

Assessing environmental concerns and weather-related issues in coastal North Carolina

Survey Report, May 2017

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Introduction

The National Oceanic and Atmospheric Administration (NOAA) placed a Coastal Management Fellow at the N.C. Division of Coastal Management (DCM) from August 2016 to August 2018 to conduct vulnerability and needs assessments with coastal communities. As part of the needs assessment process, the Fellow collected information from local elected officials and staff along the North Carolina coast regarding environmental and weather-related issues in their communities. The survey gathered data regarding the most common environmental challenges faced by community officials and managers, as well as their needs in addressing those challenges. The purpose of the survey is to better understand the range of local experiences with environmental and weather-related issues, local government capabilities in relation to planning and recovery, and ways in which DCM can assist local governments in creating more resilient communities.

The survey was conducted during February 2017 and was comprised of a mixture of 20 open-response and multiple choice questions divided into three categories:

1. General information
2. Environmental issues
3. Local government needs

DCM sent the survey to town managers and planners in the 20 coastal counties. It was also advertised by the Department of Environmental Quality (DEQ). Out of the 335 people DCM contacted, 37 completed the survey for a response rate of 11 percent.

Section 1: General Information

The survey collected general demographic data to understand the audience and the areas they represent, including the county and town in which they work, as well as their position title within their local government.

Location

Carteret County was the best represented county in the survey with six respondents, closely followed by Craven and Dare counties with five respondents each. In total, 12 coastal counties and seven non-coastal counties were represented, with the remainder of counties having one or two respondents.

Local Government Positions

Thirty-seven respondents identified their positions within their communities. Elected officials represented the majority with 15 respondents, followed by planners with eight respondents. Town and county managers, emergency services personnel, finance-related personnel, and town clerks made up the remaining demographic.

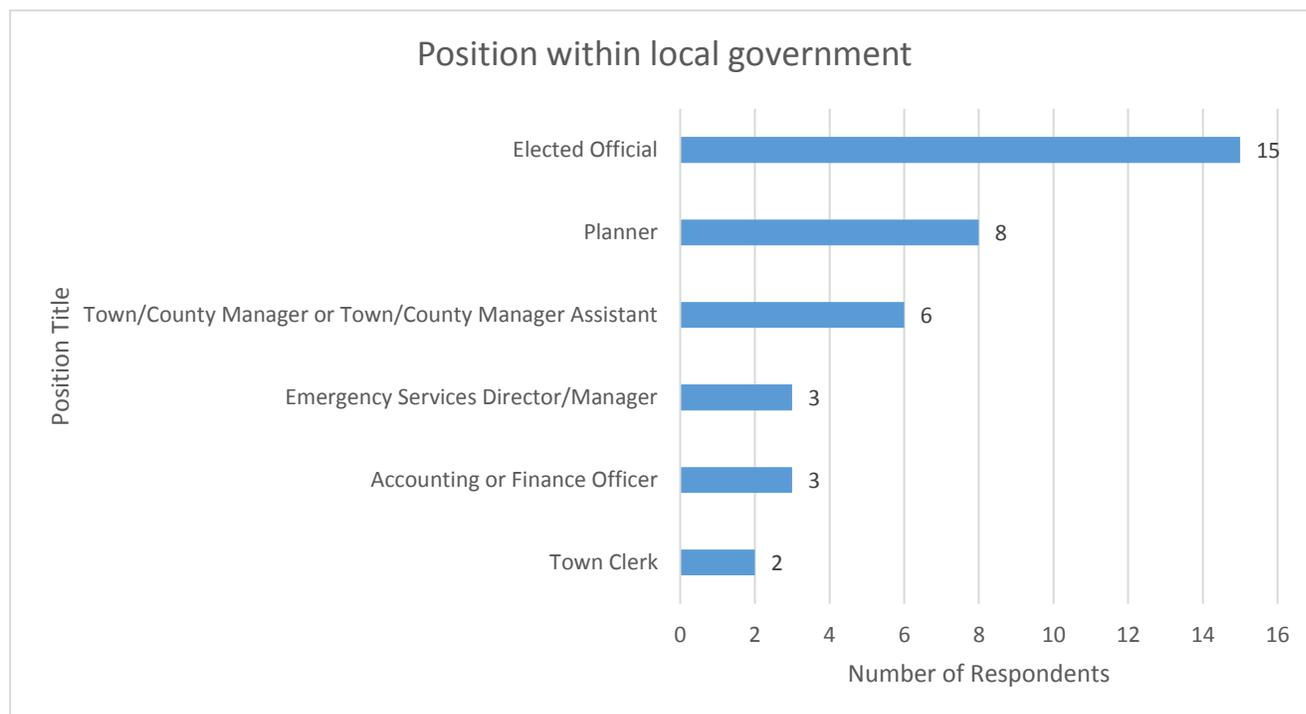


Figure 1: Respondents' positions within their local governments

Section 2: Environmental Issues

The survey questions on environmental issues were intended to identify priority concerns in individual coastal communities, as well as to find commonalities across communities. The survey also asked respondents about their community's prior planning efforts and ability to recover from a damaging weather event.

General environmental concerns

Thirty-five respondents indicated that their communities have experienced environmental issues in the past decade. The top three *most cited* issues were flooding/drainage/stormwater management issues (97 percent of respondents); hurricanes (83 percent); and damaging winds (74 percent). More than half of survey respondents have also experienced failing or damaged

infrastructure (57 percent) and Nor'easters (51 percent) in their communities during the past 10 years.

