

# TERREBONNE PARISH HAZARD MITIGATION PLAN UPDATE 2023








PUBLIC MEETING  
Main Library 151 Library Drive via Zoom  
MARCH 2, 2023

Presented Virtually by: Bill Bohn

# Hazard Mitigation

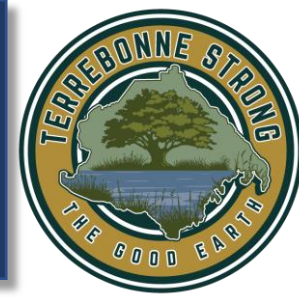


- Actions to minimize risk to people, property, and the environment
- Focus is natural hazards

National Institute of BUILDING SCIENCES™		ADOPT CODE	ABOVE CODE	BUILDING RETROFIT	LIFELINE RETROFIT	FEDERAL GRANTS
<b>Overall Benefit-Cost Ratio</b>		<b>11:1</b>	<b>4:1</b>	<b>4:1</b>	<b>4:1</b>	<b>6:1</b>
<b>Cost (\$ billion)</b>		<b>\$1/year</b>	<b>\$4/year</b>	<b>\$520</b>	<b>\$0.6</b>	<b>\$27</b>
<b>Benefit (\$ billion)</b>		<b>\$13/year</b>	<b>\$16/year</b>	<b>\$2200</b>	<b>\$2.5</b>	<b>\$160</b>
 <b>Riverine Flood</b>		<b>6:1</b>	<b>5:1</b>	<b>6:1</b>	<b>8:1</b>	<b>7:1</b>
 <b>Hurricane Surge</b>		not applicable	<b>7:1</b>	not applicable	not applicable	not applicable
 <b>Wind</b>		<b>10:1</b>	<b>5:1</b>	<b>6:1</b>	<b>7:1</b>	<b>5:1</b>
 <b>Earthquake</b>		<b>12:1</b>	<b>4:1</b>	<b>13:1</b>	<b>3:1</b>	<b>3:1</b>
 <b>Wildland-Urban Interface Fire</b>		not applicable	<b>4:1</b>	<b>2:1</b>	not applicable	<b>3:1</b>

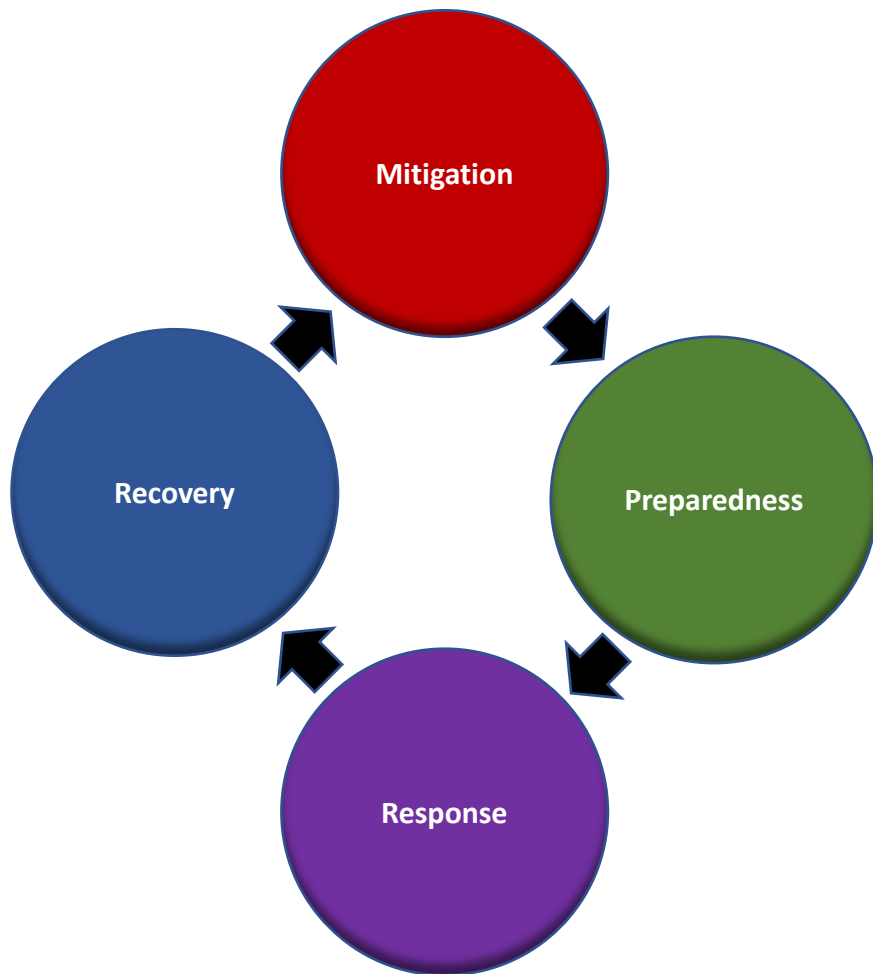
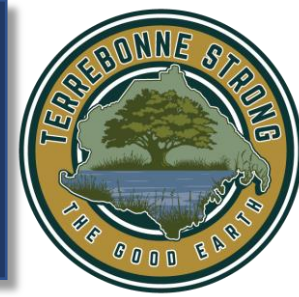
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# Benefits of Mitigation Planning



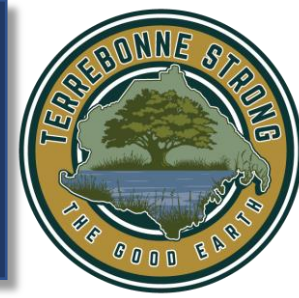
- Identify cost-effective actions to reduce risk
- Focus resources on greatest vulnerabilities
- Build partnerships
- Increase awareness of hazards and risk
- Communicate priorities
- Align with other town objectives
- Save lives and money!

