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Education

- Duke University, Durham, NC
 - **PhD, Environmental Science and Policy**, Nicholas School of the Environment; Dissertation: "Ecological Limitations and Potentials of Artificial Aquatic Ecosystems." Advisor: Dr. James B. Heffernan 2018
 - **Certificate of College Teaching**, Duke Graduate School 2018
- **B.A., Biology**, Carleton College, Northfield, Minnesota 2010

Professional Appointments

- **Post-Doctoral Research Associate, Iowa State University Agricultural & Biosystems Engineering**, Ames, IA 2019-present
- Duke University Nicholas School of the Environment, Durham, NC
 - **PhD Candidate** 2016-2018
 - **Teaching Assistant** 2014-2016
 - **PhD Student** 2013-2016
- Chesapeake Environmental Communications, Gloucester, VA
 - **Data Analyst** 2012-2013
 - **Communications Assistant** 2011-2012
- **Monitoring Assistant**, The Nature Conservancy, Charlottesville, VA 2011
- MacArthur Agro-Ecology Research Center, Lake Placid, FL
 - **Research Assistant III** 2011
 - **Research Assistant II** 2010
- Carleton College, Northfield, MN
 - **Teaching Assistant, Biology** 2010
 - **Cole Student Naturalist, Arboretum** 2008-2010
- **Seasonal Interpretive Ranger**, Virginia Department of Conservation and Recreation, Surry, VA 2009
- **Lab Aide**, White Mountain Research Center, Bishop, CA 2008

Publications

- Clifford, C.C.; Bieroza, M.; Clarke, S.J.; Pickard, A.; Stratigos, M.; Anderson, O.; Arismendi, I.; Audet, J.; Aviles, D.; Bergman, J.; Brown, A.; Carlson, E.; Connolly, J.; Crabot, J.; Cross, W.; Dean, J.; Evans, C.; Fenton, O.; Gething, K.; Giannico, G.; Habib, W.; Halls, J.; Hasselquist, E.M.; Heili, N.; Hill, M.; Kaiser, K.; Kosten, S.; Law, A.; Mathers, K.; Mazor, R.; Molino, G.D.; Oosthuizen, S.; Raheem, N.; Ranaivoson, A.; Sayer, C.; Schepers, M.; Shaw, R.; In prep.

- Smiley, P.C.; Speir, S.; Strock, J.; Struik, Q.; Tank, J.; Tatariw, C.; van der Knaap, J.; van der Lee, G.; Wang, H.; Wood, P.; Yan, Z.; Zivec, P.; Peacock, M. "Lines in the landscape: The underappreciated socio-ecological role of ditches."
- Seth, J.B.; Clifford, C.C.; Helmers, M.J. "11-Year Study of Cropping System Influence on Subsurface Drainage Flow in Central Iowa." In prep.
 - Clifford, C.C.; Holmquist, J.G.; Voss, K.; Schmidt Gengenbach, J.; Heffernan, J.B. "Urban ditches and natural creeks house similar invertebrate communities in a minimally developed California watershed." In prep.
 - Clifford, C.C.; Waring, E.R.; Pederson, C.; Helmers, M.J. "Corn yield increase under constant fertilizer did not reduce nitrate export." In revision
 - Waring, E.R.; Pederson, C.H.; Lagzdinš, A.; Clifford, C.C.; Helmers, M.J. "Water and soil quality over 10 years of no-tillage and cover crops." In revision
<http://dx.doi.org/10.2139/ssrn.4312913>
 - Clifford, C.C.; Heffernan, J.B. "North Carolina Coastal Plain ditch types support distinct hydrophytic communities." *Wetlands* 2023, 43, 56. 2023
<https://doi.org/10.1007/s13157-023-01703-5>
 - Clifford, C.C. and J.B. Heffernan. "Survey of North Carolina Coastal Plain Ditches for Wetland Characteristics, 2015 ver 1." *Environmental Data Initiative*. 2023. <https://doi.org/10.6073/pasta/e990bec9b635714f8ab9bad1c0bfe05c> 2023
 - Clifford, C.C.; J.B. Heffernan. "Artificial Aquatic Ecosystems." *Water* 2018, 10, 1096. <https://doi.org/10.3390/w10081096> 2018
 - Kohman, M.M.; C.W. Fraisse; C.C. Clifford; P.J. Bohlen. "The Carbon Footprint for Florida Beef Cattle Production Systems: A Case Study with Buck Island Ranch." *The Florida Cattleman*. March 2011

