

Sarah J. Carrier

North Carolina State University
Department of Elementary Education
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EDUCATION

University of Florida

Ph.D. Science Education 1999

Major concentration: Environmental Education

Dissertation: *The Influence of Outdoor School Yard Experiences on Elementary Students' Environmental Knowledge, Attitudes, Behaviors, and Comfort Levels*

M.A. Science Education 1992

University of Central Florida

B.S. Elementary Education 1988

PROFESSIONAL EXPERIENCE

Associate Professor, Science Education

Department of Elementary Education, North Carolina State University 2013- Present

Assistant Professor, Science Education

Department of Elementary Education, North Carolina State University August, 2007 – 2013
Raleigh, NC

Assistant Professor, Science Education

Department of Curriculum and Teaching, Auburn University, Auburn, AL August, 2005-August, 2007

Adjunct Assistant Professor, Science Education

School of Teaching and Learning, University of Florida, Gainesville, FL January, 2000-August, 2005

PUBLICATIONS

Book Chapters

Eick, C., Carrier, S., Keasel, D., & Perez, K. (2010). Summer methods in summer camps: Teaching Projects WILD, WET, and Learning Tree at an outdoor environmental education center. In A.M. Bodzin, B.S. Klein, & S. Weaver (Eds.), *The Inclusion of Environmental Education in Science Teacher Education* (pp. 173-189). New York: Springer.

Journal Articles

Stevenson, K. T., Peterson, M. N., Bondell, H. D., Moore, S. E., & Carrier, S. J. (2014). Overcoming skepticism with education: Interacting influences of worldview and climate change knowledge on perceived climate change risk among adolescents. *Climatic Change*. doi:10.1007/s10584-014-1228-7

- Stevenson, K.T., Peterson, M.N., **Carrier, S.**, Strnad, R., Bondell, H.D., Kirby-Hathaway, T., & Moore, S.E. (2014). Role of significant life experiences in building environmental knowledge and behavior among middle school students. *Journal of Environmental Education*, 43(3), 163-177. DOI: 10.1080/00958964.2014.901935
- Carrier, S.J.**, Thomson, M.M., & Tugurian, L.P. (2014). Elementary science education in classrooms and outdoors: Stakeholder views, gender, ethnicity, and testing. *International Journal of Science Education*, 1-26. DOI: 10.1080/09500693.2014.917342
- Albert, J. L., Blanchard, M. R., Kier, M. W., **Carrier, S. J.**, & Gardner, G. E. (2014). Supporting teachers' technology integration: A descriptive analysis of social and teaching presence in technical support sessions. *Journal of Technology and Teacher Education*, 22(2), 137-165.
- McIntyre, E., Walkowiak, T., Thomson, M., **Carrier, S.**, Lee, C., Grieve, E., Lowe, R., Maher, M., Difrancesca, D. (2013). A STEM-focused elementary teacher preparation program: Student and alumni perceptions. *Teacher Education and Practice*, 26(4), 670-687.
- Carrier, S.J.** & Rex, E. (2013). Learning the ropes about electricity. *Science and Children*, 50(7), 36-39.
- Carrier, S.J.**, Tugurian, L.P. & Thomson, M.M. (2013). Elementary science indoors and out: Teachers, time, and testing. *Research in Science Education*, 43(5), 2059-2083.
- Carrier, S.** (2013). Elementary preservice teachers' science vocabulary: Knowledge and application. *Journal of Science Teacher Education*, 24(2), 405-425.
- Carrier, S.** (2012). Climate change education in elementary school. *Journal for Activist Science & Technology Education*, 4(1), 40-44.
- Carrier, S.**, Scott, C., & Hall, D. (2012). Soundsational science. *Science Activities*, 49(1), 1-6.
- Carrier, S.**, Wiebe, E. N., Gray, P., & Teachout, D. (2011). BioMusic in the classroom: Interdisciplinary elementary science and music curriculum development. *School Science and Mathematics*, 111(8), 425-434.
- Carrier, S.** (2011). Effective strategies for teaching science vocabulary. LEARN North Carolina: UNC-Chapel Hill, NC. <http://www.learnnc.org/lp/pages/7079>.
- Carrier, S.** (2011). Implementing and integrating effective teaching strategies including features of lesson study in an elementary science methods course. *The Teacher Educator*, 46(2), 145-160.
- Carrier, S.** & Thomas, A. (2010). Potato problem solving. *Science & Children*, 47(7), 33-37.
- Carrier, S.** (Fall, 2009). Survey of elementary teachers' views on science teaching and its implications for self-efficacy and teacher attrition, *Florida Association of Science Teachers (FAST) journal*, 26(1), 22-23.
- Carrier, S.** (2009). The effects of outdoor science lessons with elementary school students on preservice teachers' self-efficacy. *Journal of Elementary Science Education*, 21(2), 35-48.
- Carrier, S.** (2009). Environmental education in the schoolyard: Learning styles and gender. *Journal of Environmental Education*, 40(3), 2-12.
- Carrier, S.** & Thomas, A. (2008). Button basics. *Science and Children*, 45(5), 21-23.
- Carrier, S.** (2007). Gender differences in attitudes towards environmental science. *School Science and Mathematics*, 107(7), 271-278.