# Risk Reduction and Recovery



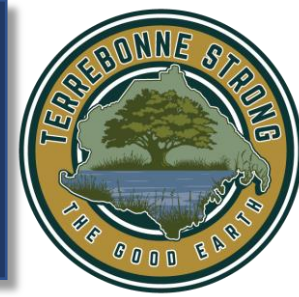
- Local plans and regulations
- Structure and infrastructure projects
- Natural systems protection
- Education and awareness programs

# Planning Process



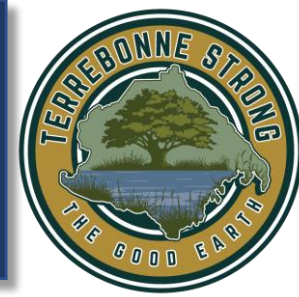
Mitigation Planning Elements	CRS Planning Steps
A. Planning Process	1. Organize to prepare the plan
	2. Involve the public
	3. Coordinate
	10. Implement, evaluate, revise
B. Hazard Identification and Risk Assessment	4. Assess the hazard
	5. Assess the problem
C. Mitigation Strategy	6. Set goals
	7. Review possible activities
	8. Draft an action plan
D. Plan Update	10. Implement, evaluate, revise 5-year update
E. Plan Adoption	9. Adopt the plan

# Hazard Mitigation Plan Development – Documents Reviewed



- Comprehensive Master Plan Vision 2030
- Previous mitigation plans
- Louisiana Coastal Master Plan 2017
- LA SAFE Terrebonne Parish Adaptation Strategy
- Terrebonne Parish Stormwater Drainage & Design Manual
- Louisiana State Hazard Mitigation Plan, April 2019
- Repetitive loss area analysis
- Lafourche Parish Hazard Mitigation Plan Update (2020)
- HNC Lock Complex Presentation – April 25, 2016
- National Flood Insurance Program Community Rating System Link
- [How to Build a Hazard Mitigation Plan](#)
- Fiscal State of Terrebonne Parish – Gordon Dove, September 12, 2019

# Hazard Mitigation Planning Committee



- Council approved the plan of approach for the process and representation
- Representatives from
  - Government – Planning, emergency preparedness, police, fire, school district, health
  - Tribes
  - Non-profits
  - Business community
  - Religious organizations
  - Organizations representing underrepresented communities

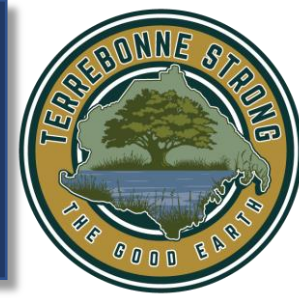
Provide supporting data and information.

Assist with outreach and stakeholder engagement.

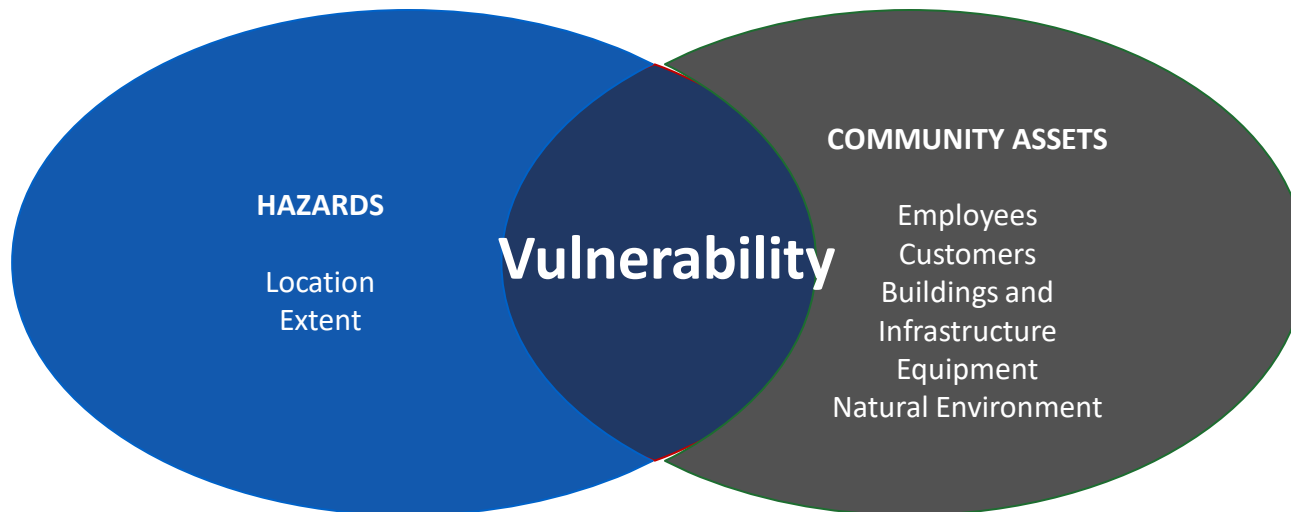
Assist in the identification and prioritization of mitigation actions.

