Environmental shifts and changing landscapes are forcing communities around the world to adapt to increased flood risk. In particular, coastal land in southeast Louisiana is rapidly being lost, converting to open water, leaving communities with little natural protection from hurricane storm surges and encroaching tides. Louisiana’s wetlands are disappearing at a faster rate than they can be restored. As a result, flood risk increases every day for the residents of this working coast, and entire communities must find ways to survive, adapt, and continue to provide the nation with seafood, oil, and gas.

Adaptation: a change or the process of change by which we become better suited to our environment—usually done in response to actual or expected changes—in order to moderate harm or take advantage of beneficial opportunities

Adaptation is considered a nonstructural approach to risk-reduction and includes flood-proofing, elevation, building codes, planning and zoning measures, and property buyouts and relocation. While conducting research for A View from the Coast - Local Perspectives and Policy Recommendations of Flood-Risk Reduction in South Louisiana it became clear that a variety of adaptation strategies will be necessary, including strategies for relocation, a particularly touchy subject politically and socially. Homeowners and businesses are already relocating one-by-one to areas with more confident futures, but discussions of planned community relocation are limited. While some communities will be able to continue living where they are, albeit in a different manner, many will not be able to manage the increased physical and economic risk and will be forced to adapt. But how, why, and when they will adapt is an unanswered question with many possible answers. Other questions include: How is risk perceived and how optimistic are coastal residents about their community’s future? How do residents view various adaptation options? And what factors account for their attitudes towards adaptation and what might change them?

CPEX developed a survey designed to evaluate each respondent’s:

1) Perception of current and future risk
2) Individual response to identified risks
3) Perception of community’s response to risk
4) Barriers to adaptation
5) Attitudes towards elevation
6) Attitudes towards voluntary relocation

The survey included multiple choice questions as well as short-answer responses allowing us to gauge general perceptions and attitudes, as well as more nuanced issues through the written responses. The survey was distributed via email to our contact list consisting of parish and municipal level elected officials, floodplain managers, coastal zone managers, planners, and other government staff. It was also distributed through contact lists of various partners including Coalition to Restore Coastal Louisiana, Foundation for Louisiana, and the Lake Pontchartrain Basin Foundation. The survey was also shared through the Breaux Act NewsFlash newsletter. It is difficult to determine how many people the survey reached. CRCL’s newsletter and the Breaux Act Newsflash have 16,000 and 1,600 subscribed email addresses, respectively. However, these lists are not monitored for active email addresses nor are they culled to eliminate inactive or deleted accounts. Further, given their similar missions, each of these organizations is likely share multiple contacts. We Conservatively estimate the survey reached 2,500 people.
Survey Findings:
Make up of respondents + location (map):

We received a total of 139 survey responses distributed across coastal Louisiana (Figure 1). Because of the targeted survey distribution, the makeup of respondents differed from the average Louisianan. Eighty-six percent (86%) of respondents owned their own home compared to a state average of 65% home ownership. In Louisiana, 22% of people have a bachelor’s degree or higher. Of our survey respondents, 76% have a bachelor’s degree or higher. Nearly half (47%) possess a graduate degree. Finally, 90% of survey respondents reported their race or ethnicity as white compared to the state average of 62%.
The first question was designed to determine which environmental hazards concerned respondents most. Flooding was a top concern for 91% of respondents. Two-thirds of respondents identified wetland loss as a top concern and approximately half of the respondents identified the interrelated risks of sea level rise, subsidence, saltwater intrusion, habitat loss, and erosion as top concerns. Unsurprisingly, only two percent of respondents were concerned about drought but neither respondent was from a coastal zip code. Interestingly, one respondent identified the ability of non-coastal municipalities to absorb the population that will inevitably have to relocate into existing infrastructure, a concern that is increasingly recognized as a coastal challenge that can extend far inland.

Take Home Message: Related hazards of flooding/sea level rise/land loss are biggest concerns.

Eighty-two percent of respondents believe their flood risk has increased, only seven percent believe their flood risk has decreased. Seventy-eight percent believe wetland loss increased, only one percent think it has decreased. Over 60% of respondents think risk from sea level rise and habitat loss increased in the past five years and over 50% feel saltwater intrusion, subsidence, and erosion have worsened; less than four percent think risk associated with these hazards has decreased.

