# K.C. BUSCH

Associate Professor, Department of STEM Education, College of Education
Cluster Lead, Leadership in Public Science, Chancellor's Faculty Excellence Program
North Carolina State University

## EDUCATIONAL BACKGROUND

Ph.D., Science Education, 2016, Stanford University, Stanford, CA
Dissertation: *The Framing of Climate Change in School Science*
Advisors: Jonathan Osborne and Nicole Ardoin

M.A., Science Education, 2012, University of Texas at Austin, Austin, TX
Thesis: *Evaluating Reciprocal Coaching as a Differentiated Professional Development Strategy for Experienced Teachers: The Effect of the GK-12 Program on Teachers*
Advisor: Leema Berland

B.S., Ecology, 1994, Iowa State University, Ames, IA

## PROFESSIONAL EXPERIENCE

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|---|---|
| 2023–Present | Associate Professor, Dept. of STEM Education, College of Education<br>Cluster Lead, Leadership in Public Science Cluster, Chancellor's Faculty Excellence Program<br>North Carolina State University |
| 2017–2023 | Assistant Professor, Dept. of STEM Education, College of Education<br>Faculty, Leadership in Public Science Cluster, Chancellor's Faculty Excellence Program<br>North Carolina State University |
| 2016–2017 | Post-doctoral Scholar, Stanford NGSS Assessment Project (SNAP),<br>Stanford Center for Assessment, Language & Equity (SCALE) |
| 2012–2015 | Graduate Research Assistant, Stanford University |
| 2011–2012 | Graduate Research Assistant, University of Texas at Austin |
| 2010–2011 | NSF GK-12 Program Coordinator, University of Texas at Austin |
| 1998–2010 | Secondary Science Teacher, Austin, Texas [National Board Certified Teacher] |
| 1997 | Park Ranger, Great Basin National Park, Nevada |
| 1996 | Urban Environmental Community Developer, Peace Corps, Ivory Coast, Africa |
| 1995 | Environmental Educator, Keewaydin Environmental Education Center, Vermont |

## SCHOLARLY AND PROFESSIONAL HONORS

NC State University Faculty Scholar, Awarded, 2024–25
NARST Early Career Research Award, Awarded, 2024
NSF CAREER Award, Awarded, 2021
NC State Goodnight Early Career Innovators Award, Nominated, 2021–22
NC State Graduate School's Outstanding Graduate Faculty Mentor Award, Nominated, 2021–22
NC State Alumni Association Outstanding Teaching Award, Awarded, 2019–20
NC State University Outstanding Teaching Award, Awarded, 2019–20
NC State University Outstanding Global Engagement Award, Nominated, 2017–18, 2018–19
Stanford Woods Institute, Rising Environmental Leaders Program, Fellow, 2016
Stanford Interdisciplinary Graduate Fellowship, Awarded, 2015–16
Stanford Gerald J. Lieberman Fellowship, Awarded & Declined, 2015–16
Stanford Graduate Women's Voice & Influence Program, Fellow, 2014–15
NSF Community for Advancing Discovery Research in Education (CADRE), Fellow, 2013–14
NSF Graduate Research Fellowship Program, Honorable Mention, 2012

## PUBLICATIONS

[+] Indicates co-author is current or former student/advisee
[*] Indicates co-author is former advisor

**Journal Articles, Peer-reviewed**

1. **Busch, K.**, Lombardi, D. (2025). Effective strategies for learning and teaching in times of science denial and disinformation [Editorial for Special Issue]. *Journal of Research in Science Teaching*, 1-8. Advance online publication.

2. Gibson, L.[+], Stevenson, K., **Busch, K.**, Cutts, B., Seekamp, E., Krementz, S. (2025). Social capital as a predictor of collective environmental action in high school students. *Journal of Environmental Education*. Advance online publication.

3. McCollum, A., Stevenson, K., Tayne, K., DeMattia, E., Jeffs, P., **Busch, K.** (2025). Educating for psychological, community, and ecological resilience: A case study from North Carolina, USA. *Journal of Environmental Studies and Sciences.* Advance online publication.

4. Gibson, L.[+], **Busch, K.**, Stevenson, K., Chesnut, L.[+], Cutts, B., Seekamp, E. (2025). Conceptualizing community-level environmental literacy using the Delphi method. *Environmental Education Research, (31)*4, 718-747.

5. Fraulo, A.[+], Carrier, S., **Busch, K.** (2025). The making of an outdoor educator: A mixed methods study of identity through voice and discourse. *International Journal of Science Education (B), 15*(2), 210-228.

6. Boyd, K., **Busch, K.**, Gold, A., Ward, E., Niepold, F., Poppleton, K., Fiorile, G., Haas, D., Morrison, D. (2024). Using social network analysis to assess connections within climate and energy education organizations: A case study conducted by the Climate Literacy and Energy Awareness Network (CLEAN). *Environmental Education Research.* Advance online publication.

7. Stevenson, K., **Busch, K.**, Peterson, M., Lawson, D., Ayala Chávez, R.[+], Carr, A. (2024). How mixed messages may be better than avoidance in climate change education. *Journal of Environmental Studies and Sciences.* Advance online publication.

8. **Busch, K.**, Rajwade, A.[+] (2024). Conceptualizing community scientific literacy: Results from a systematic literature review and a Delphi method survey of experts. *Science Education, 108*(5), 1231-1268.

9. Peterman, K., Chesnut, L.[+], Gathings, M., Martin, K., Black-Maier, A., Robertson Evia, J., Ayala Chávez, R.[+], Harris, M., **Busch, K.**, Stover, D., Larson, L., Stevenson, K., Yelton, C. (2024). Becoming the change we want to see: Aspirations, first steps, and initial progress in DEAI practice across informal science institutions. *Curator: The Museum Journal, 67*(3), 617-637.

10. Gibson, L.[+], Stevenson, K., **Busch, K.**, Cutts, B., Seekamp, E., Krementz, S. (2024). Pushing towards systemic change in the Capitalocene: Investigating the efficacy of existing behavior prediction models on individual and collective pro-environmental actions in high school students. *Journal of Environmental Education, 55*(2), 102-124.

11. Smith, H.[+], Cooper, C, **Busch, K.**, Harper, S., Muslim, A., McKenna, K., Cavalier, D. (2024). Facilitator organizations enhance learning and action through citizen science: A case study of the Girl Scouts' Think Like a Citizen Scientist Journey on SciStarter. *Environmental Education Research, 30*(2), 190-213.

12. **Busch, K.,** Chesnut, L.[+], Stevenson, K., Larson, L., Black-Maier, A., Yelton, C., Stover, D. (2024). Collaborative capacity building for collective evaluation: A case study with informal science education centers. *International Journal of Science Education (B), (14)*1, 93-115.

13. **Busch, K.,** Kudumu, M.[+], Park, S. (2023). Pedagogical content knowledge for informal science educators: Development of the ISE-PCK framework. *Research in Science Education, 53*(2), 253-274.

14. Gibson, L.[+], **Busch, K.**, Stevenson, K., Cutts, B., DeMattia, E., Aguilar, O., Ardoin, N., Carrier, S., Clark, C., Cooper, C., Feinstein, N., Goodwin, J., Peterson, M., Wheaton, M. (2022). What is community-level environmental

literacy and how can we measure it? A report of a convening to conceptualize and operationalize CLEL. *Environmental Education Research, 28*(10), 1423-1451.

