



Knowledge Exchange Series: Hurricane Recovery & Disaster Response in Florida

Prepared by Emma Wennick with Forward Pinellas

Knowledge Exchange Series Overview

- Countywide platform for discussing emerging planning topics & best practices
- Collaborative forum with representatives from 25 local governments
- Focus on real-world challenges affecting Pinellas County
- Current topic: Hurricane Recovery & Disaster Response in Florida
- Inspired by impacts from Hurricanes Milton & Helene



Why we Created this Series

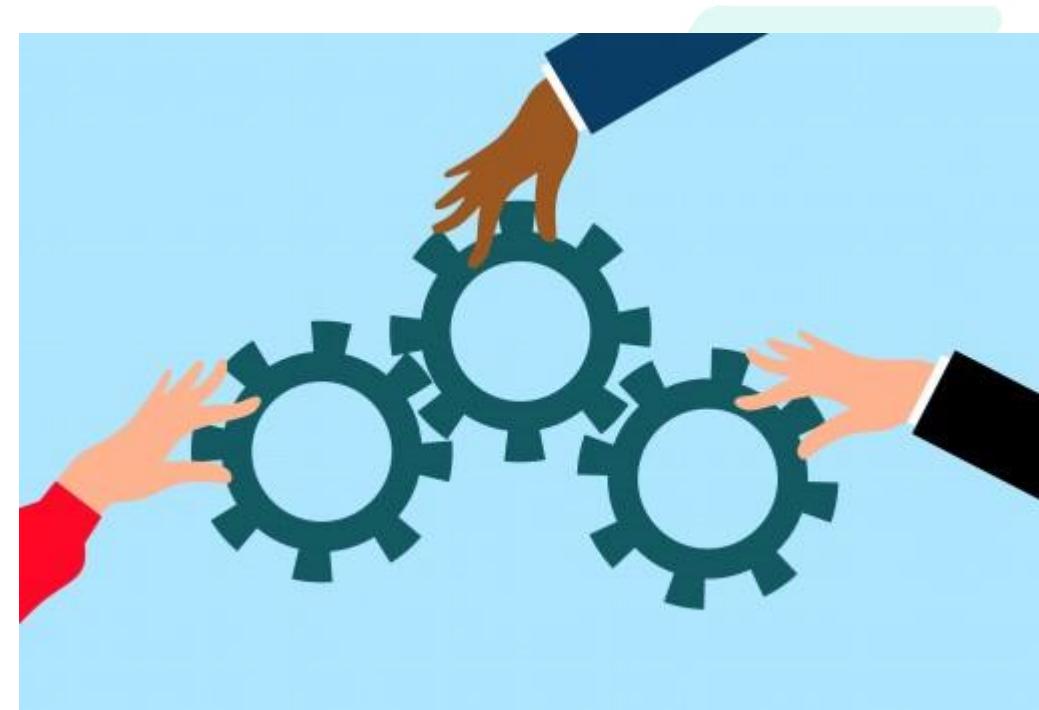
- Florida experiences some of the most frequent and severe hurricanes in the U.S.
- Hurricanes cause billions in damages and long-term disruption
- Recovery is more effective when communities plan ahead