Take Home Message: Risk from hazards of concern has increased or significantly increased in the past five years.
Question 3: Thinking about the future, complete the following statement for each of your selected concerns: In the next 10 years, risk from this hazard will:

 Respondents do not think risk associated with their major concerns will improve in the next ten years. Ninety-one percent of respondents think flooding will increase. Approximately 75% believe sea level rise, habitat loss, and land loss will worsen, 67% think saltwater intrusion will worsen, and 59% feel subsidence will worsen. Perhaps most tellingly, none of the respondents think risks associated with saltwater intrusion, wetland loss, sea level rise, or habitat loss will decrease in the next ten years. Wind damage and drought remain of little concern amongst respondents and are not expected to get significantly worse in the next 10 years.

 Take Home Message: Hazards are expected to get worse in the next decade. Very few respondents think any of the hazards will get better.
Individual Response to Risks

Question 4: What actions have you personally taken to reduce your risk to the environmental hazards or natural disasters you identified above?

The most common response to risk was to educate themselves and their neighbors on environmental hazards and advocate for risk reduction strategies. Another common response involved retrofitting their property. This includes storm shutters and hurricane roof/siding, floodproofing, and landscaping designed to manage water on-site. Elevation and insurance were also common answers though many pointed out that they were not required to take this action. The high cost of elevating was nearly universally noted by respondents, which is unexpected given respondents’ demographics. Several respondents have already relocated due to risks while others changed their behavior and did not buy a home where they otherwise would have. Interestingly, several respondents planted trees not just for their contribution to stormwater management but for their role as carbon sinks.

A selection of respondents’ short-answer responses to the above question:

> “I elevated my home at great cost.”
> “I can help to keep all catch basins and drains cleaner by picking up trash and debris to help it from going into the drainage systems. I also will try to maintain flood insurance on my home, even though it is not required. I can also support taxes and millages that will aid in the placement of levees to fight storm surge.”
> “Purchased flood insurance, although I do not live in the 100-year floodplain or area.”
> “Began moving inland. Reduced assets in risky areas. Made movable property able to be moved at a moment’s notice. Prepared my property for eventual inundation by planting trees that will sink carbon, as to utilize the property to the fullest extent for as long as possible. Urged neighbors to be aware of a changing landscape and prepare for dropping property values.”
> “We have planted more trees.”
> “Move farther from the coast to higher elevation land areas.”

Take Home Message: People are willing to adapt in a variety of ways but cannot due to financial limitations.
**Question 5: What actions would you like to take to reduce your environmental risk but are unable to? What are the obstacles for you to take this action?**

The most common approach to reducing risk that respondents wanted to take was elevating their homes. Several respondents were also interested in relocation as well as restoring natural features and retrofitting their home or property. The most common reason for not taking action is the financial cost of taking the preferred action. A few people stated family ties and vested interests were preventing them from taking action, a larger group blamed a slow or inept bureaucratic process, but the majority identified financial limits as the primary obstacle for them to take the preferred risk reduction action.

A selection of respondents’ short-answer responses to the above question:

> “Stabilize Louisiana’s coast: Beyond my power. Reduce global warming: Beyond my power.”
> “I suspect that flooding will get bad enough in New Orleans that I will eventually move somewhere else.”
> “Would like to raise structure but unable to do so because of costs.”
> “Raising my house to a point above the base flood elevation - the cost exceeds the relative benefits”
> “Move to higher land elevation communities farther inland. Funding is a major issue/challenge”
> “For government officials to create watershed districts in order for there to be consistent land use and zoning policing across municipalities.”
> “I have no idea where to start. Not enough education/awareness”
> “I can’t afford to move.”

**Take Home Message:** People are willing to adapt in a variety of ways but cannot due to financial limitations.
Community Response to Risk

**Question 6 & 8*. Has your community taken any action to address the concerns you noted in the previous section? If yes, what actions have been taken?**

*Questions 6 and 8 elicited the same responses so they have been combined here.

The most common responses for what actions the respondent’s community taken revolved around structural measures or the lack of any action taken. For respondents who say no action has been taken, they list apathy, lack of leadership, lack of community involvement, and lip service as reasons why. Several pointed out that the only action taken is prayer. Stormwater management, drainage improvements, planning and zoning, and building codes were also common answers. Several respondents noted that local governments are finally starting to enforce local regulations and are being more proactive about maintenance of drainage systems, however, they have reservations on whether these actions are sufficient. Increased taxes, in the form of sales tax or millages, was also a common answer.