Review and comment on the draft plan.

# Vulnerability Assessment

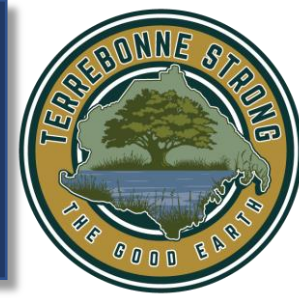


- Vulnerability definition: The susceptibility of people, property, industry, resources, ecosystems, or historical buildings and artifacts to the negative impact of a disaster. (FEMA)

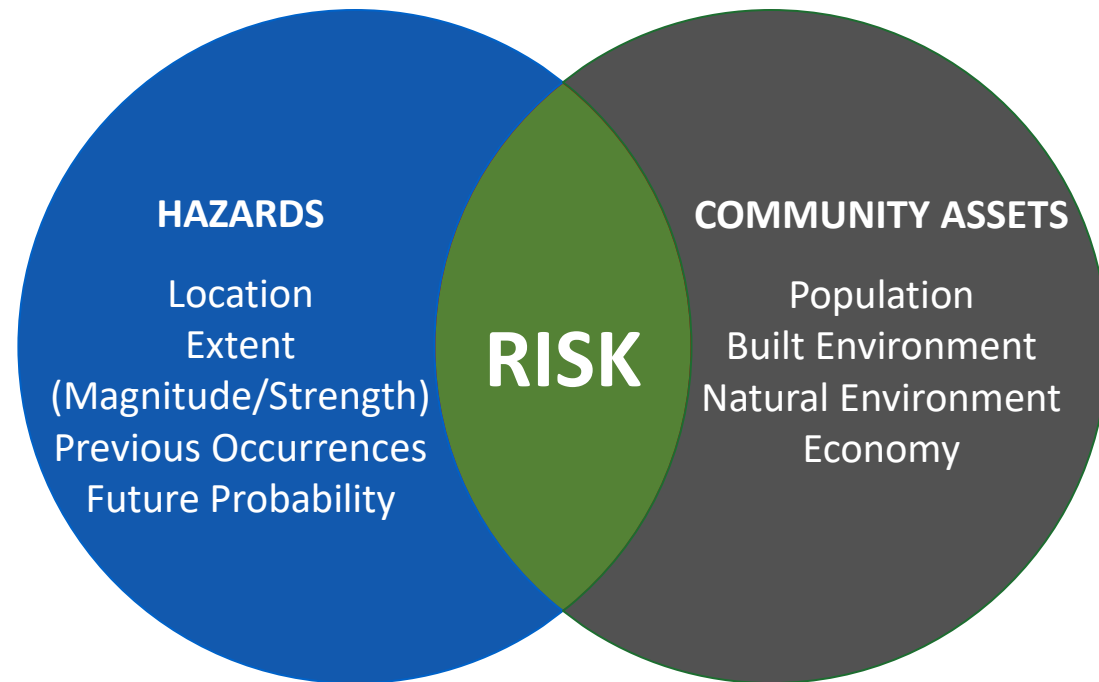




# Risk Assessment

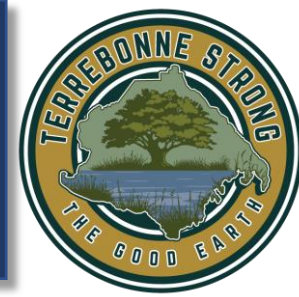


- The potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets.



*Source: Local Mitigation Planning Handbook, FEMA 2013.*

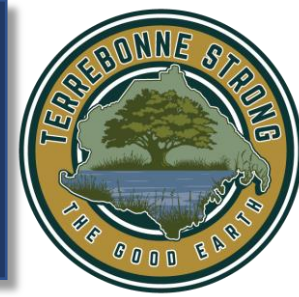
# Critical Facilities – Tier 1



- Hospitals
- Emergency operations centers
- Police stations/9-1-1
- Fire stations
- Schools
- Civic Center
- Utilities
- Court houses
- Levee District
- Department of Wildlife and Fisheries
- Buildings necessary for government functions

Entities that provide for the basic life safety and function of the Parish before, during and after an event; and buildings managed by government agencies.

# Critical Facilities – Tier 2

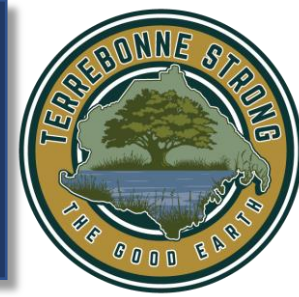


- Assisted Living
- Home Health
- Medical (clinics and non-first responders)
- Childcare
- Housing Authority
- Groceries
- Pharmacies
- Gas stations

Entities which impact residents' quality of life.

Must also consider all the people, assets, services, equipment and materials that are needed to support the facility or function.

# Hazards Identified



- Flooding (surge, rainfall, and riverine/backwater)
- Levee/Dam Failure
- Hurricanes and Coastal/Tropical storms
- Saltwater Intrusion
- Tornadoes
- Sinkhole
- Land Subsidence
- Coastal Erosion
- Lightning
- *Extreme Temperatures (new)*

Considered historical events, insurance information on losses, projected scenarios through modeling.

