EVALUATION OF THE COMMUNITY RESILIENCE INDEX

A Community Planning Tool • *September 2014*

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Gulf of Mexico Alliance
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Gulf of Mexico Program
NOAA
Alabama Cooperative Extension System
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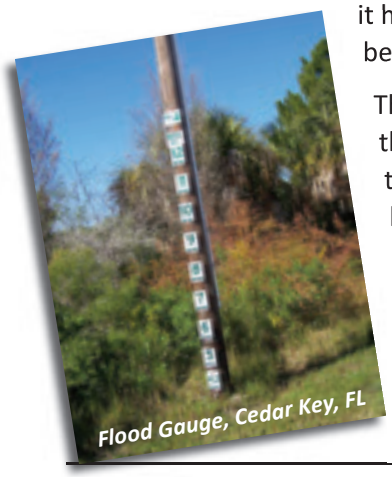
BACKGROUND

As the number of people moving to the Gulf Coast increases, so does the risk of exposure to floods, hurricanes, and other storm-related events. Although experience has shown that more homes and people located in the floodplain increases exposure and potential for people to be in harm's way, many coastal residents are complacent when asked about their preparation for the coming storm season. According to a poll conducted as part of the 2010 National Hurricane Survival Initiative, 77% of coastal residents on the Gulf and Atlantic coasts have not taken any steps in the past year to make their homes stronger; 47% have no hurricane survival kit; 45% don't feel vulnerable to a hurricane or related tornado or flooding; and 36% do not have a family disaster plan. (Mason- Dixon, 2011) This poll reported that over half of the participants would not leave home if a major storm was approaching or would only evacuate if ordered to do so by a local official. Additionally, it has been noted that natural disasters, such as hurricanes, can develop into a larger crisis, becoming for example an economic disaster (Telg et al 2008).



Flood Gauge, Cedar Key, FL

These results are particularly alarming for coastal managers and decision makers. In their role as community leaders, they would like to increase their communities' capacity to bounce back from stressors, reducing immediate impacts and long-term economic losses. However, this is a difficult task and requires having good baseline data detailing the current condition of a community in terms of its resilience to future disasters. Building resilience takes time and communities are at various levels of resilience (Chandra et. al, 2011 and Cutter, 2010). Crisis management planning is crucial for critical response; therefore, it is essential for communities to be able to measure their resilience to track progress in building resilience at the local level (Telg et al 2008).

DEVELOPMENT

The original concept for the Resilience Index was born from the work Dr. Rod Emmer conducted in local communities through Louisiana Sea Grant as well as his close collaboration with Dr. LaDon Swann who ran with the idea and worked with Dr. Emmer to compile a draft of what would become initial indicators for community resilience. The draft indicators were then refined and further developed with support from the NOAA Coastal Storms Program through a cooperative agreement with Mississippi-Alabama Sea Grant Consortium.

Recognizing that communities need support and assistance in determining their risk and resilience, the Gulf of Mexico Alliance (GOMA) formed the Community Resilience Priority Issue Team. According to the GOMA Action Plan II, resilience is the capacity of human and natural/physical systems to adapt to and recover from change. (GOMA, 2008) As one means to address gaps in existing knowledge of coastal residents and decision makers, the GOMA Resilience Team is committed to preparing a risk and resilience management toolbox. The GOMA Resilience Team identified the Coastal Community Resilience Index (CRI) as a specific tool that is needed in this toolbox to increase risk awareness among local communities of their susceptibility to natural hazard events. The purpose of this self-assessment tool 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 and structure 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 assessment may identify problems the community (city or county/parish) should address before the next disaster and where resources should be allocated. The goal is for every community to become highly resilient. Results of the assessment are presented as a CRI that estimates the adaptability of the community to a disaster.

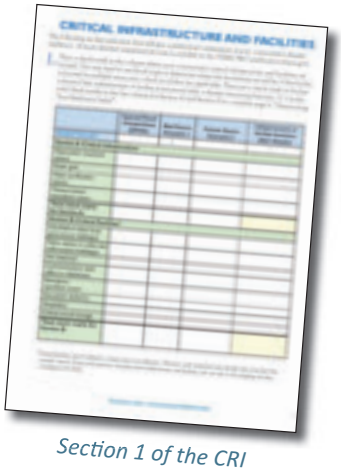
Elevated Homes, Ocean Springs, MS

FORMAT

The CRI consists of seven sections. The first, "Build Your Scenarios," serves to set a framework for meeting participants. They discuss the details of the worst tropical system they as a community have experienced, and then a storm of 50% greater magnitude. This section is not scored, but is used to inform the "Critical Infrastructure and Facilities" section, the only section dependent on location within the flood plain and function post-disaster for scoring. The final 5 sections, with yes/no answers are:

- Transportation Issues
- Community Plans and Agreements
- Mitigation Measures
- Business Plans
- Social Systems

Though the completion of the CRI does not earn a community credits in the Community Rating System (CRS), each section points out to the participant how items in that section can earn credits.