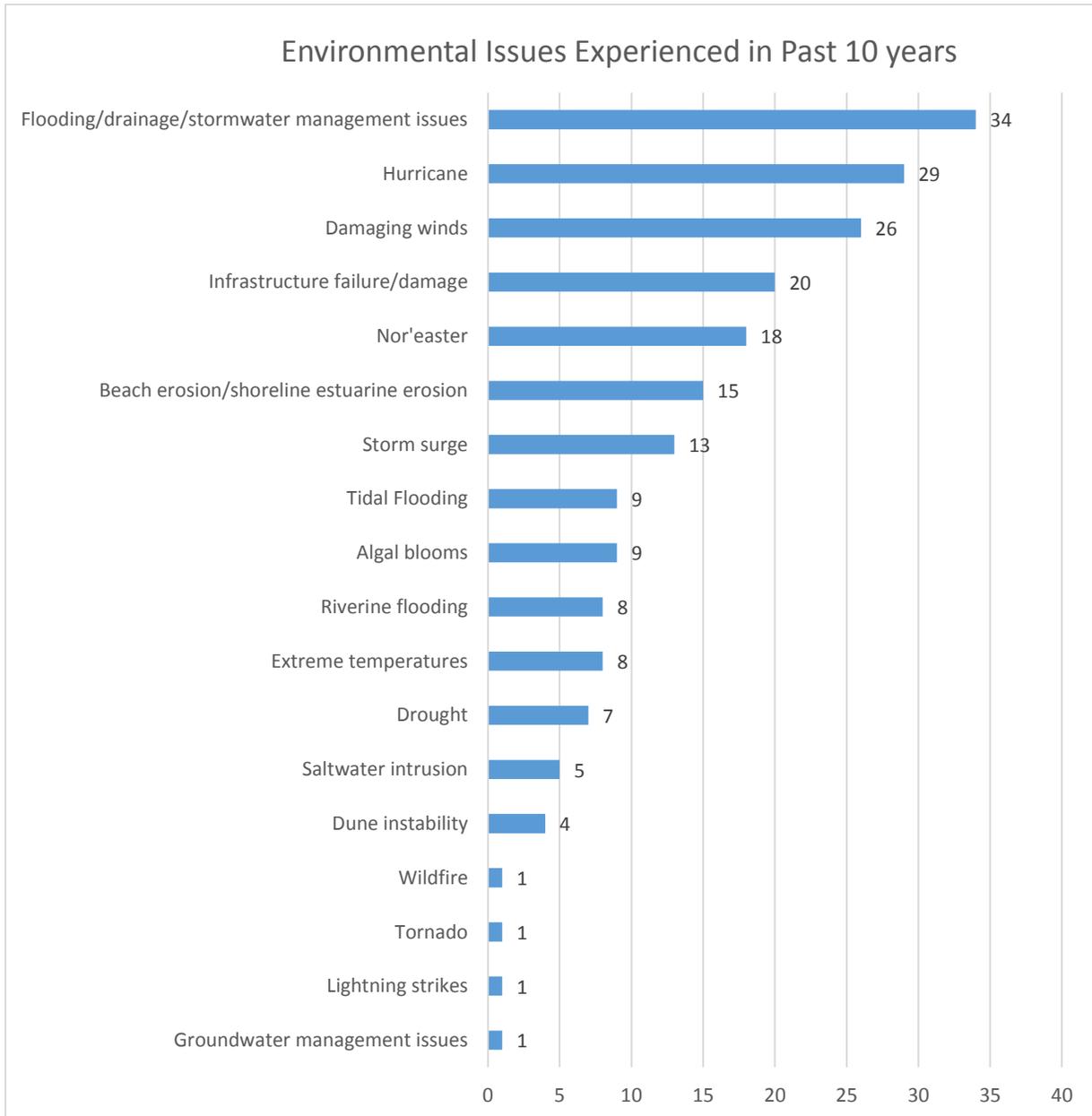


Figure 2: Major environmental issues cited by survey respondents in the past decade

Critical environmental concerns

Survey respondents were also asked to identify the top three environmental issues that had the *greatest impact* on their communities. Thirty-two respondents identified flooding/drainage/stormwater management issues (75 percent), hurricanes (28 percent), and infrastructure failure/damage (22 percent) as the three most critical issues.

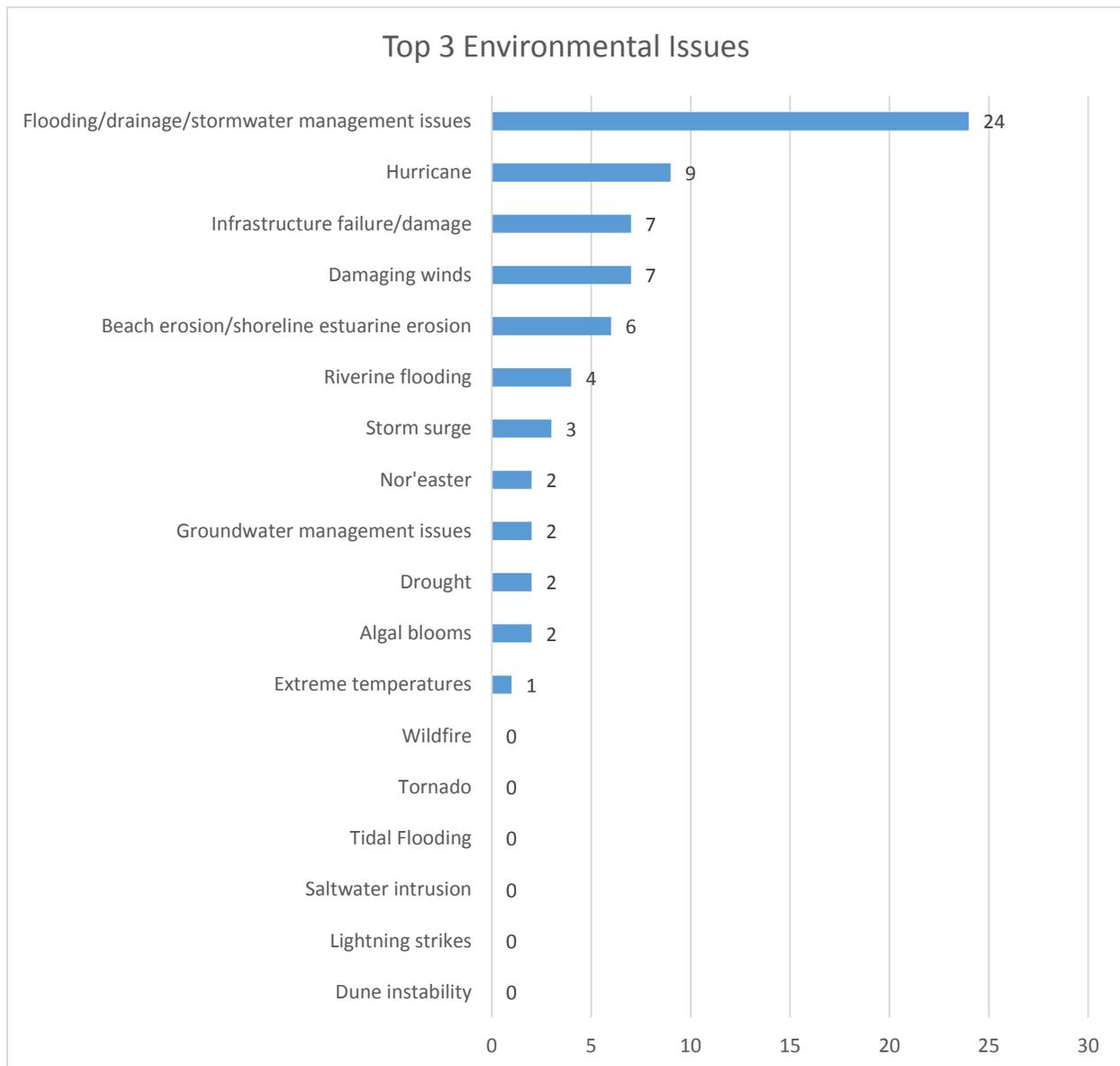


Figure 3: Top three most cited critical issues

Thirty-two survey respondents identified various ways in which their top three concerns affected their communities in an open-ended response question, which included damage to infrastructure, utilities, and personal property (66 percent); damage to local economies (53 percent); and damage to human health (34 percent) as the most common impacts resulting from weather-related events in their communities.