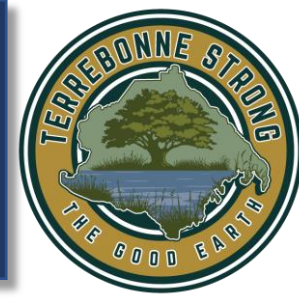
Other hazards?

# Risk Assessment



- Hazard description
- Geographic location and extent of hazard
- Magnitude and severity
- Previous occurrences
- Relationship to other hazards
- Vulnerability and risk
- Impacts – social, economic, and environmental

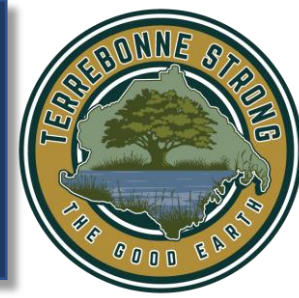
# Hazard Ranking



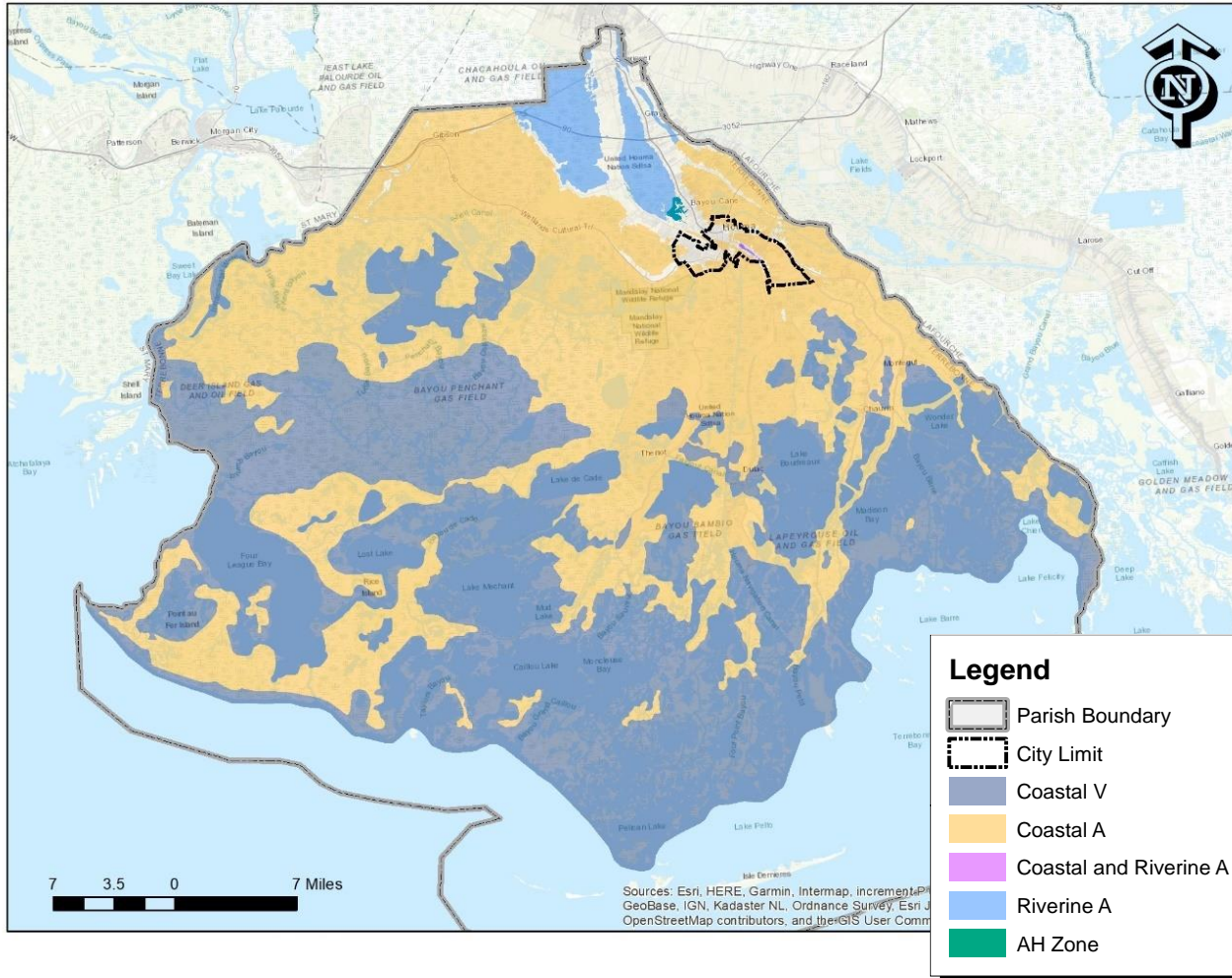
Hazards	Probability	Impact	Spatial Extent	Warning Time	Duration	Total	Rank
Flood	4	4	3	4	2	3.6	High
Hurricanes/Wind	3	4	4	1	2	3.2	High
Saltwater Intrusion	1	2	2	4	2	1.9	Low
Levee Failure	2	3	2	4	2	2.5	Mod.
Tornadoes	1	2	1	3	1	1.5	Low
Coastal Erosion	4	2	2	2	4	2.8	Mod.
Lightning	4	1	1	2	1	2	Mod.
Sinkhole	1	2	1	4	4	1.9	Low
Land Subsidence	1	2	1	4	4	1.9	Low
Extreme Temperatures	2	2	4	2	2	2.4	Mod.

Comments?