15. **Busch, K.,** Ayala Chávez, R.[+] (2022). Adolescent framings of climate change, psychological distancing & implications for climate change concern and behavior. *Climatic Change, 171*(3), 1-19.

16. Gutierrez, K., Blanchard, M., **Busch, K.** (2022). What effective design strategies do rural, underrepresented students value in STEM clubs while learning about climate change? *Environmental Education Research, 28*(7), 1043-1069.

17. **Busch, K.** (2021). Textbooks of doubt tested: The effect of a denialist framing on adolescents' certainty about climate change. *Environmental Education Research, 27*(11), 1574-1598.

18. Hartley, J.[+], Stevenson, K., Peterson, M., **Busch, K.**, Carrier, S., DeMattia, E., Jambeck, J., Lawson, D., Strnad, R. (2021). Intergenerational learning: A recommendation for engaging youth to address marine debris challenges. *Marine Pollution Bulletin, 170,* 112648.

19. Zummo, L., Donovan, B., **Busch, K.** (2021). Complex influences of mechanistic knowledge, worldview, and quantitative reasoning on climate change discourse: Evidence for ideologically motivated reasoning among youth. *Journal of Research in Science Teaching, 58*(1), 95-127. [Top cited paper in *JRST* 2020-21]

20. **Busch, K.**, Ardoin, N.[*], Gruehn, D., Stevenson, K. (2019). Exploring a theoretical model of climate change action for youth. *International Journal of Science Education, 41*(17), 2389-2409.

21. Donovan, B., Semmens, R., Keck, P., Brimhall, E., **Busch, K.**, et al. (2019). Towards a more humane genetics education: Learning about the social and quantitative complexities of human genetic variation research could reduce racial bias in adolescent and adult populations. *Science Education*, *103*(3), 529-560. [Altmetric Score: 228; Top 10 downloaded paper in *SE* 2019-20]

22. Borko, H., Osborne, J.[*], Fishman, E., Zaccarelli, F., Berson, E., **Busch, K.**, Reigh, E., Tseng, A. (2019). Impacts of a practice-based professional development program on elementary teacher facilitation of, and student engagement in, scientific argumentation. *American Educational Research Journal, 56*(4), 1067-1112.

23. **Busch, K.**, Henderson, J., Stevenson, K. (2019). Broadening epistemologies and methodologies in climate change education research. *Environmental Education Research, 25*(6), 955-971.

24. Román, D., **Busch, K**. (2016). Textbooks of doubt: Using systemic functional analysis to explore the framing of climate change in middle-school science textbooks. *Environmental Education Research, 22*(8), 1158–1180. [Altmetric Score: 169, top 5% of all research outputs scored by Altmetric]

25. **Busch, K.** (2016). Polar bears or people? Exploring ways in which teachers frame climate change in the classroom. *International Journal of Science Education (B), 6*(2), 137–165.

26. **Busch, K.**, Osborne, J.[*] (2013). Can we get "there" from "here"?: An argument for improved climate science education through state adoption of the Next Generation Science Standards. *Texas Education Review, 1*(1), 196–208.

27. **Busch, K.** (2013). Appropriate urban teaching philosophies – A book review of "Sketches in Democracy: Notes from an Urban Classroom." *Democracy & Education, 21*(1), Article 10.

**Edited Collections, Peer-reviewed**

1. Lombardi, D., **Busch, K.** (Editors). (2025). Learning and teaching in times of science denial and disinformation [Special Issue]. *Journal of Research in Science Teaching*.

2. **Busch, K.** (2017). Framing of climate change in U.S. science education. In M. Nisbet (Ed.), *The Oxford Research Encyclopedia of Climate Change Science.* Oxford University Press. [Invited Author]

**Conference Proceedings, Peer-reviewed**

1. Berland, L.[*], **Busch, K.** (2012). Negotiating STEM epistemic commitments for engineering design challenges. *American Society for Engineering Education (ASEE)*. Available at: http://www.asee.org/public/conferences/8/papers/3906/view.

**Practitioner Articles**

1. **Busch, K.**, Osborne, J.[*] (2022). Effective strategies for talking about climate change in the classroom. *Association for Science Education (ASE) International Journal, 14*, 15-24. [Selected by editor to be republished from *School Science Review*, 2014]

2. **Busch, K.**, Osborne, J.[*] (2014). Effective strategies for talking about climate change in the classroom. *School Science Review, 96*(354), 25–32.

**Book Chapters**

1. **Busch, K.**, Román, D. (2017). Fundamental climate literacy & the promise of the NGSS. In D. Shepardson, A. Roychoudhury, and A. Hirsch (Eds.), *Teaching and Learning about Climate Change: A Framework for Educators*. Routledge Press.

2. **Busch, K.** (2016). Speaking of climate change: Comparing science and social discourses. In E. Fretz (Ed.), *Climate Change across the Curriculum*. Lexington Books.

**Manuscripts in Revision and Review**

1. None at this time.

**Manuscripts in Preparation**

1. Betancourt, A, Finn, S., Fulkerson, K., Hanna, A., Harley-Wenn, G., Kiser, E., Lynch, A., Reeves, S., Trifaro, A., Woodroof, A., **Busch, K.,** Cooper, C. (In preparation). Community scientific literacy in participatory science: Evidence on the iNaturalist forum. *Research in Science Education*.

2. Smith, H.[+], Cooper, C., Larson, L., **Busch, K.**, Stevenson, K. (In preparation). Community hubs for citizen science: How libraries in the U.S. facilitate public engagement with science. *Citizen Science Theory and Practice.*

3. Franklin, B., Moore, L., Anarde, K., Murray, A., **Busch, K**., Corbette, R. (In preparation). Multi-decadal barrier island fates vary as a function of management strategy.

**Edited Collections in Preparation**

1. National Academies of Sciences, Engineering and Medicine. (In preparation, Expected 2026). Education for Thriving in a Changing Climate. [Consensus Committee; Report Contributor]

**Other Publications and Products**

1. **Busch, K**., Chesnut, L.[+], Stevenson, K., Larson, L., Yelton, C., Stover, D. (2023). *Designing for a collaborative approach to build capacity for collective evaluation: A guide for backbone organizations. A tested model with informal science education centers and museums.* [White paper]

2. **Busch, K.**, Chesnut, L.[+], Stevenson, K., Larson, L. (2023). *"Eval 101" for in/non-formal science education*. https://research.ced.ncsu.edu/eval101/ [Website]

3. **Busch, K.** (2022). *A "whole" climate change education is needed.* National Center for Science Education. https://ncse.ngo/whole-climate-change-education-needed [Blog; Invited contribution]

4. NCSU Coastal Resilience and Sustainability Leadership Group. (2020). *Coastal resilience and sustainability initiative white paper.* [White paper; Contributor]

5. **Busch, K.** (2020). *Book Review: Communicating climate change - a guide to educators.* Reports of the National Center for Science Education. Available at https://ncse.ngo/rncse. [Blog; Invited contribution]

6. **Busch, K.**, Stevenson, K., Green, K.[+], Chesnut, L.[+] (2019). *Environmental education in North Carolina: Examining North Carolina's environmental education providers as a Community of Practice using social network analysis*. [White paper]

7. **Busch, K.** (2015). *Textbooks of doubt.* National Center for Science Education. Available at https://ncse.com/blog/2015/11/textbooks-doubt-0016720. [Blog; Invited contribution]

8. **Busch, K.**, LaRocque, L. (2014). *Environmental psychology & teaching strategies.* In L. Downey, S. J. Gentile, K.S. Hollweg, et al. (Eds.), Advancing Climate Change Environmental Education: Resources and Suggestions. Ithaca, NY: EECapacity, Cornell University Civic Ecology Lab and North American Association for Environmental Education. [White paper]

## PRESENTATIONS

[+] Indicates co-author is current or former student/advisee
[*] Indicates co-author is former advisor

1. **Busch, K.,** Rudo, T, Haine, D. (2025). *What is community scientific literacy? Perspectives from the literature, an expert panel, and the public.* Paper presented at European Science Education Research Association (ESERA) International Conference, Copenhagen, Denmark.