Carrier, S. J. (2006). The road to stress-free science fairs: A long-term approach to learning inquiry takes the stress out of science fairs. *Science and Children*, 44(1), 36-39.

Pringle, R.M & **Carrier Martin, S.** (2005). The potential of upcoming high-stakes testing on the teaching of science in elementary classrooms. *Research in Science Education*, 35: 347-361.

Martin, S.C. & Pringle, R.M. (Spring, 2005). Testing in science: Teachers' views and the influence on their practices in elementary classrooms. *Florida Educational Leadership*, 5(2), 59-64.

Martin, S.C. (Fall, 2003). The influence of outdoor schoolyard experiences on students' environmental knowledge, attitudes, behaviors, and comfort levels. *Journal of Elementary Science Education*, 15(2), p. 51-56.

Pringle, R.M., **Martin, S.C.**, & Jones, G. (Fall, 2001) College of Education and P.K. Yonge Developmental Research School: Collaborators in science education. *National Association of Laboratory Schools Journal*. p. 1-3.

Curriculum materials

Kowolenko, C., **Carrier, S.**, Wiebe, E., Gray, P. & Teachout, D. (June,2010). Biomusic module-Grades 2/3. Greensboro, NC: UNC-Greensboro.

Hall, D., Patillo, C., Kowolenko, C., **Carrier, S.**, Wiebe, E., Gray, P.& Teachout, D. (July, 2010). Biomusic module-Grades 4/5. Greensboro, NC: UNC-Greensboro.

Wiebe, E., Carrier, S., Kowolenko, C., Gray, P., & Teachout, D. (July, 2010). Biomusic concepts resource guide. Greensboro, NC: UNC-Greensboro

MANUSCRIPTS IN REVIEW

Thomson, M.M., DiFrancesca, D., **Carrier, S.**, & Lee, C. (September 2013). Teaching efficacy: Exploring relationships between mathematics and science self-efficacy beliefs, PCK and domain knowledge among preservice teachers from the United States. Submitted to *Educational Psychology: An International Journal of Experimental Educational Psychology*. (under review)

Carrier, S.J., Faulkner, V.N., & Bottomley, L. (2014). Integration of STEM with elementary pre-service teachers. *Journal of Science Teacher Education* (under review)

Stevenson, K.T., **Carrier, S.J.**, Peterson, M.N. (2014). Overcoming barriers to building environmental literacy in the elementary school classroom. *Environmental Education Researcher*. (under review)

INTERNATIONAL AND NATIONAL CONFERENCE PRESENTATIONS

Greive, E.L., DiFrancesca, D., **Carrier, S.J.**, Lowe, R.Z., & Minogue, J.(2014). The development of a science instructional log to evaluate science instructional practices in elementary classrooms. Paper presented at American Educational Research Association (AERA), April 3-7, 2014, Philadelphia, PA.

Tugurian, L., & Carrier, S. (2014). Finding a place for the outdoors in elementary school science. National Association for Research in Science Teaching International Conference (NARST). March 29-April 2, 2014, Pittsburgh, PA.

Carrier, S. and Tugurian, L. (2014). Elementary Education in the Outdoors: Addressing gender, ethnicity, and testing. National Association for Research in Science Teaching International Conference (NARST). March 29-April 2, 2014, Pittsburgh, PA. .