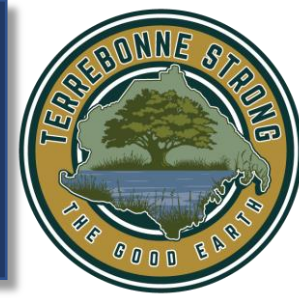
# Risk Assessment – Flood (FEMA)



\*FEMA 100-year floodplain does *not* take levee system into account



# Risk Assessment – Flood (FEMA)

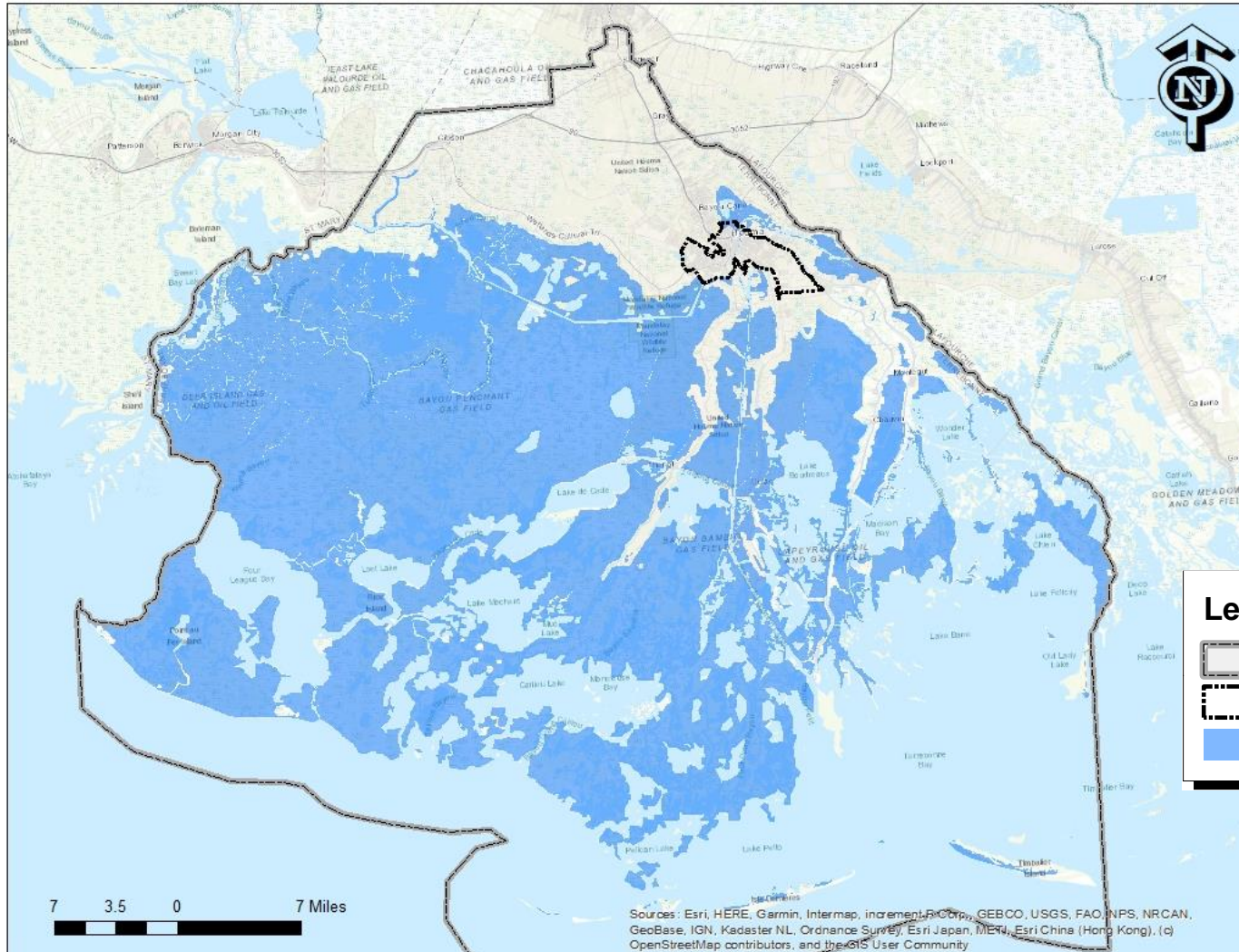
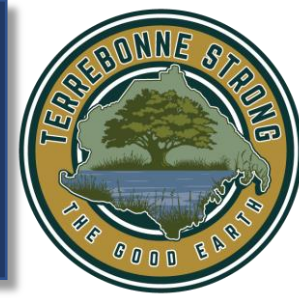