A selection of respondents’ short-answer responses to the above question:

- “The community passed a .25 cent sales tax to go towards flood protection projects.”
- “No, we need more community involvement!”
- “Built bigger levees.”
- “Yes - Participation in CRS and home elevations. Flood insurance rates have likely prompted my community to take action on this.”
- “Commenced study to allow use of water friendly building materials, engaged in dialogue with developers to incorporate environmentally friendly designs in their projects.”
- “No we only get lip service”
- “None.....Jefferson residents simply pray the levees will hold”
- “I’m sure Orleans Parish does a bunch of stuff-- but we mainly just sit behind levees and pray.”
- “It’s hard to make coastal issues “sexy.””
- “My community has elevated and reconstructed structures above the Base Flood Elevation and enforces higher standards in the Flood Damage Prevention Ordinance.”
- “No. All actions are reactive, not proactive.”
- “My community doesn’t see the big picture view, only the neighborhood by neighborhood view.”

**Take Home Message:** Communities have taken a variety of approaches to reduce risk at the community level but there is a large contingent of people who feel nothing is being done.
Question 7. Which type of plan does your municipality/parish have (select all that apply)?

Nearly one-third of respondents did not know if their community has a plan to reduce risk or promote smarter growth. About half of respondents were aware of their communities having Comprehensive Master Plans and Hazard Mitigation Plans.

Take Home Message: Nearly one-third of respondents are unaware of any plan their community has to address risk.

Barriers to adaptation

Question 9. What is the single biggest barrier for your community to adapt to the risks you face?

The biggest barriers to action identified were insufficient funding (local or state) and a lack of political will or leadership. Another common answer was “red tape” which, from answers to other questions, can mean too many studies and not enough action or a cumbersome permit process and other requirements that make it difficult to take action. A dozen respondents think a reluctance to change is the biggest barrier to adaptation while those that chose the “Other” option identified lack of federal funding and understanding, false hope in structural protection, and “the mayor” as the biggest barriers to adaptation.

Take Home Message: Respondents feel that coastal Louisiana is lacking leadership: leadership for ushering through financial assistance to lower risk for communities on the coast and leadership for any number of options geared toward preventing damage and loss instead of waiting for the next storm.
Adaptation Preference

Question 10. What adaptation strategies do you think would be most beneficial to your community for reducing risk? (Select all that apply)

Over half of respondents chose drainage and stormwater management as the strategy most beneficial to their community. Interestingly, nearly half chose regulating development as the strategy most beneficial to their community. This indicates an understanding of how development has cumulative effects on drainage, flood risk, and overall vulnerability in communities. Elevating buildings and education also were popular choices. About a quarter of respondents think acquisition or relocation would be most beneficial to their communities. Respondents that chose “Other” predominantly stated structural measures would be most beneficial. A single respondent noted that making elevation more affordable would be most beneficial to their community.

Take Home Message: Respondents prefer an All-of-the-Above approach to risk reduction.

Attitude Towards Elevation

Question 11. Would you consider elevating your home to reduce your environmental risk?

When asked if they would elevate their home to reduce risk, 40% of respondents said yes but it would be contingent on financial support. Twenty percent gave an outright “yes” answer and nearly as many said their house was already elevated. Few respondents are interested in elevation as part of a larger community initiative and even fewer are amenable to waiting for the next storm to hit. Seventeen respondents would never elevate their homes largely because they view their flood risk as minimal.

Take Home Message: Financial support is the biggest incentive for home elevation.
Question 12. What would have to happen for you to consider elevating your home? (For example: neighbors have all elevated, repetitive flood damage, increasing flood insurance costs, etc.)

The most common response for what would make a respondent elevate their home was financial assistance and/or a reduction in the cost of elevation. Also, if the frequency or magnitude of flood damage increased (i.e. increased costs) they would be more likely to elevate. Rising costs of insurance would also initiate some elevations, suggesting in many cases the marginal cost of insurance is less than that of elevation.