- Carrier, S. J.** (symposium organizer and presider) (2013). Anderson, C.W., McGinnis, J.R., Walsh, E., Golden, B. (presenters). *Symposium on climate change: Policies and implications*. National Association for Research in Science Teaching (NARST), March 29-April 2, 2014, Pittsburgh, PA.
- Carrier, S.J.,** Faulkner, V.N., & Bottomley, L. (2014). *Introducing true integration of STEM with elementary preservice teachers*. Association for Science Teacher Education (ASTE), January 15-18, San Antonio, TX.
- Carrier, S.J.** (2013) *Climate change and policy implications*. North American Association for Environmental Education (NAAEE), October 8-13, Baltimore, MD.
- Carrier, S.J. &** Tugurian, L.P. (2013) *Two elementary schools' efforts toward outdoor instruction*. North American Association for Environmental Education (NAAEE), October 8-13, Baltimore, MD.
- Thomson, M.M., Difrancesca, D., McIntyre, E., Porter, S., Carrier, S., Lowe, R. (2013). *Beliefs and knowledge: Exploring relationships between science and mathematics teaching self-efficacy beliefs, PCK and domain knowledge among preservice teachers*. American Educational Research Association (AERA), April 27-May 1, San Francisco, CA.
- Carrier, S.J.,** Thomson, M.M., & Tugurian, L.P. (2013) *Elementary science teaching: A mixed-methods analysis of teaching and learning science and environmental science*. National Association for Research in Science Teaching (NARST), April 5-9, Rio Mar, PR.
- Carrier, S.J., &** Difrancesca, D. (2013). *Elementary preservice teachers' developing identities as science teachers during STEM-focused teacher preparation*. National Association for Research in Science Teaching (NARST), April 5-9, Rio Mar, PR.
- Carrier, S. J.** (symposium organizer and presider) (2013). Anderson, C.W., McGinnis, J.R., Walsh, E., Golden, B. (presenters). *Symposium on climate change: Policies and implications*. National Association for Research in Science Teaching (NARST), April 5-9, Rio Mar, PR.
- McIntyre, E., Fleener, J., Maher, M., **Carrier, S.** Walkowiak, T., & Faulkner, V. (2013). *STEM-Focused elementary teacher preparation: Program features and research on teacher development and effectiveness*. American Association of Colleges for Teacher Education (AACTE). February 28-March 2, 2013. Orlando, FL.
- Carrier, S.J.,** Difrancesca, D., & McIntyre, E. (2013). *The relationship of elementary preservice teachers' memories of science and science teaching with their developing identities as teachers of science*. Association for Science Teacher Education (ASTE), January 9-12, 2013, Charleston, SC.
- Carrier, S.J.** (2012). *Place based practices in school yard settings*. National Science Teachers' Association (NSTA), March 29-April 1, 2012, Indianapolis, IN.
- Carrier, S. J.** (symposium organizer and presider) (2012). Anderson, C.W., McGinnis, J.R., Phillipson-Mower, T., & Walsh, E. (presenters). *Science education and climate change: Policy in K-12 education in diverse global contexts*. National Association for Research in Science Teaching (NARST), March 25-28, 2012. Indianapolis, IN.
- Carrier, S.J.,** Pop, M. & Tugurian, L. (2012). *Reflections on outdoor experiences: An analysis of the views expressed by students, parents, and educators*. Association for Science Teacher Education (ASTE). January 4-7, 2012.
- Carrier, S.J.,** Pop, M., & Tugurian, L. (2011). *Elementary science: Indoor and outdoor learning*. North American Association for Environmental Education (NAAEE). October 12-15, 2011. Raleigh, NC.
- Carrier, S. J.** (2011). *Communicating science: Sharing words and strategies with preservice teachers*. American Educational Research Association. (AERA). April 8-12, 2011. New Orleans, LA.

- Carrier, S.** (2011). *Elementary preservice teachers' knowledge and application of science vocabulary*. National Association for Research in Science Teaching (NARST), April 3-6, 2011. Orlando, FL.
- Carrier, S.,** Wiebe, E., Gray, P., & Teachout, D. (2010). *BioMusic: Science and music interdisciplinary curriculum development for the elementary classroom*. National Association for Research in Science Teaching (NARST). March 21-24. Philadelphia, PA.
- Carrier, S.,** Wiebe, E., Gray, P., & Teachout, D. (2010). *Universal BEATS (UBEATS): Connecting science and music in the natural world*. Association for Science Teacher Education (ASTE). January 14-16, 2010. Sacramento, CA.
- Kamen, M., Rogers, M., Pongsnaon, K., Akerson, V., Minogue, J., **Carrier, S.,** Demir, A., Czerniak, C. Alozie, N., & Kim, J. (2009). *Symposium: Reflective practices and professional development through Japanese lesson study*. Symposium for National Association for Research in Science Teaching (NARST). April 17-21. Garden Grove, CA.
- McIntyre, E., Jeffries, M., **Carrier, S.,** & Wiseman, A. (2009). *Enhanced lesson study in teacher education: Focusing on technique in college and elementary classrooms*. American Association of Colleges for Teacher Education (AACTE). February 6-9, 2009. Chicago, IL.
- Carrier, S.** (2009). *Preservice teachers' outdoor science activities with elementary school students impacting their confidence in teaching science*. Association for Science Teacher Education (ASTE). January 7-10, 2009. Hartford, CT.
- Carrier, S.,** Wiebe, E., Gray, P., & Teachout, D. (2009). *Universal BEATS—Interdisciplinary teams: development and implementation of elementary school curriculum connecting science and music*. Association for Science Teacher Education (ASTE). January 7-10, 2009. Hartford, CT.
- Teachout, D., **Carrier, S.,** Gray, P., & Wiebe, E. (2008). *Universal BEATS: Universal BioMusic Education Achievement Tier in Science*. National Science Foundation (NSF) DR K-12 PI Meeting: Transforming STEM Education Through Research. November 12-14, 2008. Washington, DC.
- Carrier, S.,** Wiebe, E., Gray, P., & Teachout, D. (2008). *Bringing music into the elementary science classroom*. National Science Teachers Association (NSTA) conference. October 30-November 2, 2008 Charlotte, NC.
- Carrier, S.** (2008). *Gender differences in elementary school students' environmental education*. National Association for Research in Science Teaching (NARST). March 30-April 2, 2008. Baltimore, MD.
- Carrier, S.** (2008). *Schoolyard science meeting the needs of boys and girls*. Association for Science Teacher Education (ASTE). January 10-12, 2008. St. Louis, MO.
- Carrier, S.** (2007). *The role of gender in environmental education in the schoolyard*. National Association for Research in Science Teaching (NARST). April 15-18, 2007. New Orleans, LA.
- Carrier, S.** (2007). *The importance of using accurate terminology in the elementary science classroom*. Association for Science Teacher Education (ASTE). January, 2007. Clearwater, FL.
- Carrier, S.** (2006). *Science fairs for learning*. International Consortium for Research in Mathematics and Science Education (ICRSME). March 9-11, 2006. Nassau, Bahamas.
- Carrier, S.J.,** & Pringle, R.M. (2006). *The impact of high-stakes science testing in elementary schools in Florida*. International Consortium for Research in Mathematics and Science Education, (ICRSME). March, 9-11, 2006. Nassau, Bahamas.
- Carrier, S.,** & Dresden, J. (2006). *From project approach to inquiry*. Eastern Education Research Association, (EERA). February 23-24, 2006. Hilton Head, S.C.