Section 1 of the CRI

SCORING

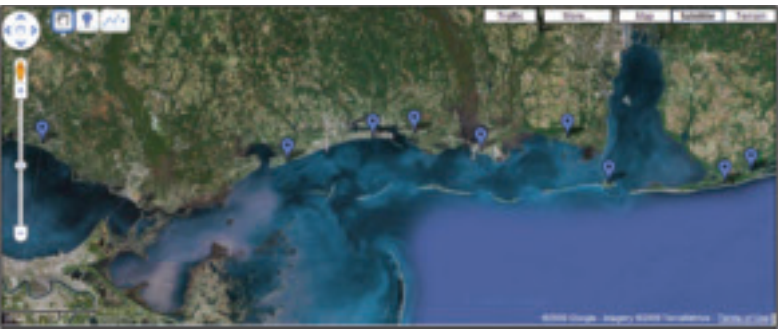
The CRI is intended to assist the community in identifying areas in which the community may become more resilient. The resulting score from this process may encourage the community to seek further consultation. Each section of the CRI is scored individually on a high-medium-low scale, with no overall score. The community's unique CRI is an internal evaluation tool and should not be used to compare communities. The process of completing the Resilience Index at the community level in small roundtable discussions, has proven to be the most important part of implementation and has sparked community action towards building resilience. The scores are used mainly as a baseline so communities can focus on where they are and chart a course for future growth and long term resilience.

PILOT TESTING

The CRI was pilot tested in 17 communities across the five Gulf states (Texas, Louisiana, Mississippi, Alabama, and Florida). The input collected in the pilot tests was used to refine the index. Communities volunteered their time to make suggested edits and additions to the draft indicators

CASE STUDIES - Perdido Beach, Alabama - *Population: 581*

The small town of Perdido Beach didn't even exist until 2009. Until then, the small, beach community in Alabama was an unincorporated area in Baldwin County. After completing the Index in June 2011, the Town updated their Comprehensive Plan to include a periodic review of the CRI to assess their progress towards being a more resilient community. The Town sought external funding to address an area identified during their Index meeting: developing a communications plan for the town that will engage and encourage citizens to provide input to guide their resilience planning effort.



Select Pilot Communities

as well as offer up case studies from their previous experiences. Pilot communities were selected based on the following criteria: (1) size of the community, (2) past experience with storms, (3) proximity to the coastline, and (4) representation from all five Gulf states. Pilot communities consisted of large and small communities, some with very recent disaster experience but others with little or no experience. This variety of selected communities helped inform pilot testers how the questions were being perceived by the intended audience and allowed for rephrasing and reworking of questions to better articulate the intent of indicators.

GULF OF MEXICO PROGRAM PROJECT

With pilot testing complete, the index had to be made available to community leaders and decision makers across the Gulf. Auburn University Marine Extension and Research Center (AUMERC) and the Mississippi-Alabama Sea Grant Consortium (MASGC), with funding from the EPA's Gulf of Mexico Program (GOMP), expanded the distribution of the CRI by using the train-the-trainer model, training facilitators in all five Gulf states and equipping them to serve as a liaison to coastal communities to deliver the CRI. A Regional Outreach Coordinator (ROC) served to guide facilitator training and ensure that communities in all Gulf states participated in the CRI during a three-year implementation and evaluation project.

METHODS

Train-the-Trainer Method

Results of the pilot testing suggest that the most effective means of implementation of CRI is in small, personal group settings where local managers, planners, and decision makers are all sitting at the same table discussing the items on the CRI while a facilitator guides discussion. In essence the process of completing the CRI was just as valuable, if not more, as the score the community received. In order to ensure participating communities experienced small facilitated group discussion, and to capitalize on local knowledge and contacts, focused intent was placed on training facilitators from Cooperative Extension and Sea Grant Extension programs, National Estuarine Research Reserves, National Estuary Programs, and other groups who worked with community resilience.

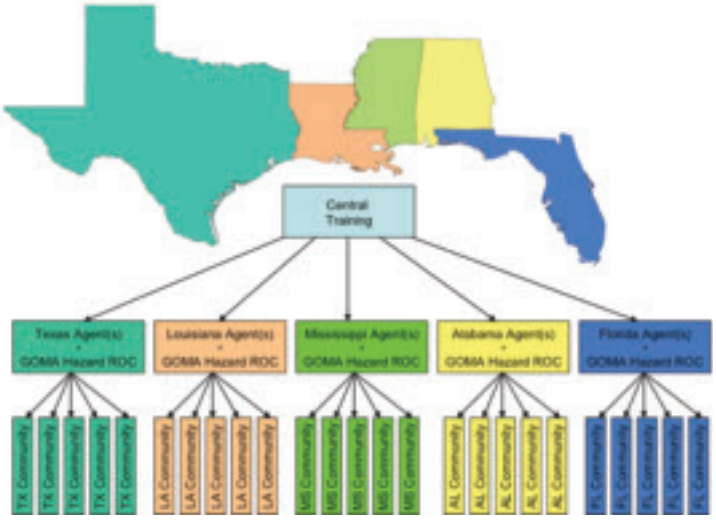


Figure 1. Dissemination Model for Gulf of Mexico Region

A series of three regional workshops (Tampa, FL, Biloxi, MS, and Lafayette, LA) were held through the first year of the project to maximize the number of facilitators trained. Through these trainings, participants would learn how to facilitate the discussion surrounding the CRI and serve as a resource to communities as they strive to address areas of weakness identified through the Index. These two-day workshops placed emphasis on neutral facilitation skills as well as the contents of the Index and its scoring. Participants experienced detailed discussion of CRI, facilitation training and dealing with difficult people provided by NOAA's Gulf Coast Services Center, and small group practice with the Index instrument. Participants were provided with a toolbox to assist in facilitation including introduction and follow-up form letters and an invitation worksheet to assist the community with developing a meeting participation list.