WUSF Public Media, 2024, WUSF News

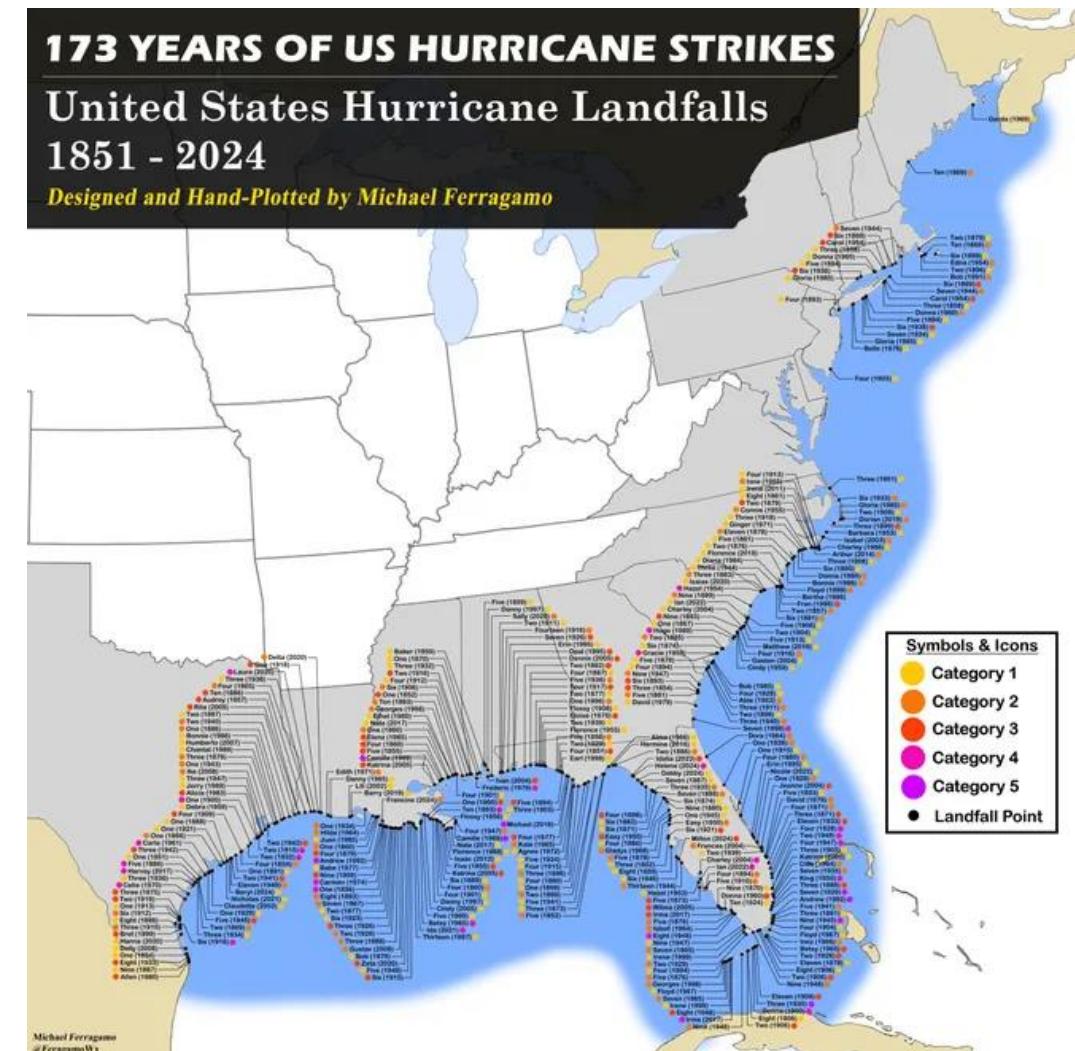
Goals of the Knowledge Exchange Series

- Document best practices from other hurricane recovery efforts
- Provide actionable strategies for planners and local governments
- Strengthen cross-jurisdictional collaboration