Carrier, S.J., & Pringle, R.M. (2006). *The impact of high-stakes testing in science in elementary classrooms*. Association of Science Teacher Education (ASTE). January 12-14, 2006. Portland, OR.

Pringle, R. & **Martin, S.** (2003). *The tests are coming*. National Association of Research in Science Teachers (NARST). March, 2003. Philadelphia, PA.

Pringle, R. & **Martin, S.** (2003). *Teaching, testing, and learning: The impact of upcoming science testing on the teaching of science in elementary classrooms*. Association for Education of Teachers of Science (AETS). January-February, 2003. St. Louis, MO.

Martin, S., Pringle, R., Jones, G. (2001). *Collaboration between University of Florida and P.K.Yonge Laboratory School*. National Association of Laboratory Schools (NALS). February 16, 2001. Gainesville, FL.

REGIONAL CONFERENCE PRESENTATIONS

Carrier, S.J. (2014). *Teaching science outdoors: Issues and trends*. Southeastern Environmental Education Alliance. September 19-21. Asheboro, NC.

Tugurian, L.P., & **Carrier, S.J.** (2014). *Children's environmental identity in the context of elementary school science*. Southeastern Environmental Education Alliance. September 19-21. Asheboro, NC.

Stevenson, K.T., & **Carrier, S.J.** (2014). *What can we learn from significant life experience research?* Southeastern Environmental Education Alliance. September 19-21. Asheboro, NC.

Bottomley, L., **Carrier, S.,** & Faulkner, V. (2013). STEM in K-2: Designing a project-based unit. *Scaling STEM: Strategies That Engage Minds*. March 11-2, 2013. Durham, NC.

Carrier, S., Tugurian, L., & Pop, M. (2011). *Elementary science: Indoor and outdoor voices*. North Carolina Science Teacher Association (NCSTA). November 10-11, 2011. Winston-Salem, NC.

Carrier, S. (2011). *Elementary science: Indoor and outdoor challenges*. Mid Atlantic Association for Science Teacher Education (MA-ASTE). September 29-October 1, 2011. Olive Hill, KY.

Carrier, S. (2011). *Introducing lesson study practices early in a teacher education experience*. North Carolina Association for College Teacher Education (NCACTE). September 22-23, 2011.

Tugurian, L. & **Carrier, S.** (2011). *Why learning outside in nature is good for your students: What the research says*. 2011 N.C. Outdoor Classroom Symposium Green and Growing! North Carolina Botanical Garden, Chapel Hill, NC

Carrier, S., & Rutherford, H. (2010). *Effective science vocabulary instruction*. North Carolina Science Teacher Association (NCSTA). November 11-12, 2010. Greensboro, NC

Carrier, S., Wiebe, E., Gray, P., Scott, C., Teachout, D. (2010). *Revealing science and music for elementary students*, North Carolina Science Teacher Association (NCSTA). November 11-12, 2010. Greensboro, NC

Carrier, S. & Tugurian, L. (2010). *Elementary students' science learning: Indoor and outdoor experience*. Mid Atlantic Association for Science Teachers Education (MAASTE). September 23-26, Johnson City, TN.

Gray, P., Wiebe, E., Teachout, D., **Carrier, S.,** & Scott, C. (2010). *Biomusic in elementary school*. NCDPI Raising Achievement/Closing Gaps Conference. March, 2010. Greensboro, NC.

Carrier, S., Wiebe, E., Gray, P. & Teachout, D. (2009). *UBEATS – Music and science – Physical and biological connections in the elementary science classroom*. North Carolina Science Teachers Association (NCSTA). November 19-20, 2009. Greensboro, NC.

Teachout, D., Scott, C., Blanton, C., Gray, P., **Carrier, S.**, & Wiebe, E. (2009). *The Universal BEATS Project: A Convergence of Research, Teacher Education, Science, and Music*. North Carolina Music Educators Association Conference. November 8, 2009. Winston-Salem, NC.

Carrier, S., Gray, P., Teachout, D., & Wiebe, E. (2009). *BioMusic: Music-making as an information highway to the world*. Carolina State of the Arts conference. March 5-7, 2009. Raleigh, NC.

Carrier, S. (2006). *Environmental science for preservice teachers*. Southeastern Association for Science Teacher Education (SASTE). October, 2006. Macon, GA.

