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The Center for Water Resiliency and Risk Reduction (CWR3) was created in 2020 by the FAU College of Engineering and Computer Science, and it is a collaborative entity involving a team of faculty and student researchers from multiple colleges and universities.

The Center's mission is to empower local communities to develop mitigation strategies in response to the devastating effects of flooding and sea level rise. CWR3 serves as a clearinghouse for watershed master planning tools and policies and provides technical assistance to communities that wish to improve in the National Flood Insurance Program (NFIP) Community Rating System (CRS).

CWR3 Capabilities:



Data Clearinghouse

- Curated datasets
- Watershed management planning tools and policies
- Outreach/public education materials
- Incentives to reduce future losses
- Mitigation strategies/Green infrastructure



Sophisticated modeling tools for assessing flood risk and providing green solutions for communities



Technical assistance for CRS activities

- Lowering premiums by increasing the number of insured and improving CRS scores
- Assisting governments to craft appropriate policies for mitigation/prevention
- Developing innovative flood management solutions

- Provide technical assistance to communities to develop watershed plans that are acceptable to reviewers at the NFIP program level
- Provide technical assistance for improving Community Rating System (CRS) scores to lower flood insurance premiums
- Provide access to curated data sets for hydrologic modeling screening tools with drilldown capability
- Provide public outreach information education materials
- Provide open access screening tools that have been tested and validated for assessing flood risk in multiple scenarios
- Develop monitoring, maintenance, and evaluation plans
- Provide model ordinance language for policy implementation
- Coordinate vulnerability assessment and prioritization for flood protection for future sea level rise scenarios
- Provide tools to prioritize infrastructure implementation
- Provide green and grey infrastructure technologies toolbox for analyzing engineering alternatives for mitigation solutions including estimated costs and time to completion
- Provide training for flood protection mapping, watershed master planning, and selection of appropriate adaptation/mitigation strategies that are creditable under CRS

CWR3 Recent Work:

The Florida Division of Emergency Management (DEM)'s Bureau of Mitigation for Hazard Mitigation Grant Program (HMGP) DR-4337-004-P funded FAU CWR3 to assist the State in lowering flood insurance premiums for homeowners

Phase 1

- Task 1: Catalog and Analyze Current Watershed Data Availability and Gaps
 - Obtained and cataloged data sets required for a comprehensive statewide flooding vulnerability and sea level rise analysis
 - Stored 4 TB of data sets on CRW3's clearinghouse site (cwr3.fau.edu)
 - Topographic data, LiDAR, groundwater levels, surface water gage heights, tidal levels, soils data, land cover/land use, precipitation, locations of stormwater infrastructure, natural resources, demographics, sea level rise, repetitive loss properties, etc.
 - Collected existing federal, state, regional, local plans and policy frameworks related to existing water management efforts
 - Performed a gap analysis to determine data needs
- Task 2: Draft Watershed Master Plan (WMP) Development Strategy
 - Developed methodology to apply open-source hydrologic modeling screening tool with ability to drill-down from regional to parcel level to estimate probability of inundation in various scenarios (e.g. sea level rise, king tides, future land use changes, multiple design storms, peak flows, minimum flows and levels, etc.)
 - Created a screening tool throughout the state for use in identifying communities at-risk to flooding and where those vulnerable areas are located in the community.
 - Developed modeling studies for all TMDL watershed in the State of Florida (ex. Appendix 1 and 2)
 - Developed a methodology for prioritizing implementation of mitigation strategies based on Department of Revenue codes at the parcel level, tiered prioritization schemes, economic damage, and repetitive loss (ex. Appendix 3)
 - Developed an inventory of potential mitigation strategies and toolbox with design guidelines (ex. Appendix 4)
- Task 3: Watershed Master Plan Template Development
 - Produced a master template (subwatershed characterization, policy frameworks, mapping/assessment of vulnerable areas, inventory of potential solutions, and action plan)
 - Created two complete WMPs to be used as examples for future WMPs creditable in CRS 452b
 - Davie/Dania Beach (coastal)
 - Ninemile Canal/Clewiston (inland)