How we Conducted this Research

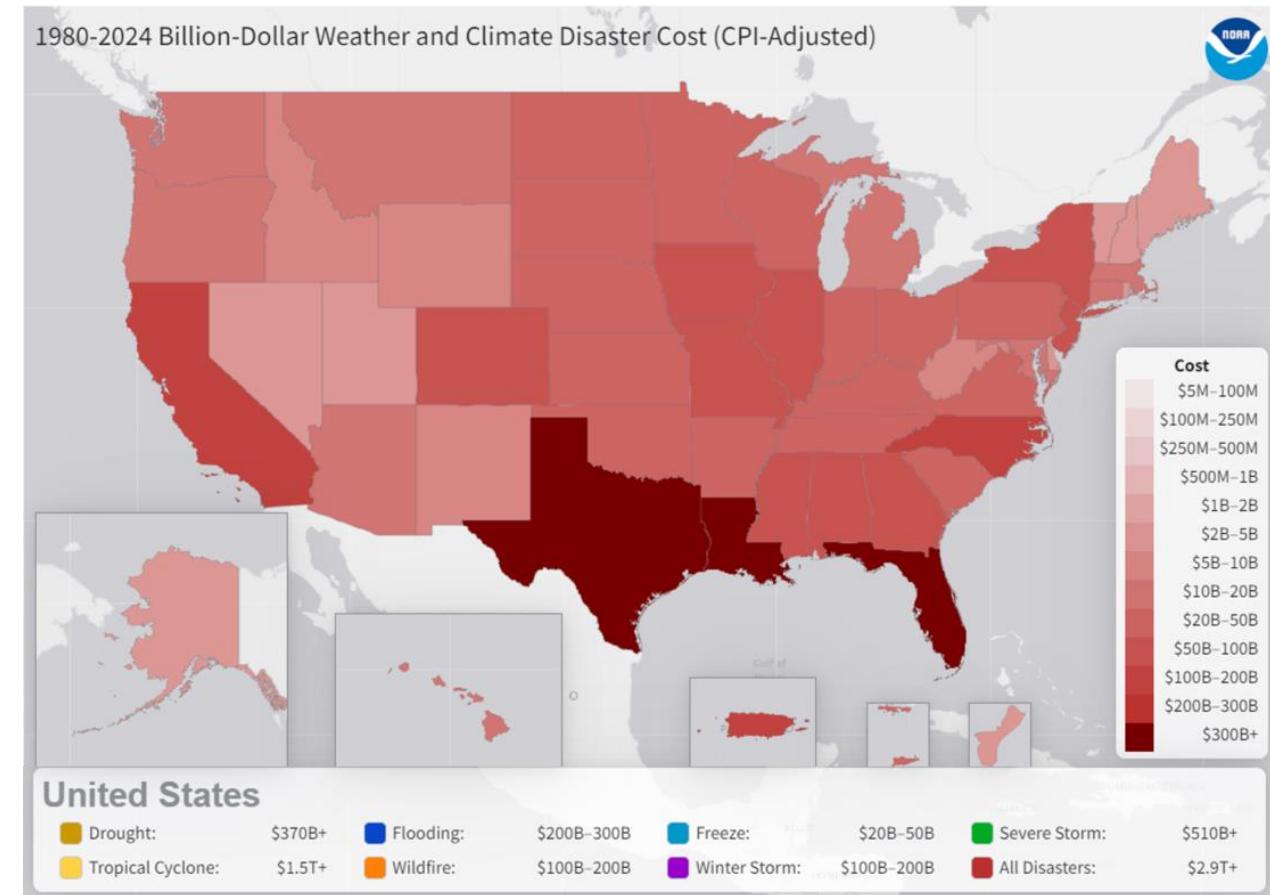
- Reviewed hurricane recovery efforts from 2005–2024, including major storms across Florida and the Gulf Coast
- Conducted three in-depth case studies (Fort Myers after Hurricane Ian, Panama City after Hurricane Michael, Harrison County, MS after Hurricane Katrina)
- Examined emergency management protocols, state/federal guidance, and funding programs relevant to Pinellas County
- Synthesized lessons into recommendations for local governments



USA Today. (2025, April 19). Map of U.S. hurricane landfalls. USA Today.

Recent Hurricane Impacts

- Hurricane frequency and intensity have increased in recent decades
- Over \$150 billion in damages in Florida in the last 10 years
- Millions displaced, widespread infrastructure damage and environmental losses



National Centers for Environmental Information. (2024, January 8). 2024: An active year for U.S. billion-dollar weather and climate disasters. NOAA Climate.gov.

