

Elizabeth (Beth) Hufnagel
Curriculum Vitae

University of Maine
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EDUCATION

- Ph.D. The Pennsylvania State University, 2014
Curriculum & Instruction, Science Education
Dissertation: *How Pre-Service Elementary Teachers Express Emotions About Climate Change and Related Disciplinary Ideas*. Chair: Gregory J. Kelly. Committee Members: Stephanie Shields, Susan Strauss, Carla Zembal-Saul.
- M.Ed. University of Massachusetts—Boston, 2004
Education
High School Biology and Earth Science Certifications
- B.S. Rutgers University, 1999
Environmental Science, Soil and Water Option

PROFESSIONAL EXPERIENCE

University of Maine

Assistant Professor of Science Education 2016 – present

- Teaching Science in the Elementary School (ESC 316)
- Seminar in Science and Mathematics Education Research (SMT 588)
- The Art and Science of Teaching (EHD 101)

The University of Pittsburgh

Assistant Professor of Instruction and Learning 2015 – 2016

Visiting Assistant Professor of Instruction and Learning 2014 – 2015

- Research Seminar for M.Ed. Students (IL 2290)
- Teaching and Learning in Secondary Science 1, 2, 3* (IL2430, IL2431, IL2432)
- Practicum in Secondary Science 1* (IL2471)
- Internship in Science MAT (IL2496)
- Research Seminar for MAT Interns (IL 2990)

The Pennsylvania State University

2010 - 2014

Instructor

- Teaching Secondary Science I* (SCIED411)
- Introduction to Philosophy of Education (EDTHP440)

Course Design and Teaching Team for SCIED297D: Biotic Response to Climate Change

- Developed and implemented science course for elementary education majors on climate change based on most current and effective teaching pedagogies and student learning literature.
- Incorporated the use of the Neotoma database to provide authentic data for students on paleoecological trends in North America.
- Examined and compiled results of students' learning about climate change in course for funding agency supporting the course.
- Consulted with Neotoma database development team about potential ways to increase usability by K-12 educators.

Research Assistant

- Investigated and compiled current research trends in environmental science education for manuscripts and conference presentations.
- Performed literature searches and create organized database of current science education literature on discourse analysis in support of chapters and manuscripts on discourse analysis.
- Provided research support to Associate Dean for Research, Outreach, and Technology in various projects around accreditation and education program needs and trends.

Teaching Assistant

- Teaching Secondary Science I (SCIED411)
- Introduction to Philosophy of Education (EDTHP440)

Brookline High School, Brookline, MA

Environmental Science & Biology Teacher

2004 –2010

- Taught Advanced Placement Environmental Science and honor, standard, and special education biology courses.

Green Committee Member

- Collaborated with colleagues in various departments to enact environmentally conscious initiatives at the school, including integrating climate change modules into existing social studies and science curricula and planning school-wide education and action initiatives.
- Organized a school-wide event to encourage students and staff to walk or bike to school.

Mentor Teacher

- Provided professional support and encouragement for a new science teacher by advising on curricular choices, lesson designs, and accommodations for students with different learning needs.

Massachusetts Comprehensive Assessment System (MCAS) Coordinator

- Coordinated MCAS testing for all grades, including ensuring proper implementation and accommodations for students, maintaining school-wide database of student data, and managing the MCAS tutoring program.

MCAS Tutoring Coordinator

- Provided teachers and teaching assistants training on math, ELA, and science MCAS curricula.
- Paired students with tutors and communicated with staff about students' learning needs.

Boston College Urban Ecology Institute, Chestnut Hill, MA

Participant & Teacher Leader

2007–2010

- Instructed teachers on scientific and technological principles behind quantifying the benefits of urban trees using ArcView GIS and CityGreen software.
- Planned and ran professional development workshops for teachers on urban ecology content and technology skills to support urban field studies using GIS during the school year and at month-long Summer Institutes.
- Provided instruction to Boston public high school students on field investigations on local urban ecology issues using various technologies to promote scientific understanding and stewardship.

Economics and Business Academy, Boston, MA

Teaching Intern, Biology and Physics

2003–2004

San Diego Unified School District, San Diego, CA

K-12 Substitute Teacher

2003

JOURNAL ARTICLES AND INVITED BOOK CHAPTERS

Hufnagel, E., & Kelly, G.J. (in press). Studying students' emotional responses to ecological crises through discourse: A methodological approach. *Cultural Studies of Science Education*.

Hufnagel, E., Kelly, G.J., & Henderson, J. (2017). How the Environment is Positioned in the *Next Generation Science Standards: A Critical Discourse Analysis*. *Environmental Education Research*. <http://dx.doi.org/10.1080/13504622.2017.1334876>

Hufnagel, E. (2017). Students' emotional connections to climate change: A framework for teaching and learning. In D.P. Shepardson, A. Roychoudhury, and A.S. Hirsch. *Teaching and Learning about Climate Change: A Framework for Educators*. Routledge.