Presentations

- Clifford, C.C. "Artificial aquatic ecosystems, ditch benthic macroinvertebrates, wetland plant communities." Liverpool Ditch Workshop. Liverpool, England. 8 Mar. 2023
- Clifford, C.C.; Heffernan, J.B. "North Carolina Coastal Plain ditches unrecognized as novel wetlands despite visibility." Joint Aquatic Sciences Meeting. Grand Rapids, MI. 16 May 2022
- Seth, J. B.; Clifford, C.C.; Helmers, M.J. "11-Year Study of Cropping System Influence on Subsurface Drainage Flow in Central Iowa." 2021
 - AGU Fall Meeting. American Geophysical Union. New Orleans, LA. 17 Dec. 2021
 - 76th Soil and Water Conservation Society International Annual Conference. Soil and Water Conservation Society. Virtual. 26-28 Jul. 2021
 - Iowa Water Conference. Iowa State University. Virtual. 6-8 April 2021
- Clifford, C.C.; M.J. Helmers. "Consistent fertilizer application increased corn yields without change in nitrate export." 2021
 - 2022 International Drainage Symposium. Soil and Water Conservation Society. Des Moines, IA. 2 Sep. 2022
 - 76th Soil and Water Conservation Society International Annual Conference. Soil and Water Conservation Society. Virtual. 28 Jul. 2021
 - Iowa Water Conference. Iowa State University. Virtual. 6-8 April 2021
- Clifford, C.C.; M.J. Helmers. "Tile Drainage Increased Flashiness and Nitrate Concentrations in Midwestern Streams." Society for Freshwater Science Annual Meeting. Society for Freshwater Science. Virtual. 2021
- Clifford, C.C. "Ecological Limitations and Potentials of Artificial Aquatic Ecosystems." University of Oklahoma Department of Biology Seminar. 24 Oct 2018
- Clifford, C.C.; J.B. Heffernan. "Similar processes explain water quality in 24 May 2018

- artificial and natural US lakes.” Society for Freshwater Science Annual Meeting. Society for Freshwater Science. Detroit, MI.
- [Clifford, C.C.](#); J.B. Heffernan. “[North Carolina Coastal Plain ditch types support distinct hydrophytic communities.](#)” Society for Freshwater Science Annual Meeting. Society for Freshwater Science. Raleigh, NC. 8 Jun. 2017
 - [Clifford, C.C.](#); J.B. Heffernan. “[Cultural Biases Limit Ecosystem Services Provided by Ditches and Connected Ecosystems.](#)” 2017 AWRA Spring Specialty Conference: Connecting the Dots: The Emerging Science of Aquatic System Connectivity. American Water Resources Association. Snowbird, UT. 2 May 2017
 - [Clifford, C.C.](#); A.J. Felson. “[Introduction to the Earth Stewardship Initiative Demonstration Projects.](#)” Novel Ecosystems in the Anthropocene. Ecological Society of America. Fort Lauderdale, FL. 12 Aug. 2016
 - [Clifford, C.C.](#); J.B. Heffernan. “[What drives wetland structure in ditches?](#)” Novel Ecosystems in the Anthropocene. Ecological Society of America. Fort Lauderdale, FL. 10 Aug. 2016
 - [Clifford, C.C.](#); J.B. Heffernan. “[Ditch types host different plant communities with similar wetland indicator statuses.](#)” 2016
 - North Carolina Wetlands Symposium. Duke University. Durham, NC. 4 Mar. 2016
 - Freshwater in the North Carolina Coastal Plain: Understanding and Preparing for 21st Century Challenges. North Carolina State University Water Resources Research Institute. New Bern, NC. 16 Feb. 2016
 - Clifford, C.C. “[Anthropogenic Ecosystems Have Conservation Potential.](#)” Joint Ecology / Marine Lab Symposium. Beaufort, NC. 14 Nov. 2015
 - [Clifford, C.C.](#); J.G. Holmquist; J. Schmidt Gengenbach; J.B. Heffernan. “[Ecosystem artificiality does not impact aquatic communities.](#)” Ecological Science at the Frontier. Ecological Society of America. Baltimore, MD. 13 Aug. 2015
 - Clifford, C.C.; J. B. Heffernan. “[Artificial Aquatic Systems.](#)” Connections in Ecology. Duke University. Beaufort, NC. 17 Apr. 2015
 - [Clifford, C.C.](#); J.G. Holmquist; J. Schmidt Gengenbach; J.B. Heffernan. “[Artificial vs. natural streams: an invertebrate case study from Bishop, California.](#)” Poster. 2014
 - Joint Aquatic Sciences Meeting. Portland, OR. May 22, 2014
 - Ecology Across Scales. Duke University. Durham, NC. Mar. 21, 2014
 - Water Resources Research Institute Annual Conference. NCSU. Raleigh, NC. Mar. 19, 2014
 - [Clifford, C.C.](#); E.H. Boughton; P.J. Bohlen; P. Quintana-Ascencio; H. Swain. “[Florida ranch wetland plant community response to increased water.](#)” Poster. Mar. 27, 2011
Southeastern Ecology and Evolution Conference. Auburn University.