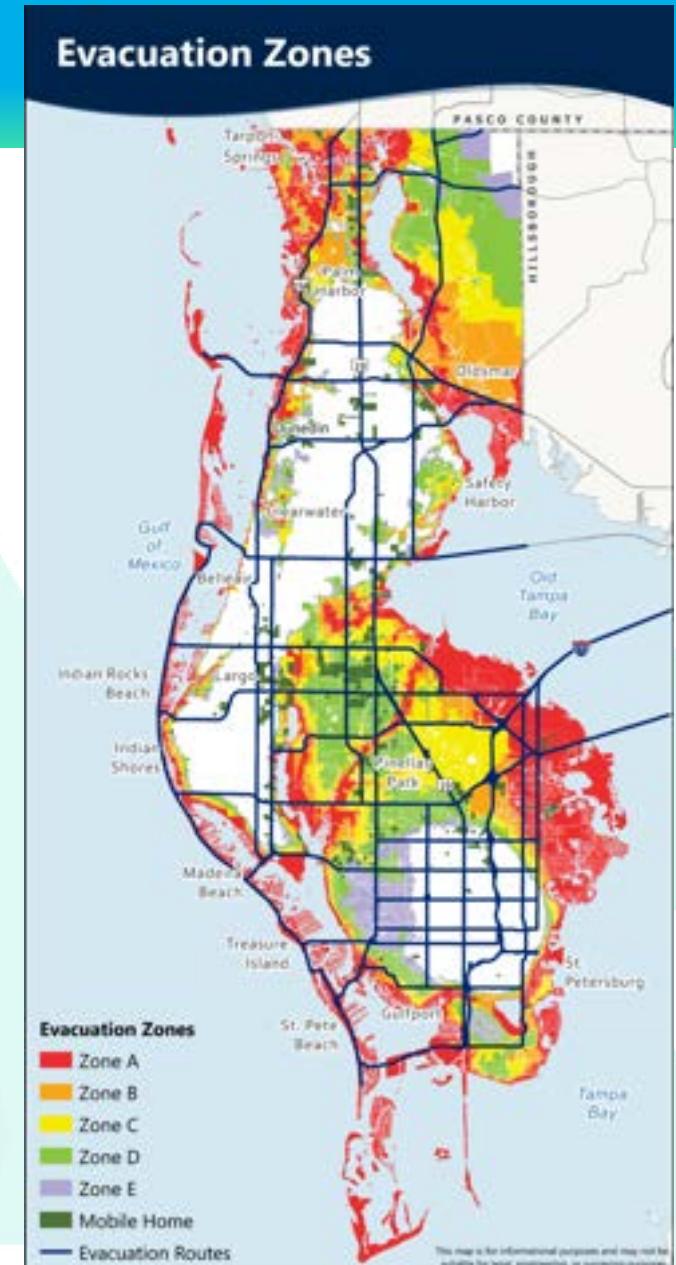
Role of Planners in Recovery

- Planners help lead long-term recovery by:
 - Advocating for resilient infrastructure
 - Guiding land use, zoning, and housing policies
 - Restoring natural systems and integrating green infrastructure
 - Engaging communities in the recovery process



Pinellas County's Vulnerabilities

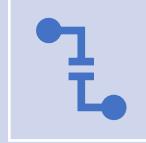
- High exposure to storm surge and coastal flooding
 - Over 50% of residents live in evacuation zones
- Dense population and ongoing housing affordability challenges
- Aging infrastructure not designed for modern storm intensity
 - Example: St. Pete Beach's stormwater and sewer systems are decades past design life, with saltwater intrusion and frequent flooding even in heavy rain
 - Beach renourishment delays and weakened dunes increase storm surge risk



Local Vulnerability Assessments



Largo, Clearwater, and Tarpon Springs are some of our municipalities that have existing resilience action plans.



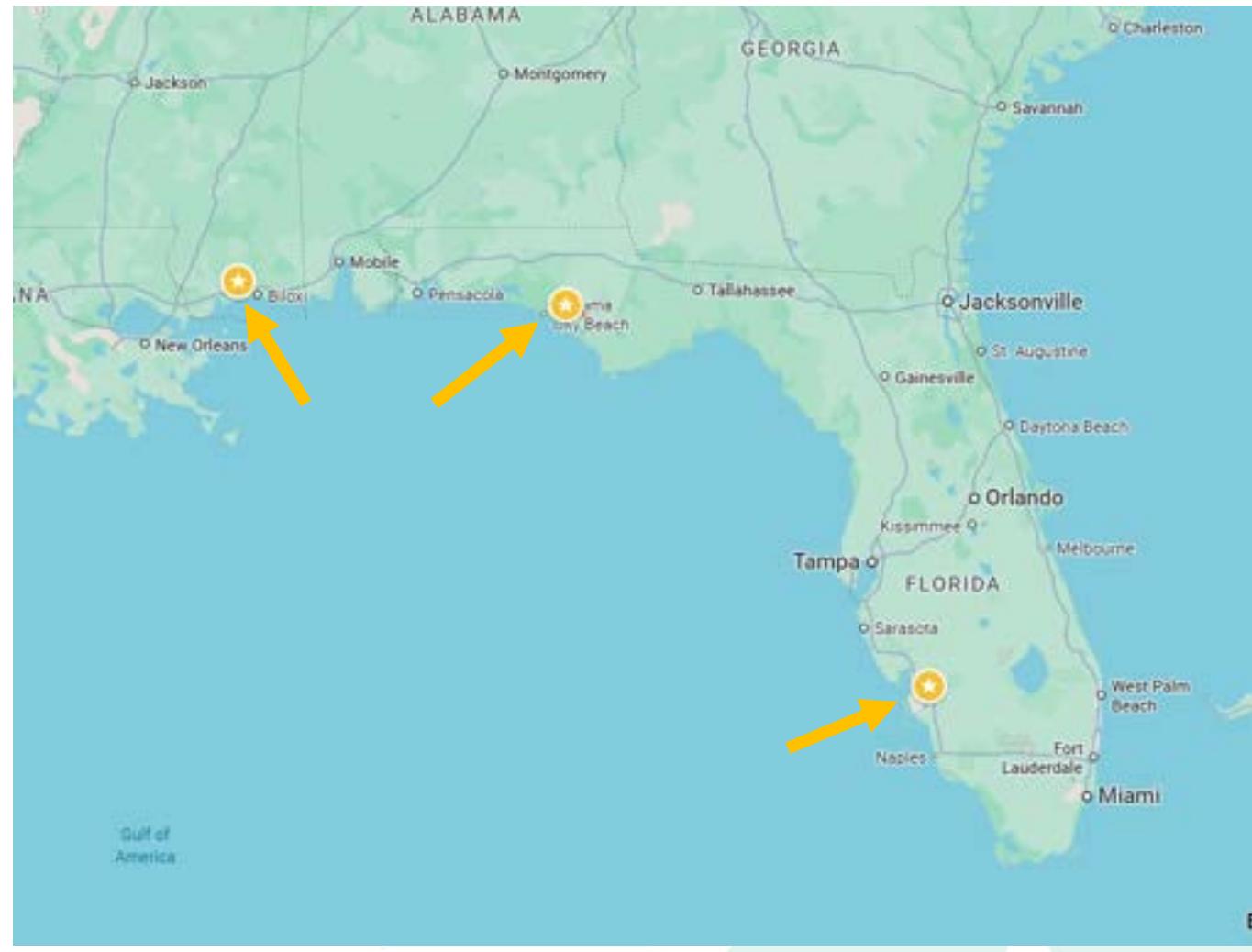
Pinellas County is in the process of updating its own countywide vulnerability assessment.



