

“On the road to coastal resilience”



A Community Self-Assessment

*Understanding how prepared your
community is for a disaster*

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Supplemental information and additional resources are available on the Web at masgc.org/ri

MASGP-08-014

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Disclaimer: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected using the Coastal Resilience Index for the purpose of evaluating the post-disaster adaptability of a community, and planning safety enhancements of that community, shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data. Information compiled using the Coastal Resilience Index is speculative, and is not presented to the community as a definitive statement of fact or prediction, but rather an assessment that may encourage a community to seek further consultation.

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Resilience Index Team

Community Name _____

Date Completed _____

Name	Title

Date proposed for next Index assessment _____

Additional information and resources can be found at masgc.org/ri

INTRODUCTION

The purpose of this self-assessment is to provide community leaders with a simple and inexpensive method of predicting if their community will reach and maintain an acceptable level of functioning after a disaster. Experienced local planners, engineers, floodplain managers or administrators can complete this self-assessment using existing sources of information from their community. The goal is for every community to become highly resilient. The assessment may identify problems your community should address before the next disaster and where resources should be allocated.

Results of the assessment are presented as a Resilience Index that estimates the adaptability of your community to a disaster. This self-assessment was created to identify areas in which your community may become more resilient. Your community's unique Resilience Index is an internal evaluation tool and should not be used to compare your community with others.

The Resilience Index and methodology does not replace a detailed study just as a self-examination for skin cancer is not a substitute for a check-up and tests by a dermatologist. But, the Resilience Index resulting from this Community Self-Assessment may encourage your community to seek further consultation.

DISASTER RESILIENCE is the capacity of a community exposed to hazards to adapt, by resisting or changing, in order to reach and maintain an acceptable level of functioning and structure.

RESILIENCE is determined by the degree to which the community is capable of organizing itself to increase its capacity for learning from past disasters.

Definitions are from the Subcommittee on Disaster Reduction. 2005. Grand Challenges for Disaster Resilience. National Science Technology Council, Committee on Environment and Natural Resources. Washington, D.C.: National Science and Technology Council.

NOTE: This Community Self-Assessment is date-specific and should be periodically applied as the community grows and/or the landscape changes, such as when shoreline erosion accelerates. Your community officials should conduct new assessments on a regular basis (annual, biannual, etc.) because of this growth and/or change.

RESULTS OVERVIEW

After completing this self-assessment, you should complete the summary that will help you calculate your Resilience Index (see pages 9 and 10).

The Resilience Index used in this self-assessment will be defined as LOW, MEDIUM or HIGH.

The rating will give you an idea of how long it may take your community to provide basic services and reoccupy homes and businesses after a disaster.

For more details about interpreting Resilience Index results, go to page 11.

BUILD YOUR SCENARIOS

Use the definitions of Bad and Future Storm below to complete the table. Decide as a group what the best benchmarks would be based upon your past experience, historical records, and prior knowledge. You will then refer to these benchmark storms to complete the rest of the Index.

Bad Storm: Select a benchmark storm you will use to answer questions on the Index. Look back at historical events to help you determine as a group which storm would be the best to use. Remember, this is a self-assessment, so try and select a benchmark you feel will give you the most information about where the community vulnerabilities may be.

Future Storm (greater intensity): Select a storm which would be 50 percent worse than the “bad storm” you selected. For example, what if the storm surge was higher? The rainfall greater? This is to assist you in preparing for a future event that has not been witnessed in the historical records.

Variables	Bad Storm (benchmark) Scenario 1 Name:	Future Storm (greater intensity) Scenario 2 Name:
Wind speed at landfall (mph)		
Rain (total/24hours)		
Storm Surge (height in feet)		
Direction		
Speed of Movement		
Duration		
Tidal Influence (high or low)		
Landfall Location		

CRITICAL INFRASTRUCTURE AND FACILITIES

The following are key indicators that will give a preliminary assessment of your community’s disaster resilience. A more detailed assessment process is available in the FEMA 386-2 publication (fema.gov).