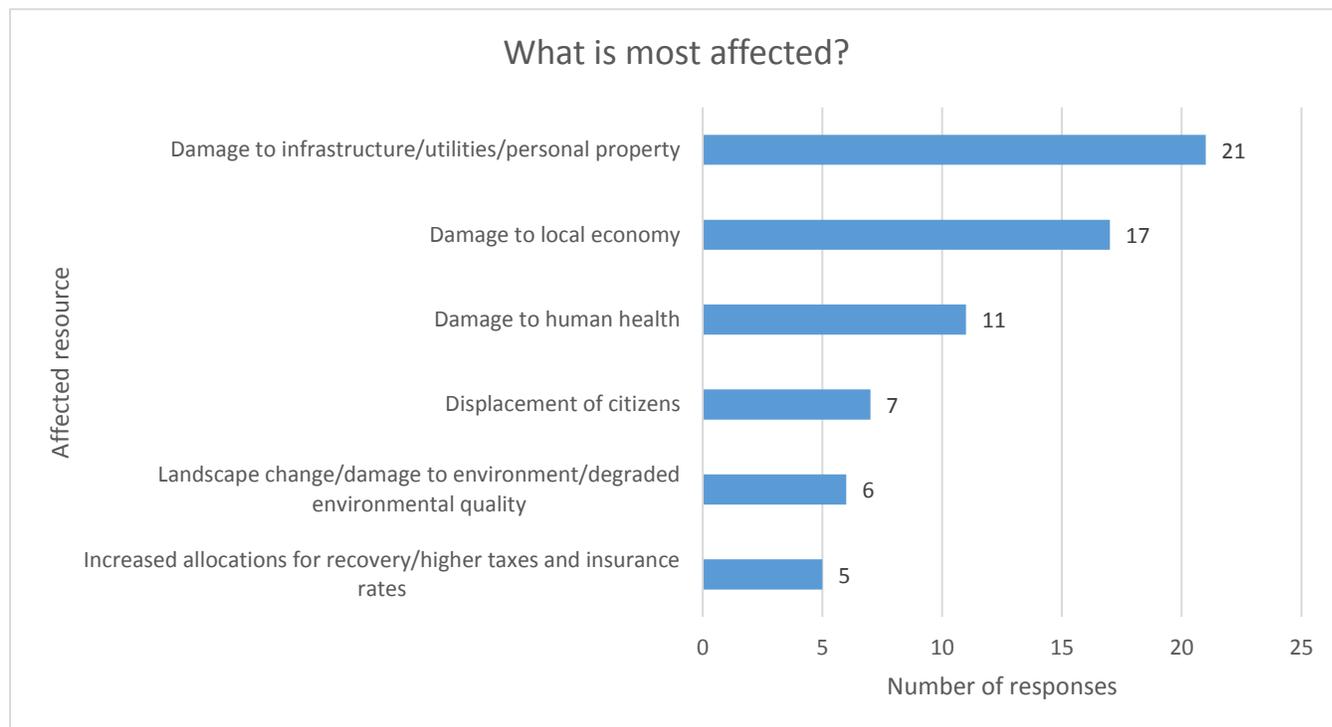


Figure 4: How environmental issues affect local communities

Community assessments

The survey assessed the type of work local officials and staff have conducted within their communities to address environmental issues. Out of 34 respondents, 94 percent of local governments have undertaken formal planning, such as hazard mitigation plans. Eighty-two percent of local governments have taken additional steps to address their environmental issues, including outreach projects, public meetings, and local ordinance enforcement.¹ However, only 56 percent of communities have conducted a formal risk or vulnerability assessment.

¹ See Appendix, Fig. 2 for details on the types of projects local governments have undertaken.

Community recovery

Respondents were also asked to self-assess their ability to recover after a storm event with minor and major flooding on a scale from 1 to 10, with 1 being “completely unable” to recover and 10 being “fully able” to recover.

Of the 30 responses, 47 percent of respondents believe their community could fully recover from a storm event with *minor* flooding, with the remaining respondents selecting a rating between 5 and 10. Respondents cited experience, prior planning exercises, and adequate resources as reasons why they felt they could recover adequately or fully from a storm event with minor flooding.²

Only 7 percent of respondents felt their community could fully recover from a storm event with *major* flooding. The remaining respondents selected a rating between 1 and 9, with a majority rating their community at a “5” or above. Many communities were confident in their ability to fully recover from major flooding with time and state or federal funding. Other communities cited issues with drainage and lack of resources as barriers to recovery after a storm event with major flooding.³

Vulnerable populations

Out of 30 respondents, about 53 percent said that environmental issues disproportionately affect specific sectors of their community. Older populations, low-income populations, and populations lacking in mobility were cited as the most affected by environmental problems. Respondents noted that it is more difficult for the elderly and residents lacking full mobility to adequately prepare for storm events and evacuate their homes if needed. Respondents also noted that low-income populations have limited financial resources to fully recover after a severe weather event like Hurricane Matthew.⁴

Section 3: Local Government Needs

The survey assessed local managers’ issues in building resilience through identifying the barriers within their community.

² See Appendix, Fig. 3 for a graph of ratings and for textual responses about why those ratings were selected.

³ See Appendix, Fig 4. for a graph of ratings and for textual responses about why those ratings were selected.

⁴ See Appendix, Fig. 5 for graph and textual responses on vulnerable populations.

Barriers to resilience

Twenty-six respondents elaborated on the most difficult aspects of dealing with environmental issues in their area through an open-response question. Lack of financial resources was the most common issue, with 65 percent of respondents citing it. Limited staff size and time was the next most common issue at 31 percent, followed by lack of community buy-in at 23 percent.