2. Mendoza, R., Dawson, E., Saxena, M., Ennes, M., Refrem, E., **Busch, K.** (2025). *From inspiration to retention: Exploring the professional journeys of informal science educators.* Paper presented at European Science Education Research Association (ESERA) International Conference, Copenhagen, Denmark.

3. **Busch, K.,** Stevenson, K. (2024). *What is community scientific literacy? Perspectives from the literature, an expert panel, and the public.* Paper presented at European Science Education Research Association (ESERA) Environment|Science|Health SIG Mini-Conference, Valencia, Spain.

4. Rajwade, A.[+], **Busch, K.** (2024). *Exploring collective learning in an environmental movement in India using the Community of Practice framework.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Denver, Colorado.

5. Moore, L., Odendahl-James, J., Williams, K., **Busch, K.** (2024). *Performing science to promote learning and engagement: The development of Rollover to communicate the impacts of climate change on barrier island coastlines and communities*. Paper presented at American Geophysical Union (AGU) Ocean Sciences Meeting, New Orleans, Louisiana.

6. Stevenson, K., Tayne, K., DeMattia, L., McCullum, R., **Busch, K.**, Jeffs, P. (2024). *Building an interdisciplinary, community-based resilience curriculum with and for teachers, kids and communities.* Presentation at NOAA Social Coast Forum, Charleston, South Carolina.

7. **Busch, K.,** Rajwade, A.[+] (2023). *What is community level scientific literacy? A systematic literature review and Delphi method study.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Chicago, Illinois.

8. Rajwade, A.[+], **Busch, K.** (2023). *Psychosocial determinants of pro-environmental behaviors studied in the last decade: A systematic review of research*. Poster presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Chicago, Illinois.

9. **Busch, K.** (2022). *Using social network analysis to understand and improve climate change education efforts.* Paper presented at American Geophysical Union (AGU) Fall Meeting, Chicago, Illinois. [Invited]

10. Gold, A., **Busch, K.,** Niepold, F., Ward, E., Boyd, K., Fiorile, G., Poppleton, K., Haas, D. (2022). *Increasing interconnectedness among climate change education efforts: Results from a social network analysis of the Climate*

*Literacy and Energy Awareness (CLEAN) network.* Paper presented at American Geophysical Union (AGU) Fall Meeting, Chicago, Illinois. [Invited]

11. **Busch, K.,** Ayala, R.[+] (2022). *Adolescent framings of climate change, psychological distancing & implications for climate change concern and behavior*. Poster presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Vancouver, Canada.

12. **Busch, K.**, Chesnut, L.[+] (2022). *Social network analysis as a tool to operationalize communities of practice and document social learning.* Poster presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Vancouver, Canada.

13. **Busch, K.**, Chesnut, L.[+], Ayala, R.[+], Stevenson, K., Larson, L., Yelton, C. (2022). *Building capacity for collective evaluation across ISE centers: A tested model for a collaborative approach.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Vancouver, Canada.

14. Jadallah, C., Rajwade, A.[+], Gibson, L.[+], **Busch, K.,** Stevenson, K., Ballard, H. (2021). *Perspectives on community-level environmental literacy: Theories and operationalization.* Presented at North American Association for Environmental Education (NAAEE) Annual Research Symposium, virtual [COVID].

15. Sadan, N., Gibson, L.[+], Pizmony-Levy, O., **Busch, K.** (2021). *Network theory: Methodologies that focus on connections.* Presented at North American Association for Environmental Education (NAAEE) Annual Research Symposium, virtual [COVID].

16. **Busch, K.**, Park, S., Kudumu, M.[+] (2021). *Pedagogical content knowledge for informal science educators.* Paper presented at Mid-Atlantic Association for Science Teacher Education (MA-ASTE), Blowing Rock, North Carolina.

17. Busch, K., Chesnut, L.[+], Stevenson, K., Larson, L. (2021). *Building capacity for collective evaluation in science & environmental education centers across N.C.* Project presented at Environmental Educators of North Carolina (EENC) – Southeastern Environmental Education Alliance (SEEA) Research Symposium, Arden, North Carolina.

18. Patrick, P., Achiam, M., Ash, D., Sedawi, W., Striligwa, A., **Busch, K.** (2021). *Applying learning theories in research outside the classroom: How people learn science in informal environments.* Symposium discussant at European Science Education Research Association (ESERA) Biannual Conference, virtual [COVID].

19. Ward, R., **Busch, K.,** Cawley, M., Daniel, L., Maycock, T. (2021). *Climate change communication and education.* Panel presentation at Carolinas Climate Resilience Conference, virtual [COVID].

20. **Busch, K.**, Chesnut, L.[+], Ayala, R.[+], Stevenson, K., Larson, L., Yelton, C., Coscolluela, N. (2021). *Assessing participant learning outcomes in science museums: Building capacity for collective evaluation.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, virtual [COVID].

21. **Busch, K.**, Chesnut, L.[+], Ayala, R.[+], Stevenson, K., Larson, L., Yelton, C., Coscolluela, N. (2021). *Building capacity for collective evaluation of learning in museums.* Presented at North Carolina Museums Conference (NCMC) Annual Meeting, virtual [COVID].

22. Gibson, L.[+], Stevenson, K., Wheaton, M., DeMattia, L., **Busch, K.** (2020). *Conceptualizing community level scientific literacy.* Panel at North American Association for Environmental Education (NAAEE) Annual Research Symposium, virtual [COVID].

23. **Busch, K.**, Green, K.[+], Chesnut, L.[+] (2020). *Seeing social learning: Using social network analysis to operationalize communities of practice.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Portland, Oregon [conference cancelled - COVID].

24. **Busch, K.**, Park, S., Kudumu, M.[+] (2020). *iPCK: Developing a framework for pedagogical content knowledge for informal science educators.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Portland, Oregon [conference cancelled - COVID].

25. Zummo, L., Donovan, B., **Busch, K.** (2020). *Influences of worldview and knowledge on climate change discourse: Evidence for ideologically motivated reasoning among youth.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Portland, Oregon [conference cancelled - COVID].

26. Reynolds, W., Park, S., **Busch, K.** (2020). *Increasing candidate success on the edTPA through an NGSS-aligned science methods course.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Portland, Oregon [conference cancelled - COVID].

27. Stevenson, K.T., Hartley, J.[+], Lawson, D., DeMattia, E., Peterson, M.N., **Busch, K.,** Carrier, S.J., Strnad, R.L. (2020). *Youth as community change agents: How marine and coastal education are shaping how communities view coastal challenges.* Poster presented at NOAA Social Coast Forum, Charleston, South Carolina.

