



Celso M. Ferreira, PhD

Associate Professor, Civil, Environmental & Infrastructure Engineering

Faculty Fellow: Sustainable & Resilient Communities & Ecosystems, Institute for a Sustainable Earth
Center Affiliate, Business for a Better World Center

Education

PhD, Civil Engineering, Texas A&M University

Key Interests

Flood Hazards | Nature-Based Coastal Resilience | Hurricane Storm Surge and Waves |
Field-Based Monitoring of Extreme Flooding | Flood Forecasting | Compound Flooding

CONTACT

Phone: 703-993-1782 | Email: cferrei3@gmu.edu

Website: <https://water.vse.gmu.edu/>

SELECT PUBLICATIONS

- › Khalid, A. and Ferreira, C. M. (2020). Advancing real-time flood prediction in large estuaries: iFLOOD a fully coupled surge-wave automated web-based guidance system. *Environmental Modeling and Software*, (131).
- › Rezaie, A., et al., (2020). Valuing natural habitats for enhancing coastal resilience: Wetlands reduce property damage from storm surge and sea level rise. *PLOS ONE*, in press.
- › Garzon, J. L., et al., (2019). Wave attenuation by Spartina saltmarshes in the Chesapeake Bay under storm surge conditions. *Journal of Geophysical Research - Oceans*, 124(7), 5220-5243.

Research Focus

I specialize in investigating and developing solutions that increase society's resilience to flood-related natural hazards. My work is focused on flood hazards from coastal, riverine, and urban environments and includes real time flood forecasting, monitoring storm surges, and supporting incorporation of natural systems into coastal flood defenses. I have ample experience leading instrument deployment for hydrodynamic and wave data collection during extreme events measuring storm surge and coastal flooding during several hurricanes that impacted the Chesapeake Bay. My work investigating the capacity of natural areas to attenuate waves is providing scientific and technical evidence for the adoption of green infrastructure as a resilient form of coastal defense.

Current Projects

- National Oceanic and Atmospheric Administration (NOAA) Ecological Effects of Sea Level Rise Program: quantifies the benefits of natural and nature-based features in Maryland, Chesapeake and Atlantic Coastal Bays to inform conservation and management under future sea level rise scenarios.
- U.S. Coastal Research Program: this project will provide field-based evidence and information to support coastal communities to safely and cost-effectively rely on natural and nature-based features for local-level resilience against flooding.
- National Science Foundation Navigating the New Arctic Program: investigating the Arctic impacts and reverberations of expanding global maritime trade routes.
- Coastal Hydrodynamics and Flood Hazards Study. First Street Foundation: Led the development of the numerical simulation of historical coastal hazards in the US East Coast with ADCIRC+SWAN and several weather models leading to mapping of historical coastal flooding from hurricanes and nor'easters.