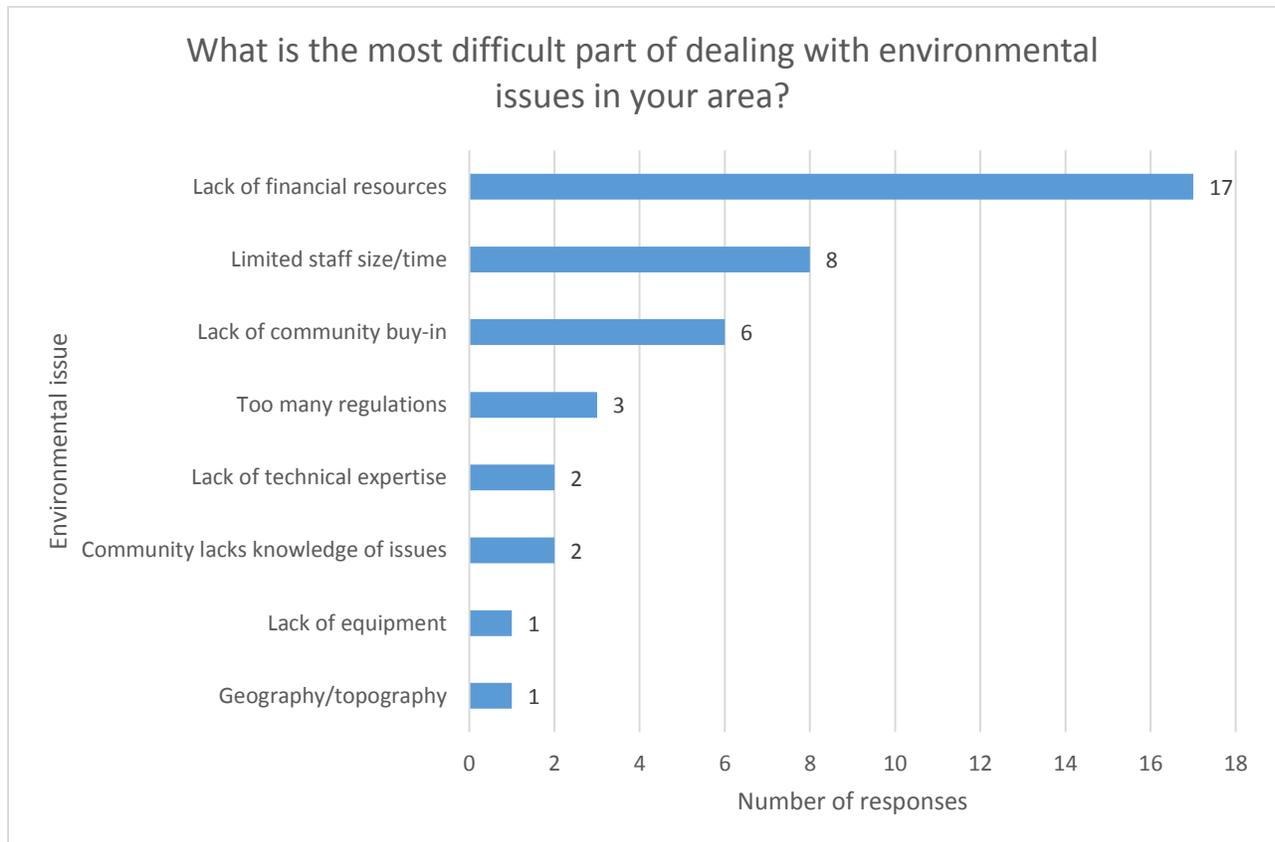


Figure 5: Issues cited by respondents (grouped by theme)

Management Needs

To address their barriers to resilience, the survey asked respondents about their needs as a local government. Finding relevant funding and grant-writing assistance were the most common needs of the 29 respondents. Resources to increase community buy-in and digital resources from state or federal entities, such as mapping or visualization tools, were commonly cited by about half of survey respondents.

In the open response section of the question, respondents cited fewer regulations, technical expertise, and community workshops on environmental issues as needs, which closely mirrors their reported barriers to addressing environmental challenges.

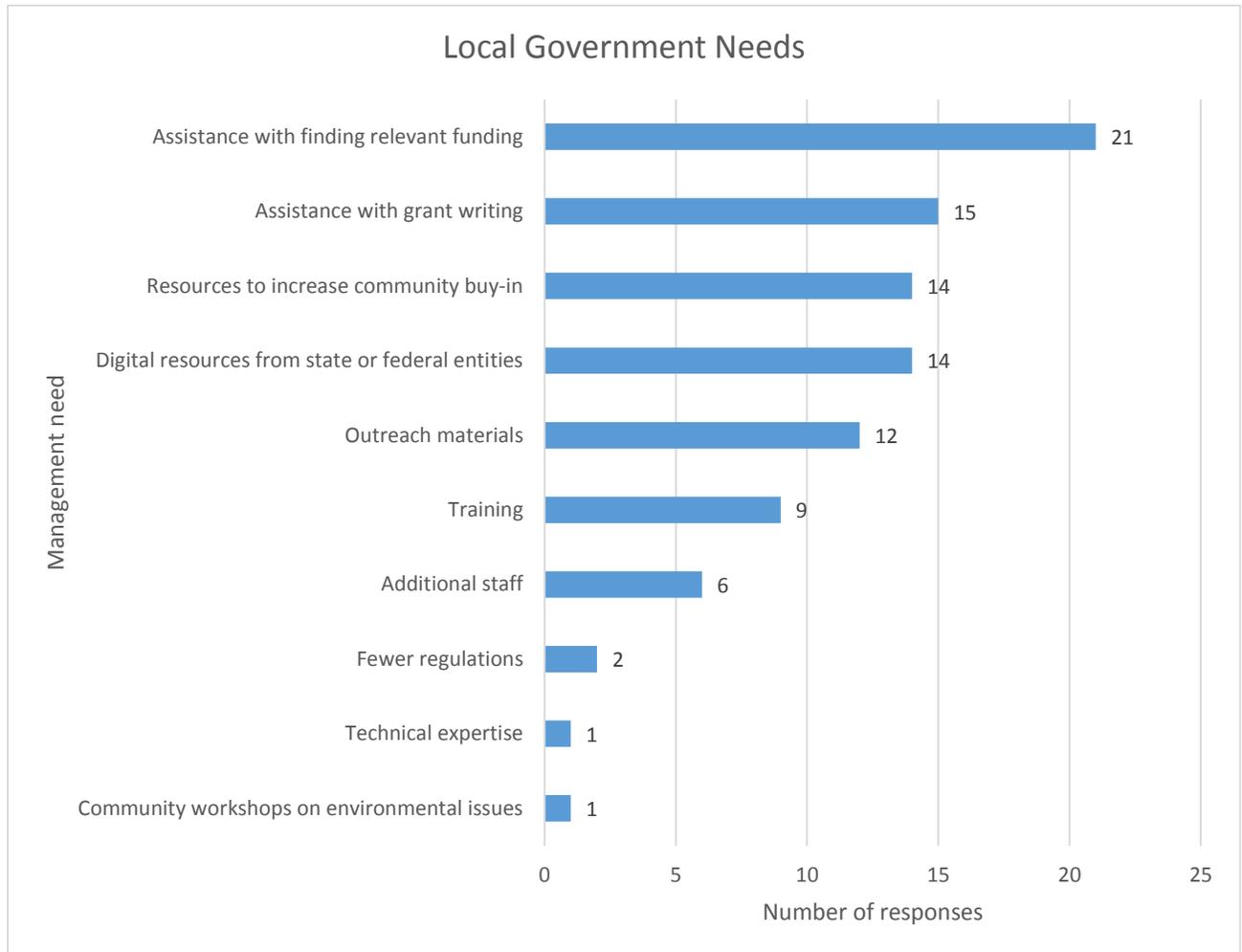


Figure 6: Local government needs

Summary

Communities cited recovery from flooding and drainage issues, hurricanes, and damaging winds as their most common environmentally-related challenges; and physical infrastructure, the local economy, and human health as their most commonly affected resources. Although more than half of survey respondents recognize the challenges their communities face by severe weather and environmental issues, about half of the local governments have not conducted risk or vulnerability assessments in their community.