1. Place a check mark in the column where your community’s critical infrastructure and facilities are located. You may need to use flood maps to determine where the boundaries would be. If the facility is located in multiple areas, put a check in all that are applicable. Then put a check mark in the last column if the infrastructure or facility is functional after a disaster (assuming Scenario 1). Use the total check marks in the last column for Section A and Section B to complete page 9, “Determining Your Resilience Index”.

	Special Flood Hazard Area (SFHA)	Bad Storm Scenario 1	Future Storm Scenario 2	Infrastructure or facility functions after disaster
<i>Example: Power grid</i>		√		√
Section A: Critical Infrastructure				
Wastewater treatment system				
Power grid				
Water purification system				
Transportation/evacuation routes				
Total check marks for Section A:				
Section B: Critical Facilities*				
City Hall or other local government building(s)				
Police station or other law enforcement building(s)				
Fire station(s)				
Communications main office or substations				
Emergency operation center				
Evacuation shelter(s)				
Hospital(s)				
Critical record storage				
Total check marks for Section B:				

* Critical facilities may be defined a certain way in an ordinance. However, each community may identify other structures they consider critical. If you need assistance locating critical infrastructure and facilities, you can refer to the mapping tool that accompanies the Index.

TRANSPORTATION ISSUES

2. Assuming Scenario 1, if any of the following affect your transportation/evacuation route(s), will your community regain a pre-storm level of service within one week? Check Yes or No.

Transportation issue*	Yes	No
<i>Example: Will flood-prone areas (tunnels, roads in low-lying areas) be operational within one week?</i>	✓	
Will primary bridge(s) be out for less than one week?		
Will roads blocked by storm debris (trees, wrack) be cleared in less than one week?		
Will washouts (roads) be passable in less than one week?		
Will flood-prone areas (tunnels, roads in low-lying areas) be operational within one week?		
Is public transportation available to assist evacuation of residents unable to evacuate on their own?		
Is there more than one evacuation route?		
Is there a plan for post-storm traffic management?		
Total number of Yes answers and No answers:		

ADDITIONAL NOTES

DID YOU KNOW?

Communities can receive up to 50 points through the National Flood Insurance Program's Community Rating System for protecting critical access routes.

*Some communities use waterways as transportation infrastructure and/or evacuation routes (canals, docks, streams, marinas, and ferries).

COMMUNITY PLANS AND AGREEMENTS

3. Does your community have the following plans, personnel or agreements in place? Check Yes or No.

Does your community:	Yes	No
<i>Example: Have a certified floodplain manager?</i>		✓
Participate in the FEMA Community Rating System? (Rating of 8 or lower)		
Use an early flood warning system?		
Have a certified floodplain manager?		
Have planning commissioner(s) with formal training in planning?		
Have a planning staff with credentials from the American Institute of Certified Planners (AICP)?		
Have a FEMA-approved and state EMS-approved mitigation plan?		
If you have an approved mitigation plan, has it been revised in the past two years?		
Have Memorandums of Understanding (MOUs) or Memorandums of Agreement (MOAs) with neighboring communities to help each other during times of disaster?		
Have a comprehensive plan or strategic plan that addresses natural disasters?		
Have a floodplain manager or planner who participates in the following organizations: Association of State Floodplain Managers or State Floodplain Management Association?		
American Planning Association (APA) or state APA chapter?		
American Society of Civil Engineers (ASCE) or state or local section of ASCE?		
American Public Works Association?		
Have first-hand experience with disaster recovery within the last 10 years?		
Have a communication system to use before, during and after a disaster?		
Total number of Yes answers and No answers:		

ADDITIONAL NOTES

DID YOU KNOW?

Communities with a multi-hazard mitigation plan can receive up to 294 points through the Community Rating System.

