

### ORGANIZATION ROLE

Coastal Scientist

### PROJECT ROLE / FOCUS AREAS

Hydrodynamic Modeling

Flood Risk and Impacts

Sea-Level Rise

Adaptation Planning

### EDUCATION

PhD Civil and Environmental Engineering, Carnegie Mellon University, 2026

MS Environmental Engineering, University of Tennessee, Knoxville, 2021

BS Mechanical Engineering, University of Tennessee, Knoxville, 2017

# MATTHEW WEATHERS

## *Coastal Scientist*

Matthew Weathers, Coastal Scientist, supports The Water Institute's Coastal and Deltaic Modeling team in the development of physics-based multidimensional coastal and estuarine hydrodynamic modeling frameworks. These coastal hydrodynamic models will support the Institute's work in providing decision support to communities facing water-related challenges, evaluating coastal restoration efforts, and quantifying benefits and consequences of nature-based solutions.

With over ten years of experience, Matthew has a strong understanding of hydrodynamic processes and has proven expertise in hydrodynamic modeling, as well as data analysis and statistical interpretation. With a Ph.D. in Civil and Environmental Engineering from Carnegie Mellon University, Matthew's research and dissertation focused on advancing sea-level rise projections to inform coastal flood modeling and adaptation planning. Throughout his education and professional experience, Matthew has developed an expertise in hydraulic and hydrologic modeling (SFINCS, FloodAdapt, HEC-RAS 1D/2D, HEC-HMS, EPA SWMM, EPANET, Delft3D, SMS, and STEPL) as well as programs such as Python, ArcGIS, BASH, and AutoCAD.

Matthew is located at The Water Institute’s Pittsburgh, PA office.

### PROFESSIONAL EXPERIENCE

2026-Present: Coastal Scientist, The Water Institute

2022-2026: Graduate Research Assistant, Carnegie Mellon University

2021: Water Resources Engineering Intern, Dewberry

2019-2021: Graduate Research Assistant, University of Tennessee

2017-2019: Hydropower Research Associate, Oak Ridge National Laboratory

2011-2013: Fisheries Technician, Tennessee Technological University

## SELECTED PROJECTS

**Community-informed adaptation and ensemble-based flood modeling for coastal resilience in Jackson County, Mississippi.** *Jackson County, Mississippi*. Flood Risk Modeler. Evaluated the effectiveness of multiple adaptation strategies by integrating compound flood maps with infrastructure datasets to quantify risk reduction.

**Evaluating the Role of Storm Characteristics, Sea-Level Rise, and Land Use Change on Compound Flood Impacts in Jackson County, Mississippi.** *Jackson County, Mississippi.* Flood Risk Modeler. Developed and validated a SFINCS compound flood model to assess present and future flood risk under a range of spatiotemporal storm event characteristics and sea-level rise scenarios.

## SELECTED PUBLICATIONS


1. Weathers, M., Mahmoudi, S., Rounce, D. R., Georgiou, I. Y., & Bregman, M.: Storm Characteristics and Sea-Level Rise Shape Compound Flood Hazards and Impacts in Jackson County, Mississippi, Water Resour. Res., [preprint], https://doi.org/10.22541/essoar.15003589/v1, 2026.
2. Felikson, D., Rounce, D. R., Fasullo, J., Rodriguez, A., Adhikari, S., Buzzanga, B., ... & Weathers, M. (2025). Progress and future directions in constraining uncertainties in sea-level projections using observations. Nature Climate Change, 15(10), 1039-1051.
3. Weathers, M., Rounce, D. R., Fasullo, J., & Maussion, F. (2025). Evaluating the role of internal climate variability and bias adjustment methods on decadal glacier projections. Earth's Future, 13(7), e2024EF005624.
4. Hamlington, B. D., Tripathi, A., Rounce, D. R., Weathers, M., Adams, K. H., Blackwood, C., ... & Kopp, R. E. (2023). Satellite Monitoring for Coastal Dynamic Adaptation Policy Pathways. Clim. Risk Manag., 100555.
5. Weathers, M., Hathaway, J. M., Tirpak, R. A., & Khojandi, A. (2023). Evaluating the impact of climate change on future bioretention performance across the contiguous United States. J. Hydrol., 616, 128771.
6. Tirpak, R. A., Hathaway, J. M., Khojandi, A., Weathers, M., & Epps, T. H. (2021). Building resiliency to climate change uncertainty through bioretention design modifications. J. Environ. Manage., 287, 112300.
7. Pasha, M. F. K., Weathers, M., & Smith, B. (2020). Investigating energy flow in water-energy storage for hydropower generation in water distribution systems. Water Resour. Manag., 34, 1609-1622.