28. Reynolds, W., Park, S., **Busch, K.**, Wright, G. (2020). *Meeting the challenges of the edTPA by developing candidates understanding and implementation of the NGSS science & engineering practices*. Paper presented at the annual international conference of the Association for Science Teacher Education, San Antonio, Texas.

29. **Busch, K.,** Ardoin, N., Gruehn, D., Stevenson, K. (2019). *Moving beyond a knowledge deficit perspective & towards a model for youth climate change behavior.* Poster presented at European Science Education Research Association (ESERA) Biannual Conference, Bologna, Italy.

30. **Busch, K.**, Stevenson, K., Green, K.[+], Lawson, D. (2019). *Using social network analysis to improve a community of practice: A case study of environmental education centers.* Paper presented at European Science Education Research Association (ESERA) Biannual Conference, Bologna, Italy.

31. **Busch, K.** (2019). *Epistemic cognition: The role of uncertainty on youth's climate change behavior*. Paper presented in Investigating Epistemic Cognition in Relation to Food, Water, And Energy (FEW) Issues session organized by C. Lundholm at American Educational Research Association (AERA) Annual International Conference, Toronto, Canada.

32. **Busch, K.,** Pérez-Jöhnk, G., Miller, D., Green, K.[+] (2019). *The role of power and politics in education for sustainability in the Galapagos Islands.* Paper presented in Education for Sustainability: A Public-Private Partnership for Transforming Education in the Galapagos session organized by K. Busch at American Educational Research Association (AERA) Annual International Conference, Toronto, Canada.

33. Hartley, J.[+], Stevenson, K. T., Peterson, N. M., DeMattia, E., Strnad, R., Carrier, S., **Busch, K.** (2019). *Intergenerational learning beyond the immediate family: Are students environmental change-agents in their communities?* Poster presented at Citizen Science Conference, Raleigh, NC.

34. Forbes, C., Stevenson, K., **Busch, K.** (2018). *Towards a national collaborative for food, energy, and water education (NC-FEW) research*. Panel at North American Association for Environmental Education (NAAEE) Annual Conference, Spokane, Washington.

35. **Busch, K.,** Stevenson, K., DeMattia, L. (2018). *Redefining and researching environmental literacy at the community level.* Facilitated discussion at North American Association for Environmental Education (NAAEE) Annual Conference, Spokane, Washington.

36. **Busch, K.**, Henderson, J. (2018). *Climate change education – What matters in research and public education.* Paper presented in What Matters in Climate Change Education roundtable organized by Reid, A., and M. McKenzie at American Educational Research Association (AERA) Annual International Conference, New York, New York.

37. Perez, G., Rossi, D., Roman, D., **Busch, K.,** Miller, D., Rahim, H., Agredo, H. (2018). *The culture of Pachamama: How science teachers contextualize the Ecuadorian science curriculum in Galapagos.* Poster presented in International Perspectives on Ecoliteracies: Work at the Intersection of Community, Environmental, and Scientific Issues session organized by Tzou, C. at American Educational Research Association (AERA) Annual International Conference, New York, New York.

38. Roman, D., Rossi, D., del Rosal, K., Perez, G., **Busch, K.,** Rouse, R., Rahim, H. (2017). *There is no conservation without education: Embedding social topics in the teaching of science in the Galapagos Islands.* Paper presented at European Science Education Research Association (ESERA) Biannual Conference, Dublin, Ireland.

39. **Busch, K.** (2017). *A symposium on teaching and learning about climate change: A framework for educators.* Symposium organized by Hirsch, A., Shepardson, D., and A. Roychoudhury at National Association for Research in Science Teaching (NARST) Annual International Conference, San Antonio, Texas.

40. Donovan, B., Semmens, R., **Busch, K.,** Keck, P., Brimhall, E., Edelson, D. (2017). *A human(e) genetics education: Teaching about human genetic variation can reduce racial bias amongst adolescents.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, San Antonio, Texas.

41. Osborne, J.*, Borko, H., **Busch, K.,** Fishman, E., Million, S., Tseng, A. (2016). *Developing and using an instrument to assess the dialectic potential of whole-class discussions in teaching science.* Paper presented at American Educational Research Association (AERA) Annual International Conference, Washington, D.C.

42. **Busch, K.**, D. Román, D. (2015). *Textbooks of doubt: Uncertainty and attribution of climate change in middle-school science.* Paper presented at European Science Education Research Association (ESERA) Biannual Conference, Helsinki, Finland.

43. Osborne, J.*, Berson, E., Borko, H., **Busch, K.,** Zaccarelli, F., Million, S., Tseng, A. (2015). *Assessing the quality of classroom discourse and interaction in science teaching.* Paper presented at European Science Education Research Association (ESERA) Biannual Conference, Helsinki, Finland.

44. **Busch, K.** (2015). *Talking climate science – How teachers frame climate change in the classroom & why it matters.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Chicago, Illinois.

45. **Busch, K.,** Berson, E., Osborne, J.*, Borko, H. (2015). *Teachers talking about talk: What elementary science teachers identify as the value and barriers to science discourse pedagogy.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Chicago, Illinois.

46. **Busch, K.** (2014). *Polar bears or people? How framing can provide a useful analytic tool to understand and improve climate change communication in classrooms.* Poster presented at Fall Meeting of the American Geophysical Union (AGU), San Francisco, California.

47. Osborne, J.*, **Busch, K.,** Tseng, A., Berson, E., Borko, H., Khachatryan, E., Million, S. (2014). *Assessing the quality of classroom discourse and interaction in science teaching.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Pittsburgh, Pennsylvania.

48. **Busch, K.** (2012). *Assessing current state science teaching and learning standards for ability to achieve climate science literacy.* Paper presented at Fall Meeting of the American Geophysical Union (AGU), San Francisco, California.

49. Berland, L.*, **Busch, K.** (2012). *Negotiating STEM epistemic commitments for engineering design challenges.* Paper presented at American Society for Engineering Education (ASEE) Annual Conference, San Antonio, Texas.

50. **Busch, K.** (2012). *The effect of the GK-12 program on teachers: Evaluating reciprocal coaching as a differentiated professional development strategy for experienced teachers.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Indianapolis, Indiana.

51. Rogers, S., **Busch, K.** Berland, L.* (2012). *Understanding the role of context and activity in students' argumentation practice: Variation in how individuals argue about scientific and socioscientific questions.* Paper presented at National Association for Research in Science Teaching (NARST) Annual International Conference, Indianapolis, Indiana.

## EXTERNAL AND INTERNAL RESEARCH FUNDING

**Funded, Current**

*Expanding the Scope and Nature of Theoretical Frameworks to Understand Adult Learning in the Participatory Sciences*
NSF AISL Synthesis Grant, 2025–2028
Total award: $499,977
Co-Principal Investigator (PI: C. Cooper, NCSU)
Purpose: The goal of this project is to assess and bolster the theoretical foundations for understanding learning in the participatory sciences. Utilizing a Systematic Literature Review and a Theoretical Integrative Review, we will answer two research questions: (1) What theories have shaped understanding of the scope and nature of adult's learning experiences in the contributory-style participatory sciences? (2) How can we synthesize elements and premises of leisure theories and learning theories to improve our understanding of the broad scope and nature of learning experiences in participatory sciences?

