Nonstructural Frequently Asked Questions

CPRA Flood Risk and Resilience Program

This document compiles Frequently Asked Questions (FAQs) that pertain to the Coastal Protection and Restoration Authority's Flood Risk and Resilience Program and the nonstructural risk reduction project recommendations developed for the 2017 Coastal Master Plan. The intent is to provide interested coastal Louisiana residents, parish officials, coastal stakeholders, and the general public with additional information about CPRA's nonstructural risk reduction projects and related programmatic and policy initiatives. The FAQs cover a range of topics, from general information to more technical details of the analysis, in order to be of use to a wide range of audiences.

To help users navigate the information, this document is organized into the following sections and questions:

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General Information about the Flood Risk and Resilience Program

1. What is CPRA's Flood Risk and Resilience Program?

CPRA's Flood Risk and Resilience Program is focused on promoting the state's objective of reducing the impacts of coastal storm surge based flooding on communities. The program emphasizes the planning for and implementation of nonstructural risk reduction projects, which are complements to the other structural risk reduction measures, such as levees and flood gates. Nonstructural risk reduction measures include activities that do not stop floodwaters, but reduce the impacts of flooding to buildings and infrastructure by floodproofing, elevation, or voluntary acquisition where property owners move away from high risk areas. Additionally, the Flood Risk and Resilience Program also supports other programmatic efforts and resilience policies to reduce risk to future building infrastructure, promote safer growth, and to encourage greater flood risk awareness.

2. What is unique about the Flood Risk and Resilience Program?

CPRA is utilizing the best available science and lessons learned from other mitigation programs to create a coast wide nonstructural program that effectively reduces flood risk and meets the needs of coastal residents. This process enables wise use of resources while working to meet the needs of the communities most vulnerable to flood damage because they are either located in areas of high risk or they may not have the economic resources to prepare for or recover from a storm surge event. The program is also designed to adaptively respond to local needs by enabling parishes to further develop and refine nonstructural risk reduction projects. Building off of the many ongoing mitigation successes, the Flood Risk and Resilience Program is unique in scope and offers substantial benefits such as:

- **Reduced cost share requirements** as compared to federal programs: 90% CPRA funded and with up to 100% full state funding when certain requirements are met
- **Promotes implementation of large-scale nonstructural risk reduction projects** (i.e., 100-6,000+ structures) to take advantage of economy of scale
- **Supports local decision making** through parish prioritization of structures to be mitigated
- **Promotes higher standards** of risk reduction by recommending the elevation of residential structures to CPRA 100-year flood depths (above grade) plus two feet

3. What are the major improvements to the nonstructural program for the 2017 Coastal Master Plan?

The Flood Risk and Resilience Program has advanced by:

- Developing a framework and nonstructural application process to create the institutional mechanism to distribute funding to parishes
- Furthering state and local planning and coordination by establishing consistent dialogue between CPRA, other state agencies, and parishes throughout program development process
- Focusing recommended nonstructural risk reduction project on areas of high risk
- Developing recommended nonstructural measures (floodproofing, elevation, voluntary acquisition) that consider local needs and technical feasibility

The 2017 flood risk analysis has improved through:

- Expanding the study area to account for a growing floodplain
- Increasing spatial resolution of the flood risk model grid (1 km^2 grid cell or smaller census block) to allow for more detailed analysis of flood risk, especially in rural areas
- Improving the inventory of coastal assets at risk through more current and robust datasets
- Additional improvements include: incorporating recent levee system research into system fragility scenarios, incorporating parametric uncertainty into flood depth

estimates, and comparing the Coastal Louisiana Risk Assessment (CLARA) model flood depth and damage estimates to those observed during Hurricane Isaac for verification purposes

The program works to respond to community concerns and changing community needs by:

- Incorporating social vulnerability by emphasizing that low to moderate income (LMI) households be prioritized during the nonstructural application process and the parishes' implementation of nonstructural risk reduction projects
- Incorporating future economic growth scenarios by varying several factors including rates of population growth/decline, and changes in future flood depths and land loss over time due to relative sea level rise to better determine future vulnerabilities

4. How does CPRA communicate and collaborate with communities? How is CPRA getting the word out?

CPRA welcomes feedback from coastal communities and stakeholders and established several stakeholder groups to hold ongoing conversations as the master plan was developed. Additionally, CPRA held a series of community meetings in February and March of 2015, February of 2016, and October of 2016. Additional public meetings were also held in January-March of 2017 to gather feedback before the final plan was submitted to the Louisiana State Legislature.