These assessments inform funding, policy, and infrastructure priorities.

Case Study Overview

- Examined recovery efforts in Fort Myers, Panama City, and Harrison County (MS)
- Conducted interviews with their local staff and reviewed recovery plans
- Identified key successes, challenges, and lessons for Pinellas County



Google Maps, 2025

Case Study: Fort Myers (Hurricane Ian)

- Hurricane Ian struck on September 28, 2022 as a Category 4 storm, bringing catastrophic winds, flooding, and storm surge
- Massive damage to neighborhoods, infrastructure, and the downtown Yacht Basin
- Comprehensive Recovery Plan adopted, integrating resilience into every sector
- Code changes: stronger wind and flood regulations, use of permeable pavement, improved drainage systems
- Funding leveraged from Elevate Florida and Community Development Block Grant – Disaster Recovery (CDBG-DR) for home elevation, neighborhood revitalization, and infrastructure upgrades



Fort Myers: Key Lessons

- **Integrated Recovery Planning** – A citywide plan guided every step, aligning zoning, infrastructure, and funding priorities
- **Resilient Infrastructure** – Investments in drainage and underground utilities reduced future flood risk
- **Community Engagement** – Recovery was shaped by input from all income levels and neighborhoods
- **Financial Readiness** – Leveraged multiple funding sources quickly to avoid delays