*Redefining Scientific Literacy at the Community Level—Researching Science Learning using a Social Network Approach*
NSF CAREER Grant, AISL and ECR Programs, 2021–2026
Total award: $1,103,218
Principal Investigator
Purpose: The goal of this project is to develop an empirically based conceptual model and metrics for community level scientific literacy. A theory building through multiple case study research design will be used in which three North Carolina coastal communities of place, faced with the need to make scientifically informed adaptation decisions to combat the effects of sea level rise, serve as bounded cases to be studied sequentially. A convergent mixed methods design will be employed, in which qualitative and quantitative data collection and analyses are performed concurrently. This project uses qualitative research methods, including document analysis, observation, and interviews, to understand and describe the case contexts. Social network analysis (SNA) is used to quantitatively measure the features of community organization (such as relationships between individuals) of the community cases.

*Community READY: Building a more Resilient coast through Education And change leD by Youth*
NOAA North Carolina Sea Grant, 2024–2026
Total award: $150,000
Co-Principal Investigator (PI: K. Stevenson, NCSU)
Purpose: This grant builds upon a prior project—*Developing a Model for Supporting Coastal Resilience through Youth-led Coproduction* (2022–2024)—to address emerging questions developed by researchers and teachers. Together, we will continue and expand implementation of the co-created resilience curriculum while a) documenting key impacts teachers, students, and communities, including both process (e.g., how co-productive workshops benefit teachers) and outcomes (e.g., how do the activities result in student and community resilience); b) co-generating and answering research questions with teachers to capture the impacts; and c) directly engaging with parents and other community members to understand how the curriculum can best resonate with existing community priorities and promote community support for school-based resilience efforts. Through these efforts, we plan to involve a minimum of 20 teachers, 400 students, and 100 parents to document, measure, and expand the impacts of this promising curriculum.

*Effects of Coastal Adaptation on Ocracoke Island*
National Parks of Eastern NC, Cooperative Agreement, 2023–2025
Total Award: $200,000, NCSU subaward: $48,659
Co-Principal Investigator (PI: L. Moore, UNC–Chapel Hill; A. Murray, Duke University; K. Anarde, NCSU)
Purpose: For this project, we will use a barrier island computer model to assess the likely long-term effects of mitigation and adaptation scenarios on the barrier island landscape under different future storminess and sea-level rise conditions. We will adapt participatory modeling and deliberative dialogue approaches to gather community feedback on the scenarios to inform the selection process. In partnership with the National Park Service and the NC Department of Transportation, the goal is to support adaptation planning in the Cape Hatteras National Seashore and surrounding communities. The proposed project will provide a framework for a co-creation process that could be utilized in other communities facing similar challenges.

**Funded, Completed**

*Developing a Model for Supporting Coastal Resilience through Youth-led Coproduction*
NOAA North Carolina Sea Grant, 2022–2024
Total award: $119,995
Co-Principal Investigator (PI: K. Stevenson, NCSU)
Purpose: The objective for this project was to collaboratively create and refine a curricular framework that supports coastal resiliency through schools. The framework addressed ecological resiliency through field work in collaboration with scientists, social resiliency through developing and leading community engagement events, and personal resiliency through fostering personal connections, hope and efficacy. In year 1, grant activities included forming a curriculum advisory committee of

teachers, students, and community partners and facilitating meetings with scientists, planning boards, and local officials to learn about local coastal hazards and resiliency strategies; and co-creation of a curricular framework for middle grades that built in mechanisms for students to identify local resiliency challenges and solutions. In year 2, grant activities included training a second cohort teachers through a two day in-person workshop to use the co-created curriculum.

*Strengthening Community Networks for Environmental Learning and Resilience through Children*
NOAA North Carolina Sea Grant, 2020–2022
Total award: $119,998
Co-Principal Investigator (PI: K. Stevenson, NCSU)
Purpose: The objective of this project was to conceptualize community level environmental literacy through social networks. For this research, we conducted an online Delphi study, a structured communication technique, to improve definitions of community-level environmental literacy (CLEL) and means to measure it. In addition, we trained 30 middle and high school teachers in a citizen-science and school-based environmental education program around water quality that is specifically designed to build CLEL through intergenerational learning. From these two objectives, we tested how this curriculum boosts individual environmental literacy among students, teachers, parents, and community members, and how these changes express themselves at the community level in North Carolina.

*Building Capacity for Collective Evaluation across North Carolina Science Museums*
Institute of Museum & Library Services (IMLS) Leadership Grant, 2019–2022
Total award: $465,149; NCSU subaward: $356,750
Principal Investigator (Co-PIs: C. Yelton, NC Museum of Natural Sciences; K. Stevenson, NCSU; L. Larson, NCSU)
Purpose: Through a research-practice partnership between the NC Museum of Natural Sciences (NCMNS) and NC State University (NCSU), we built on the emerging work surrounding collective evaluation to develop a Community of Practice of over 25 informal science education centers in North Carolina, enhancing capacity for collective impact. The objectives for this project were to: 1) create a shared sense of purpose for informal programming and evaluation, 2) build capacity among science museum educators to conduct evaluation for their informal programs, and 3) establish a set of common metrics and methodologies for collective evaluation of informal science learning across the state. Over three years, we designed and created online professional development modules to improve evaluation skills. Then, we conducted online workshops to develop and implement evaluation plans using shared co-developed outcomes and metrics. The collaborative process was documented to inform other efforts to build collective evaluation systems and foster cultures of evaluation in museums and informal science education providers across the nation.

*The Role of Education in Climate Change Adaptation*
Spencer Foundation Conference Grant, 2020–2022
Total award: $49,850
Principal Investigator (Co-PIs: J. Henderson, Paul Smith College; D. Haas, Paleontological Research Institute)
Purpose: In January 2021, we held a virtual conference to springboard the Climate Change Education Collective. The conference brought together nearly 70 researchers, educators, and policymakers whose expertise is climate change education to summarize, develop and advance research agendas in the emerging area of climate change education.

*Building a Culture and Capacity for Environmental Education Evaluation 2.0*
Pisces Foundation, 2020–2021
Total award: $29,626
Co-Principal Investigator (PI: C. Clark, Duke University)
Purpose: Using interviews with thought-leaders and case studies of existing programs, we identified practices for successful collective evaluation in environmental education and identified paths forward toward a culture and capacity of evaluation.

*Improving Environmental Decision Making in Coastal Communities through giving Children a Voice: Building Science Literacy, Civic Engagement, and Coastal Resilience through K-12 Citizen Science*
NOAA North Carolina Sea Grant, 2018–2021
Total award: $119,998
Co-Principal Investigator (PI: K. Stevenson, NCSU)
Purpose: We partnered with Duke University Marine Lab to scale up two citizen science-based environmental education projects, designed to enhance intergenerational transfer. We expanded the projects to 32 middle grade classrooms across the CAMA counties and experimentally tested impacts on knowledge of coastal environmental challenges, environmental self-efficacy, pro-environmental behavior, and interest in STEM careers among students; comfort using citizen science among teachers; and increased salience of coastal environmental issues and importance of using scientific data in environmental decision makers in the eyes of decision makers and community members.

*Defining and Measuring Community-Level Learning to Support Environmental and Science Education Innovation*
NCSU Faculty Research & Professional Development Fund, 2019–2020
Total award: $5,800
Co-Principal Investigator (PI: K. Stevenson, NCSU)
Purpose: To make progress in the conceptualization and measurement of community-level science and environmental literacy, we brought together EE experts to participate in a convening held at NC State. During the event, we engaged participants in structured consensus-building activities around definitions and indicators.