In all, seventy-four facilitators from all five Gulf states, Mexico, and Bangladesh completed the training. In return for the no-cost workshop, travel stipend (if requested), and training materials, the facilitators were asked to voluntarily report community meetings they organized and resulting scores to the ROC through an online system. It was understood the scores would inform the evaluation of the CRI instrument and that scores would remain anonymous for this purpose.

CRI completion

Trained facilitators were asked to hold CRI meetings with their local communities and report to the ROC. The reasons for this were two-fold: utilize local knowledge and connections and extend the efforts of the ROC. For the purposes of evaluation of the tool, a goal was set of

Facilitator Training, Biloxi, MS

twenty-five communities; five communities in each of the five Gulf states to each have one initial CRI exercise and one re-visit conducted. Facilitators worked within their local communities, using the tools provided in training, to identify and invite the appropriate community representatives to each meeting held.

The CRI was developed to give a quick baseline evaluation of a community's resilience before and after a tropical event and was designed to be completed in two hours or less. It is a snap-shot in time and should be periodically updated as the community grows and/or the landscape changes, like municipal elections or staff turnover occurs. It was developed with the intention that community officials should conduct new assessments on an annual basis.

Surveys

Approximately thirty months into the project, surveys were distributed to both facilitators and CRI community participants that had agreed to be contacted. These internet-based surveys used the tool SurveyMonkey with the express purpose of gathering qualitative data on the CRI and to investigate activities that were implemented following CRI participation.

RESULTS

Community Meeting Results

For the purposes of the evaluation of the CRI tool, only scores reported voluntarily by trained facilitators were used, though other communities may have participated in CRI meetings with trained facilitators. Based on information reported in the facilitator survey (see below), meetings were facilitated without scores being reported to the ROC. Participating communities were assigned a tracking number, so actual scores are not related to specific communities in this document.

Thirty-two municipalities, cities and parishes participated in a

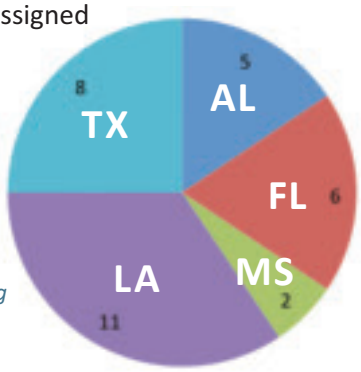
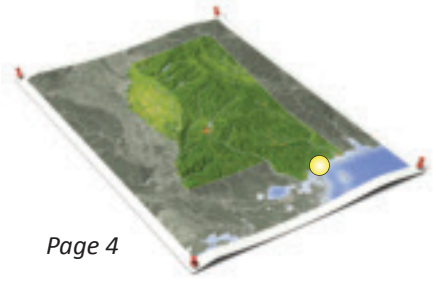


Figure 2. Number of Participating Communities by State

CASE STUDIES - Biloxi, Mississippi - *Population: 44,054*



Receiving a devastating impact from Hurricane Katrina in 2005, the city of Biloxi has participated in numerous planning and recovery exercises in recent years. However, during the CRI meeting, it was brought to light a lack of communication channels with the CSX railroad company, whose tracks bisect the city and cause potential issues in times of emergency and disaster. As a result of the CRI, Biloxi formed better emergency plans and network connections with the railroad company.

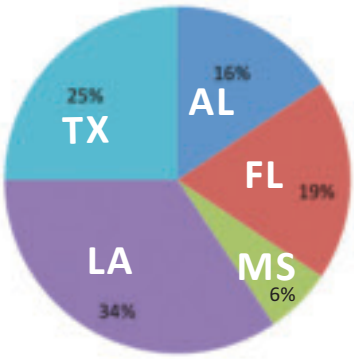


Figure 3. Percentage of Participating Communities by State

CRI meeting between April 2010 and August 2014, far surpassing the goal of twenty-five community participants.

The highest participation came from Louisiana (34%), followed by Texas (25%) and Florida (19%). Mississippi had the lowest participation (6%). (Figures 2&3) This is likely due to fewer trained facilitators working in that state and a lack of community interest as a result of oversaturation of resilience and recovery activities in the years following Hurricane Katrina. In addition, four Mississippi communities had previously pilot tested the Index before the implementation process. Nearly twice as many counties and parishes participated in CRI meetings as did municipalities. (Figure 4).

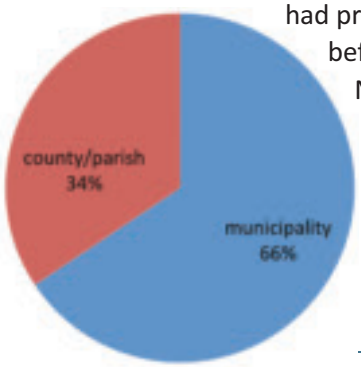


Figure 4. Municipality Participation vs. County/Parish Participation

Census data from 2010 shows a wide range of sizes of communities who participated. (Figure 5). Communities ranged in population from as small as 581 residents to as large as 900,000+.

