RYAN THOMAS McCUNE, E.I.T.

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Department of Civil, Construction, and Environmental Engineering
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EDUCATION

Ph.D. Civil Engineering — Expected 2027
North Carolina State University — Raleigh, NC
Concentration in Coastal Engineering

Master of Civil Engineering — 2025
North Carolina State University — Raleigh, NC
Concentration in Coastal Engineering

Honors Bachelor of Environmental Engineering with Distinction — 2022
University of Delaware — Newark, DE
Thesis: Potential Impacts of Soil Aging on TDR Calibrations of Biochar Amended Urban and Coastal Soils

Honors Bachelor of Civil Engineering — 2022
University of Delaware — Newark, DE
Concentration in Facilities Design and Construction

PROFESSIONAL EXPERIENCE

Graduate Research & Teaching Assistant — 2022-present
Dept. of Civil, Construction, and Environmental Engineering, NC State University — Raleigh, NC

- Investigate chronic "sunny day" flood hazards by developing high-resolution coupled simulations using SFINCS and ADCIRC numerical models.
- Architect custom Python workflows on High-Performance Computing (HPC) systems to process geospatial data and automate model forcing.
- Collaborate within the interdisciplinary "Sunny Day Flooding Project," integrating physical hydrodynamic modeling with social impact data to characterize regional flood risk.
- Mentor undergraduate researchers, providing technical training in Python programming and semantic image segmentation to support independent inquiry.
- Delivered annual guest lectures for the Introduction to Coastal Engineering course and facilitated semester-long student success through technical office hours and assessment.

Research Intern — 2022
United States Geological Survey — St. Petersburg, FL

- Leveraged MATLAB to analyze high-frequency imagery from the USGS coastal camera network, utilizing statistical techniques to extract and quantify wave runup parameters.
- Transformed raw optical data into actionable hydrodynamic metrics to support coastal change research.

Engineering Intern 2020-2022
Coastal Resilience Design Studio, University of Delaware Newark, DE

- Achieved First Place in the Coastal & Estuarine Research Federation (CERF) national design competition for an innovative, resilience-focused coastal infrastructure proposal.
- Developed community-informed conceptual designs for public infrastructure within a multi-disciplinary team of landscape architects, policy analysts, and engineers to integrate technical constraints with aesthetic and regulatory requirements.

Undergraduate Research Assistant 2018-2022
Dept. of Civil & Environmental Engineering, University of Delaware Newark, DE

- Investigated the hydraulic performance of biochar-amended soils for stormwater filtration, performing sensor calibrations using Time Domain Reflectometry (TDR) probes.
- Conducted independent laboratory analysis to quantify the Electron Reduction Capacity (ERC) of biochar substrates for environmental remediation applications.
- Supported transportation planning studies by deploying JAMAR counters to capture and analyze field traffic volume data.

Engineering Intern 2020-2021
C.S. Davidson, Inc. York, PA

- Analyzed historical state contract datasets to develop updated unit price schedules, directly improving the accuracy of cost estimation and bidding for future municipal projects.
- Conducted technical reviews of land development plans to ensure compliance with municipal ordinances, zoning codes, and stormwater regulations.
- Performed field operations including precision field surveys and stormwater BMP inspections to verify construction quality and document existing infrastructure conditions.

Engineering Intern 2019
Manchester Township York, PA

- Established a digital inventory of over 300 stormwater Best Management Practices (BMPs) by migrating legacy engineering archives into the CSDatum platform.
- Optimized future maintenance operations by centralizing infrastructure data, enabling efficient tracking of BMP performance and necessary repairs.

Keller Family Senior Writing Fellow 2021-2022
Honors College, University of Delaware Newark, DE

- Selected as the inaugural Keller Family Senior Fellow, responsible for leading the fellowship team and managing operational logistics including scheduling and performance reviews.
- Oversaw the professional development of the fellowship team, providing mentorship and actionable reviews to improve coaching strategies.

Writing Fellow 2020-2021
Honors College, University of Delaware Newark, DE

- Selected for a competitive fellowship requiring a semester-long training course in writing pedagogy and communication strategy.
- Partnered with faculty to provide editorial guidance on dozens of essays per semester, mentoring a cohort of 20 students to improve their argumentation and clarity.