*Examining North Carolina Environmental Education Providers as a Community of Practice using Social Network Analysis*
NCSU Faculty Research & Professional Development Fund, 2018–2019
Total award: $7,500
Principal Investigator (Co-PIs: K. Stevenson, NCSU; B. Cutts, NCSU)
Purpose: In this research-practice partnership project, we collaborated with three state-wide organizations that have as their central mission to promote excellence in environmental education (EE) by fostering networking and collaboration among the EE community. Social network analysis methods were used to examine and interpret in what ways EE providers across the state exemplify a successful Community of Practice through a shared sense of enterprise, opportunities for mutual engagement, and a shared repertoire of resources.

*Learning STEM in Informal Contexts*
NCSU STEM Education Initiative Grant, 2018–2019
Total award: $13,925
Principal Investigator
Purpose: To engage NC State students in the processes and practices of STEM learning that happens outside of school, this project supported the development of a Learning STEM in Informal Contexts course offered in the spring semester of the 2018-19 academic year.

*Why Words Matter: Framing of Climate Change in School Science*
Stanford University Graduate School of Education Dissertation Support Grant, 2015–16
Total award: $6,000
Principal Investigator

**In Review**

*Classroom Integration and Transfer with a Game-Based Learning Environment*
NSF DRK-12 Grant, submitted 2024
Senior Personnel (PI: J. Nietfeld, NCSU)

**In Preparation**

None at this time.

## POST-SECONDARY TEACHING EXPERIENCE

**North Carolina State University**

| Semester | Course Title | Enrollment | Evaluation^ |
|---|---|---|---|
| Fall 2025 | EMS 475: Methods of Teaching Science II | 18 | |
| Spring 2025 | EMS 552: Learning in Informal Contexts – Evaluation | 19 | 5.0 |
| Fall 2024 | EMS 775: Foundations of Science Education | 10 | 5.0 |
| Fall 2024 | EMS 475: Methods of Teaching Science II | 17 | 5.0 |
| Fall 2023 | EMS 475: Methods of Teaching Science II | 12 | 4.8 |
| Spring 2023 | EMS 531: Introduction to Research in Science Education | 17 | 4.8 |
| Spring 2023 | EMS 551: Learning in Informal Contexts – Theory to Practice | 6 | NA |
| Fall 2022 | EMS 475: Methods of Teaching Science II | 14 | 4.9 |
| Spring 2022 | EMS 731: Fundamentals of Research in Science Education | 17 | 4.7 |
| Fall 2021 | EMS 594: Evaluation of Learning in Informal Contexts | 13 | 5.0 |

| | | | |
|---|---|---|---|
| Spring 2021 | EMS 594: Learning in Informal Contexts | 18 | 4.8 |
| Fall 2020 | EMS 521: Advanced Methods of Science Education I | 30 | 4.9 |
| Fall 2020 | EMS 775: Foundations of Science Education | 13 | NA |
| Spring 2020 | EMS 505: Methods of Teaching Science I | 15 | NA |
| Fall 2019 | EMS 594/794: Evaluation of Learning in Informal Contexts | 15 | 5.0 |
| Fall 2019 | EMS 791: Contemporary Research and Critical Issues in STEM Education | 13 | 4.9 |
| Spring 2019 | EMS 594/794: Learning in Informal Contexts | 16 | 4.9 |
| Fall 2018 | EMS 475: Methods of Teaching Science II | 6 | 4.7 |
| Spring 2018 | EMS 594: Learning in Informal Contexts | 11 | 5.0 |
| Fall 2017 | ED 730: Introduction to Qualitative Research Methods in Education | 11 | 5.0 |

^ Overall teaching effectiveness score on student evaluations, score range 1–5; NA no quantitative data available

**Stanford University**

*Instructor of Record*
STEP Science Curriculum & Instruction (instructional methods course), Master's, Winter Quarter 2016

*Teaching Assistant*
Qualitative Methods in Education, Graduate, Spring Quarter 2015
Theory & Practice of Environmental Education, Undergraduate & Graduate, Spring Quarter 2015, 2016
STEP Science Curriculum & Instruction (instructional methods course), Master's, Winter Quarter 2015
STEP Science Curriculum & Instruction (instructional methods course), Master's, Fall Quarter 2014

## GRADUATE COMMITTEE MEMBERSHIPS

**PhDs completed as Chair or Co-Chair**

1. Shannan George, Ph.D. Science Education, *Investigation of the scientific and participant outcomes of an international citizen science project in water, sanitation, and hygiene*, Co-Chair, 2019
2. Mwenda O. Kudumu, Ph.D. Science Education, *The perceptions and practices of informal science educators regarding culturally relevant education in science centers*, Co-Chair, 2022
3. Lynn Chesnut, Ph.D. Science Education, *How do science museum exhibits contribute to perceptions of inclusion and belonging?*, Chair, 2024
4. Aparajita Rajwade, Ph.D. Science Education, *Exploring drivers of collective-level learning and action: A case study of an environmental movement in India*, Chair, 2024
5. Regina Ayala Chávez, Ph.D. Science Education, *Understanding climate change learning and behaviors of mothers in Mexico and the United States: A mixed-method multiple case study*, Chair, 2024
6. Katlyn May, Ph.D. Science Education, *Exploring environmental health literacy among communities impacted by PFAS exposure: A mixed methods study*, Chair, 2025

**PhDs in progress as Chair or Co-Chair**

1. Stephanie Teeter, Ph.D. Science Education, Co-Chair, expected 2025
2. Dana Haine, Ph.D. Science Education, Chair
3. Tara Rudo, Ph.D. Science Education, Chair
4. Max Cawley, Ph.D. Science Education, Chair
5. Rae Cohn, Ph.D., Science Education, Chair

**PhDs completed as Committee Member**

1. Kimberly Pigford, Ph.D. Science Education, 2018
2. Casey Holmes, Ph.D. Teacher Education and Learning Sciences, 2021
3. Teena Coates, Ph.D. Technology and Engineering Education, 2021
4. Jenna Hartley, Ph.D. Parks, Recreation and Tourism Management, 2022
5. Megan Morin, Ph.D. Technology and Engineering Education, 2022

6. Aimee Fraulo, Ph.D. Teacher Education and Learning Sciences, 2022
7. Pamela Huff, Ph.D. Science Education, 2022
8. Lauren Gibson, Ph.D. Parks, Recreation and Tourism Management, 2022
9. Karen Collier, Ph.D. Science Education, 2023
10. Lili Wang, Ph.D. Teacher Education and Learning Sciences, 2023
11. Madeline Hinckle, Ph.D. Science Education, 2023
12. Robin Bulleri, Ph.D. Science Education, 2025
13. Sera Harold, Ph.D. Science Education, 2025
14. Haley Smith, Ph.D. Fisheries, Wildlife and Conservation Biology, 2025
15. Ana-Maria Topliceanu, Ph.D. Science Education, 2025