Teaching

- Duke University
 - Environ 646, “[Urban Ecology](#)”
 - Taught “Human Ecology” section Spring 2018
 - Teaching Assistant Spring 2016
 - Environ 102, “[Introduction to Environmental Sciences and Policy,](#)” as Teaching Assistant Fall 2015
 - Environ. 217, “[Restoration Ecology,](#)” within Duke Immerse “Urban Environmental Justice and Social Entrepreneurship,” as Teaching Assistant Spring 2015
 - Environ 714, “[Landscape Ecology,](#)” as Teaching Assistant Fall 2014
- Carleton College

- Bio 353, “[Population Ecology Lab](#),” as Teaching Assistant

Spring 2010

Mentorship

- Iowa State University undergraduate researchers
 - Stevens, N. “[Event-Level Drainage Nutrient Fluxes](#).” 2023-present
 - Bishop, D. “[Bioreactor Nitrogen Removal Response to Temperature](#).” 2022-present
 - Seth, J. “[11-Year Study of Cropping System Influence on Subsurface Drainage Flow in Central Iowa](#).” 2020-present
 - Tong, L. and Faheem, S. “[Flashiness in Drainage Water Management](#).” 2020-2023
- Duke University high school researcher Malladi, S. 2016

Honors

- [Anthropocene Farm Fellowship](#), The Kenan Institute for Ethics 2018
- [Duke University Wetland Center Graduate Student Research Support Grant](#) 2017
- [Earth Stewardship Research Fellowship](#), Earth Stewardship Initiative 2014
- [Graduate Research Fellowship](#), National Science Foundation 2013
- [Kolenkow-Reitz Fellowship](#), Carleton College 2009-2010

Service/Leadership

- [Founder](#), Ditch-Integrating Transdisciplinary Collaboration Hub 2022-2023
- [Judge](#), State Science and Technology Fair of Iowa 2023
- [Scientist](#), Skype A Scientist 2020
- Duke Women in Science and Engineering
 - [Sci-Fi Book Club Coordinator](#) 2016-2018
 - [Social Media Editor](#) 2014-2017
- [Scientist](#), Science Research Education Networking Triangle 2014-2018
- [Scientist](#), Durham County Environmental Field Day 2017
- [Judge](#), North Carolina Student Academy of Sciences 2013-2017
- Nicholas PhD Advocacy Council
 - [Environment Representative, Webmaster](#) 2016-2017
 - [Coordinator, Nicholas School Graduate Afternoon Seminar](#) 2015-2016
- [Volunteer steward](#), Friends of the Mountain-to-Sea Trail 2014-2016
- [STEM Days volunteer](#), Museum of Life and Science 2016
- Duke STEM/MAT Network 2016
- [Founder/Coordinator](#), Duke Nature and People 2015-2016
- [Scientist](#), NC Science Festival Invite-a-Scientist 2014-2015
- [Coordinator](#), Duke River Center Chalk Talks 2015
- [Volunteer steward](#), Ellerbe Creek Watershed Association 2013-2015
- [Mentor](#), Durham Women and Math 2013-2014
- Gloucester Blueways Committee 2012-2013
- [Naturalist](#), Kids Kayak and Conservation Camp 2012-2013
- [Naturalist](#), Beaverdam Parks Spring Festival 2013
- [Geologist](#), Girl Scout Math and Science Day 2010
- [Volunteer steward](#), Carleton College Arbor 2006-2009
- [Volunteer trail maintainer](#), California Backcountry Horsemen 2008

Certifications

Virginia DGIF Boater Education	2012
Virginia Master Naturalist	2012
PADI Open Water Diver	2010
US (Currently Iowa) Driver's License	2006

Affiliations/Memberships

American Geophysical Union	2017, 2023
Ecological Society of America	2014-2016, 2023
Society for Freshwater Science	2017-2018, 2021-present
American Water Resources Association	2017
Graduate Women in Science (Rho Tau)	2014-2016
North Carolina Association of Water Resources	2014-2016
Sigma Xi	2010-2016