Vulnerability assessments are the first steps to understanding a community's unique risk to coastal hazards and other environmental threats. To fill the gap in community-driven vulnerability assessments, DCM created a pilot project entitled "RENA: Resilience Evaluations and Needs Assessments." The RENA process aims to address the resilience knowledge gap in coastal communities through a locally-driven process. From 2016 to 2018, DCM staff will continue to assist pilot communities in conducting vulnerability assessments to better understand their unique risks, to involve the community in vulnerability, and to create a guiding framework for all coastal communities to recreate the pilot process currently underway.

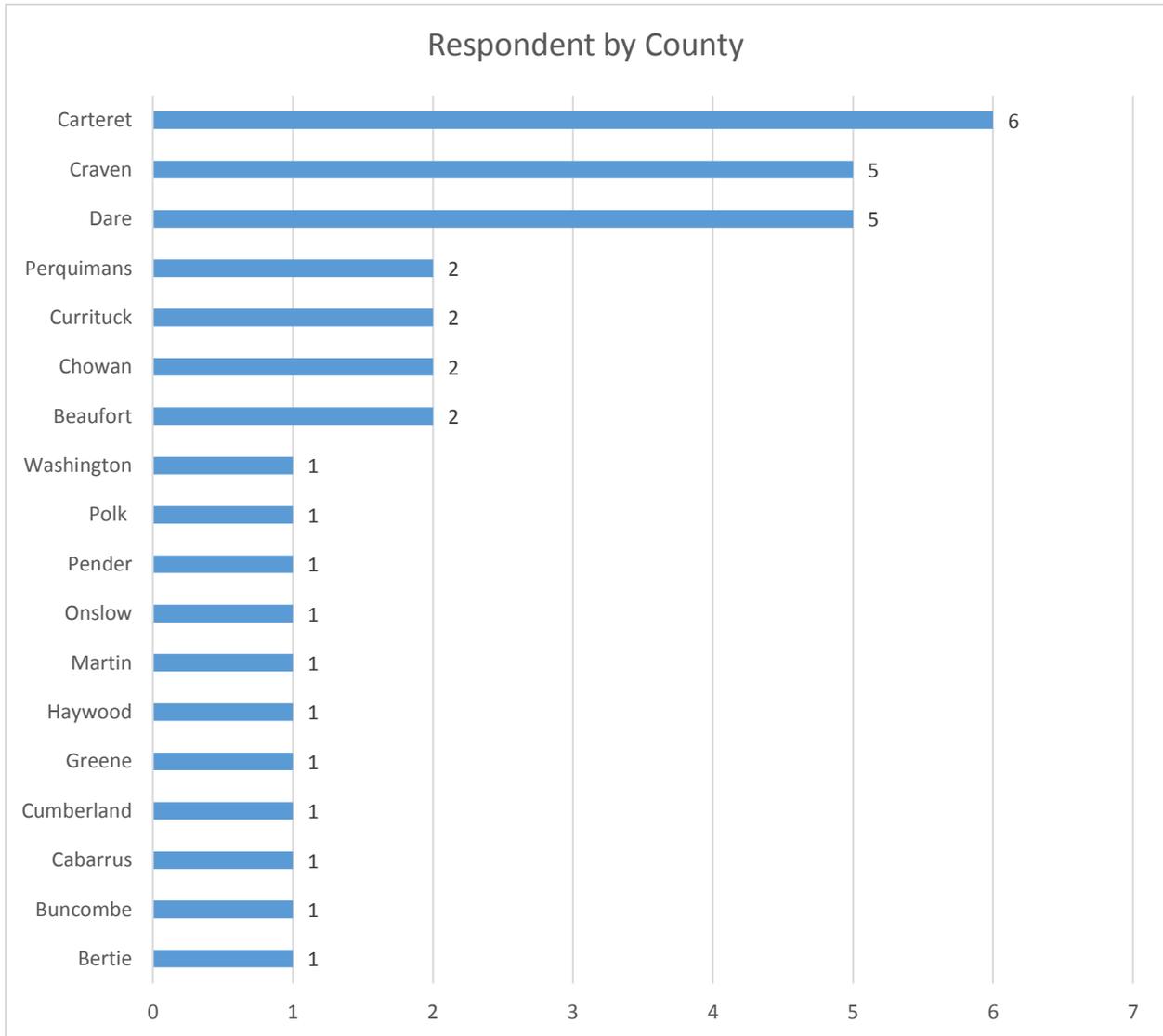
Respondents also revealed a high need for financial resources and assistance with finding and applying for relevant grants. In the past, DCM has conducted grant-writing workshops to assist local governments in improving their understanding of the grant process. DCM could fill the need for additional assistance in finding and obtaining funds through increased communications about grant databases and increasing the number of grant-writing workshops. It might also benefit communities to increase communications with their regional planner to be better informed about upcoming grants applicable to their desired projects.

Streamlining the vulnerability assessment process across coastal communities, increasing communications from DCM to local government staff about upcoming funding opportunities, and providing grant-writing workshops to more locations can help fill the gaps identified by respondents in this survey.

Appendix

Figure 1: Full list of participating counties (graph A) and towns (graph B):

1A:



1B:

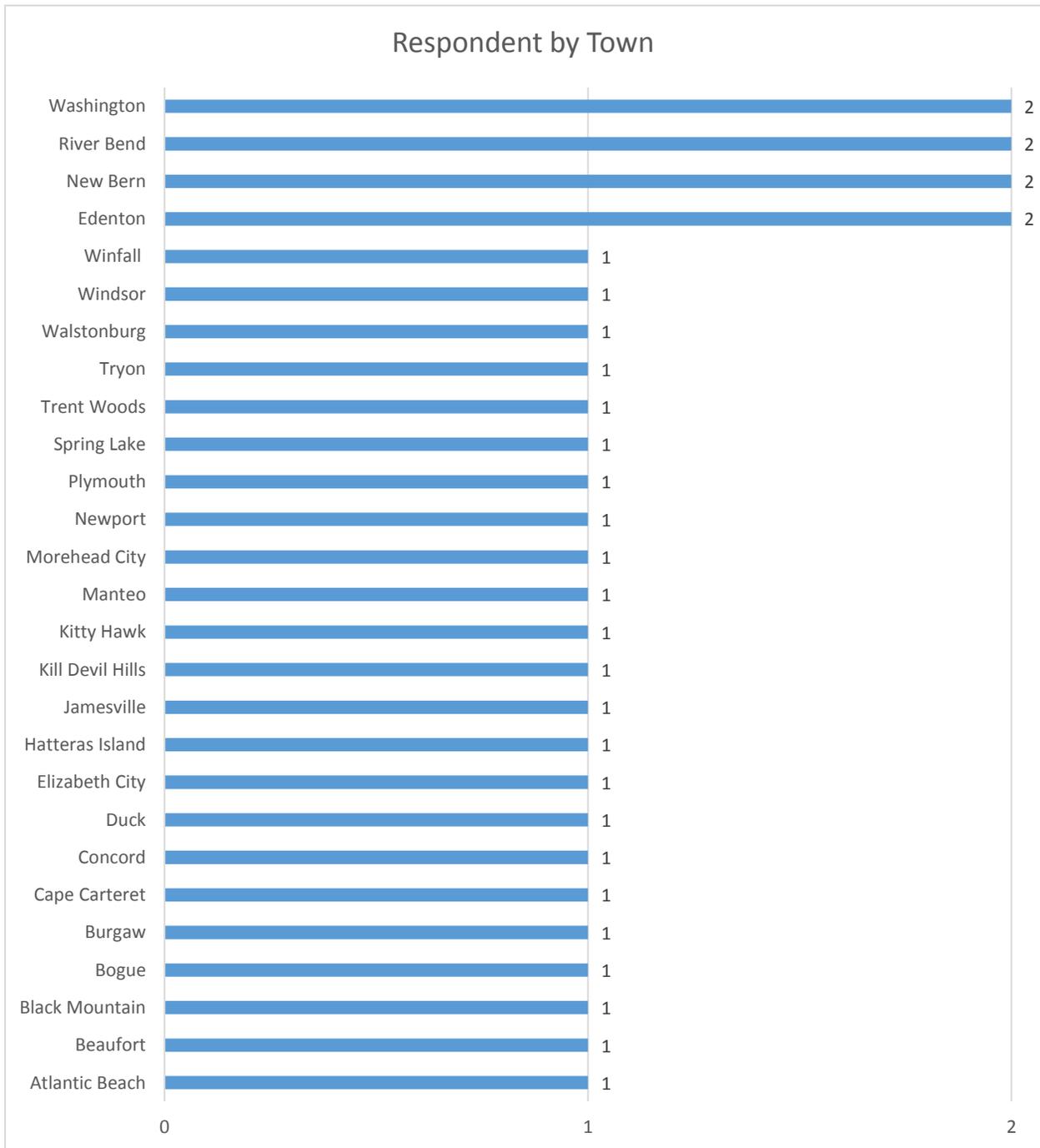


Figure 2: Planning and projects undertaken by local governments to address environmental issues:

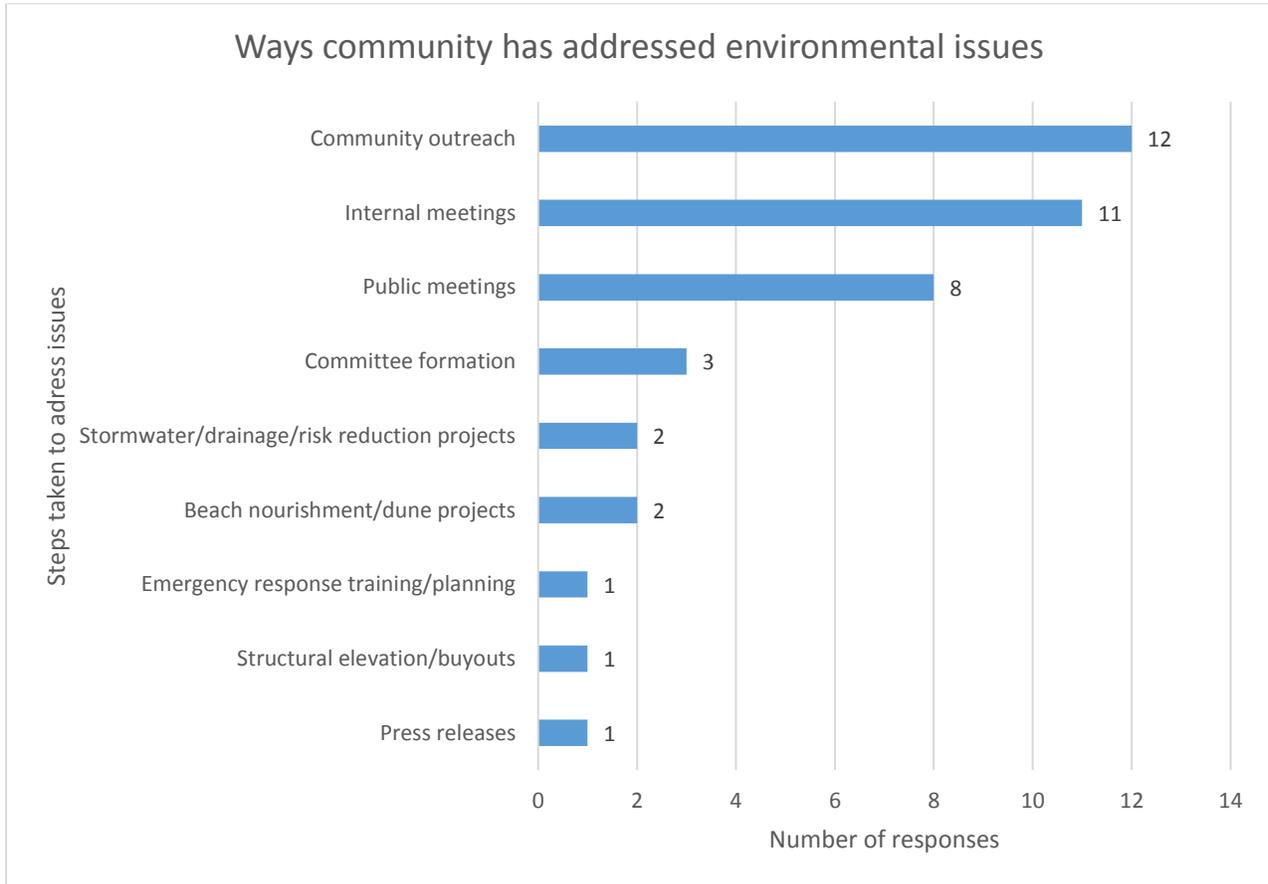
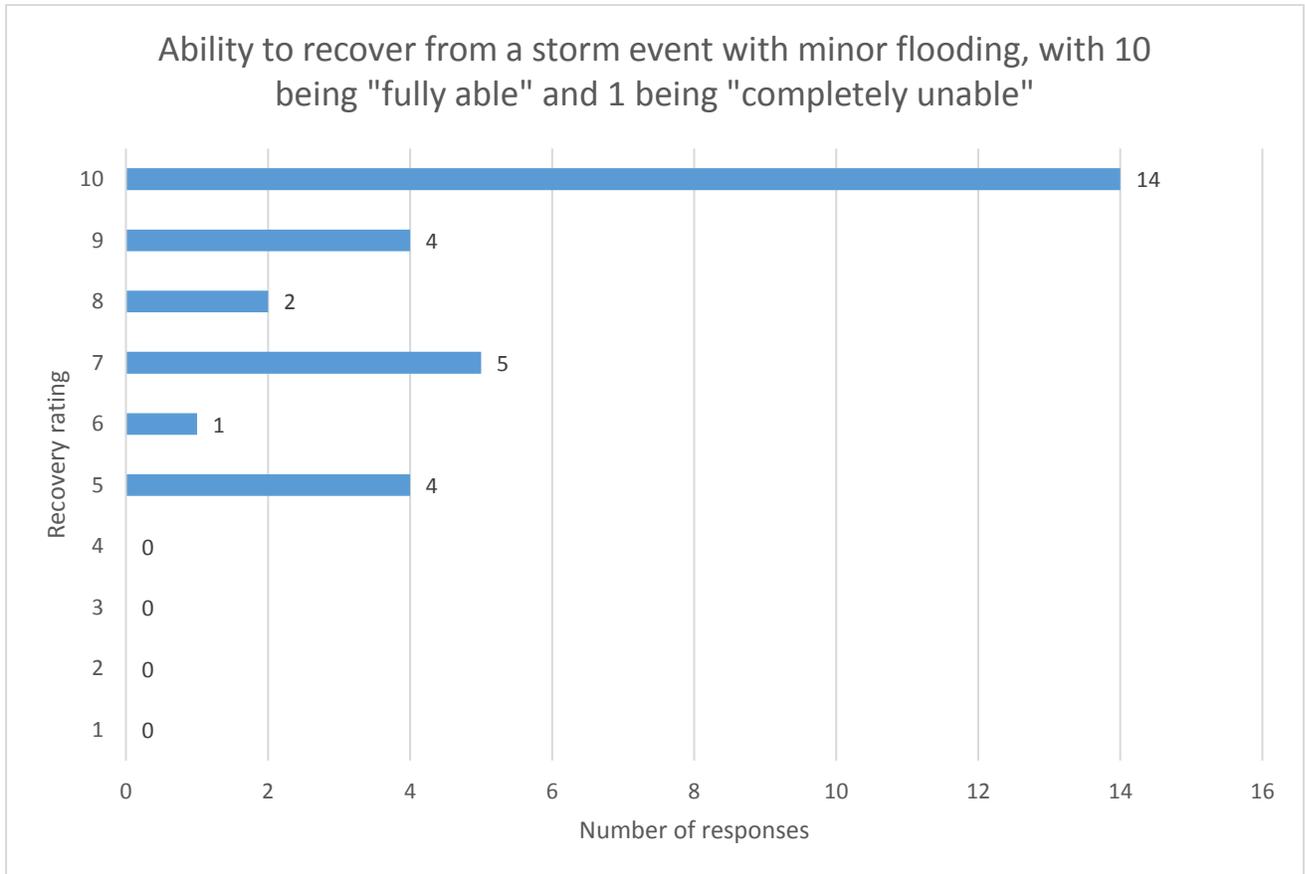