**PhDs in progress as Committee Member**

1. Jennifer Sollinger, Ph.D. Science Education
2. Jessica Chestnut, Ph.D. Science Education
3. Laura Chalfant, Ph.D. Science Education
4. Brooklynn Joyner, Ph.D. Fisheries, Wildlife and Conservation Biology
5. Jamie Elsner, Ph.D., Learning Sciences and Psychological Studies, UNC–Chapel Hill
6. Emily Braren, Ph.D., Teacher Education and Learning Sciences
7. Briana Trager, Ph.D., Teacher Education and Learning Sciences
8. Toluwalase Salako, Ph.D. Science Education
9. Lynn Huff, Ph.D. Science Education
10. Vallari Sheel, Ph.D. Fisheries, Wildlife and Conservation Biology

**MSs (with thesis) completed as Committee Member**

1. Maria Sharova, M.S. Fisheries, Wildlife and Conservation Biology, 2019

## OUTREACH & ENGAGEMENT ACTIVITIES

**Leadership and Synergistic Organizations**

National Academies of Science, Engineering, and Mathematics (NASEM), Education for Thriving in a Changing Climate, Consensus Committee Member, 2025–present

Coastal Resilience and Sustainability Initiative, NCSU, Faculty Affiliate, 2022–present

Collaboratory for Coastal Adaptation over Space and Time (C-CoAST), Advisory Board, 2020–present

Southeast Climate Adaptation Science Center, U.S.G.S. Department of the Interior, Faculty Affiliate, 2017–present

NSF AISL: Climate Stories: A Community and Planetarium Partnership Model to Develop Local Data-Driven Visual Impact Narratives (#2415812), Advisory Board, 2024–2027 [grant canceled 2025]

NSF DRK-12: Community Tech Press: Elementary youth expanding engineering through critical multilingual journalism (#2300726), Advisory Board, 2023–2027 [grant canceled 2025]

NSF AISL: BSCS Climate Education Pathways Project (#2100808), Advisory Board, 2021–2025

Coastal Resilience and Sustainability Leadership Group, NCSU Office of the Executive Chancellor and Provost, Selected Faculty Member, 2019–2022

Climate Change Education Collective, Co-Founder, 2020–2022

Network of STEM Education Centers: National Collaborative for Research on Food, Energy, and Water Education (NC-FEW), Informal Learning Group Leadership, 2017–2021

BSCS OpenSciEd unit on Natural Resources & Human Impact, Advisory Board, 2020–2021

Education for Sustainability in Galapagos: A Public-Private Partnership with The Ecuador Ministry of Education, Galapagos Conservancy, the Galapagos Governing Council, and Fundaçion Scalesia, Science Education Advisor, 2016–2020

Innovating Teaching and Learning at the Food-Energy-Water Nexus, National Collaborative for Research on Food, Energy, and Water Education (NC-FEW), Washington D.C., 2017

International Policy Forum: Advancing, Monitoring, Evaluation, and Research on Sustainability in Education. Sponsored by the Sustainability and Policy Network, Vancouver, Canada, 2017

NAAEE & National Issues Forums, Climate Choices Issue Guide for Classrooms, Contributing Author, 2016

Framing Scientifically Complex Issues for Public Deliberation Research Exchange. Sponsored by The Kettering Foundation and NAAEE, Dayton, Ohio, 2015

NAAEE Climate Change Education Project-Based Online Learning Community Alliance (POLCA), Contributing Author, 2012–2013

**Speaking Events, Invited**

1. Columbia University Teachers College, International Workshop on Environment, Sustainability, and Education, "Exploring Collaborations in the Climate Literacy and Energy Awareness Network (CLEAN)," 38 participants (Feb 12, 2025).

2. Duke University Marine Laboratory and Nicholas School of the Environment Seminar, "How can a community be scientifically literate?," 34 participants (Oct 16, 2024).

3. NCSU, KIETS Climate Leaders Program, Panel, "Climate Education," 32 participants (Oct 17, 2023).

4. NCSU, Strengthening the Impact of Research (STIR) Program, "Assessing Broader Impacts," 22 participants (Mar 8, 2022).

5. NCSU, Coastal Resilience and Sustainability Initiative, Panel, "The power of interdisciplinary, inter-institutional collaboration: the C-CoAST experience and a broader discussion of what else might be possible," 20 participants (Feb 22, 2022).

6. International Consortium for Interdisciplinary Education about Health and the Environment, Winter Meeting on Interconnected Climate Risks & Opportunities in Health, Environment, and Education, "The Social Side of Climate Change Education for Youth," 62 participants (Jan 15, 2022).

7. NCSU, College of Education, Research Café, Panel, "Community Engaged Approaches to Educational Research and Practice," 23 participants (Nov 4, 2021).

8. NCSU, Coastal Resilience and Sustainability Initiative, Panel, "Community Engagement and Co-production of Research," 41 participants (Oct 27, 2021).

9. NCSU, EMS 350 Environmental Education, Dr. Gail Jones, "Communicating about Climate Change," 15 participants (Oct 26, 2021).

10. Maine EE, Research Symposium, "Why We think what we think about climate change," 15 participants (May 11, 2021).

11. NCSU, Strengthening the Impact of Research (STIR) Program, "Assessing Broader Impacts," 24 participants (Apr 20, 2021).

12. SECASC, Global Change Seminar panel, "Intergenerational Learning: How Children are Changing Past Generations' Environmental Perceptions," 62 participants (Apr 13, 2021).

13. Cornell University, Network Climate Action MOOC, Dr. Marianne Krasny, “The Climate Change Education Collective & Related Efforts to Support Climate Education,” w/ Dr. Don Haas, 70 participants (international) (Mar 17, 2021).

14. NCSU, FW221 Conservation of Natural Resources, Dr. Caren Cooper, “Why we think what we think about climate change,” 250 participants (Feb 16, 2021).

15. NC Museum of Natural Sciences, Teen Science Café, “Why you think what you think about climate change,” 50 participants (Jan 15, 2021).

16. SECASC, “Evaluation 101 & Actionable Science,” w/ Dr. Lincoln Larson, 20 participants (Nov 10, 2020).

17. NCSU, EMS 350 Environmental Education, Dr. Gail Jones, “Communicating about Climate Change,” 25 participants (Oct 13, 2020).

18. NCSU, EMS 732 Theoretical and Critical Perspectives of Science Education, Dr. Cesar Delgado, “Complex influences of mechanistic knowledge, worldview, and quantitative reasoning on climate change discourse: Evidence for ideologically motivated reasoning among youth,” 10 participants (Sep 7, 2020).

19. SECASC, Global Change Seminar, “Faith & Reasoning in Climate Change Views,” w/Reverend Susan Tuttle, 60 participants (Mar 5, 2020).

20. NCSU, EMS 792 Foundational Learning Theories in STEM Education, “Framing Theory,” Dr. Gail Jones, 20 participants (Mar 2, 2020).

21. NCSU, EMS 732 Theoretical and Critical Perspectives of Science Education, Dr. Cesar Delgado, “Textbooks of doubt, tested: The effect of a denialist framing on adolescents’ certainty about climate change,” 10 participants (Fall, 2019).

22. NCSU, EMS 350 Environmental Education, Dr. Gail Jones, “Communicating about Climate Change,” 25 participants (Fall, 2019).

23. NCSU, Leadership in Public Science Cluster, “Evaluation 101,” 40 participants (Sep 16, 2019).

24. NCSU, FW221 Conservation of Natural Resources, Dr. Caren Cooper, “Framing Climate Change,” 250 participants (Feb 26, 2019).