Zemba-Saul, C., Merritt, M., **Hufnagel, E.** & Graham, R. (2016). Fossil mammals and biotic response to climate change. In R. Duschl & A. Bismack (Eds.), *Reconceptualizing STEM education: The central role of practices*. Routledge.

Hufnagel, E. (2015). Preservice elementary teachers' emotional connections and disconnections to climate change in a science course. *Journal of Research in Science Teaching*, 52, 1296–1324.

Barnett, M., Houle, M., Mark, S., Minner, D., Hirsch, L., Strauss, E., Cotter-Hayes, L., **Hufnagel, B.** (2013). Participatory Professional Development: Geospatially Enhanced Urban Ecological Field Studies. In J. MaKinster, N. Trautmann, & M. Barnett (Eds.), *Teaching Science and Investigating Environmental Issues with Geospatial Technology* (pp. 13-43). New York, NY: Springer.

Barnett, M., Houle, M. **Hufnagel, B.** Pancic, A., Lehman, M., & Hoffman, E. (2010). Using GIS to Determine the Ecological Value of Urban Street Trees. *The Science Teacher*, 77, 35-39.

MANUSCRIPTS AND INVITED BOOK CHAPTERS IN PROGRESS

Biddle, C. & **Hufnagel, E.** (under review). Navigating the "danger zone": Tone-policing and bounding civility in the practice of student voice. *The High School Journal*.

Hufnagel, E. (under review). Framing opportunities for emotional discourse in science classrooms. *International Journal of Science Education*.

Hufnagel, E. (in progress, all data analyzed). High School Teachers' Conceptions of Emotions in Science Classrooms.

Hufnagel, E. & Sezen-Barrie, A. (in progress). "All Jumbled Up:" Agency, Emotions, and Climate Change.

Jaber, L. **Hufnagel, E.**, Radoff, J., & Dini, V. (in progress, submission expected October 2017). "This is really frying my brain!": How affect supports inquiry in an online learning environment.

Hufnagel, E. (in progress). Emotional discourse as constructed in environmental science. In G.J. Kelly & J. Green (Eds.), *Discourse Studies in Science and Engineering Education: Research Methods for the Study of Knowledge and Practice*. Routledge.

PEER-REFERREED PRESENTATIONS

Hufnagel, E. (2017, April). *A Symposium on Teaching and Learning about Climate Change: A Framework for Educators*. Invited presenter for the annual meeting of the National Association for Research in Science Teaching, San Antonio, TX.

Hufnagel, E., Sezen-Barrie, A. & Pontbriand, K. (2017, April). "All Jumbled Up:" Agency, Emotions, and Climate Change. Paper accepted for the annual meeting of the National Association for Research in Science Teaching, San Antonio, TX.

Sezen-Barrie, A., Trevi, D. & **Hufnagel, E.** (2017, April). "'It's a Gassy World": Using Middle School Students' Questions to Inform Climate Change Education." Poster presentation accepted for the annual meeting of the National Association for Research in Science Teaching, San Antonio, TX.

Radoff, J., Jaber, L. **Hufnagel, E.**, & Dini, V. (2017, April). "This is really frying my brain!": How affect supports inquiry in an online learning environment. Poster presentation accepted for the annual meeting of the National Association for Research in Science Teaching, San Antonio, TX.

Hufnagel, E. (2016, April). *Secondary School Science Teachers' Ideas About Emotions in Their Science Classrooms*. Paper accepted for the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

Hufnagel, E. (2015, December). *Attending to Emotional Sense-Making of Climate Change: A Science Education Perspective*. Invited talk for the University of Pittsburgh's Department of Environmental and Occupational Health in the Graduate School of Public Health.

Hufnagel, E. (2015, April). *Images of the Environment Communicated in the Next Generation Science Standards*. Paper presentation for the annual meeting of the American Educational Research Association, Chicago, IL.

Hufnagel, E. (2015, April). *Studying Students' Emotional Responses to Ecological Crises through Discourse*. Paper presentation for symposium at annual meeting of the National Association for Research in Science Teaching, Chicago, IL.

Hufnagel, E. (2014, March). *Emotions and How They Emerge in a Climate Change Course for Prospective Elementary Education Students*. Poster presentation for annual meeting of the National Association for Research in Science Teaching, Pittsburgh, PA.

Hufnagel, E. & Carlsen, W.S. (2013, October). *What Counts as K-12 School-Based Environmental Science Research?* Research presentation at annual meeting of the North American Association for Environmental Education, Baltimore, MD.

Zembal-Saul, C., Merrit, M., Graham, R., & **Hufnagel, E.** (2013, July). *Deepening K-8 Teachers' Knowledge of Scientific Understandings and Practices in a Climate Change Course*. Poster presentation for invited meeting, The Waterbury Summit: Issues and Trends in K-16 STEM Education, The Pennsylvania State University.

Hufnagel, E. (2013, April). *Students' Emotions in a Climate Change Course*. Poster presentation for annual meeting of the National Association for Research in Science Teaching, Puerto Rico.