Figure 3: Town's self-rated ability to recover from a storm event with *minor* flooding (A) with textual responses on why the rating was selected (B):

3A. Graph

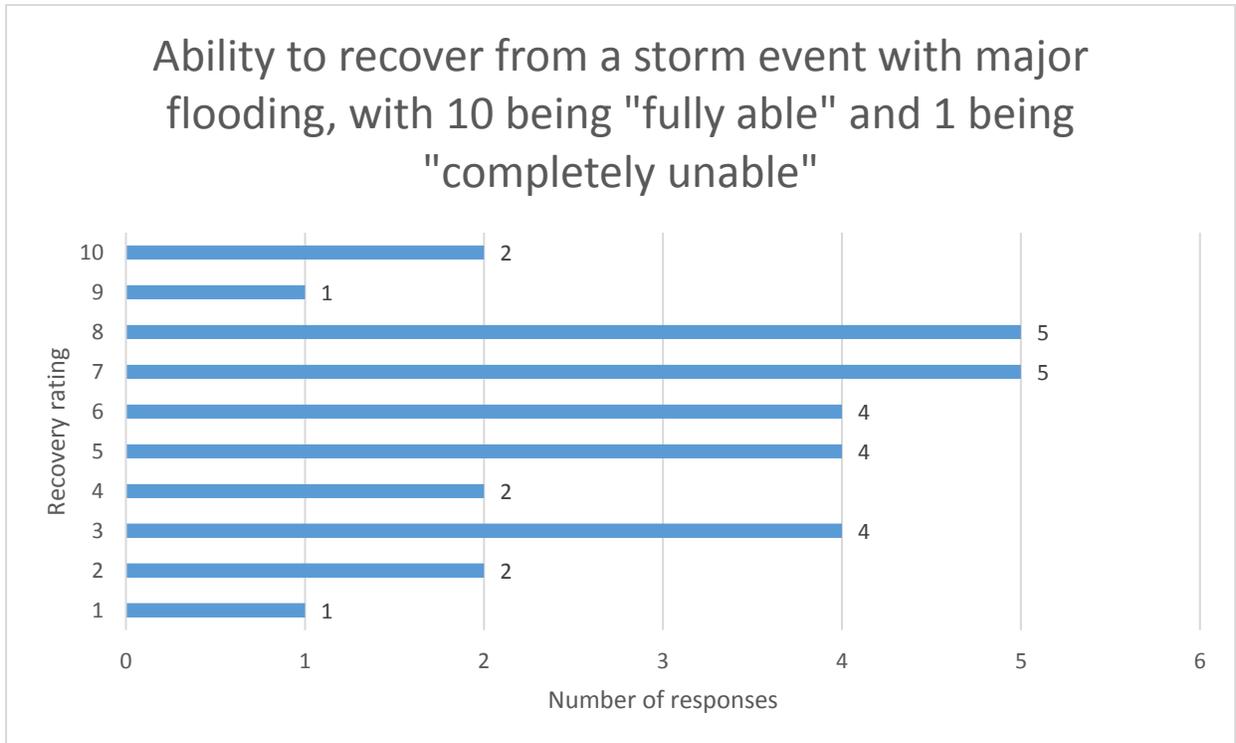


3B. Textual responses – raw survey data:

Why did you select this rating?
We have the financial and workforce resources to do so.
been there, done that, have the t-shirts
Storms and flooding are unfortunately common occurrences in my community.
We've been able to a number of times.
[The] RIVER WOULD ONLY FLOOD A SMALL SECTION OF TOWN/ETJ
town is predominately in flood plain
we have lived through numerous hurricanes and have a good well trained staff
Based on experience and our financial position
The problem in reason years related to problem after heavy rains over long period of time
Community has the resources to deal with minor flooding issues
We have improved some of our problem areas in Town and think that they should be able to withstand minor flooding. We know that we have some areas that would not fare so well.
Minor storm damage is predictable and there are mitigating factors in place
Historical performance from similar storms
We're used to it, it's not convenient living on a barrier island so experience in this environment is worth everything
Minor storms have happened and we recovered on our own, but there is always that one time.
Because the town does not have any funds to address this issue.
The town is currently working on town drainage issues that are caused by excessive rain amounts and CSX pipes too small.
Our Town has the resources to recover from minor flooding. It may take time but we can recover.
We have decent storm water system to handle minor flooding
Experience, planning and exercise
Minor flooding for us starts with water over washing streets in known areas, minimal response required.
because we have done so through extensive improvements in SW infrastructure
Because of in-place pumping equipment and floodgate system
Experience
Waters recede and typically structure damage is minimal.
Specific knowledge about how we have handled events
we had minor flooding before and recovered.
we do it all the time
we can handle small storms