It is recommended that communities participate in annual updates of the CRI, as it serves as a snapshot in time. Of the thirty-two communities who participated in a facilitated CRI meeting, only nine (30%) chose to participate in an annual follow-up meeting. (Figure 6). Facilitators familiar with local communities reported many reasons for the lack of participation in revisits, including a lack of significant changes over time and resilience planning fatigue. These reasons were reiterated in the participant survey (see below). It is also known that several communities who participated in an initial CRI visit began taking actions to address deficiencies identified in the exercise, i.e. sea level and climate change planning, and therefore felt they had "moved beyond" the effectiveness of the initial CRI exercise. For instance, rather than elect to participate in a follow-up meeting, two communities in Alabama participated in a Vulnerability, Consequences, and Adaptation Scenario (V-CAPS) exercise facilitated in part by MASGC, to create a community discussion around flooding, coastal hazards, and climate adaptation in their individual communities. Though they did not participate in a follow-up CRI visit, these further activities were a direct result of utilization of the CRI tool.

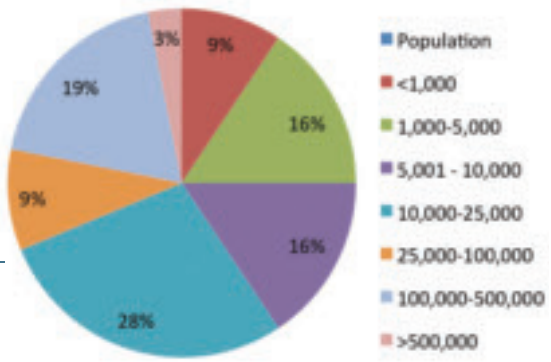


Figure 5. Population Distribution (2010 Census Data)

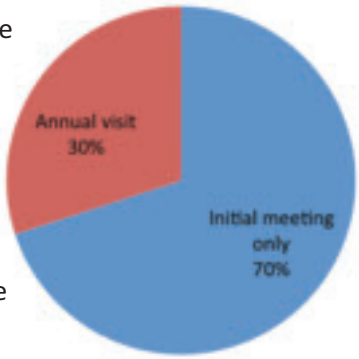


Figure 6. Communities with Annual Re-visit vs. Those with Initial Meeting Only

As mentioned previously, nine of thirty-two communities participated in a revisit. It was initially hypothesized that a measure of the effectiveness of the CRI would be resulting increases in scores after a secondary CRI meeting after one year. This proved not to be true in all cases.

Following revisits meetings, the majority of scores did not change, and in fact, some scores decreased. (Figures 7 & 8) Did communities become less resilient by utilizing the CRI? This is not likely. Several reasons can explain the lack of scoring increases.

- *Scores were already at the highest level.* Figure 7 shows the raw scoring data from the nine communities who participated in two meetings. Review of this data shows that many segments of the CRI were rated "high" in both the initial and follow up visit, so there would be no scoring increase over time.
- *Not enough time between meetings for significant changes to occur.* Implementing change at the municipal level can take time, sometimes several years. An annual re-examination of the CRI might not give enough time

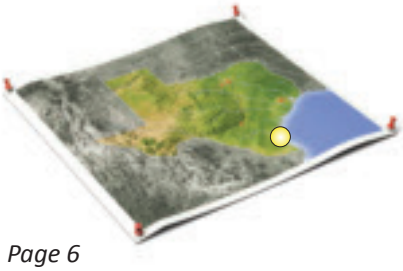
Community Code	Critical Infrastructure	Critical Facilities	Transportation Issues	Community Plans and Agreements	Mitigation Measures	Business Plans	Social Systems
CRI-11-003	Medium	Medium	Medium	High	Medium	High	High
CRI-11-003	Low	Low	Medium	Medium	Medium	High	Medium
CRI-11-008	Medium	High	High	High	Medium	Low	High
CRI-11-008	Medium	High	High	High	High	Low	High
CRI-11-009	Low	High	High	High	High	High	High
CRI-11-009	Medium	High	High	High	High	High	High
CRI-11-010	Medium	High	High	High	High	Low	High
CRI-11-010	High	High	High	High	High	High	High
CRI-11-012	Medium	Medium	High	High	High	High	High
CRI-11-012	Low	Medium	High	High	High	High	High
CRI-11-013	High	High	High	High	High	High	High
CRI-11-013	Medium	High	High	High	Medium	High	High
CRI-11-014	High	High	High	High	High	High	High
CRI-11-014	Medium	High	High	High	High	High	High
CRI-12-020	High	High	High	High	Medium	High	High
CRI-12-020	High	High	High	High	High	High	High
CRI-12-025	Low	Low	Medium	Medium	Medium	High	Medium
CRI-12-025	Medium	Low	Medium	Medium	Medium	High	High

Figure 7. Revisit Raw Scores

for actions to be implemented or have an effect.

- *Meeting attendees not consistent between meetings.* Staff turnover. Scheduling conflicts. Illness. There are many reasons that meeting attendees changed between two meetings. But because the Index is a self-assessment, differing attendees can mean differing opinions, and this can result in a decrease in a score from one year to the next.
- *Appropriate community representatives not in attendance.* Though facilitators and community contacts made efforts to ensure the appropriate aspects of the community were represented at meetings, this did not always occur. Consistently, the business and social systems groups were under- represented at meetings or not present at all. Without the appropriate local knowledge, sections of the CRI could not always be answered to their fullest, resulting in negative scoring differences.

