Sebastian **Rowan**

Ph.D Candidate in Civil and Environmental Engineering

University of New Hampshire, Durham, NH

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I am Ph.D. candidate in civil and environmental engineering researching the impacts of flood events and climate change on people and communities. The goal of my research is to develop a more comprehensive understanding of the risks posed by floods to enable the development of mitigation efforts that prioritize long-term sustainability and community well-being.

Education

University of New Hampshire — *Durham, New Hampshire*

Ph.D. Candidate, Civil and Environmental Engineering — *2026*

- Dissertation Title: Towards Sustainable Flood Risk Management: Incorporating Uncertainty and Environmental Impacts
- Developed model to estimate economic loss and greenhouse gas emissions from flood exposure to residential buildings using component-level fragility estimates
- Quantified expected GHG emissions from flood exposure to residential buildings under current and future climate projections in a nation-wide, multi-frequency flood risk assessment

University of New Hampshire — *Durham, New Hampshire*

B.S. Environmental Engineering — *2016*

Experience

U.S. Army Corps of Engineers, Engineer Research Development Center — *Vicksburg, MS*

ORISE Graduate Research Fellow — *Sep. 2020 - Present*

- Implemented method to estimate greenhouse gas emissions from flood damage in USACE'S "go-consequences" flood consequence analysis tool
- Co-lead economic consequence and social vulnerability analysis of future flooding in the Mississippi River Valley
- Lead systematic literature review and meta-analysis to assess the effect of home damage on post-flood psychiatric morbidity to support USACE effort to comprehensively assess "Other Social Effects" of floods for planning studies
- Performed data analysis using social vulnerability and other geospatial data to support Tier 1 Other Social Effects/Environmental Justice Analysis for the USACE New York/New Jersey Harbors and Tributaries Coastal Storm Risk Management Feasibility Study

University of New Hampshire — *Durham, NH*

Research & Teaching Assistant — *Aug. 2018 - Dec. 2020*

- (RA) Resilient Bridge Planning in Mozambique - Bridge Failure Risk from Flooding and Climate Change
- (TA) CEE 705: Introduction to Sustainable Engineering (Fall 2019, Fall 2020)
- (TA) CEE 502: Project Engineering (Spring 2019)

New Hampshire Department of Transportation, Bureau of Planning and Community Assistance — *Concord, NH*

Civil Engineer I-II — *2016 - 2018*

University of New Hampshire InterOperability Laboratory — *Durham, NH*

10 Gigabit Ethernet Technician — *2014-2017*

New Hampshire Department of Environmental Services, Air Resources Division — *Concord, NH*

Environmental Technician — *2015*

Awards

3rd Place - UNH 3-Minute Thesis (3MT) Competition — *2025*

Publications

Rowan, S., Yeates, E. **(In Review)**. The effects of home damage on post-flood mental health: A systematic review and meta-analysis. *npj Mental Health Research*

Qiao, Y., Guo, Y., **Rowan, S.**, Medina, R., Espinet, X., Cullen, J., Meng, F., Cao, Z. (2026). Doubling of flood-induced bridge asset failure loss in Mozambique under 2050 climate. *Global Environmental Change*, https://doi.org/10.1016/j.gloenvcha.2025.103103

Rowan, S., Bell, E. S., Mo, W., (2025). Quantifying the hidden carbon cost of floods: a stochastic and uncertainty-based valuation framework. *Environmental Research Letters*, https://doi.org/10.1088/1748-9326/ae2d76

Rowan, S., Yeates, E., (2024) PROTOCOL: The effect of home damage on post-flood psychiatric morbidity: A systematic review and meta-analysis. PROSPERO, https://www.crd.york.ac.uk/PROSPERO/view/CRD42024618891

Memarsadeghi, N. P., **Rowan, S.**, Sisco, A. W., Tavakoly, A. A., (2024). Enhancing resilience: Integrating future flood modeling and socio-economic analysis in the face of climate change impacts. Science of the Total Environment, https://doi.org/10.1016/j.scitotenv.2024.174893