Pringle, R. & **Carrier-Martin, S.** (2005). *Teachers' views and the impact of standardized testing in science on their practices in elementary classrooms*. Southeastern Association of Science Teacher Education (SASTE). October, 2005. Athens, GA.

Martin, S. & Russell, J. (2004). *Science Buddies*. Florida Association of Science Teachers (FAST). October, 2004. Orlando, FL.

Pringle, R., Mayne, D. & **Martin, S.** (2003). *Learning to teach elementary science: An exploratory study of preservice elementary teachers*. Southeastern Association Education of Teachers of Science (SAETS). October, 2003. Greenville, SC.

Martin, S. (2000). *Schoolyard research: Environmental knowledge, attitudes, behaviors, and comfort levels*. Florida Association of Science Teachers (FAST). October, 2000. Miami, FL.

Rice, J. & **Martin, S. C.** (1996). *Students as consumers, collaborators, and producers on the World Wide Web*. Critical Issues in Education. October, 1996. Gainesville, FL.

Martin, S. C. & Shaeffer, J. (1995). *Schoolyard ecosystems and your School Improvement Plan*. Crown Region Center for Excellence. Sharing Best Practices. November, 1995. Gainesville, FL.

Foti, S. & **Martin, S. C.** (1994). *Classroom Hydroponics-Integrating the curriculum with technology*. Crown Region Center for Excellence. Sharing Best Practices. October, 1994. Gainesville, FL

SERVICE

National Science Foundation (NSF) review panel. AISL Science Learning + Planning Arlington, VA	August, 2014
Presidential Awards for Excellence in Mathematics and Science (PAEMST), Review of applications for elementary science teaching awards, North Carolina Department of Public Instruction (DPI), Raleigh NC	May, 2014
<i>Physical Science Explorations</i> – Bringing science to 1 st grade students at North Ridge Elementary School, Raleigh, NC – Elizabeth Chapman, teacher	May 22, 2014
Hilburn Academy STEAM Expo, Raleigh, NC	March 26, 2104
Science Fair Judge AB Combs, Raleigh, NC	February 3, 2014
<i>Classification systems</i> – Bringing science to 5 th grader students at A.B. Combs Elementary School Raleigh, NC – Megan Horst, teacher	October 8, 2013

Presidential Awards for Excellence in Mathematics and Science (PAEMST), Review of applications for elementary science teaching awards, North Carolina Department of Public Instruction (DPI), Raleigh NC	May, 2012
Education Policy Institute of Carolina – UNC-GA Teacher Quality Research Group. Dr. Gary Henry, Dr. Charles Thompson, Dr. Meghan Manfra, Sarah Carrier and Beth Grieve Review and develop observation instrument for preservice teachers.	October, 2011 - Summer, 2012
<i>Tiny Science</i> - Room of hands-on investigations for Math and Science night. 300 parents, teachers, and students. Stough Elementary School, Raleigh, NC	October 27, 2011
Invited attendee, <i>Catalyzing Research in Science Education Policy</i> conference Arlie Conference Center, Warrenton, VA, National Science Foundation supported Award No. 095372. Principal Investigators: Nancy W. Brickhouse, James Earl Davis, & Stephen P. Norris. PI Nancy Brickhouse described the project: “We have gathered a carefully selected group of people who come from the worlds of science, science education, education policy and policy making. The intent was to begin a conversation around issues of science education policy.	June 8-10, 2010
Presidential Awards for Excellence in Mathematics and Science (PAEMST), Review of applications for elementary science teaching awards, North Carolina Department of Public Instruction	May, 2010
Associate Editor, <i>Electronic Journal of Science Education</i>	2011 – Present
Reviewer, <i>Early Childhood Research Quarterly</i> .	2010 – Present
Reviewer and Editorial Board, <i>International Journal of Environmental and Science Education</i> .	2010 – Present
Reviewer, <i>The Teacher Educator</i>	2009 – Present
Reviewer, <i>Electronic Journal of Science Education</i>	2009-2011
Reviewer, <i>The Science Education Review (SER)</i>	2007 – Present
Reviewer, <i>International Journal of Science Education (IJSE)</i> .	2009 – Present
Reviewer second edition chapters of <i>So You Want to Be a Teacher? Teaching and Learning in the 21st Century</i> . Janice Koch. Boston, MA: Houghton Mifflin.	July, 2009
Science fair judge, A.B. Combs Elementary, Raleigh, NC	February 7, 2012
Science fair judge, Centennial Middle School, Raleigh, NC	February 8, 2011
Science fair judge, Olds Elementary School, Raleigh, NC	January 27-28, 2011
Science fair judge, Bugg Elementary School, Raleigh, NC	February 15, 2010
Science fair judge, Bugg Elementary School, Raleigh, NC	February 10, 2009
Science fair judge, Olds Elementary School, Raleigh, NC	January 24-25, 2008
External Policy and Relations Committee, National Association for Research in Science Teaching (NARST).	2012 - Present
Co-coordinator for Policy Strand 15. National Association for Research in Science Teaching	2008 – 2012

(NARST).