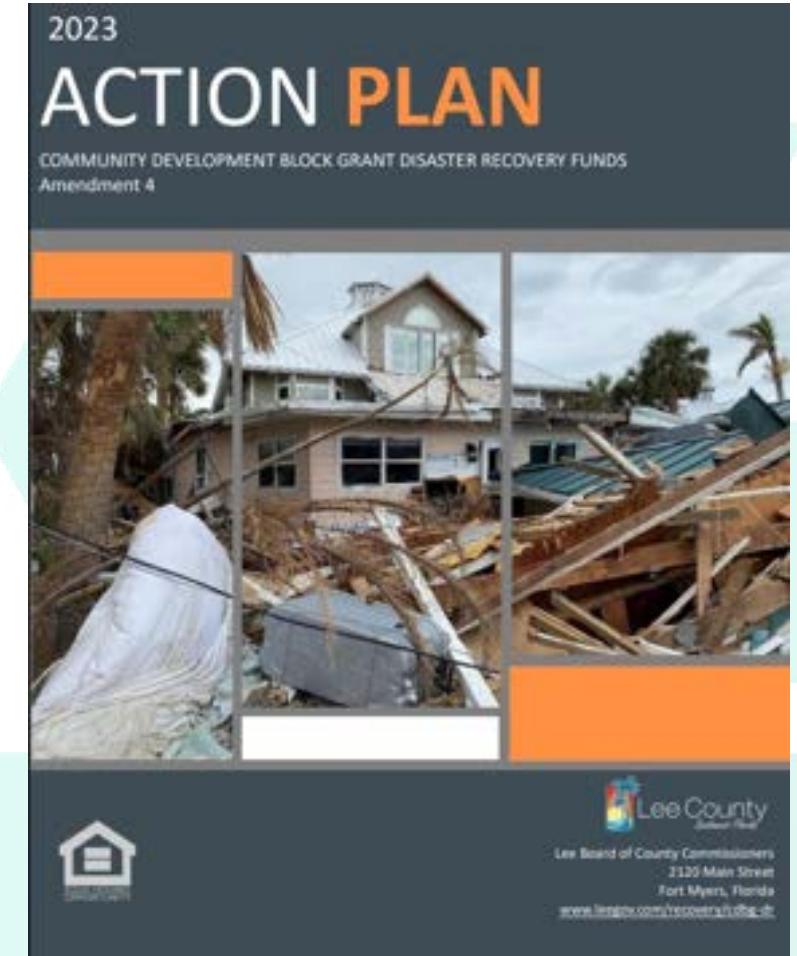


Image source: Town of Fort Myers Beach (n.d.)

Case Study: Panama City (Hurricane Michael)

- Category 5 storm on October 10, 2018 caused historic wind and storm surge, destroying homes, businesses, and infrastructure
- Adopted neighborhood zoning districts and new land use categories to guide targeted recovery
- Increased freeboard requirements to 2 feet above Base Flood Elevation (BFE) to reduce future flood damage
- \$330M infrastructure rebuild: underground utilities, upgraded drainage
- Funded through FEMA reimbursements, Community Development Block Grant – Disaster Recovery (CDBG-DR), state loan programs, and Elevate Florida



Aerial photo comparison of the severe damage in Mexico Beach (R127-R132). Source: Vexcel Imaging/ NICB Geospatial Intelligence Center.

Panama City: Key Lessons

- **Pre-Established Neighborhood Plans** – Enabled faster, targeted rebuilding
- **Elevation Standards** – Extra 2 feet above BFE provided measurable flood protection
- **Infrastructure Resilience** – Underground utilities and stormwater upgrades reduced risk
- **Funding Mix** – Federal, state, and local financing kept projects moving despite FEMA delays

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PANAMA CITY
NEIGHBORHOOD PLANS
A Strategic Vision for Glenwood, Millville, & St. Andrews

City of Panama City Long Term Recovery Planning Project

From Hurricane Michael Recovery Update by City of Panama City, 2022

Case Study: Harrison County (Hurricane Katrina)

- August 2005: Katrina's 22-foot surge devastated Gulf Coast homes, infrastructure and tourism economy
- Created structured temporary housing permit system to avoid long-term trailer park issues
- Prohibited permanent FEMA trailer parks on private land; limited to government property
- Updated flood regulations: all new construction must be at least 2 feet above the flood level
- Balanced rapid redevelopment with wetland protection



Photo of damaged shipping containers at the Port of Gulfport after Hurricane Katrina. From Gulfport, MS: The Port of Gulfport by Esri StoryMaps, 2018