MITIGATION MEASURES

4. Has your community implemented the following ongoing mitigation measures or projects?
Check Yes or No.

Mitigation measures in place	Yes	No
<i>Example: Relocation of buildings and infrastructure</i>		√
Elevation of residential, nonresidential buildings, or infrastructure to National Flood Insurance Program standards for your community*		
Relocation of buildings and infrastructure from flood-prone areas		
Flood-proofing of nonresidential structures		
Education programs about mitigation options for your community		
Acquisition of repetitive loss structures, infrastructure, or property		
Incentives-based mitigation measures		
Adoption of the most recent International Building Codes		
Hiring certified building inspectors		
Staffing an adequate number of people to enforce building codes		
Have completed or planned shoreline restoration projects for critically eroding areas		
Require the protection and maintenance of sensitive coastal habitats, ecosystems, and natural features (dunes, barrier islands, salt marshes, mangroves)		
Have undeveloped public lands, such as parks, forests or preserves in the coastal high hazard areas (V-zone on FIRM map)		
Total number of Yes answers and No answers:		

ADDITIONAL NOTES

DID YOU KNOW?

Creating permanent no-build areas can earn a community up to 900 points through the Community Rating System. For buildings in hazardous areas that cannot be relocated or removed, retrofitting of existing structures is an option that can earn communities up to 2,800 points.

*Note that the Association of State Floodplain Managers recommends communities consider higher elevations than the minimum National Flood Insurance Program standard.

BUSINESS PLANS

5. What assets do the large retail stores (The Home Depot, Wal-Mart, etc.), grocery stores and fuel distributors in your community have to reopen after a disaster? If more than 50 percent of the businesses in your community have the following equipment or plans, mark yes. If fewer than 50 percent have the equipment or plans, check no.

Business equipment/plans*	Yes (50% or more)	No (Less than 50%)
<i>Example: Generators</i>		✓
Generators		
Backup options for basic needs (water, sewer, food, and communications)		
Plans to bring in staff to help reopen the business (considering impacts to staff)		
Plans for restocking		
Plans for ice distribution		
Total number of Yes and No answers:		

ADDITIONAL NOTES

DID YOU KNOW?

Communities that create a Post Disaster Recovery Plan can earn up to 10 points through the Community Rating System. This requires working with all sectors of the community.

*Businesses may include functioning marinas or ports as important distribution points after a disaster. If so, consider the assets these businesses have to reopen after a disaster.

SOCIAL SYSTEMS

6. Are there social systems that define your community or serve as the core of your community?
 Check Yes or No.

Social system category	Yes	No	If yes, describe relationship
<i>Example: Strong faith-based networks</i>	√		<i>Church networks</i>
Strong faith-based networks (counted on during a disaster)			
Cultural identity (unified Hispanic, Asian or other ethnic communities)			
Neighborhood associations Support members in times of need			
Business cooperative or working relations (industries that employ many residents, Chamber of Commerce, other business-related networks, etc.)			
Strong civic organizations (Kiwanis Club, Rotary Club, etc.)			
Total number of Yes answers and No answers:			

ADDITIONAL NOTES

DID YOU KNOW?

Several agencies, organizations, and programs provide information on flooding, erosion, and other coastal hazards. Communities that make hazard information available and accessible to the general public can earn up to 30 points through the Community Rating System.

DETERMINING YOUR RESILIENCE INDEX

To determine your Resilience Index for each section, use the following tables, which are based on the totals you entered for each section of the Index.

Section IA: Critical Infrastructure

Total number of infrastructure functioning after a disaster: _____

Number of check marks	Percentage of infrastructure and facilities functioning after a disaster	Resilience Index
0	0%	LOW
1	25%	LOW
2	50%	MEDIUM
3	75%	MEDIUM
4	100%	HIGH

Your critical infrastructure Resilience Index is _____.

Find out what your Resilience Index means on page 11.

Section IB: Critical Facilities

Total number of critical facilities functioning after a disaster: _____

Number of check marks	Percentage of critical facilities functioning after a disaster	Resilience Index
1	13%	LOW
2	25%	LOW
3	38%	LOW
4	50%	MEDIUM
5	63%	MEDIUM
6	75%	MEDIUM
7	88%	HIGH
8	100%	HIGH

Your critical facilities Resilience Index is _____.

Find out what your Resilience Index means on page 11.

Sections 2-6: Transportation, Community Plans, Mitigation Measures, Business Plans and Social Systems

Use the box labeled “Total number of Yes answers” from Sections 2-6 to complete the following chart.