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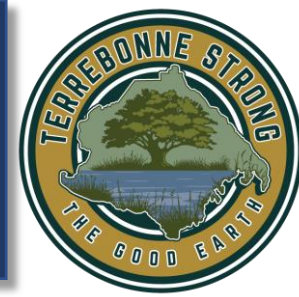
Building Impacts	Buildings Impacted	Structure Loss (\$)	Content Loss (\$)	Inventory Loss (\$)	Total Loss (\$)	Loss Ratio
Single-Family Housing	20,978	2,781,772,255	1,510,659,211	0	4,292,431,466	41.5%
Manufactured Housing	678	13,237,926	5,328,251	0	18,566,177	26.1%
Multi-Family Housing	891	188,514,450	115,628,577	0	304,143,027	29.4%
Other Residential	13	3,572,554	4,919,528	0	8,492,082	16.3%
Commercial	2,179	322,535,943	998,017,577	820,818,044	2,141,371,564	29.3%
Industrial	301	36,775,773	104,827,876	20,432,813	162,036,462	16.2%
Government	103	20,959,301	114,727,608	0	135,686,909	47.4%
Education	31	18,781,203	94,366,842	0	113,148,045	22.2%
Agricultural	10	254,390	1,037,712	1,051,474	2,343,576	15.7%
Religious	68	9,806,408	71,591,479	0	81,397,887	34.5%
<b>TOTAL BUILDING LOSS</b>	<b>25,252</b>	<b>3,396,210,203</b>	<b>3,021,104,661</b>	<b>842,302,331</b>	<b>7,259,617,195</b>	



# Risk Assessment – Flood (LSU)



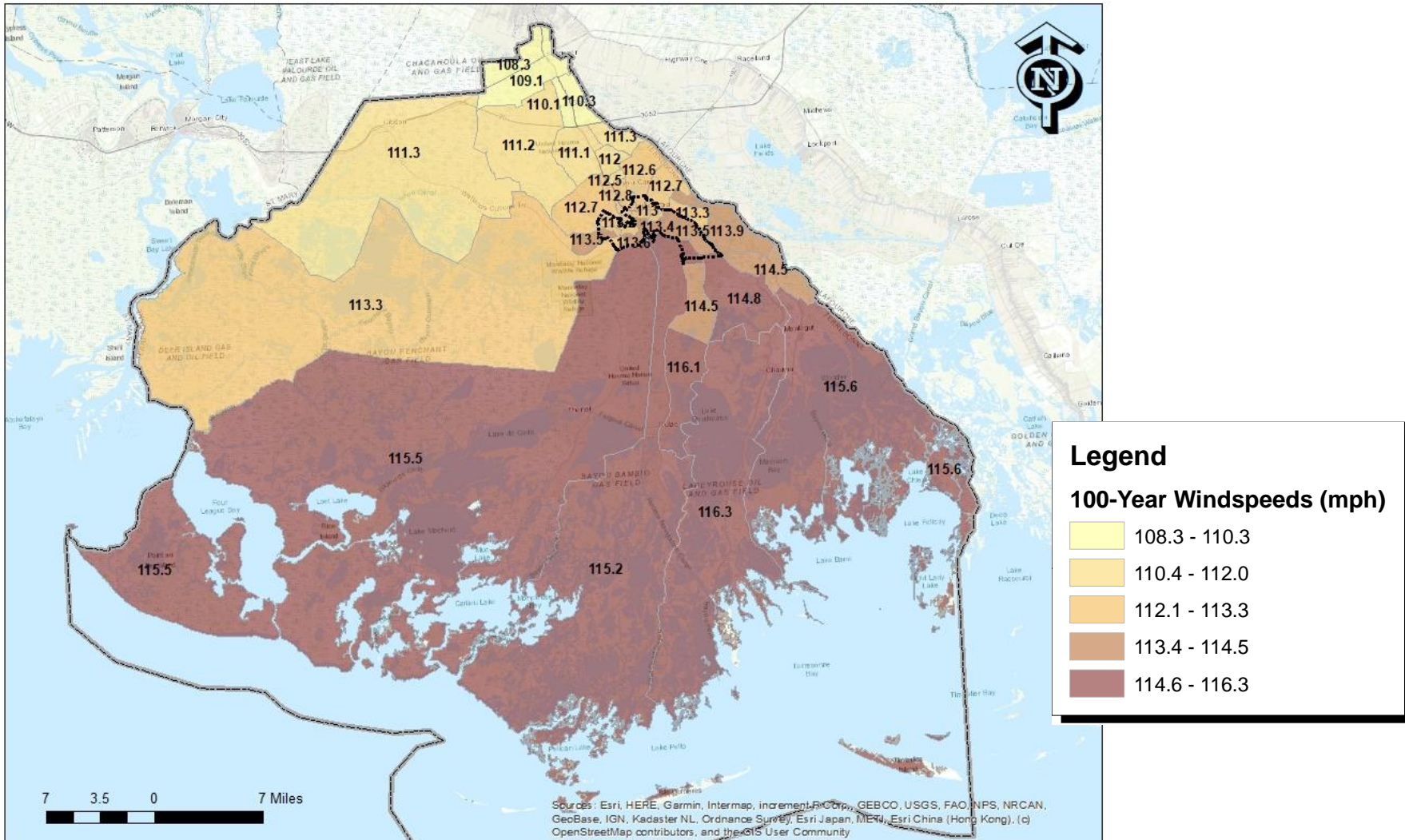
# Risk Assessment – Flood (LSU)



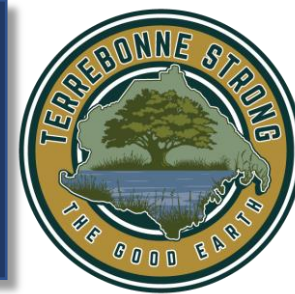
\*LSU Hurricane Ida surge does take levee system into account