CASE STUDIES - Ingleside, Texas - *Population: 9,387*



The small waterfront town of Ingleside, with help from their Sea Grant and National Estuarine Research Reserve partners, addressed their identified needs by holding a workshop on the Community Rating System, and participating in a visualization exercise. Developed by Texas Sea Grant, the Coastal Community Health and Resource Management (CHARM) tool incorporated GIS and Nintendo Wii technology into an hands-on community visualization tool, allowing the community to see the impacts of land use changes on coastal hazard planning.

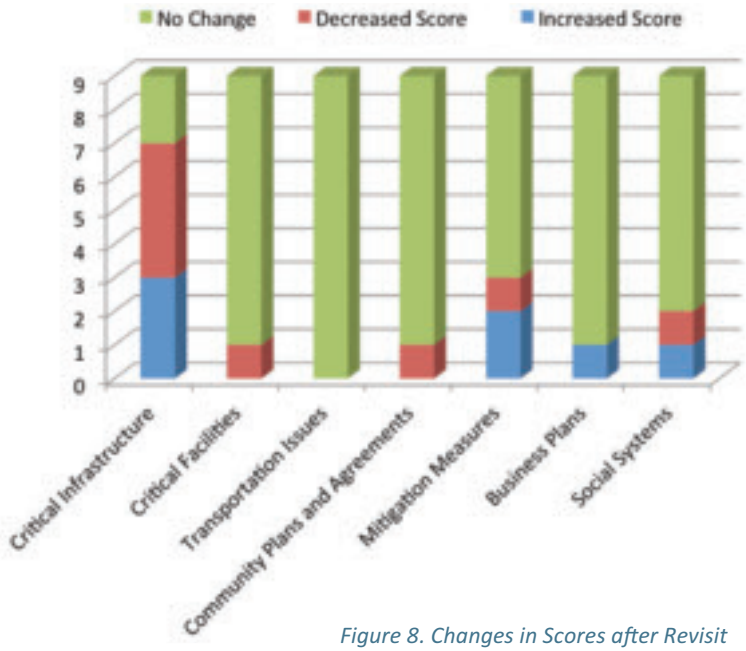


Figure 8. Changes in Scores after Revisit

- *Lack of available funding.* Some actions identified by communities required additional funding sources and these were not able to be secured in the one year period. However, some communities have put in proposals to address vulnerabilities identified in the CRI process.

Community Participant Survey

Survey invitations via SurveyMonkey were disseminated to community representatives that had participated in a CRI activity and gave permission to be contacted following that activity. Sixty-four invitations were sent to representatives of four states (Alabama, Florida, Louisiana, Texas) and sixteen communities at the city or county/parish level. Three invitations bounced back, and there were sixteen responses, for a 26.2% response rate. All responses were anonymous.

Of those that responded, 100% felt that the Community Resiliency Index (CRI) exercise helped them to understand the potential risks that their community faces from a coastal storm, and 100% felt the CRI reflects their needs as a community. The majority (93.3%) of respondents felt the CRI helped them understand the steps needed to improve their community's resiliency.

The vast majority (93.8%) of reporting participants felt participation in the CRI exercise was a good use of their time, and the same percentage felt participation in the CRI has made their community better prepared for major coastal storms by:

- "We have developed close working relationship with our federal and state partners: NWS, NOAA, Naval Research Lab, USACE (Vicksburg and New Orleans Districts) [Governor's] office for Homeland Security and Emergency Preparedness for contact pre, post and during storm events; for identifying deficiencies in forecasting... and for collaborative efforts in addressing these inadequacies (many Regional... MS & LA) through funding, massive data mining & collection, and modeling."
- "Education and reflection"
- "Knowledge, preparation"
- "We are viewing more as a group than by individual departments."
- "We were able to identify our businesses that provide critical services such as food, fuel, financial, medical and building repairs."
- "As a group, we had an opportunity to become aware of the preparations and measures in place by other agencies in our community and how they will respond to a storm event."

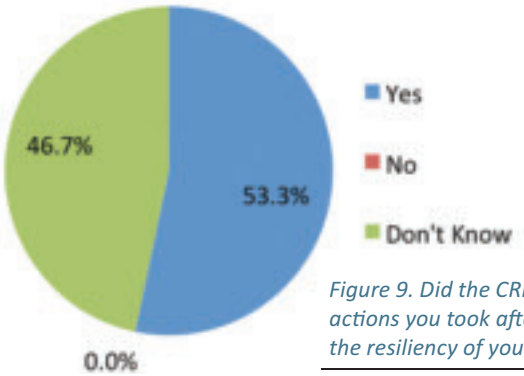
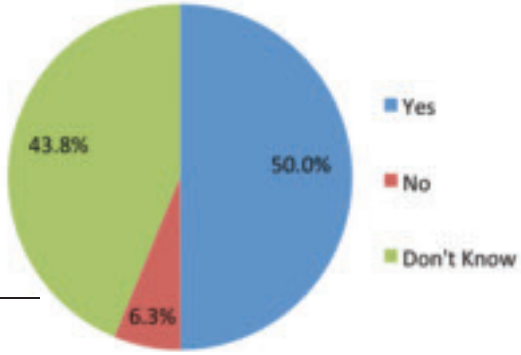


Figure 9. Did the CRI exercise and any actions you took afterwards improve the resiliency of your community?