Sections 2-6	Number of Yes answers	Translate number of Yes answers to Resilience Index	Resilience Index	Comments
<i>(Example) Section 2: Transportation issues</i>	<i>1</i>	<i>2 or fewer (LOW) 3 to 4 (MEDIUM) 5 or more (HIGH)</i>	<i>LOW</i>	<i>A road construction project will create an additional evacuation route within a year. Also, we are in talks with the local public transportation provider about a program to assist evacuation.</i>
Section 2: Transportation Issues		2 or fewer (LOW) 3 to 5 (MEDIUM) 6 or more (HIGH)		
Section 3: Community Plans and Agreements		4 or fewer (LOW) 5 to 8 (MEDIUM) 9 or more (HIGH)		
Section 4: Mitigation Measures		4 or fewer (LOW) 5 to 8 (MEDIUM) 9 or more		
Section 5: Business Plans		1 or fewer (LOW) 2 to 3 (MEDIUM) 4 or more (HIGH)		
Section 6: Social Systems		1 or fewer (LOW) 2 to 3 (MEDIUM) 4 or more (HIGH)		

ADDITIONAL NOTES

INTERPRETING RESILIENCE INDEX RESULTS

RESILIENCE INDEX: A Resilience Index is an indicator of your community’s ability to reach and maintain an acceptable level of functioning and structure after a disaster.

After completing the Summary section of this self-assessment, your Resilience Index was identified as **LOW**, **MEDIUM** or **HIGH** in different categories.

LOW Resilience Index. A low Resilience Index indicates that your community should pay specific attention to this category and should make efforts to address the areas of low rating. If the critical infrastructure category received this rating, then reoccupation of your community may take more

than 18 months before basic services are restored.

MEDIUM Resilience Index. A medium Resilience Index indicates that more work could be done to improve your Resilience in this category. If the critical infrastructure category received this rating, reoccupation of your community may take less than 2 months before basic services are restored.

HIGH Resilience Index. A high Resilience Index indicates that your community is well prepared for a storm event. If the critical infrastructure category received this rating, then the community probably will not suffer or will have minimal damage (can be functional in less than two weeks) to basic services.

NEXT STEPS

Regardless if your city has a **HIGH**, **MEDIUM** OR **LOW** Resilience Index, you should learn about and investigate the weaknesses you have identified during this process. Refer to the references page for additional information on resources, training, and support.

For more information, contact the NOAA Gulf of Mexico Coastal Storms Program Outreach Coordinator, Mississippi-Alabama Sea Grant Consortium, 703 East Beach Drive, Ocean Springs, MS, 39564, or (228) 818-8829.

ACKNOWLEDGMENTS

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Bayou La Batre, AL	Dauphin Island, AL	Ocean Springs, MS	Port Arthur, TX
Biloxi, MS	Ft. Myers Beach, FL	Orange Beach, AL	Sarasota, FL
Cameron Parish, LA	Gulf Shores, AL	Pascagoula, MS	St. Tammany Parish, LA
Cedar Key, FL	Marco Island, FL	Pass Christian, MS	Steinhatchee, FL

A special thank you to members of the Gulf of Mexico Alliance Resilience Team and Gulf of Mexico Sea Grant Extension Specialists for their assistance in making suggested changes, pilot testing the draft versions, and promoting the use of the Index in local communities.

REFERENCES

Useful Definition

Critical facility (also called critical action) means facilities for which the effects of even a slight chance of flooding would be too great. The minimum floodplain of concern for critical facilities is the 0.2 percent chance flood level. Critical facilities include, but are not limited to facilities critical to the health and safety of the public such as: emergency operations centers, designated public shelters, schools, nursing homes, hospitals, police, fire and emergency response installations, vital data storage centers, power generation and water and other utilities (including related infrastructure such as principal points of utility systems) and installations which produce, use or store hazardous materials or hazardous waste (as defined under the Clean Water Act and other Federal statutes and regulations). Such facilities and access to such facilities will be constructed outside the one percent chance Special Flood Hazard Area or elevated/protected to or above the 0.2 percent chance flood level.