Figure 4: Town's self-rated ability to recover from a storm event with *major* flooding (A) with textual responses on why the rating was selected (B):

4A. Graph

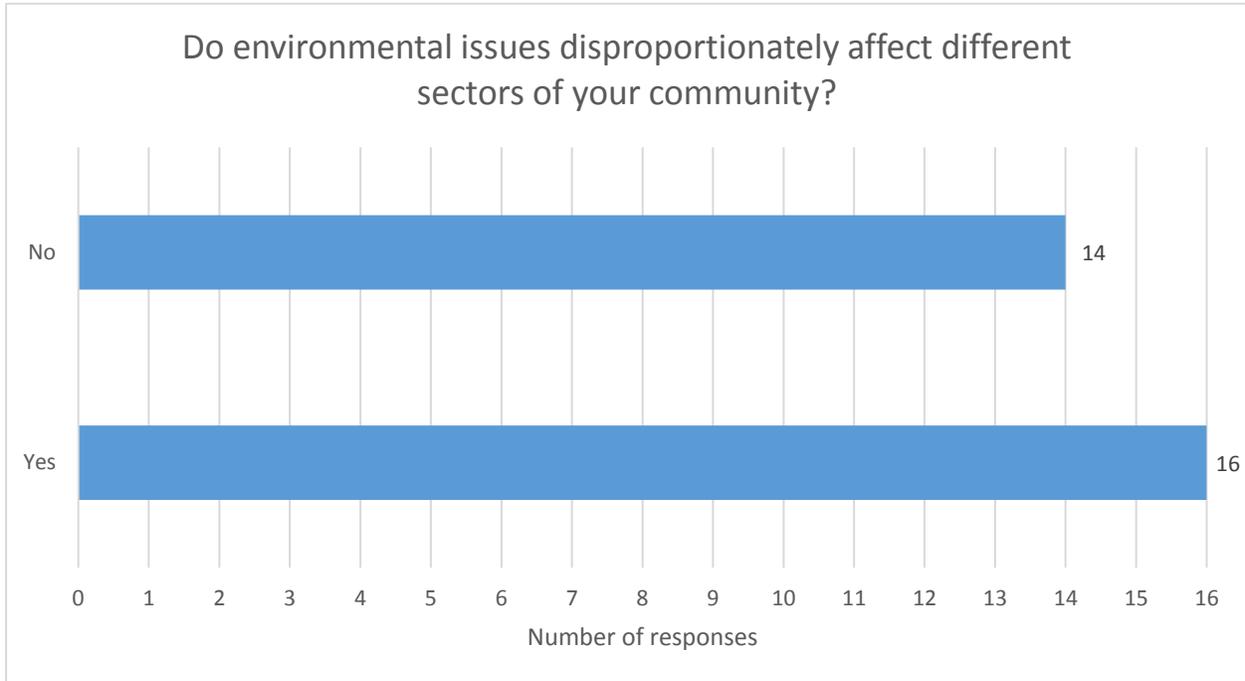


4B. Textual responses – raw survey data:

Why did you select this rating?
We have solid reserves and good resources. May need financial help from State/Federal government depending on extent of damage.
major storm and extensive flooding are relative terms. there is always the possibility of total devastation
A major storm may lead to significant loss of tourism revenue and permanent residents leaving the area.
We've been able to already.
WOULD OR COULD RESULT IN FLOODING OF LOCAL STREETS, IS BASED ON THE TIME IN THE [the] RIVER, IF STORM COMES IN ON HIGH TIDE THE WATER WOULD NOT HAVE ANYWHERE TO GO
current plans for infrastructure repair
our experience and financial position
Experience during my 12 years living here
Community has capability of coordinating efforts, but would require some outside resources
Being a coastal community there are some areas in Town that would/could be devastated if a major storm were to hit. Our shorelines would deteriorate and we don't have any means to stop that with the current systems in place.
Mitigating measures for major storms were tested during Hurricane Isabel. Improvements were made following lessons learned, however it was 2 - 3 weeks before all services were restored due to tree and water damage
We've never had that to my knowledge, so it's a 50/50 chance
We're the second highest hurricane strike probability on the East Coast and we hope for the best but prepare for the worst
we have one employee, no equipment, only volunteer help from council and residents
because the town lacks funds to attack the problem
The town is at the mercy of CSX as their drainage pipes going under the railroad are too small to drain the town's stormwater during a major storm.
Our Town may not have the resources or personnel to recover. Citizens may face catastrophic loss of homes.
With financial assistance from FEMA and State, I know we can recover
this will take many outside resources and time to recover
Lack of human capacity to navigate FEMA/state resources post-event; exceptionally time consuming.
Hurricane Matthew dropped over 8 inches of rain in 5 hours. While we had significant flooding in areas where we had problems with lesser amounts, we were able to get rid of this water fairly fast.
same as previous answer
We're dealing with Hurricane Matthew right now and its effects on a community not built to withstand long-term flooding.
Just survived Matthew
we've never experienced that but I am confident that we could handle it.
we have done it in the past and will overcome challenges in the future
after 4 major flood events in 17 years, the community ability to take another has been depleted

Figure 5: Respondents were asked whether environmental issues in their communities disproportionately affected different sectors of the community. Graph (A) displays the respondent's answer and box (B) provides raw textual data from the survey:

5A. Respondent's response:



5B. 'Yes' textual responses – raw survey data:

Please elaborate on your response so we can better understand how environmental issues disproportionately affect different sectors of your community.
Low income, elderly, and disabled are sometimes less self-reliant physically and economically, and may not be able
to afford good insurance /any insurance.
rents and low income renters
some of the senior citizens do not fully appreciate the threat that hurricanes can impact a community
Individuals who are mobility-challenged find it more difficult to access necessary services following significant flooding/storm damage
Poor people/seniors with limited financial resources are impacted.
elderly have no one to help, low income can't afford to get help, disabled are usually both elderly and low income
A disable persons' home was flooded during Hurricane Matthew as well as several local businesses located in the core part of town.
Poorer areas do not have the financial resources to recover unless there is help from state/local/federal governments. They simply do not have the means.
Major weather events often, but not always, disproportionately affect severe poverty citizens more.
we are in a tier I county and our median income in the city is 35 percent lower than the national median income. Any improvements come at the expense of our citizens through higher taxes, and water/sewer and stormwater rates.
Older population is less able to adjust to issues raised by flooding
Flood prone areas are typically occupied by low/moderate income and minority populations. The exception to this is along the ICWW.
by places to go in an emergency, can't get out of their homes, not financially able to get out.
low income residents have few resources to recover proportionately