Undergraduate Teaching Assistant 2020-2022
Dept. of Civil & Environmental Engineering, University of Delaware Newark, DE

- Provided supplementary instruction during office hours, translating theoretical engineering concepts into practical problem-solving strategies for students.
- Evaluated technical assignments and exams against established rubrics, providing detailed feedback to identify gaps in understanding.

Munson Fellow 2019-2020
Honors College, University of Delaware Newark, DE

- Selected as a residential peer mentor to facilitate the academic and social transition of incoming Honors students, directly supporting university retention goals.
- Advised a cohort of first-year students on course selection and degree planning, serving as a critical resource for navigating university administration and academic requirements.
- Designed and executed social programming and community-building events, effectively managing logistics to enhance the student living-learning environment, foster a cohesive residential community and promote student engagement.

HONORS & AWARDS

National Defense Science & Engineering Graduate Fellowship 2024-2027

KIETS Climate Leaders Program Scholar 2024

AGU Outstanding Student Presenter Award 2023

NSF Graduate Research Fellowship Program, Honorable Mention 2023

EWC Student Poster Competition, 2nd Place 2023

Provost Doctoral Fellowship, North Carolina State University 2022

American Society of Landscape Architects Award of Excellence in Student Collaboration 2022

PA-DE Chapter of the American Society of Landscape Architects Student Honor Award 2022

RJN Foundation Department of Civil & Environmental Engineering Award 2022

1st Place 2021 Coastal & Estuarine Research Federation Design Competition 2021

Delaware Section of the American Society of Civil Engineers Junior Award 2021

Honors Enrichment Award, University of Delaware Honors College 2021

Chair's Fellowship, University of Delaware Dept. of Civil & Environmental Engineering 2021

General Honors Award 2020

CONFERENCE PRESENTATIONS

Oral Presentations

Collins, J., Hino, M., **McCune, R.**, Anarde, K., Frankenberg, E., (2025). *Tolerating the tide: accommodation and tolerance of chronic coastal flooding in rural North Carolina*. Population Association of America Annual Conference. Washington, D.C., 2025.

McCune, R., Anarde, K., (2025). *Evaluation of Chronic Coastal Flooding Inundation of Low-Lying Roadways and Impacts to Community Livability*. Presented at the 3rd Regional (East Coast) Peer Exchange for Sustainable Eco-Resilient Bridges and Structures. Raleigh, August 2025.

McCune, R., Anarde, K., Sebastian, A., Collins, J. P., Grimley, L., Hamidi, E., Hino, M., Dietrich, J. C., (2025). *The End of the Road: Present and Future Chronic Flood Risk Along Coastal Roadways and Impacts to Community Livability*. Presented at the AGU Fall Meeting. New Orleans, December 2025.

Hino, M., Anarde, K., **McCune, R.**, Thelen, T., Farquhar, E., Fridell, T., Whipple, T., Woodard, P., (2024). *Incidence and Impacts of Chronic Coastal Flooding in North Carolina*. Invited presentation at the AGU Fall Meeting. Washington, D.C., 2024.

McCune, R., Anarde, K., Goldstein, E. B., Srebnik, E. R., Thelen, T., Hino, M., (2024). *Quantification of chronic coastal flooding using machine learning*. Presented at the International Conference of Coastal Engineering. Rome, September 2024.

McCune, R., Anarde, K., Goldstein, E. B., (2023). *Semantic Image Segmentation of Coastal Roadway Inundation*. Presented at the AGU Fall Meeting. San Francisco, December 2023.

Muldrow, L., **McCune, R.**, Bruck, J., (2022). *Resilient Self-Generative Infrastructure: A Blue Carbon Solution for Coastal Protection in Hampton, VA*. PA-DE ASLA Conference on Landscape Architecture. Wilmington, April 9, 2022.

Poster Presentations

McCune, R., Anarde, K., Goldstein, E., Baker, C., (2025). *Quantification of Chronic Coastal Flooding: A machine learning-driven approach to water level extraction*. Presented at the NC State Environmental, Water, and Coastal Engineering Symposium. March 21, 2025.

McCune, R., Anarde, K., Goldstein, E., (2024). *Witness to the Rising Tide: Semantic Image Segmentation of Chronic Coastal Flooding*. Presented at the NC State Environmental, Water, and Coastal Engineering Symposium. March 8, 2024.

McCune, R., Anarde, K., Hino, M., Frankenburg, E., Amspacher, K., (2024). *Rising tides, drowning ditches: Analysis and communication of chronic coastal flooding in rural communities*. Presented at the National Adaptation Forum. Baltimore, May 2024.