A selection of respondents’ short-answer responses to the above question:

> “A significant flooding event in the future and funding to support the home elevation.”
> “I am in a severe rep loss house, however, my home will cost as much as it is worth to elevate it.”
> “If I could afford it.”
> “Repetitive flood damage, increasing flood insurance, funding.”
> “MONEY.”
> “I would consider elevating if my Flood Zone were changed requiring an elevation for new construction to keep my insurance premiums down for resale value.”
> “I am unable to elevate due to finances. I flooded in the August flood, after the next flood... you can have my house for $1. I won’t rebuild.”
> “Nothing. Design of house will not lend to elevation.”

Take Home Message: It’s all about economics. If insurance or flood damage costs increase or if elevation becomes less expensive than more people will elevate their homes.
**Attitudes Towards Voluntary Relocation**

**Question 13.** If you were compensated the full market value of your home and property, would you consider voluntarily relocating to reduce your environmental risk?

<table>
<thead>
<tr>
<th>Option</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, but only if there was sufficient financial support</td>
<td>40</td>
</tr>
<tr>
<td>Yes, but only if it was part of a larger community initiative</td>
<td>10</td>
</tr>
<tr>
<td>No, I would never sell my home and relocate</td>
<td>21</td>
</tr>
<tr>
<td>I have already relocated</td>
<td>1</td>
</tr>
<tr>
<td>Ask me again after the next storm</td>
<td>10</td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
</tr>
</tbody>
</table>

Ninety-two of 139 respondents said they would voluntarily relocate to reduce their risk if given full market value or sufficient financial support. This makes it a more favorable option to elevation whereas only 83 of 139 said they would elevate if given sufficient financial support. Twenty-one respondents say they will never sell their home and relocate; however, several of these respondents acknowledged they bought their house knowing they had minimal flood risk. A couple respondents have already relocated due to high risk. Ten respondents are on the fence, saying they’ll make that decision after the next storm.

**Take Home Message:** Among these respondents, relocation is not such a volatile topic. In some ways, it is preferable to elevation. But like elevation, it all comes down to economics: if the money is right they will relocate.
Question 14. What would have to happen for you to consider voluntarily relocating? (For example: My neighbors and friends have already relocated, rising insurance costs, loss of social services, etc.)

Respondents’ answers to relocation largely mirror their answers for elevation: the money has to be enough to move or it has to be too expensive to stay for them to consider relocating. The most common answer was the need for buyout and relocation assistance to relocate. Additionally, economic costs associated with rising insurance premiums and increased flood damage. Catastrophic loss, community deterioration, and family and friends leaving also were motivating factors several respondents. A couple altruistic respondents said they would do it for the greater good but only as part of a major storm or community wide effort. A common theme throughout is the anchor effect that respondents’ jobs have. If their livelihoods were impacted or they could relocate and keep working, they are more likely to do so. Another theme was the desire to be made whole (i.e compensated for the loss of value of their home) so that they could relocate to a comparable home. Others state “fair market value” would be needed, however, fair market value may be less than what they paid for their house. A selection of respondents’ short-answer responses to the above question:

> “Total neighborhood destruction, like not only my house, but the entire community it is situated in.”
> “Loss of social services.”
> “If fully retired and no family left in the community.”
> “Loss of physical, social and cultural opportunities as well as economic opportunities.”
> “Just write the check & I am gone. I can’t live with the threat of another Katrina, loss of life, unaffordable flood and homeowner’s insurance.”
> “Paid fair market value.”
> “Funding of a relocation that would allow us to not lose the house or our investment.”
> “Our homes have depreciated in value so that getting enough money to relocate is not possible. If I could get enough money to relocate without having to carry a note, I’d leave in a flash.”
> “I’m considering it already.”
> “Frankly, I expect to die and leave these problems to my children.”

**Take Home Message:** Financial assistance for relocation is necessary. Given diminishing property value, rising costs, and the cost of moving, it is nearly impossible to relocate without leaving people financially vulnerable.
Findings and Recommendations

The survey results shed light on the complex and shifting situation of environmental risk in south Louisiana. Across the coast there is a spectrum to the risks residents face as well as a spectrum to residents’ ability to adapt. There is a wide range of adaptation preferences with a few adaptation strategies clearly being the preferred option. Discussions solely focused on elevation or relocation are likely to be a non-starter with many individuals who view that strategy as excessive or unnecessary for their situation. The overarching message is that residents are generally open to adaptation strategies viewed as effective for their situation, provided they are able to afford it. Of particular interest in our results is the prevalence of statements of unaffordability of elevation and relocation in a survey where nearly half the respondents have a graduate degree. This points toward the ability to finance adaptation as the biggest barrier to doing so regardless of education level.