With the goal of providing community-based solutions to improve monitoring and implement mitigation strategies to reduce flood insurance premiums and reduce flood damage, CWR3 (& affiliated faculty) have delivered educational outreach, technical assistance, and training modules to:

- Municipalities and counties
- WMDs
- FDEM/FEMA
- Homeowner associations (CFB-Resilience Ambassadors Program)
- Silver Jackets
- NFIP CRS reviewers

Phase 2 of the program will apply the protocol developed in Phase 1 by FAU CWR3 to create WMPs for all Florida watersheds and municipalities that wish to participate in improving CRS standing to reduce flood insurance premiums for homeowners

CWR3 Research Team:

CIVIL, ENVIRONMENTAL & GEOMATICS ENGINEERING	GEOSCIENCES	ARCHITECTURE & URBAN PLANNING	ADVISORY BOARD	PARTNERS
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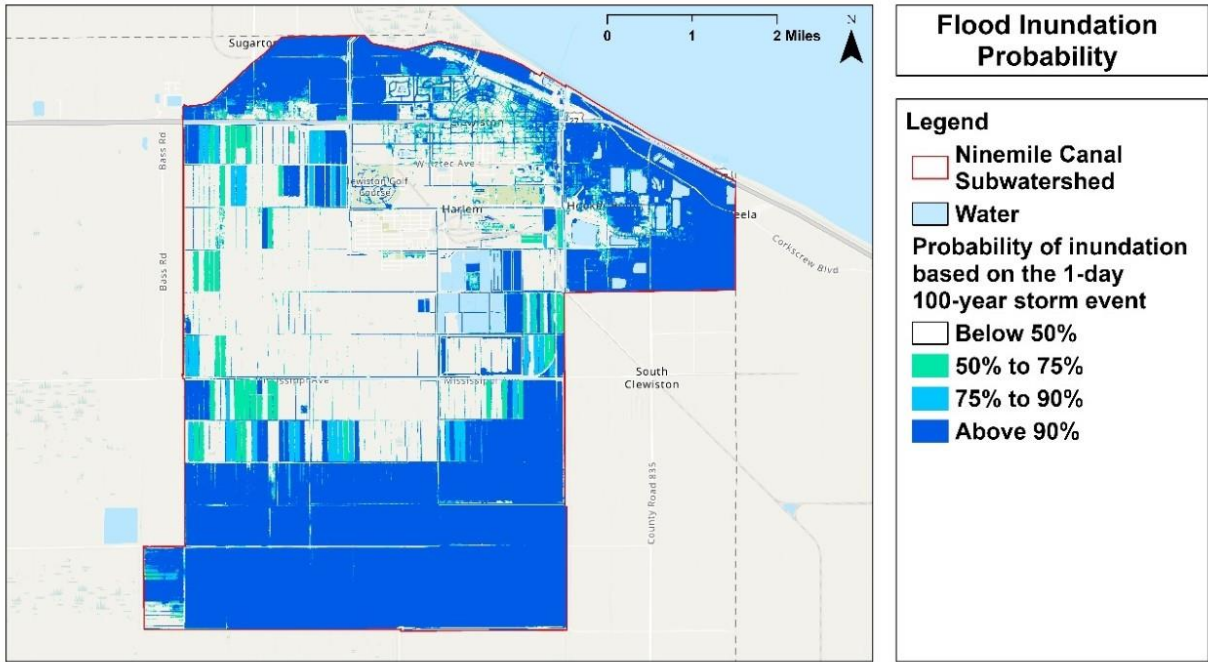
Selected Publications:

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- Bloetscher, F., 2012. Protecting people, infrastructure, economies, and ecosystem assets: Water management in the face of climate change. *Water*, 4(2), pp.367-388.
- Bloetscher, F., Berry, L., Moody, K. and Hammer, N.H., 2013. Climate Change and Transportation in the Southeast USA. In *Climate of the Southeast United States* (pp. 109-127). Island Press, Washington, DC.
- Bloetscher, F., Berry, L., Rodriguez-Seda, J., Hammer, N.H., Romah, T., Jolovic, D., Heimlich, B. and Cahill, M.A., 2014. Identifying FDOT's physical transportation infrastructure vulnerable to sea level rise. *Journal of Infrastructure Systems*, 20(2), p.04013015.
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- Bloetscher, F., Meeroff, D.E., Heimlich, B.N., Brown, A.R., Bayler, D. and Loucraft, M., 2010. Improving resilience against the effects of climate change. *Journal-American Water Works Association*, 102(11), pp.36-46.
- Bloetscher, F., Polsky, C., Bolter, K., Mitsova, D., Garces, K.P., King, R., Carballo, I.C. and Hamilton, K., 2016. Assessing potential impacts of sea level rise on public health and vulnerable populations in Southeast Florida and providing a framework to improve outcomes. *Sustainability*, 8(4), p.315.
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- Suarez, E.L and Meeroff, D.E. (2021). Interdisciplinary approach to flood risk and the consequence of flooding. FLOODrisk 2020 – 4th European Conference on Flood Risk Management. Budapest, Hungary.