CPRA has also enlisted community members and coastal stakeholders to provide input into the Flood Risk and Resilience Program and the broader 2017 Coastal Master Plan including:

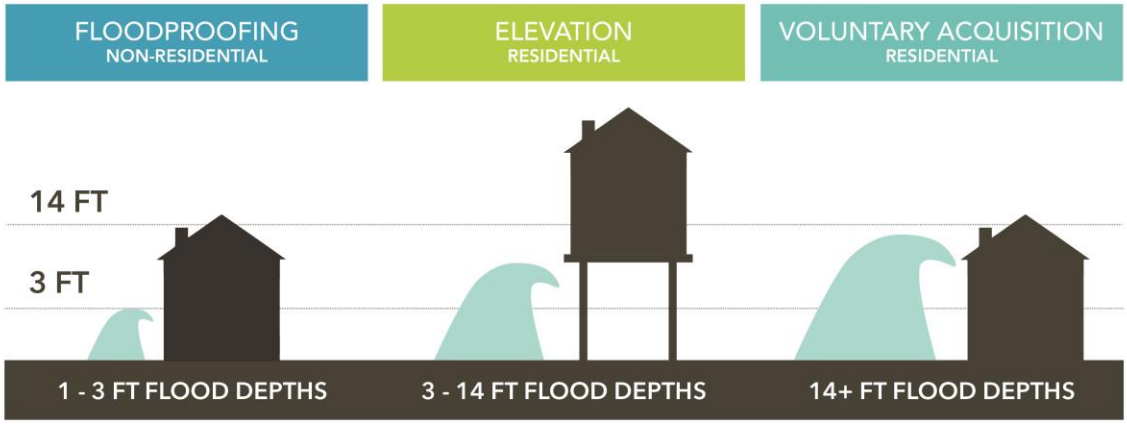
- The **Community Focus Group** provides feedback on how the master plan may be able to better address communities' needs. Comprised of community advocates and organizers, faith-based groups, and tribal leaders, the group is charged with enhancing and expanding ongoing communications between the state and local coastal citizens.
- The **Parish Floodplain Manager's Group** offers insight into the implementation of nonstructural risk reduction projects, including expertise in grant applications, funding procurement, and project implementation. These professionals consist of local parish floodplain managers, grant administrators, state hazard mitigation staff, and parish planners. They also offer experience in broader planning efforts for reducing flood risk and promoting safer community development such as the development of local plans and ordinances, as well as local management of NFIP's Community Rating System.
- The **Flood Risk and Resilience Stakeholder Group** consists of NGOs and other stakeholders who are convened periodically to provide feedback on the Flood Risk and Resilience Program developments and path forward.

CPRA convenes additional working groups as needed to further other targeted initiatives. One such example is the workgroup that developed the Master Plan Data Viewer and provided input on the development of the online, interactive flood risk visualization tool. This workgroup consisted of a variety of community advocates, faith-based groups and NGOs, as well as a range of flood risk and outreach/education practitioners.

Overview of Nonstructural Risk Reduction Projects

5. What types of projects are considered for nonstructural mitigation? How are these nonstructural risk reduction projects defined?

Nonstructural risk reduction project areas in the 2017 Coastal Master Plan include one or more of the following nonstructural mitigation measures, which are recommended according to flood depths and structure types. Each mitigation measure is based on the CPRA estimates of 100-year flood depths (plus two feet of freeboard for elevation projects) expected for either 10 or 25 years into the future.



The 2017 Coastal Master Plan considers three types of mitigation measures including:

- **Floodproofing** of non-residential structures. Recommended in areas where the mitigation standard is less than 3 feet.
- **Elevation** of residential structures. Recommended in areas that where the mitigation standard is between 3 and 14 feet.
- **Voluntary Acquisition** for residential structures. Recommended in areas where the mitigation standard is greater than 14 feet.

Thus, if an area experiences six feet of future flooding, residential structures are proposed to be elevated to eight feet in order to account for the required two feet of freeboard. Similarly, an area that experiences 13 feet of flooding would be eligible for voluntary acquisition, as structures would need to be elevated greater than 14 feet in order to account for two feet of required freeboard. Nonstructural risk reduction project recommendations add two feet of freeboard in order to increase the margin of safety and reduce risk from future flooding.

Nonstructural risk reduction projects proposed to be implemented in year 1-30 are defined by 100-year (1-percent annual chance) future flood depths expected 10 years in the future under the High environmental scenario; nonstructural risk reduction projects proposed for implementation in year 31-50 are defined by 100-year future flood depths expected 25 years in the future under the High environmental scenario (see FAQ #12 for more information about environmental scenarios).