Figure 10. Following the exercise, did your community take any actions to improve resiliency?



53.3% of respondents felt that actions taken by their community following the CRI improved the resilience of the community. (Figure 9). Nearly half (43.8%), however, were not aware if their community had taken any actions. (Figure 10).

Regarding the CRI's effectiveness as a tool, 50% of respondents reported their community had taken some action to improve resiliency following the CRI exercise. For 12.5% of respondents, activities taken as a direct result of CRI participation resulted in an improvement in the community's Community Rating System (CRS) rating. (Figure 11). This result is compounded by the fact that 25% of the respondents reported that their community does not participate in the CRS. Other actions included:

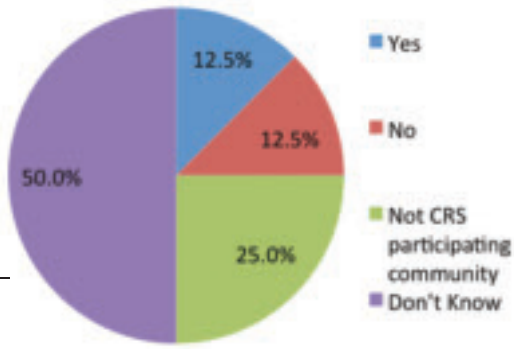


Figure 11. Did these actions lead to an improved Community Rating System score?

- "Made the Administration and Departments (specifically Engineering, [Department of Public Works] and Grants) more aggressive in acquiring funding for shovel-ready projects as well as future projects for resiliency. We have also developed a Master Plan for stormwater management that coincides with flood protection, wetland conservation and water quality improvement."
- "Sparked an update to our emergency response plan."
- Several comments regarding general increase in awareness of shortfalls and the value of group discussions.

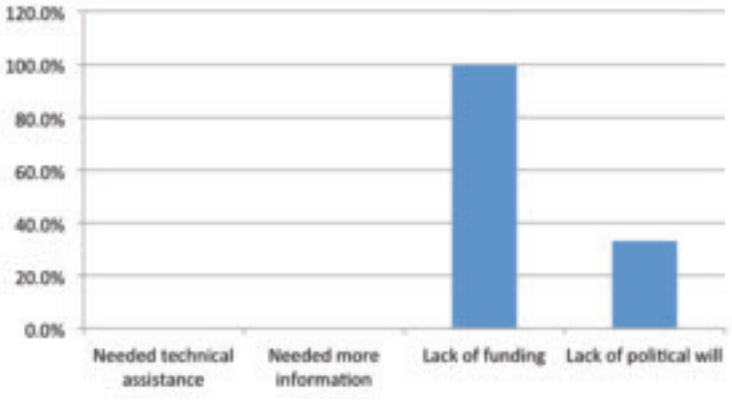


Figure 12. If no action was taken, what was the reason?

If a community did not take any action following the CRI exercise, it was likely due to a lack of funding or of political will. (Figure 12). One community participant noted that generators for businesses were identified as a critical need, but convincing the businesses to purchase them was difficult.

Survey participants were also asked open-ended questions on the topic of ways to improve the CRI. When asked if the six sections were sufficiently covered or if other topics should be added, one respondent wished for more information on business plans, social systems, and community plans and agreements. Another felt that more emphasis needs to be placed on communication across socio-economic sectors, noting that vulnerable minority populations were not included in their exercise. Other comments included:

- "Questions 1, 2, and 3 should have been scaled, or at least have added other options such as Fully, Somewhat, Not at all."
- "Use it on communities that have NO current plan in place to help them get started in the right direction. A community like ours that has been identifying and addressing resiliency measures for some time needs a different and more advanced type of assistance (ex.

CASE STUDIES - Foley, Alabama - *Population: 14,618*

Downtown Foley, Alabama is situated 12 miles north of the Gulf of Mexico. Though not a beach community, Foley still feels the effects of tropical systems and their impacts on area tourism. After participating in the CRI, participants here reported better communication among city offices regarding hazard planning. The Town participated in a project through the Mississippi-Alabama Sea Grant Consortium and Louisiana Sea Grant to assess their financial stability and ability to withstand the financial implications of tropical events. Foley recognized the benefit of participation in the Community Rating System, and teamed with a neighboring CRS-participating community to investigate joining the program.

innovative resiliency actions not currently employed, etc.) to move us forward."

Facilitator Survey

A similar survey via SurveyMonkey was sent to those who had attended facilitator trainings. The focus of this survey was to determine if the respondent had facilitated a CRI meeting (regardless of if the data had been reported) and feedback on the tool. Sixty-seven invitations were sent to representatives of all 5 states. Three invitations bounced back, one opted out, and there were nineteen responses, for a 29.6% response rate. All responses were anonymous.

Of the responses received, 63.2% had facilitated a CRI meeting with a community. Of those, 23% did not choose to report the meeting to the ROC. Time constraint was given as a reason meetings were not reported. Of the 36.8% of respondents who did not facilitate a meeting, lack of time, budget, or not being included in plans of work were the dominant reasons.