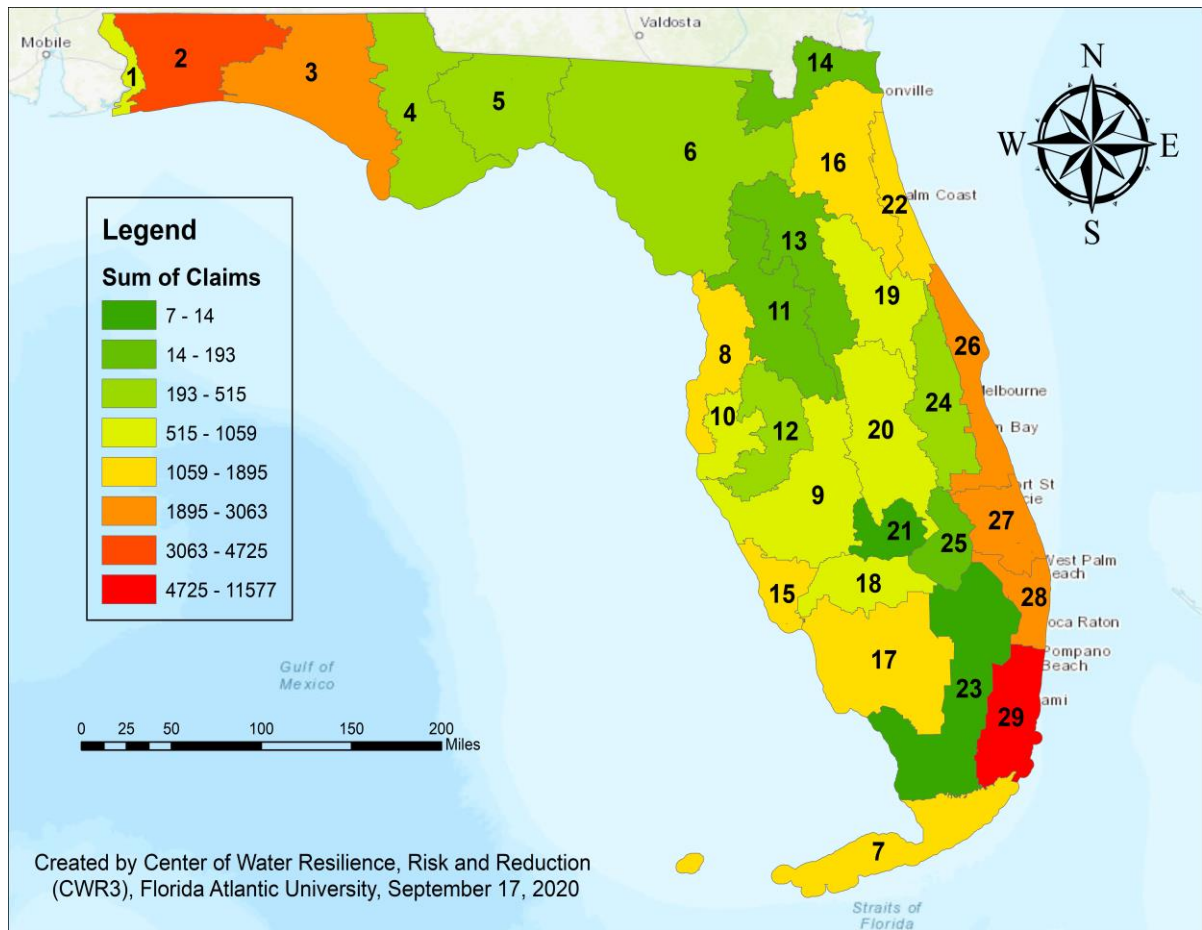
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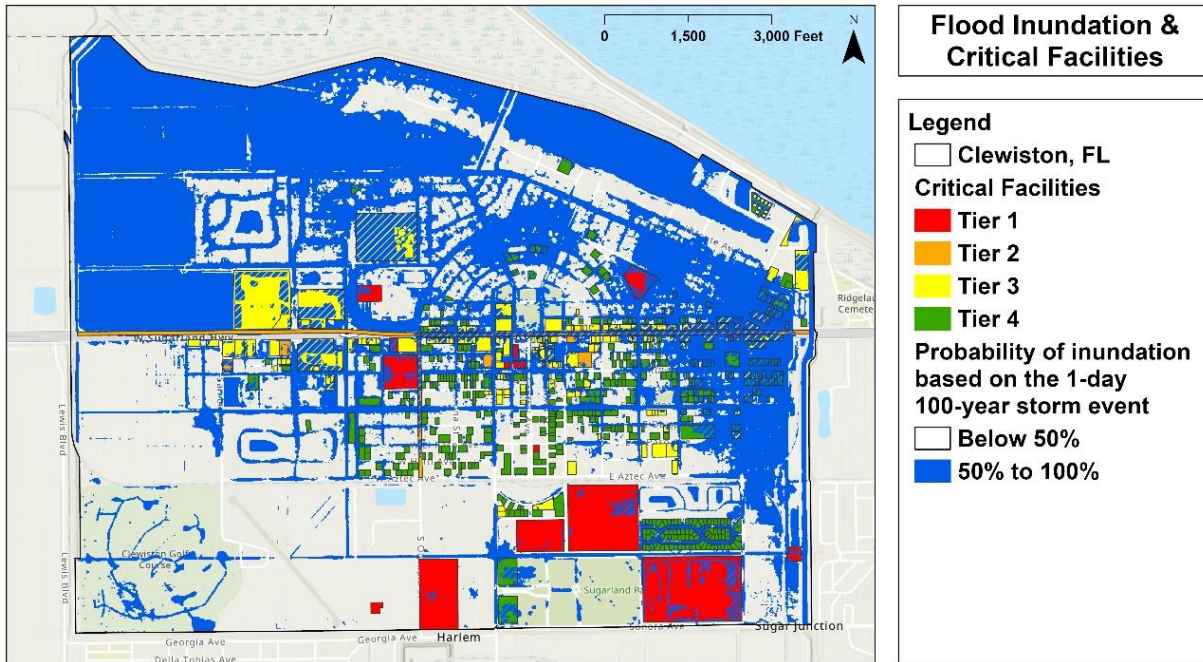
Appendix 1



Appendix 2



Appendix 3



Appendix 4