25. NC MNS, Non-formal Educators Meeting, “Evaluation Clinic,” w/ Dr. K. Stevenson, 50 participants (Dec 13, 2018).

26. SECASC, Global Change Fellows Meeting, “Communicating about Climate Change,” 15 participants (Feb 14, 2019).

27. NCSU, EMS 732 Theoretical and Critical Perspectives of Science Education, Dr. Meg Blanchard, “Communicating about Climate Change,” 12 participants (Nov 12, 2018).

28. NAAEE, “Evaluation Clinic,” w/ Dr. K. Stevenson, 45 participants (Oct 12, 2018).

29. Environmental Educators of North Carolina (EENC), “Evaluation 101,” w/ Dr. K. Stevenson, 50 participants (Sep 29, 2018).

30. NCSU, EMS 350 Environmental Education, Dr. Gail Jones, “Framing of Climate Change,” 12 participants (Sep 24, 2018).

31. NCSU, Leadership in Public Science Cluster, “Qualitative Methods,” 35 participants (Sep 24, 2018).

32. NIEHS Fellows, “Communicating Risk,” 12 participants (Aug 12, 2018).

33. NCSU, College of Education, PGU, “Why words matter - Hidden messages in texts,”10 participants (Apr 5, 2018).

34. NCSU, College of Education, Research Café, "Community Science Literacy," 20 participants (Mar 1, 2018).

35. NCSU, Parks Scholars, "Writing OpEds," 100 participants (Feb 28, 2018).

36. University of Vermont, Environmental Education course, Dr. R. Gould, "Framing of Climate Change," 15 participants (Nov 28, 2017).

37. NC GAP Conference, "Implementing Argumentation & Debate in your science classroom," w/ Dr. Jean Goodwin, 70 participants (Oct 24, 2017).

38. NCSU, NR 595 Out in the Open: The Principles of Public Science course, Drs. M. Katti and C. Cooper, "Science Communication Principles," 10 participants (2 classes Oct, 2017).

39. Sustainability and Policy Network International Policy Forum, "Climate Change Education Research & Environmental and Sustainability Education Policy," 40 participants, Vancouver, Canada (Sept 7, 2017).

**Selected Media Engagement and Mentions**

Mother Jones. (2023). Mike Huckabee is now peddling climate misinformation to children.
https://www.motherjones.com/politics/2023/08/mike-huckabee-kids-guide-climate-misinformation-denialism/

Inside Climate News. (2023). Mike Huckabee's "Kids Guide to the Truth About Climate Change" shows the changing landscape of climate denial.
https://insideclimatenews.org/news/31072023/huckabees-kids-guide-to-climate/

Coastal Review. (2023). Wording matters when talking about climate change.
https://coastalreview.org/2023/02/wording-matters-when-talking-about-climate-change-study/

Teach For America. (2022). Students combat air pollution in 'Asthma Alley.'
https://www.teachforamerica.org/one-day/ideas-and-solutions/environmental-racism-south-bronx

Edutopia. (2022). Why climate change is a tough topic to teach.
https://www.edutopia.org/article/why-climate-change-tough-topic-teach

Scripps National News. (2021). Climate learning program looks to educate workers and encourage action.
https://www.youtube.com/watch?v=aFjomR1ggsA

Teen Vogue. (2019). Textbooks are lying to students about climate change.
https://www.teenvogue.com/story/how-climate-change-taught-schools

Rethinking Schools. (2018). Teaching the truth about climate change is up to us, because textbooks lie.
https://rethinkingschools.org/articles/teaching-the-truth-about-climate-change-is-up-to-us-because-textbooks-lie/

The Guardian. (2015). California school textbooks mislead students on climate, study says.
http://www.theguardian.com/us-news/2015/nov/23/california-public-school-textbooks-mislead-students-climate-study-says

Science Daily. (2015). California 6th grade science textbooks: Climate change a matter of opinion not scientific fact.
https://www.sciencedaily.com/releases/2015/11/151110120441.htm

Phys.org. (2015). California 6th grade science books: Climate change a matter of opinion not scientific fact.
http://phys.org/news/2015-11-california-6th-grade-science-climate.html

SFGate. (2015). California school textbooks seen as spineless on climate change.
http://www.sfgate.com/bayarea/article/Study-California-school-textbooks-spineless-on-6652861.php

## PROFESSIONAL SERVICE

**ON CAMPUS**

**Department of STEM Education**

Science Education Program, Graduate Program Coordinator, 2024–present

Department of STEM Education, Learning in Informal Contexts certificate administrator, 2023–present

Science Education Program, Course scheduler, 2021–present

**College of Education**

College of Education, Louis D. Hunt Service Leadership Award Committee, 2022–present

College of Education, Student Scholarship Committee, 2018–present

College of Education, Vice/Chairperson of the Faculty, Nominated & elected, 2021–2024

College of Education, Strategic Planning Committee, 2023

College of Education, DEI in Teaching Class Evaluation Item Task Force, 2022–2023

College of Education, Goodnight Endowed Professor of Education Innovation, Search committee member, 2018–2019

College of Education, Computer & Technology Committee, 2017–2018

**North Carolina State University**

Park Scholarship Faculty Scholar, Class of 2029, 2025–present

NCSU Office of the Executive Chancellor and Provost, Coastal Resilience and Sustainability Leadership Group, Selected Faculty Member, 2019–2022

**OFF CAMPUS**

**Peer Review, Journal Manuscripts**

*Environmental Education Research, International Journal of Science Education, Journal of Research in Science Teaching, Science Education, International Journal of Science Education Part B, Science Communication, International Journal of STEM Education, Applied Environmental Education & Communication, Citizen Science Theory and Practice, Environmental Communication*, *Sustainability, BioScience, SAGE Open, PLOS One, The Educational and Developmental Psychologist, Climatic Change, Children Youth & Environments, Evaluation and Program Planning,* 2015–present

**Peer Review, Conference Proposals**

American Education Research Association (AERA), North American Association for Environmental Education (NAAEE), National Association for Research in Science Teaching (NARST), 2015–present

**Peer Review, Grant Proposals**

NSF Division of Research on Learning in Formal and Informal Settings, Proposal Review Panelist, 2024

NSF Division of Research on Learning in Formal and Informal Settings, Proposal Review Panelist, 2022

**Committees and Leadership, Professional Organizations**

Journal of Environmental Education (JEE), International Editorial Review Board, 2025–present

Journal of Research in Science Teaching (JRST), Guest Editor for Special Issue, 2024–2025

NARST, Membership Committee member, 2020–2023

ESERA, Special Interest Group 3: Science Education outside the Classroom, Co-Coordinator, nominated & elected, 2019–2023

## CONTINUING PROFESSIONAL DEVELOPMENT

### Workshops

Intermediate Social Network Analysis with R, University of Kentucky, 2023
Introduction to Social Network Analysis, University of Kentucky, 2020
Champions for Change, Collective Impact Forum, 2020
Institute in Community-Based Learning, NCSU Office of Outreach and Engagement, 2019
Social Networks and Health Scholars Training, Duke University, 2018

### Membership in Professional Organizations

American Educational Research Association (AERA), current
European Science Education Research Association (ESERA), current
National Association for Research in Science Teaching (NARST), current
North American Association for Environmental Education (NAAEE), current
Environmental Educators of North Carolina (EENC), current
North Carolina Museums Council (NCMC), current
American Association for the Advancement of Science (AAAS), not current
American Geophysical Union (AGU), current