Gray, P., Teachout, D., Carrier, S., & Wiebe, E. Scott, C., Hall, D., Patillo, C., Blanton, C., *Universal BioMusic Education Achievement Tier in Science (UBEATS)* summer institute for elementary school teachers and students. Greensboro, NC. July 19-25, 2009

Reviewer, National Association for Research in Science Teaching (NARST) conference	2006 – Present
Reviewer, Pearson, Merrill, Prentice Hall, <i>Exploring Mathematics and Science</i>	September, 2006
Reviewer, <i>Electronic Journal of Science Education</i> (EJSE) Associate Editor EJSE	2006 – Present 2011-Present
Reviewer, Association for Science Teacher Education (ASTE)	2006 – Present
Review panel, National Science Foundation (NSF) - Instructional Materials Division (IMD) Arlington, VA	May 3-5, 2006
Reviewer, North American Association for Environmental Education (NAAEE) conference	2006
Pringle, R., & Martin, S. (2005). <i>Reclaiming academic freedom through classroom assessment in science</i> , Professional development workshop at Florida Council on Elementary Education Orlando, FL.	September, 2005
Co-Presenter, Schoolyard Ecology for Elementary School Teachers (SYEFEST) Leadership training workshop for 50 ecologists, Ecological Society of America Conference. Providence, RI.	October, 1996
Consultant for Schoolyard Ecosystem Design for teachers from Lake Butler, Florida.	January, 1996
GLOBE (Global Learning and Observations to Benefit the Environment), Project Coordinator, Norton Elementary School.	1995-2005
Florida's lead teacher for Schoolyard Ecology for Elementary School Teachers (SYEFEST) Ecological Society of America (ESA) conference, Stone Mountain, Georgia.	October, 1996
Florida's Lead Teacher, SYEFEST (Schoolyard Ecology for Elementary School Teachers), Coordinated and conducted workshops for Florida elementary school teachers with Florida's Lead Ecologist-Dr. Don W. Hall	Summer, 1994
SYEFEST (Schoolyard Ecology for Elementary School Teachers) Planning conference, National Science Foundation grant to Institute of Ecosystem Studies, Alan Berkowitz, Project coordinator.	March, 1994
Selected as Florida's Lead Teacher with Florida's Lead Ecologist, Dr. Don W. Hall, to coordinate and conduct workshops for Florida teachers, Gainesville, Florida.	
Presented Professional Growth Program for Elementary Educators, <i>Wildlife Habitats in the Schoolyard</i> , University of Florida in conjunction with P.K. Yonge Developmental Research School and the School Board of Alachua County,	January 1993
<i>Creating a Schoolyard Ecosystem</i> workshop. Co presenter with Dr. Linda Cronin-Jones, Dr. Joe Schaeffer, University of Florida,	January, 1993
<i>Portfolio Assessment Committee</i> , Representative for elementary science for designing portfolio assessment guidelines for the state of Florida through the University of Florida Office of	1993-1994

Instructional Resources.

- Activities Integrating Math & Science (AIMS) workshop for teachers at Norton Elementary School, Gainesville, Florida. 1993
- Curriculum Writing Project for Schoolyard Ecosystems*, Developed curriculum for the State of Florida. North Central Region in accordance with Florida Department of Education's *Florida's Fragile Environment*. August, 1992
- Ecological Society of America (ESA), Ecology in Education Workshop, Selected as teacher representative on four person team from the state of Florida to attend workshop, National Science Foundation funded-Ecological Society of America grant to enhance ecology education in K-12, Tuscaloosa, Alabama. April, 1992
- Consultant for behavioral objectives to accompany Florida Entomological Society/ University of Florida, Department of Entomology poster distributed to Florida schools: *Insects: Friend or Foe*. 1991
- Coordinator and Instructor AIMS (Activities Integrating Math and Science) Workshop Duval County School System, Jacksonville, Florida. June, 1991
- Coordinator and Instructor AIMS (Activities Integrating Math and Science) Workshop, Talbot Elementary School Faculty, Gainesville, Florida. February, 1991

University Service

- University Grievance Committee 2014-2018

College and Department Service

- College of Education STEM Department Head Search Committee 2013
- Department of Elementary Education Social Studies Search Committee - Chair 2012-2013
- MAT Governance Committee 2.0 2012- Present
- Scholarship review committee 2010-Present
- NCSU College of Education Professional Education Committee (PEC) – Co-chair. 2008- Present
- College of Education Dean's Search Committee 2009-2010
- NCSU College of Education Professional Dispositions Review Panel development. 2009

HONORS AND AWARDS

Teacher of the Year, Norton Elementary School Alachua County Teacher Recognition Program, Gainesville, Florida. 1994

Program of Quality for 'The Schoolyard Ecosystem' Natural Selections: Sharing Success in Environmental Education, Florida Department of Education. 1994

Demonstration Site, Save our State Environmental Education Trust Fund for the Florida Advisory Council on Environmental Education for Norton Elementary Schoolyard Ecosystem Site. 1993

Entomological Society of America's first President's Award for *Outstanding Achievement in Primary Teaching Using Insects as Educational Materials* presented at the Entomological Society of America Conference, Baltimore, MD. December, 1992