Building Impacts	Buildings Impacted	Structure Loss (\$)	Content Loss (\$)	Inventory Loss (\$)	Total Loss (\$)	Loss Ratio
Single-Family Housing	2,010	70,031,537	41,573,449	0	111,606,996	11.0%
Manufactured Housing	0	0	0	0	0	0.0%
Multi-Family Housing	24	586,515	290,109	0	876,648	11.0%
Other Residential	10	869,823	1,809,392	0	2,679,225	12.8%
Commercial	189	13,976,481	41,594,611	37,271,056	92,842,337	14.9%
Industrial	16	1,752,212	3,096,888	557,207	5,406,323	21.0%
Government	14	703,036	4,751,046	0	5,454,096	15.4%
Education	4	318,403	1,719,967	0	2,038,374	6.2%
Agricultural	0	0	0	0	0	0.0%
Religious	1	7,589	97,409	0	104,999	0.3%
<b>TOTAL BUILDING LOSS</b>	<b>2,268</b>	<b>88,245,596</b>	<b>94,932,871</b>	<b>37,828,263</b>	<b>221,008,998</b>	

# Risk Assessment – 100-Year Wind



# Risk Assessment – 100-Year Wind



Building Impacts	Structure Loss (\$)	Content Loss (\$)	Inventory Loss (\$)	Total Loss (\$)	Loss Ratio
Single-Family Housing	833,881,245	296,664,236	0	<b>1,130,545,481</b>	5.5%
Manufactured Housing	8,557,354	2,996,133	0	<b>11,553,488</b>	12.2%
Multi-Family Housing	196,682,956	36,928,106	0	<b>233,611,062</b>	8.7%
Other Residential	11,684,454	2,049,429	0	<b>13,733,883</b>	7.8%
Commercial	292,247,423	163,024,716	33,238,288	<b>488,510,427</b>	4.1%
Industrial	86,651,442	66,645,786	9,885,132	<b>163,182,360</b>	7.3%
Government	10,490,547	6,403,789	0	<b>16,894,336</b>	2.0%
Education	52,202,438	29,827,994	0	<b>82,030,432</b>	5.7%
Agricultural	713,694	426,636	402,673	<b>1,543,003</b>	7.2%
Religious	9,783,364	4,695,607	0	<b>14,478,971</b>	2.8%
<b>TOTAL BUILDING LOSS</b>	<b>1,502,894,917</b>	<b>609,662,432</b>	<b>43,526,093</b>	<b>2,156,083,443</b>	

# Summary of the Steering Committee Takeaways from Data



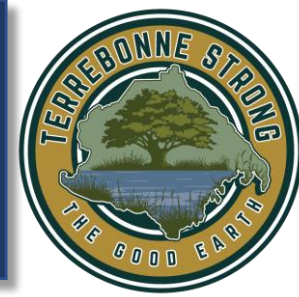
- Shift from mostly flood based risk reduction
- Pivot to wind after Hurricane Ida
- Energy Provision a new Focus
  - Microgrids for Hubs or Isolated Communities
  - System Hardening
- Long-term Sheltering with Public Buildings
- Extreme Heat and Cold
- Use new data on poverty to focus on the underserved
- (the next page shows how to capture this in the plan)

# Mitigation Goals



- Mitigation goals must reduce the risk of the identified hazards.
- Mitigation goals are broad, long-term policy and vision statements that explain what is to be achieved by implementing the mitigation strategy.

# Revised Mitigation Goals



**Goal 1:** Identify and pursue preventive measures that will reduce future damages and preserve lives from natural hazards.

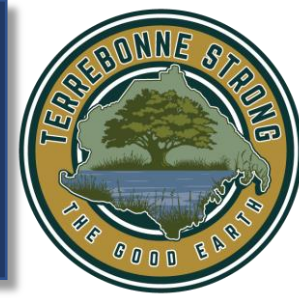
**Goal 2:** Increase resilience of all entities, facilities, and utilities that support all lifelines through a systems-based analysis that includes support services, equipment and personnel.

**Goal 3.** Enhance public awareness, public education, and understanding of local vulnerabilities and risk reduction practices.

**Goal 4:** Reduce repetitive flood losses in the parish and continue participation in the Community Rating System program.

**Goal 5:** Facilitate sound development and implementing nature-based solutions in the parish to reduce or eliminate the potential impact of hazards.

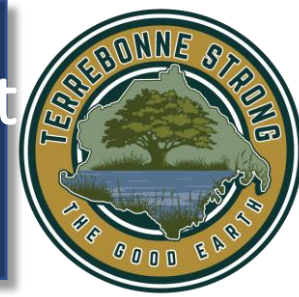
# Mitigation Objectives



- Detailed statements of direction that indicate what is necessary and important to achieve for risk reduction.
- Support mitigation goals.

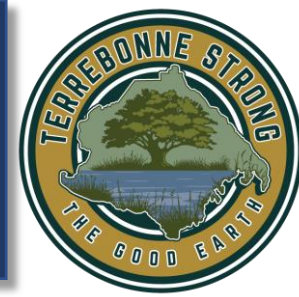


# Goal 1: Identify and pursue preventive measures that will reduce future damages from natural hazards.



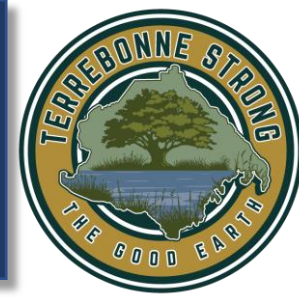
- 1.1: Ensure existing structures are structurally sound to endure hurricane-force winds
- 1.2: Ensure all citizens and employees of Terrebonne Parish are safe from natural hazards
- 1.3: Ensure all first responders are adequately equipped and trained to respond to a storm event
- 1.4: Protect historic and cultural resources, such as cemeteries and gathering places from all natural hazards

## Goal 2: Increase resilience of all entities, facilities, and utilities that support all lifelines through a systems-based analysis that includes support services, equipment and personnel.