Hufnagel, E. (2013, April). *How Prospective Elementary Educators Express Emotions While Learning about Climate Change*. Poster presentation for the annual meeting of the American Educational Research Association, San Francisco, CA.

Hufnagel, E. (2012, June). *Using Video Data to Analyze Students' Emotions in a Science Classroom*. Research presented at the annual meeting of Discourse Analysis in Educational Research. Columbus, OH.

Hufnagel, E., Carlsen, W.S., & Kelly, G.J. (2012, March). *Environmental Science Education in K-12 School Programs: Recent Research*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Barnett, M., **Hufnagel, B.**, & Pacheco, H. (2009, March). *Using GIS and Computer Modeling to Evaluate Urban Trees*. Paper presented at the annual meeting of the Massachusetts Environmental Educators Society. Worcester, MA.

Barnett, M. & **Hufnagel, B.** (2008, March). *Using GIS and Computer Modeling to Evaluate Urban Trees*. Paper presented at the annual meeting of the Massachusetts Environmental Educators Society. Worcester, MA.

INVITED PRESENTATIONS

Hufnagel, E. (2016, November). Emotions in the Science Classroom: An Introduction. Presentation at RiSE STEM Summit. Point Lookout, Maine.

AWARDS AND GRANTS

Co-Principal Investigator: Building Rural Students' Disciplinary Engagement in STEM: A Researcher - Practitioner Partnership \$3,000,000. National Science Foundation. Principal Investigator: Dr. Susan McKay (University of Maine), Co-PIs. Dr. Mitchell Bruce (University of Maine), Jon Doty (RSU24, Maine), William Zoellick (Schoodic Institute) – *This grant was submitted December, 2016.*

Stephen R. Smith and Eileen Baumgarten Smith Graduate Scholarship in the College of Education, *The Pennsylvania State University*, 2011-2012, 2012-2013, & 2013-2014

Sandra K. Abell Summer Research Institute Fellow, *National Association of Research in Science Teaching*, Summer, 2013.

Vincent N. and Lois W. Lunetta Fellowship in Science Education, *The Pennsylvania State University*, 2010-2011

Brookline Education Foundation Grant, *Study at Urban Ecology Summer Institute*, 2007

Teacher Education Program Award for Excellence, University of Massachusetts—Boston, 2004

Teach Next Year Full Scholarship Intern, University of Massachusetts—Boston, 2003 – 2004

Bergen County Utilities Authority Conservation Scholarship, 1994

PROFESSIONAL ACTIVITIES & SERVICE

Journal of Research in Science Teaching
Reviewer

2015 – present

Cultural Studies in Science Education 2015 – present
Reviewer

Journal of Science Education and Technology 2015 – present
Reviewer

Journal of Environmental Studies and Science 2017 – present
Reviewer

Convergent Theater (proposed ITEST project) 2015 – present
Advisory Board Member

University of Pittsburgh 2014 – 2016
Department of Instruction and Learning Doctoral Committee
School of Education Sustainability Grant Project
Ed.D. Advisor
Ph.D. Committee Member: Aaron Kessler (2014 – 2015). Building Preservice Science Teacher Pedagogical Design Capacity for Technology in an Integrated Preparation Program.
M.Ed. Comprehensive Exam Committee Member

National Association of Research in Science Teaching
Conference Proposal Assessor 2011 – present

American Educational Research Association 2013 – present
Conference Proposal Reviewer

North American Association for Environmental Education
Conference Proposal Reviewer 2013 – 2016

Discovery Space of Central Pennsylvania
Environmental Education Exhibit Consultant 2011 - 2012

Massachusetts Department of Education
Standards Setting Panel 2007

PROFESSIONAL AFFILIATIONS

National Association for Research in Science Teaching (NARST)
American Educational Research Association (AERA)
North American Association of Environmental Education (NAAEE)

RELATED PROFESSIONAL EXPERIENCES

Harvard School of Public Health, Boston, MA
Research Assistant 2000 – 2001

- Analyzed air pollution samples using gas chromatography-mass spectrometry and ion chromatography to find various particle concentrations.
- Performed QA/QC on lab equipment and chemical analyses.
- Managed laboratory by maintaining supply stock and supervising other employees.

AmeriCorps National Civilian Community Corps

Corps Member

1999–2000

- Tutored elementary school children in reading and mathematics.
- Assisted 3rd grade teacher with development and implementation of lesson plans.
- Organized and supervised summer programs for children, including community day festival.

New Jersey Division of Parks and Forestry, Forest Management, Trenton, NJ

Forest Ecologist

1999

- Identified and documented riparian vegetation from groundcover to trees in watershed study area.
- Characterized physical stream attributes to create GIS maps of land types in management areas.

Rutgers University Pinelands Field Station, New Lisbon, NJ

Summer Intern

1998

- Designed and executed field study on relationship between fire intensity and soil respiration rates in Pine Barrens.