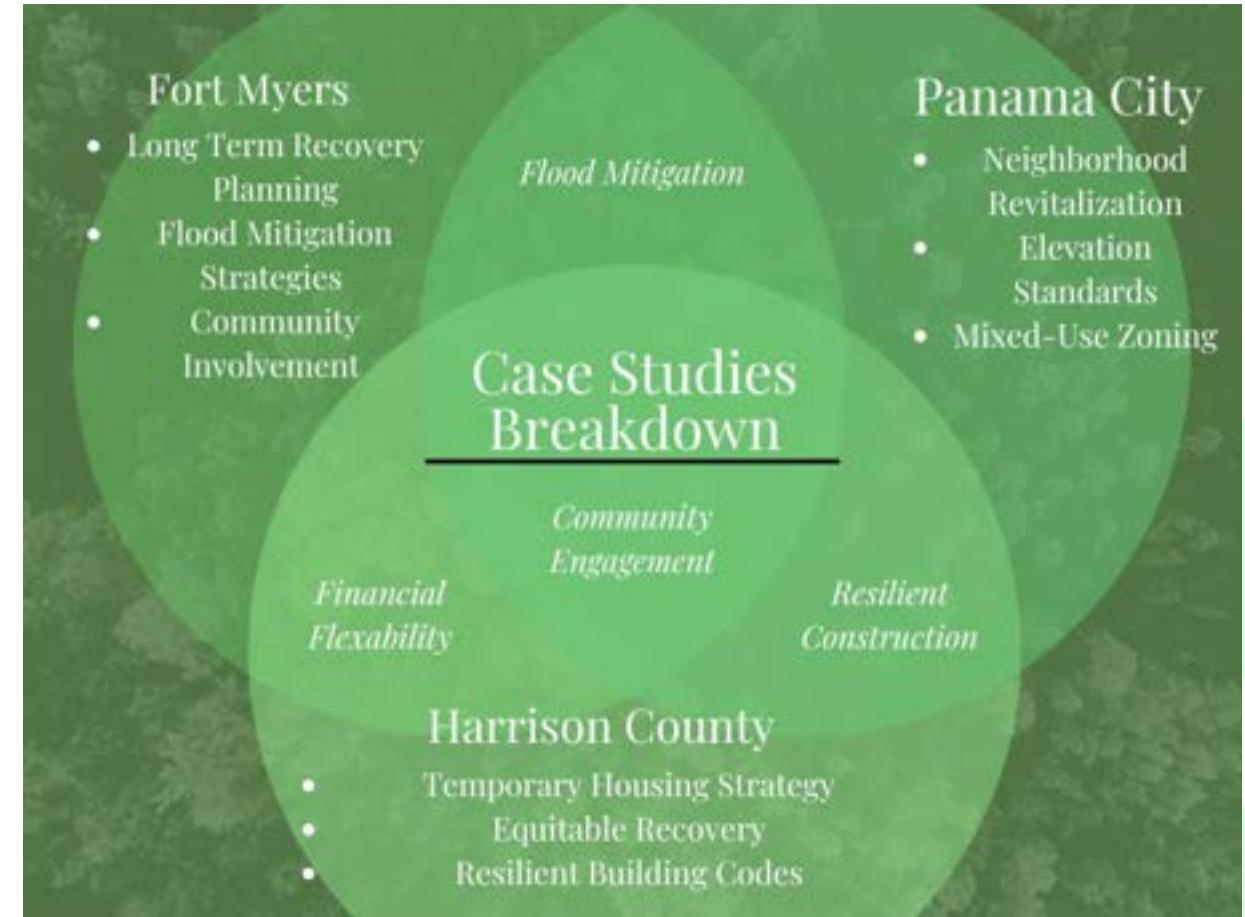
Harrison County: Key Lessons

- **Temporary Housing Strategy** – Pre-set permits prevent long-term zoning conflicts
- **Stronger Codes** – Elevation and wind-resistance standards improved future storm durability
- **Underserved Focus** – Targeted assistance for low-income homeowners reduced displacement
- **Environmental Balance** – Integrated wetland and floodplain protections into redevelopment



Lessons Across Case Studies

- **Start Recovery Planning Early:** Effective planning before a disaster reduces damage and speeds recovery
- **Engage the Community:** Involving residents and stakeholders improves outcomes and local buy-in.
- **Use Resilient Strategies:** Adopt updated building codes, nature-based solutions, and flexible funding to strengthen recovery



FEMA & Funding Resources

- **FEMA Grants:**

- HMGP – Hazard Mitigation Grant Program: reduces disaster risk
- BRIC – Building Resilient Infrastructure & Communities: community-driven mitigation
- PA – Public Assistance: repair, replacement, and emergency protective measures

- **Other Funding:**

- Elevate Florida – state flood mitigation for homes & critical facilities
- CDBG-DR – Community Development Block Grant – Disaster Recovery: housing & infrastructure recovery
- IIJA PROTECT – Infrastructure Investment and Jobs Act (IIJA) – Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Program