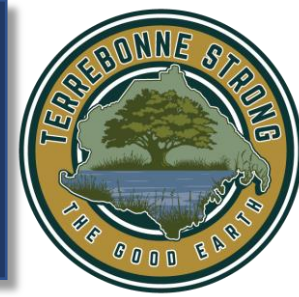
- **2.1:** Create resilient power infrastructure tailored to serve all areas of the parish.
- **2.2:** Provide resilience hubs with access to power, health, sanitation and communication support for critical facilities and public use.
- **2.3:** Enhance safety and resilience of public facilities including schools, libraries, recreation facilities and auditoriums to serve as shelters and resilience hubs.
- **2.4:** Study and support pre-placement or isolation of water sources for health and safety and air conditioning functionality immediately after an event.
- **2.5:** Ensure access to health services for first responders during events and the public during recovery.
- **2.6:** Seek out and encourage public private partnerships to achieve risk reduction and resilience goals.

# Goal 3. Enhance public awareness, public education, and understanding of local vulnerabilities and risk reduction practices.



- **3.1:** Increase public awareness of hazard areas.
- **3.2:** Educate the public on mitigation through existing channels and organizations and their memberships.

## Goal 4: Reduce repetitive flood losses in the parish and continue participation in the Community Rating System program.



- **4.1:** Eliminate threat of flood damage to structures in Terrebonne Parish including storm surge and levee failure.
- **4.2:** Eliminate threat of flood damage to utility infrastructure

## Goal 5: Facilitate sound development and implementing nature-based solutions in the parish to reduce or eliminate the potential impact of hazards.



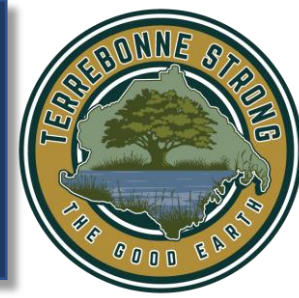
- **5.1:** Promote and permit commercial and industrial development, including public critical facilities, outside of hazard areas to limit business interruption, property damage, and impairment to critical facilities in strict accordance with the parish zoning, flood management, and other applicable state and federal regulations.
- **5.2:** Promote preservation and/or conservation of flood prone areas for parish parks, recreation areas, and general flood plain management.

# Mitigation Actions



- Mitigation actions are a measure, project, plan or activity proposed to reduce current and future vulnerabilities described in the risk assessment.

# Typical Mitigation Actions



Local Plans and Regulations



Structure and Infrastructure Projects

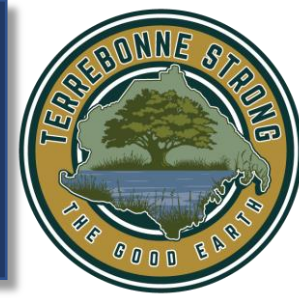


Natural Systems Protection



Education and Awareness Activities

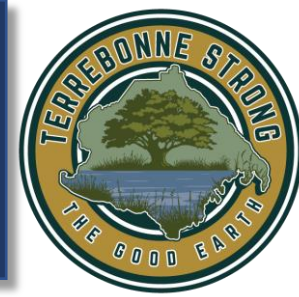
# 2023 New Mitigation Actions



- Utility mitigation
  - Electrical grid hardening
  - Drainage upgrades
  - Microgrids for isolated communities or resilience hubs
- Roof hardening (Fortified Standards)
- Vessel Safety/Transportation
- Hospital Resilience
- Generators for Tier 2 essential facilities
- Cooling and Heating Centers
- Additional flood modeling – integrating the levee system
- Additional flood mitigation? Other mitigation?

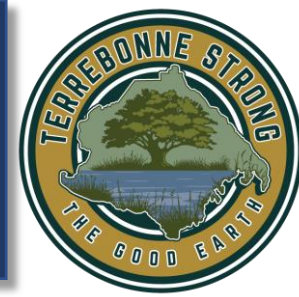


# Project Assessment



- Social – Does the public support the mitigation?
- Technical – Is the mitigation technically feasible and is it effective at reducing future losses?
- Administrative – Are the resources available: staffing, funding, and maintenance requirements met?
- Political – Is there a political champion and support?
- Legal – Are proper laws, ordinances, and resolutions in place to support the mitigation?
- Economic – Is the mitigation cost effective?
- Environmental – How will the mitigation impact the land and water, endangered species?

# Next Steps



- Review plan (if you haven't already)

[www.tpcg.org/files/flooding/HMPU2023-draft-plan.PDF](http://www.tpcg.org/files/flooding/HMPU2023-draft-plan.PDF)

- Provide comments by March 7, 2023

[http://www.tpcg.org/index.php?f=flooding&p=contact\\_us\\_form](http://www.tpcg.org/index.php?f=flooding&p=contact_us_form)

The link allows for free text or attachments.

- Comments will be considered, included in the plan, and revisions made as necessary.
- March 13 and 15<sup>th</sup> the Council will Adopt or suggest revisions
- The Draft will be submitted to the State for review and then FEMA for approval.