McCune, R., Collins, J., Anarde, K., Hino, M., (2024). *A Summer Down East: Internship and Research Experiences in Carteret County*. Presented at the KIETS Climate Leaders Symposium 2024. September, 2024.

McCune, R., Anarde, K., Goldstein, E., (2023). *On-device Machine Learning for Identifying the Spatial Extent of Chronic Coastal Flooding*. Presented at the NC State Environmental, Water, and Coastal Engineering Symposium. March 10, 2023.

Anarde, K., Goldstein, E., Bolewitz, J., **McCune, R.**, Gold, A., Hino, M., (2022). *On-device machine learning for identifying the spatial extent of chronic coastal floods*. Presented at the International Conference of Coastal Engineering. Sydney, December 5, 2022.

McCune, R., Fettke Von Koeckritz, H., Bruck, J., Puleo, J. A., (2021). *Fenwick Island Dune Encroachment Monitoring Project*. Presented at the Young Coastal Scientists and Engineers Conference – Americas. Myrtle Beach, October 30, 2021.

PUBLICATIONS

Peer-Reviewed Journal Articles (Published or Accepted)

Hino, M., Anarde, K., Fridell, T., **McCune, R.**, Thelen, T., Farquhar, E., Woodard, P., Whipple, A., (in press). "Land-based sensors reveal high frequency of coastal flooding". In: *Nature Communications Earth and Environment*. In press.

Naquin, K., Adams, D. R., Bailey, M. M., Brown, L., Diez, M., Kanipe, J., **McCune, R.**, Thelen, T., Hunter, D. L., Cooper, C. B., (Apr. 2025). "Not Empty Rain Gauges: Experienced Hobbyists Fulfilled in a Contributory Project". In: *Citizen Science: Theory and Practice*. DOI: 10.5334/cstp.774.

Peer-Reviewed Journal Articles (Under Review & In Preparation)

McCune, R., Anarde, K., Goldstein, E., Baker, C., (in preparation). "Quantification of chronic coastal flooding: a machine-learning driven approach to water level extraction". In preparation for Water Resources Research.

Datasets

Ku, V., Gabbula, S. R. A. K., **McCune, R.**, Budavi, P., Sigdel, R., Buscombe, D., Favela, J., Shah, M., Goldstein, E. B., Fitzpatrick, S., (2022). "Segmentation Labels for Emergency Response Imagery from Hurricane Barry, Delta, Dorian, Florence, Isaias, Laura, Michael, Sally, Zeta, and Tropical Storm Gordon". In.

PROFESSIONAL DEVELOPMENT

Community Surface Dynamics Modeling System Annual Meeting, Boulder, CO	2025
Earth Surface Processes Institute, Boulder, CO	2025
From Ice Sheets to the Coast: Sea-Level Rise Impacts Workshop, Houston, TX	2024
KIETS Climate Leaders Symposium, Raleigh, NC	2023
5th NOAA AI Workshop, virtual	2023
Coastal Imaging Research Network Workshop, Duck, NC	2023
Blue Economy Workshop, Morehead City, NC	2023

PROFESSIONAL SERVICE

Chair, EWC Seminar Visiting Student Logistics Committee	2026
Student Ambassador, NC State Climate and Sustainability Academy	2025
Session Chair and Organizer, AGU Annual Meeting "The MacGyver Session" Ocean Sciences Poster Session	2025
Member, EWC Seminar Visiting Student Logistics Committee	2025
Organizer and Moderator, Panel: Community Responses to Chronic Flooding and Sea-Level Rise Impacts, North Carolina Coastal Conference	2024

Chair, EWC Seminar Food Committee	2024
Member, EWC Seminar Food Committee	2023
Student Member, Provost Search Committee, University of Delaware	2022
Engineering Ambassador, College of Engineering, University of Delaware	2022
Engineering Ambassador, Dept. of Civil & Engineering, University of Delaware	2021-2022
Honors College Ambassador, University of Delaware	2019-2022

LEADERSHIP

President, Coasts, Oceans, Ports & Rivers Institute Student Chapter	2025-present
Vice President, Coasts, Oceans, Ports & Rivers Institute Student Chapter	2023-2024
Vice President, Environmental Engineering Student Association	2020-2022
Parliamentarian, Phi Sigma Pi National Honor Fraternity Alpha Eta Chapter	2021