Need for CPRA and LASAFE programs

Participants clearly believe that risks have worsened in the past five years and will only get worse in the next ten years. This supports the necessity, and likely popular support, for programs such as the CPRA’s Flood Risk and Resilience Program and OCD’s LASAFE program. Both of these state programs recognize the need for flexible strategies for adaptation, indicating there is no one-size-fits-all solution to the challenges on the coast; our survey results reaffirm this. Further, the financial support offered by these programs appears to be absolutely necessary to ensure residents are able to reduce their risk; however, balancing the best option from the residents’ point of view versus the state’s point of view will likely require tough conversations.

CPEX’s Scaled Approach

The preference for a wide range of adaptation strategies is in line with CPEX’s advocacy for a scaled approach to build resilience through adaptation. CPEX, and other experts in resilience planning, argues for a comprehensive approach to risk reduction which we present at multiple scales. Various strategies exist at the site or homeowner scale, the neighborhood or community scale, and at the watershed scale. Strategies differ at each scale but are complementary and intended to be combined to increase a community’s resilience. There is a strong preference for site level adaptations like retrofitting properties, elevating structures, and using natural features such as planting trees and maintaining green space to reduce risk. At the community scale there is a preference for stormwater management and drainage improvements as a necessary component to reduce risk. At the watershed scale, in addition to stormwater management and drainage, regulating or guiding development is seen as another approach to lowering risk.

Knowledge is Potential Power

Support for education and advocacy was common throughout the survey responses in two aspects. First, individuals pointed towards educating themselves as the impetus for why they adapted or feel the need to adapt. Second, they see educating their communities as a way to ensure better decisions are made in the future and that there is support for these decisions. While this does little to help people address the risks they currently face, it does inform future decisions, which are limited by the financial means of the individual or local government. Several respondents noted that their parish or municipality has voted to raise taxes to address current and future risks, a result that would otherwise be impossible without residents who recognize the need for increased revenue to adapt to their changing situation.
Discussions on relocation are not a non-starter, however, requiring relocation to take place at community scale likely is.

A surprising result was that relocation was more acceptable than anticipated. In fact, amongst respondents, relocation was a more preferable option. More respondents were interested in being bought out and relocating, provided there was sufficient financial support, than they were interested in elevation under the same conditions. This result suggests that many individuals are willing to relocate, with some going so far as to admit they would be gone tomorrow if someone cut them a check today. This was not a unanimous result though, with many respondents pointing out how their livelihoods and personal ties have all but anchored them in place. Therefore, due to varying personal situations, focusing efforts on whole community relocations will likely preclude opportunities to aid individuals open to relocation. On the surface, the potential impact to a parish or municipal tax base under any relocation scenario remains a disincentive to advocate for it. However, by supporting and assisting residents in the process of relocation, local governments will put themselves in a better position to influence decisions that achieve a mutually beneficial result.

The Bottom Line Really is the Bottom Line

Adaptation costs money. The response “I/We would adapt if I/we could afford to” was pervasive throughout the survey. For adaptation to occur on a scale large enough to increase community resilience, financial assistance is necessary. Financial assistance can create a positive situation for local governments. Currently, local officials are limited in what they can do to help their residents. Their inability to take meaningful proactive steps to reduce community vulnerability means they are unable to create an environment that disincentivizes the current trend of outmigration in many communities. With the high costs of some adaptation strategies like elevation, as well as the individual’s inability to affect community level adaptations like stormwater management and drainage improvements, it often makes economic sense for an individual to relocate instead of adapt in place. This outmigration and resulting loss of tax base can increase the pressure on local governments to allow development that is not conducive to a less-vulnerable, more resilient community. If local governments had sufficient funding to enact risk-reduction measures or proactively help current residents adapt in place, they would be in a better position to support smarter development. In short, without additional aid the only option is to wait for the next disaster and hope recovery money is sufficient to adapt and do more than just rebuild.