Respondents reported that the CRI exercise reflected the needs of the community(ies) they worked with (Figure 13), although it was noted that the CRI failed to address some circumstances, such as inland coastal flooding from rain rather than storm surge, and the lack of key community sectors at the meeting that led to inability to answer some questions.

When asked if the CRI sufficiently covered the six topic areas, the respondents agreed they were covered well, but made some suggestions for improvement, most notably with government-business communications:

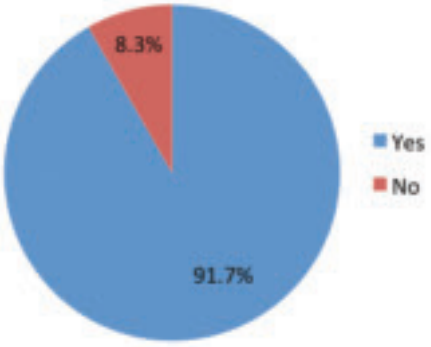


Figure 13. Did the exercise reflect the needs of the community(ies) you facilitated?

- More detailed exploration of
  - Transportation issues
  - Business plans
  - Social systems
- Incorporate more business planning for small businesses
- Difficult to incorporate region-specific topics
- Critical infrastructure and facilities section too complex

Fifty percent of respondents felt that the CRI should be expanded to include other topics. (Figure 14). Suggestions include:

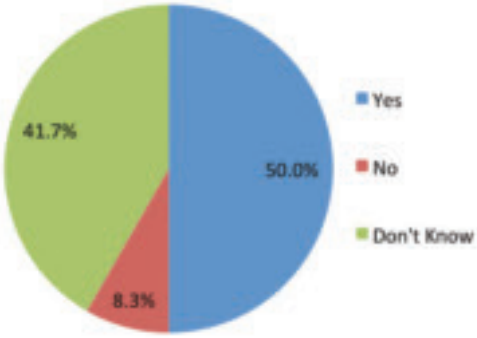


Figure 14. Do you feel that other topics should be covered in the CRI?

- Ecotourism
- Fisheries
- Industry
- Shipping/Ports
- Community Support and Partner organizations
- Other major economic drivers
- Community communication plans
- Green infrastructure
- Ecosystem services
- Break floodplain management and building and development practices into their own section
- Health and human services
- Schools/childcare

Other suggestions to improve the CRI are:

- Build Your Scenarios takes too long and participants overanalyze the numbers
- Clarify instructions for Critical Facilities and Infrastructure. The multiple storm scenarios are confusing to people.
- Add question on who is responsible for clearing streets following a storm event
- Transportation section unclear
- Business plans and social systems sections need improvement

Nearly 92% of respondents reported that the community(ies) they worked with requested further information or technical assistance from them (Figure 15),

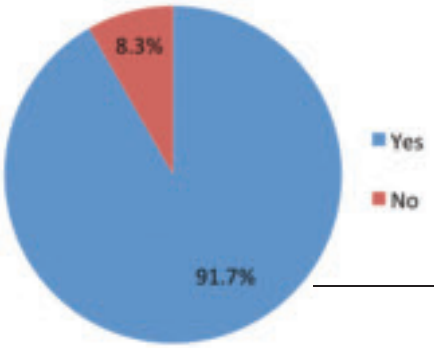


Figure 15. Did the community(ies) you worked with request any further information or technical assistance?

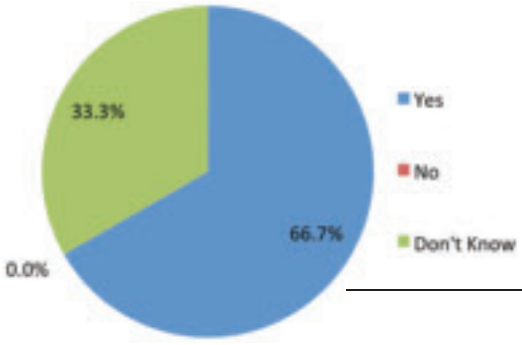


Figure 16. Do you plan to continue to use the CRI in the communities you work with?

and 66.7% will continue to utilize the CRI tool in their local communities. (Figure 16), though a few respondents noted difficulty in getting community participation for CRI follow-up visits and the need for technical support following the assessment:

- "The self-assessment tool is useful for getting a community to look at its resilience for the first time. However, it has been increasingly difficult to get communities to agree with a re-assessment, because capacity is such that improvements are difficult to make. The CRI is much more warmly received when there is follow up technical assistance associated with the self-assessment."
- "Our communities in Texas are burnt out on the resilience index. They don't want to reevaluate and they don't want to talk about it."

Further, open-ended comments were:

- "I feel it can also be used in non-coastal counties/ communities, especially if they have potential flooding issues associated with rivers or lakes."
- "I might weight the scoring of different sections differently depending on which items deliver the most resilience or are most valuable."
- "There might also be some consideration for the community locations. Perhaps a modified tool is needed for different location categories. I could see communities categorized as urban coastal, rural coastal, barrier island, and inland coastal. Each of these types of communities presents different opportunities and challenges that are difficult to capture with one uniform instrument."
- "One of the most meaningful exercises I have been through in my professional career. You could tell communities were honestly taking a look at their preparedness."
- "Promote the tool to colleagues. Also use for not-traditional audiences (youth)"
- "Sometimes confusing with small communities as to who from county level needs to participate, especially if the county also did the index."
- "The best part of the tool really wasn't the score, but the conversations it generated. Additionally, it helped solidify the relationship between the facilitator (Sea Grant) and the community."