Distinguished Achievement Award for Teaching. Presented by the University of Florida Department of Entomology and Nematology, Gainesville, Florida. April, 1992

GRANT PROJECTS

Under Review

National Science Foundation, *Cracking the Code to Climate Literacy: Coupled Outdoor and Data-rich Education for Middle School Students*. The proposed interdisciplinary project is a full implementation and development project and is in the learning track. As such, the project is guided by the overall *hypothesis*: Coupled outdoor and data-rich climate science education will effectively increase middle school students' climate literacy (CL). The project team will develop a new middle school climate science curriculum based on CODE to test this blended learning pedagogy. CODE will contain six modules, each with three tiered, hierarchical activities to be taught *indoors (classrooms)*, *outdoors*, and *online*. The climate science modules will support common themes and will be broken into component tiers that will be taught individually, but collectively will *enhance both the cognitive and affective domains* of learning and incorporate instructional scaffolding ranging from guided to open inquiry opportunities for students. PI – Susan Moore (Forestry), Nils Peterson (Natural Resources), Karen McNeal (Geology), Ryan Boyles (Climate Science), Sarah Carrier (Science Education)
\$2,928,748

Funded

Graduate Student Recruitment Grant for Department of Elementary Education

North Carolina SeaGrant *Building Ocean and Climate Literacy in North Carolina through a Project WET Climate Literacy Module*. (2014-2016). This project will create, test, and train teachers on a climate literacy module for Project WET, and existing curriculum that has yet to include climate literacy modules. NCSU is working with NCCU, a public Historically Black College and University and engaging minority undergraduate students in summer internships. The project goals are to develop the curriculum, train 20 teachers in using the curriculum, measure the climate literacy of their students, and disseminate the product through education outlets. PI – Nils Peterson. Co PIs from NCSU: Sarah J. Carrier, Susan Moore, Renee Strnad, Kathryn Stevenson. Co-PI from NCCU: Laurell Malone. \$34,399

2013-2014 *Researching identities related to science teaching*, ELM department funding for research assistant. Review literature related to teacher identities in science. \$1400.

Research and Innovation Seed Funding Program (RISF) *Environmental Literacy for Teachers and Students*

Funded by the Office of Research, Innovation, and Economic Development. The one-year grant July 2013-June 2014 is designed to determine the level of environmental literacy of elementary teachers in NC with the ultimate goal of advancing students' knowledge and awareness of the state's environment and environmental sciences. The project will collect survey data to determine the current knowledge of elementary educators throughout the state in order to develop a comprehensive roadmap that will pull together key stakeholders in formal (school-based) contexts. This work will support the pursuit of future funding to enhance elementary educators' environmental literacy. The data will inform the state's science and environmental science preparation for young students as the state transitions to Next Generation Science Standards (NGSS) and implements NC's Environmental Literacy Plan. Sarah Carrier is PI with co-PIs Nils Peterson (CNR) and Susan Moore (CNR).
\$14,838

2012-2013 *Qualitative data analysis of preservice teachers' memories and identities in elementary science*, ELM department funding for research assistant. Analyses and coding of common themes from interview data. Research revealed connections with pre-service teachers' identification of memories of elementary science instruction with potential personal identities as teachers of science. \$1400.

Developing Diverse Departments (D3) External Grant Mentoring Mini-Grant. This project supported Dr. Richard Duschl, a national leader in science education from The Pennsylvania State University, to visit North Carolina State University on May 10-11, 2012. Dr. Duschl presented his work on national policies and *Taking Science to School* to NCSU's Department of Elementary Education in support of elementary science education. Dr. Duschl served as a mentor for Sarah Carrier and advised the STEM-focused Elementary Education department and the research team for NSF-funded research study, *Accomplished Elementary Teachers of Mathematics and Science (ATOMS)* for which Sarah Carrier is co-PI. D3 award (\$1200). Additional funding for the D3 project \$454

NSF-DRK-12 Project ATOMS (Accomplished Elementary Teachers of Mathematics and Science). This 5 year project (2011-2016) is designed to examine our innovative Science, Technology, Engineering, and Mathematics (STEM)-focused ELM program at NCSU. In this study we are examining five dimensions of teacher preparation: mathematics and science content knowledge, pedagogical content knowledge for mathematics and science, knowledge of teaching, a sense of self-efficacy, and beliefs about mathematics and science instruction. Value added data of student achievement will help us further understand the effectiveness of NCSU graduates. This five-year project (currently in the second year) will provide insight into elementary teacher preparation in STEM areas and information about the critical link between teacher preparation, practice, and student achievement. Principal Investigator is Temple Walkowiak (ELM Mathematics). Co-PIs include: Jayne Fleener (Dean of NCSU College of Education), Sarah Carrier (ELM Science Education), Margareta Thomson (ELM Educational Psychology), Michael Maher (Assistant Dean College of Education), Steve Porter (CICE), and Ellen McIntyre (Dean of UNC-C College of Education \$3,100,000