6. Why is 14 feet the limit for residential elevation?

The 14 foot maximum elevation height is a recommendation of the United States Army Corps of Engineers (USACE) National Nonstructural/ Flood Proofing Committee. Based on engineering

knowledge and professional floodplain management best practices, this maximum is a prudent limit that avoids introducing significant hazards to the structure from tropical wind speed. From an engineering standpoint, higher elevations can be achieved, but not without additional and unconventional design, as well as significant cost increases. Furthermore, the recommendations from the USACE/CPRA Southwest Coastal study, as well as local shoring company data, both support this elevation height. For these reasons, and because the elevation project definition also includes additional required freeboard of 2 feet, only elevations up to 14 feet are considered.

7. What is non-residential floodproofing?

Floodproofing projects consist of dry floodproofing techniques, which make buildings watertight up to an established elevation (generally to a maximum of 3 feet flood depths). Dry floodproofing is a viable mitigation option for non-residential buildings and large-scale multi-family structures such as apartments that are too large to be elevated. However, it is not typically feasible in areas of high-velocity flow or wave action. Single family, small multi-family (e.g., duplexes), and manufactured homes are generally not suitable for dry floodproofing measures given the level of emergency preparedness actions required to successfully install features at openings in the case of an impending storm, as well as the hydrostatic pressures that act on the exterior of the building when water is prevented from entering. Most building codes also prohibit dry floodproofing of these structures. In addition, floodproofing of a residential building does not affect the flood insurance rating as it is not considered an acceptable mitigation measure under NFIP. The exception to FEMA's rule is for historic residential buildings if an elevation would modify its historic character. Residential floodproofing is also not an allowable mitigation measure according to the American Society of Civil Engineers (ASCE) Flood Resistant Design and Construction Standard 24-14, as well as most flood damage prevention ordinances and building codes. Therefore, at this time, CPRA is not considering residential floodproofing as an eligible project type in the Flood Risk and Resilience Program.

Floodproofing is allowed only for non-residential structures that may experience 1-3 feet of flood depths. In areas where dry floodproofing is not feasible, a structural protection measure, such as constructing a small ring levee or flood wall, may be submitted by parishes and considered by CPRA.

Master Plan Analysis and Development of Nonstructural Risk Reduction Projects

8. How are flood depths determined? Does CPRA consider riverine flooding or rainfall estimates in the modeling?

To estimate flood depths, 60 synthetic storms with different intensities, sizes, and landfall locations were modeled to provide an estimate of storm surge across Louisiana's coast. Using this storm surge and wave data along with the relative likelihood of each storm occurring, the CLARA model translates the information into flood depths (defined as the height of the floodwaters or storm surge above grade or ground level) for the current condition, as well as 10, 25, and 50 years in the future. It is important to note that flood depths do not include the possible effects of riverine flooding. For more information on the CLARA model, see Section 1.0 Introduction from Attachment C3-25: Storm Surge and Risk Assessment.

The CLARA model also takes into account the chance of levee/floodwall overtopping and levee/floodwall failure in protected areas using different fragility scenarios. In coastal areas unprotected by levees, floodwalls, or other structures, flood depths are determined by the height of the storm surge plus the height of the highest waves. This does not include any flooding due to rainfall. In areas entirely enclosed by a levee, flood depths include both rainfall and storm surge inundation due to levee overtopping or breaching. This approach is consistent with the USACE LACPR Study (2009). For more information on fragility scenarios, see Section 4.0 Updates to Levee Fragility and Breaching Approach from Attachment C3-25: Storm Surge and Risk Assessment.

9. What types of things are included in the assets at risk?

- Residential structures (single family homes, multi-family homes, and manufactured homes)
- Businesses & commercial structures
- Public facilities
- Industrial structures
- Agricultural crops and structures
- Roads, railroads, bridges
- Vehicles

In the 2017 Coastal Master Plan, the assets used to calculate economic damage were based on inventories derived from several sources of data which have been expanded or revised since 2012. **Residential structure data** were obtained from USACE Louisiana Coastal Protection and Restoration (LACPR) (2008), FEMA Hazus-MH (2009), Greater New Orleans Community Data Center (GNOCDC) (2010), American Community Survey (ACS) (2014); **Non-residential structure data** were obtained from LACPR, FEMA, and the U.S. Census County Business Patterns (CBP) (2005-2008). Additionally, both residential and non-residential structure datasets were updated with more recent and detailed inventory estimates from USACE New Orleans District. These datasets describe individual structures in areas derived for three separate studies including Morganza to the Gulf (MTTG) Reformulation Study, Southwest Coastal Louisiana (SWC) Feasibility Study, and West Shore Lake Pontchartrain Feasibility Study. **Critical assets data** were developed from the Homeland Security Infrastructure Program (HSIP) Gold database (2014) and augmented by an inventory of strategic assets identified by the State of Louisiana.