Additional Resources

Resilience Index Critical Facilities Mapping Tool: www.csc.noaa.gov/criticalfacilities

Risk and Vulnerability Assessment Tools: www.csc.noaa.gov/rva_tools

Community Rating System: <http://www.fema.gov/business/nfip/crs.shtm>

StormSmart Coasts Network: <http://stormsmart.org>

NOAA Coastal Storms Program: www.coastalstorms.noaa.gov

Gulf of Mexico Alliance Resilience Team: www.gulfofmexicoalliance.org/issues/resilience.html

Training

Gulf of Mexico Sea Grant College Programs: <http://gulfseagrant.org>

Florida Sea Grant: <http://www.flseagrant.org>

Louisiana Sea Grant: <http://www.laseagrant.org>

Mississippi-Alabama Sea Grant: <http://www.masgc.org>

Texas Sea Grant: <http://texas-sea-grant.tamu.edu>

Coastal Services Center: <http://www.csc.noaa.gov/training/>

National Estuarine Research Reserves Coastal Training Program: <http://gulfalliancetraining.org/>

Federal Emergency Management Agency: <http://training.fema.gov/>

AL Emergency Management Agency Training: <http://ema.alabama.gov/Organization/Preparedness/Training.cfm>

FL Division of Emergency Management Training: <http://floridadisaster.org/TrainingCalendar/index.asp>

LA Homeland Security & Emergency Preparedness Training: <http://www.ohsep.louisiana.gov/Training/>

MS Emergency Management Agency Training: <http://www.msema.org/training/>

TX Division of Emergency Management Training: <http://www.txdps.state.tx.us/dem/pages/Training.htm>

Networking

StormSmart Connect: <http://stormsmartconnect.org>

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In Memoriam

DR. ROD EMMER

1944 — 2008

The original concept for the Resilience Index was born from the work Dr. Emmer conducted in local communities through Louisiana Sea Grant. With his passing, the Gulf region lost a great resource of knowledge and experience in the fields of floodplain management, hazard mitigation, geography, and culture. Although he was not able to see this final version of the Index, it is sincerely hoped he would approve of the transformation this tool has made and its potential to assist many communities across the Gulf and the nation.

(Photo courtesy of Louisiana Sea Grant)

Coastal Resilience Index Critical Facilities Tool

<http://csc.noaa.gov/criticalfacilities/>

- assists communities in completing sections of the Index
- includes drop down menus for selecting your state, then county, or municipality
- generate and print reports directly from the site

The screenshot shows the NOAA Coastal Services Center website interface for the Coastal Resilience Index Critical Facilities Tool. The header includes the NOAA logo and navigation links: Home, About, Data, Tools, Training, How-To Guides, Publications, Partnerships, and Technical Assistance. The main heading is "Coastal Resilience Index Critical Facilities Tool". Below this, there are four numbered steps:

1. Check which elements to view: Map Results Table
2. Choose a State: then County or Municipality
3. Choose Visible Facilities: A list of facility types with checkboxes and radio buttons for visibility. The "All Facilities" section has a radio button set to "On".
 - Airports
 - Communication Towers
 - Electric Power Facilities
 - Emergency Operations Centers
 - Fire Stations
 - Hazardous Materials Sites
 - Medical Care Facilities
 - Oil Facilities
 - Police Stations
 - Potable Water Facilities
 - Rail Facilities
 - Schools
 - Waste Water Facilities
 - Flood Zone
 - Counties
 - Municipalities
4. Use the search box to locate a missing facility (ex., school, County Hospital, etc.)

The interface also features a map of the Gulf Coast region with various facility icons overlaid. A search box is located in the top right corner. The map data is attributed to 2010 Google, and there is a "View Printable Map" link at the bottom right.

StormSmart Coasts Network

<http://stormsmart.org/>

- Learn how to identify your community's risks
- Find ways to reduce those risks (and the funding to do so)
- Discover what other communities across the Gulf and the nation are doing to address their risks
- Find others working to protect their communities