Extension Seed Grant entitled *Enhancing Science Teaching in Elementary Schools: Bringing Rainforest Research to Classrooms*. This project addressed the goals of creating educational innovation and driving innovation in energy and the environment by providing practicing elementary teachers and teacher candidates (NC State students) with current research data about the rainforest and its relation to climate change and strategies that scientists use for the study of tropical rainforests on March 17, 2012. This project combined content knowledge with pedagogical strategies to help both groups learn about and participate in science inquiry. The project reached 24 practicing teachers and 3 MAT preservice teachers who will implement instructional units in their elementary classrooms on the topic during the 2012-2013 academic year. Many submitted their resulting lesson plans for publication on LearnNC curriculum source. This project extended the generous in-kind grant of **\$3120** from the Department of Elementary Education that provided Carrier, PI of this project, travel expenses to participate in tree canopy research in the Amazon rainforest in Iquitos, Peru in July, 2011. PI is Sarah Carrier (Science Education). \$9,270 Project #261105

Faculty Research and Professional Development (FRPD). *Elementary Students' Science Learning: Indoor and Outdoor Experiences*. This grant funds a research study that I developed to document science instruction and learning at two schools in Durham, NC. The development included original design of the study, presented my research ideas to ELM faculty for feedback, revised the design, presented and established a relationship with Durham County's science supervisor and two school principals. I secured approval from IRB and Durham Public Schools' research office. \$8000.

2010-2011. ELM department funding research and participant compensation support for: *Elementary Students' Science Learning: Indoor and Outdoor Experiences* included supplemental funds for a course release for Spring, 2011, Graduate student support plan (GSSP), incentives for teachers participants, and translation services. **(\$11,000)**. August 2010 – June 2011

Co-PI on a NSF-HER/DRL DRK-12 grant entitled *Universal BEATS: Modules to Help Educators Develop Universal BioMusic Education Achievement Tier in Science*. This project's product has been instructional materials for grades 2-5 that will support science instruction through music, linking physical and life sciences. My role was mentoring teacher participants, reviewing and revising curriculum materials. PI is Patricia Gray (Music

Education, UNC-G). Other co-PIs include Eric Weibe (Science Education) and David Teachout (Music Education, UNC-G). Value of the grant: \$333,000 (\$153,000 for the NCSU sub-award) over 30 months.

Not Funded

NSF-AGS grant proposal entitled Consortium on Climate Change Education in the SouthEast. Dr. Fred Semazzi, MEAS Department, NCSU – PI; Dr. Gail Jones, Co-PI; Dr. Sharon Shulze, Co-PI; Dr. Sarah Carrier, Senior Personnel; Dr. Meghan Manfra, Senior Personnel. This strategic planning initiative was designed to lay the foundation for the development of comprehensive educational programs on climate change in formal (school-based) and informal contexts in the southeast. Its goals were to bring together multidisciplinary teams of climate change scientists (NCSU PAMS, NCCO), experts in climate sensitive sectors and social-economic adaptation to climate change (NCSU CEng, NCSU CNR, NCSU CVM & CHASS), experts in the learning sciences (CEdu), and practitioners from informal and formal learning venues (The Science House, NC Museum of Natural Sciences, WECO, COSEE). Grant requested: \$999,686.

Co-PI (lead PI for NCSU subaward) for National Oceanic and Atmospheric Association (NOAA) grant entitled *Climate Literacy for Elementary Educators of North Carolina (CLEEN)*. Working with North Carolina A&T University, we submitted a pre-proposal on 9.8.10 that was accepted. Grant request: \$1,493,224 (\$475,278 for NCSU subaward).

COMMITTEE MEMBERSHIPS

Doctoral Committee Co-Chair

Sarah Luginbuhl, Science Education (SED) 2012-present
NCSU

Linda Tugurian, Science Education (SED) 2009-present
NCSU Co-chair, Dr. Eric Wiebe

MEd

Heather Rutherford, Science Education (SED) 2007-present
NCSU Co-chair, Dr. Eric Wiebe

Graduate Committee Membership

Doctoral Committee

Kathryn Stevenson, College of Natural Resources 2012-present
Megan Leagon, SED 2012-present
Elysa Corin, SED 2012-present
Huei-Chen Lao, SED 2012-present
Diane Johnson, SED 2012-present
Tammy Lee, SED 2011-present
Sam Wheeler, SED 2011-present
Lindsay Patterson, SED 2011-present

Graduates

Meredith Kier 2011-2013
Defended March 20, 2013
Chair, Dr. Meg Blanchard

Catherine LeProvost, NCSU 2009-2011
Defended March 29, 2011
Co-Chairs, Dr. Meg Blanchard & Dr. W. Gregory Cope

Beth Folta, NCSU 2007-2010
Defended December 8, 2010
Chair, Dr. Len Annetta

Masters Committee 2004-2005

3 Masters students -Auburn University

PROFESSIONAL MEMBERSHIPS

National Association for Research in Science Teaching (NARST)
Association of Science Teacher Education (ASTE)
Mid Atlantic Association of Science Teacher Education (MAASTE)
American Educational Research Association (AERA)
North American Association for Environmental Education (NAAEE)
National Science Teachers' Association (NSTA)
North Carolina Science Teachers' Association (NCSTA)

American Association of Colleges for Teacher Education (AACTE)