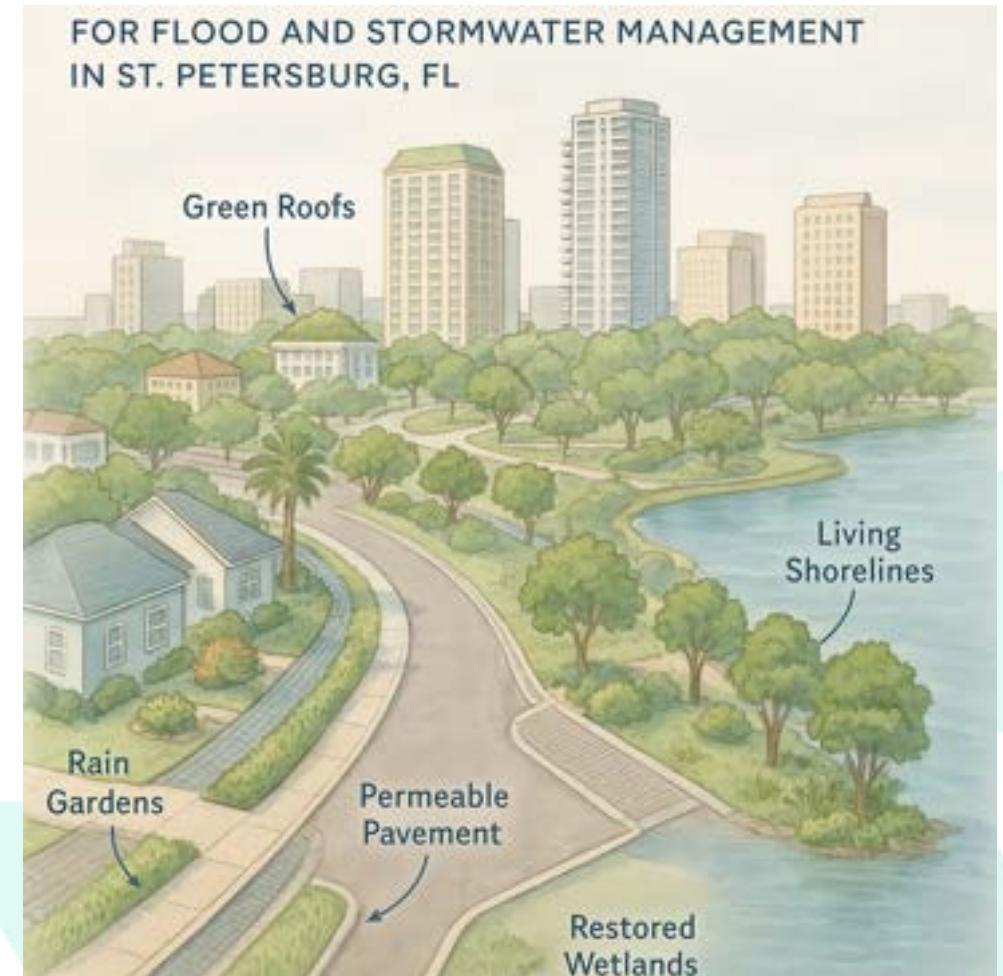
Emergency Management Protocols

- Pinellas County Emergency Operations Center coordinates disaster response
- Comprehensive Emergency Management Plan guides recovery
- Joint municipal drills, ongoing trainings, and mutual aid agreements enhance readiness



Opportunities for Pinellas

- **Expand Nature-Based Solutions:** Living shorelines, wetland restoration, and green infrastructure
- **Incentivize Resilient Housing Construction & Invest in Infrastructure Upgrades:** Encourage new resilient homes and strengthen critical facilities and stormwater systems
- **Strengthen Local Collaboration:** Coordinate planning, funding, and response across municipalities and agencies



Generated by ChatGPT (GPT-4), OpenAI, 202

Recommended Code Updates

- **Elevate Homes Above Base Flood Elevation (BFE):** Reduce flood risk for new and substantially improved structures
- **Strengthen Wind-Load Provisions:** Improve building standards in coastal areas to withstand high winds and hurricanes
- **Limit Development in Coastal High Hazard Areas (CHHA):** Restrict construction in areas most vulnerable to storm surge and flooding



Elevating your home to protect against flooding and comply with FEMA rules
by Bay News 9, 2025

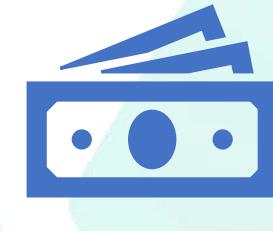
How this Knowledge Exchange Series Can Be Used



Resource for
planners
and policymakers



Supports
comprehensive plan
updates and recovery
protocols



Informs grant
applications and
funding priorities

Recovery + Resilience = Stronger Pinellas

Our Hope for this Series:

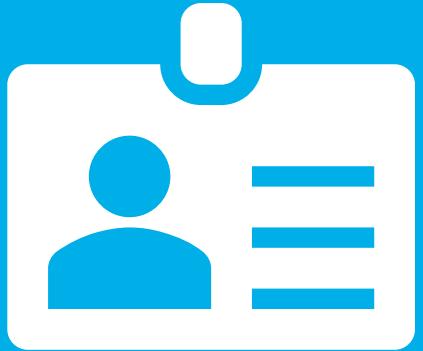
- Inspire proactive planning and collaboration.
- Equip communities with practical tools for recovery.
- Build a more resilient, equitable Pinellas County.



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Ongoing vulnerability assessment, regional collaboration, public engagement, funding alignment

Thank you!



Contact Us



Emma Wennick
Program Planner
Direct: 727-464-5679
Main: 727-464-8250
forwardpinellas.org