Seigerman, C. K., McKay, S. K., Basilio, R., Biesel, S. A., Hallemeier, J., Mansur, A. V., Piercy, C., **Rowan, S.**, Ubiali, B., Yeates, E., & Nelson, D. R. (2023). Operationalizing equity for integrated water resources management. JAWRA Journal of the American Water Resources Association, 59(2), 281–298. https://doi.org/10.1111/1752-1688.13086

Galaitsi, S., Kurth, M., **Rowan, S.**, Yeates, E., & Kalaidjian, E. (2022). New York—New Jersey Harbor and Tributaries Coastal Storm Risk Management Feasibility Study—Tier 1 Other Social Effects/Environmental Justice Analysis. U.S. Army Corps of Engineers New York District. https://www.nan.usace.army.mil/Portals/37/Appendix%20A12_Tier%201%20OSE_EJ_HATS.pdf

Rowan, S., & Kwiatkowski, K. (2020). Assessing the Relationship Between Social Vulnerability, Social Capital, and Housing Resilience. Sustainability, 12(18), 7718. https://doi.org/10.3390/su12187718

Presentations

Rowan, S., Han, F., Permenter, R., Mo, W. Monte Carlo-Based Building Damage and Emission Functions for Assessing Flood Risks. *AGU25; December 2025; New Orleans, LA.* Oral Presentation.

Rowan, S., Yeates, E. The Effect of Home Damage On Post-Flood Psychiatric Morbidity: A Systematic Review and Meta-Analysis. *AGU25; December 2025; New Orleans, LA.* Oral Presentation.

Rowan, S., Measuring what matters for flood risk management. *University of New Hampshire 3MT (3-Minute Thesis) Competition Finals; March 2025; Durham, NH.* Oral Presentation. https://media.unh.edu/media/Sebastian%20Rowan%20-%20UNH%203MT%20Finals%202025%20-%20Third%20Place/1_da4qt06x

Rowan, S., Memarsadeghi, N., Sisco, A., Tavakoly, A. An Assessment of the Socio-Economic Impacts from Climate Change and its Relationship with Vulnerability. *AGU23; December 2023; San Fransisco, CA.* Oral Presentation.

Rowan, S., Yeates, E., Mo, W. Estimating the Greenhouse Gas Emissions of Flood Damages. *AEESP Research & Education Conference; June 2023; Boston, MA.* Poster.

Rowan, S., Yeates, E. Predicting the Mental Health Impacts of Floods. *47th Annual Natural Hazards Research and Applications Workshop; July 2022; Virtual.* Poster.

Rowan, S., Yeates, E., Wells, E. Quantifying the Health Impacts of Floods - A Systematic Literature Review. *2021 UNC Water and Health Conference; October 2021; Virtual.* Poster.

Rowan, S., Kwiatkowski, K. Assessing the Relationship Between Social Vulnerability, Social Capital, and Housing Resilience. *45th Annual Natural Hazards Research and Applications Workshop; July 2020; Virtual.* Poster.

Rowan, S., Kwiatkowski, K., Qiao, Y. Resilient Bridge Planning in Mozambique: Bridge Failure Risk from Flooding and Climate Change. *2nd International Conference on Transportation System Resilience to Natural Hazards and Extreme Weather Events (TR2019); November 2019; Washington, D.C.* Oral Presentation.

Open Source Projects

sviBuildr *Active*

- An R package that allows users to download or construct the CDC's Social Vulnerability Index as a tidyverse or simple features data frame.
- Enables greater flexibility in region selection for SVI analyses than is possible with state- or national-level datasets hosted by CDC.

NSI Data QGIS Plugin *Active*

- A QGIS plugin that downloads data from the USACE National Structures Inventory for a specified region and adds it to a map.

nsipy *Active*

- A Python package to download data from the U.S. Army Corps of Engineers National Structures Inventory using the NSI API.

Skills

Programming Languages

- Python, R, Go, SQL, MATLAB

Software

- QGIS, ArcGIS, go-consequences, Vensim, NVivo, Excel