar series through the EMU Faculty Development Center.
6. Summer Teaching Institute. 2014 Co-facilitator, NC State University.
7. Moodle Learning Management System Brown bag. 2014, NC State University.
8. (Re)Designing introductory geoscience labs to promote inquiry. 2013 SERC Career Development Teaching Webinar with D. McConnell.
9. Revitalizing your STEM lab. 2013 and 2014 NC State Preparing Future Leaders Workshop.

Talks (Sole presenter unless otherwise noted)

1. Scholarship of Teaching and Learning: Working Paper presentation. 2017 CONNECT Mini-conference at EMU.
2. Facilitating exchanges between geoscientists and geoscience education researchers, March 21, 2016. IRIS EPO Committee Meeting. Invited presentation and discussion.
3. The total geology lab makeover: Improving the learning process for students and teachers. 2016 Invited Speaker, Northern Illinois University, Department of Geology and Environmental Geosciences.
4. Inquiry into Intro: What's Possible with Introductory Geology. 2016 Invited Speaker, Western Michigan University, Department of Geosciences.
5. Augmented Reality Sandboxes: What works, and how do we know? 2016 Invited Speaker, James Madison University, Department of Geology and Environmental Science.

6. Promoting Inquiry-Based Learning in Introductory Geoscience Labs. 2015 Invited Speaker, Michigan State University, CREATE for STEM Institute.
7. Time Management for Graduate Students. 2013 Guest lecture, NC State University.
8. What's next? From student teaching to grad school. 2013 Guest lecture, Duke University.

MENTORING AND ADVISING EXPERIENCE

- Supervising the M.S. in Earth Science Education program at Eastern Michigan
- Mentor for one undergraduate presentation at a national conference
- Mentor for seven undergraduate presentations at Eastern Michigan University's Undergraduate Research Symposium, including five in 2017.
- Lab coordinator for three intro labs: ESSC 109: Earth Science Laboratory for Non-Science Majors, ESSC 110: The Dynamic Earth System, and ESSC 202: Earth Science for Elementary Teachers.
- Advisor for Student Instructor Stephanie Porcari for ESSC 202: Earth Science for Elementary Teachers.
- Supervised Graduate Teaching Assistant, Wendy Dorman, and nominated her for the 2016 Outstanding Teaching Assistant Award, National Association of Geoscience Teachers.

SELECTED OUTREACH AND SERVICE

- Vice President, National Association of Geoscience Teachers Geoscience Education Research Division Executive Board, 2017 – Present.
- Associate Editor, Journal of Geoscience Education, 2016 – Present
- National Science Foundation, grant proposal reviewer, 2015 – Present
- AWG Distinguished Lecturer, 2015 – Present
- Secretary, National Association of Geoscience Teachers Geoscience Education Research Division Executive Board, 2014 – 2017
- Scholarship of Teaching and Learning Group Facilitator, 2016 – 2017
- University Writers' Collaborative Group Lead Facilitator, 2016 – 2017
- Geography and Geology Assessment Ad Hoc Committee Chair, 2016 – 2017
- Interdisciplinary Environmental Science and Society Assessment Committee, 2016 – 2017
- Search committee member (Hydrogeology, Surficial Processes Geology), 2016-2017
- Planned the first and second Environmental Science and Society honors and graduation ceremony in 2016 and 2017.
- Earth Educators' Rendezvous Program Committee, Spring 2015
- Founded a writing group for new female faculty and lecturers through the EMU Faculty Development Center, Fall 2014
- Led two presentations on my office hours system for the New Faculty Learning Community (October 2014); shared resources by request with library staff for wider dissemination. System is currently under review by the Disability Resource Center advisory committee for wider faculty implementation.

- Quantitative Literacy University Assessment team member, North Carolina State University; 2013-2014
- Association of Environmental & Engineering Geologists (AEG) K-12 Education Committee, 2011 - 2013

Conference Sessions: Chaired and upcoming

- Geoscience Education Research: Implications for Undergraduate Geoscience Teaching and Learning. GSA Annual Meeting, Seattle, WA. October 2017 with K. McNeal, K. St. John, A. Gold.
- Preparing the Next Generation of Geoscience Educators: Research on Teacher Education. GSA Annual Meeting, Seattle, WA. October 2017 with H. Petcovic.
- Methodological Decision Making in Geoscience Education Research. GSA Annual Meeting, Denver, CO. September 2016 with T. Ellis, K. Cheek and N. LaDue.
- Teacher Preparation, Professional Development and Policy Issues. Earth Educators' Rendezvous, 2016 with K. Browne.
- Methods for Conducting Research about Teaching and Learning in the Geosciences. GSA Annual Meeting, Baltimore, MD. October 2015 with L. Lukes, N. LaDue, and K. Cheek.
- Geoscience Education Research I. Earth Educators' Rendezvous, 2015 with A. Gold.

SELECTED PROFESSIONAL DEVELOPMENT

- Scholarship of Teaching and Learning Facilitator Training seminar series, Winter 2016
- ENGAGE: Encouraging Networks between Geoscience and Geoscience Education, IRIS workshop, 2015
- Michigan TeachingWorks Network, Monthly meetings 2015-2016
- Creative Scientific Inquiry Experience seminar series, Fall 2015
- Earth Educators' Rendezvous, July 2015
- Synthesizing Geoscience Education Research Workshop, July 2015
- Maximizing the Value of Your Intro Course for K-12 Teachers Workshop, July 2015
- IUSE Grant Writing Workshop, May 2015
- EMU Science Writers' Collaborative, Spring 2015
- NGSS Earth and Space Science: Vision, Opportunities, and Action, March 2015
- New Faculty Learning Community seminar series, Fall 2014-Spring 2015
- Early Career Workshop, Summer 2014
- Preparing for an Academic Career in the Geosciences, June 2012
- Pursuing an Academic Career: Faculty Positions: exploring the range of possibilities, June 2011