Coastal Storms Program Evaluation

An evaluation of the Gulf of Mexico Coastal Storms Program (CSP) involved interviews with CRI community representatives in nine participating communities in Mississippi and Alabama. Interview questions in most cases were similar to the surveys above, but also concentrated on defining actions resulting from the CRI process as well as the usefulness of the tool. Because results of both this process and the survey conducted by the ROC are anonymous, there is likely some overlap in respondents; however, the information gathered by the CSP evaluation supports the information gathered in the evaluation of the CRI, specifically the usefulness of the open facilitated discussion, expanded community participation in resilience planning,

CASE STUDIES - Mandeville, Louisiana - *Population: 11,560*

Situated on the north shore of Lake Pontchartrain, Mandeville has been affected many times by hurricanes, most recently Hurricane Isaac in 2012, and, like much of southern Louisiana, is beginning to experience first-hand the effects of sea level rise. Working with the Louisiana Sea Grant Legal Program, the city participated in a workshop series on climate adaptation, resulting in draft sea level rise planning policy language. Mandeville is also pursuing strengthening business continuity planning, as identified in their CRI exercise.

and actions taken as a result of participation in the exercise. (Eastern Research Group, Inc., 2014)

EXPANDED USES

Expansion of the impact of the Index has taken place during the three-year implementation and evaluation project, though this was outside of the GOMP project funded work. Though designed specifically for the Gulf of Mexico region, as use of the CRI expanded and other regions learned of the tool, MASGC received demand for facilitator training in the New England and Pacific Islands regions

Expansion has also occurred on an international scale. Further expanding the CRI, in accordance with the GOMA mission to include Mexican regions in Gulf planning, a representative of the Veracruz Aquarium attended a facilitator training, and in August 2012, representatives of GOMA travelled to Villahermosa to assist in a CRI meeting facilitation. The CRI was translated into Spanish to better serve Mexican communities. Two representatives from Bangladesh became trained facilitators and took the CRI back to their home villages, where sea level is rising at an alarming rate. The Midwest Region Sea Grant programs used the CRI as a model to develop a Climate Change Readiness Index, adapting the Index to address drought, flooding, and winter storms. (Midwest Sea Grant) Expansion across the United States and into other countries shows the CRI is a tool that is easily adaptable to fit their specific needs.

Based on preliminary feedback from participants and facilitators and the availability of funding, four additional indices are in the development process. These indices are intended to be companion modules to the initial Community Resilience Index, and target sectors of the community outside the municipal/county/parish government structure, and that are vital to local coastal community economies. The Fisheries Resilience Index and Tourism Resilience Index, managed by MASGC, target the resilience of individual coastal businesses. At the time of this document, these two indices are in the pilot stage and will be released and implemented in the coming months.

At the beginning stages of development are the Ports and Harbors Index and Oil and Gas Index. These two indices are being coordinated through the Gulf of Mexico Alliance and are scheduled for completion in fall 2016.

RECOMMENDATIONS

Based on collected data, the recommended time between CRI visits might be extended to a bi-annual basis, unless there are local elections, staff turnover, or a major storm event. The “Build Your Scenarios” and “Critical Infrastructure and Facilities” sections should be clarified to make it easier for participants to understand.

In addition to the four expansion indices, the Community CRI should be expanded to include factors for health and human services and school system planning and recovery. Finally, there is demand for a simple resilience tool from many areas of the country, and not from only coastal communities. The CRI should include the flexibility to cover other natural hazards, such as drought and fire, and regional topics, both in the Gulf region and outside of it.

The CRI proves to be most beneficial if follow-up technical assistance and possibly funding opportunities are available to the participating communities.

CONCLUSION

Qualitative data suggests the CRI is an effective tool for improving community resilience. Surveys with both community participants and facilitators, as well as personal communications with both, affirm the CRI is a helpful tool in creating community discussion to improve resilience planning. It is particularly effective at creating a broad community discussion, and for initial discussions with communities, especially those with little or no resilience planning in place. The tool can also serve as an entry for further community planning, such as for sea level change or involvement with the Community Rating System (CRS). With some adaptation, the tool can better reflect all aspects of the community, and can easily be modified for use in other regions.

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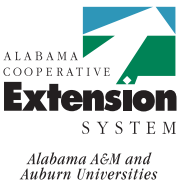
EVALUATION OF THE COMMUNITY RESILIENCE INDEX

A community planning tool



MASGP-12-037
This publication was funded by the U.S. Environmental Protection Agency under through the Gulf of Mexico Program award MX 95452310-0 and the U.S. Department of Commerce through a cooperative agreement between the National Oceanic and Atmospheric Administration's Coastal Storms Program and the Mississippi-Alabama Sea Grant Consortium under NOAA Grant NA07OAR4170510. Additional support was provided by the Gulf of Mexico Alliance Coastal Community Resilience Team under NOAA grant NA08NOS473398 and the Alabama Cooperative Extension System. The view expressed herein do not necessarily reflect the views of any of these organizations.