In addition, previously mitigated structures are also omitted from the assets at risk to avoid duplication of nonstructural investments. Mitigation data were obtained from the Office of Community Development (OCD) and the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), and included approximated 19,000 structures that had been mitigated from 2005-2014. For more information on how assets were determined, see Section 3.0 Improved Asset and Valuation Data for Damage Estimation from Attachment C3-25: Storm Surge and Risk Assessment.

10. How is economic damage determined?

Economic damage is determined by the value of assets in a given area and the depth of flooding the assets are subject to. These calculations are based on FEMA's Hazus model, a nationally applicable standardized methodology that contains models for estimating potential economic losses from earthquakes, floods, and hurricanes. Damage is calculated using various depth-damage curves, depending on local conditions, such as fresh versus salt water inundation or flooding in A Zones versus V Zones. In some instances, more locally tailored data is used from the USACE New Orleans District based on historical observed flood damage data in coastal Louisiana.

Economic damage includes the value of assets directly damaged by flooding, as well as repair or replacement costs, and other direct economic impacts, such as cost of evacuation, loss of sales, loss of income, and relocation costs. To determine economic damage over time, flood depths and assets are projected over the next 50 years. Future flood depths respond to a changing landscape, and assets respond to a changing population (which is described in more detail in question #11 below).

Lastly, summaries of economic damage are made using the metric "expected annual damage" (EAD), which quantifies the average amount of damage projected to occur from a storm surge flood event for each community, expressed as dollars of damage for a given year. While every

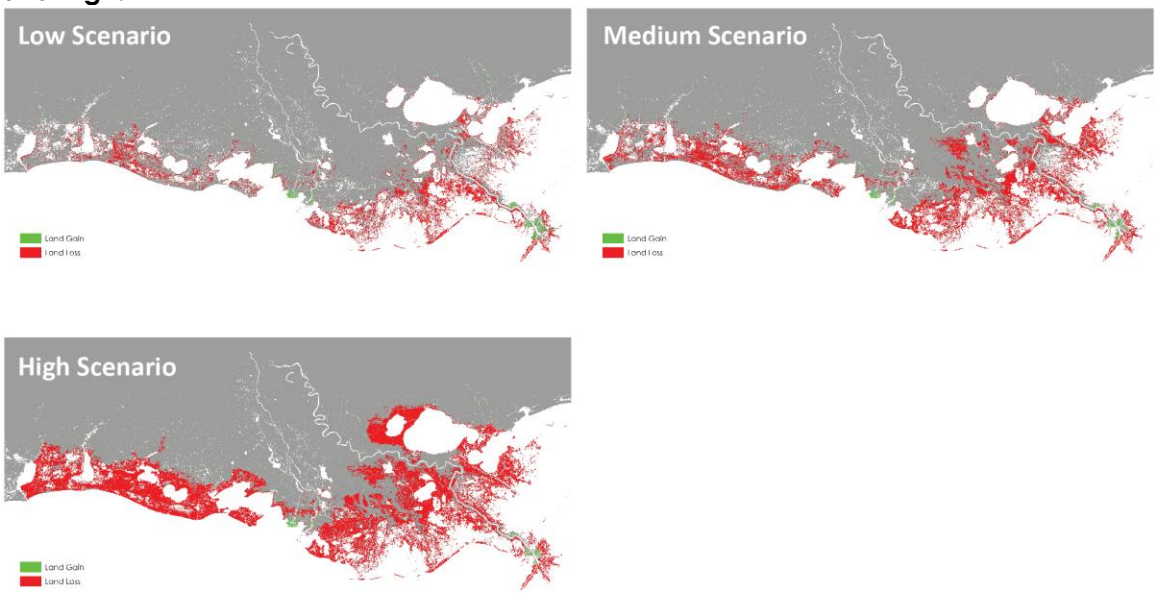
community will not flood every year, these statistical averages at year 50 show a given community's expected flood risk and the damage that would be associated with that risk as a way to compare the effects of risk reduction projects.

11. **Does the master plan consider future population change/growth into its analysis?**
The 2017 Coastal Master Plan considers future population change by taking into account three population scenarios which vary by overall annual coast wide growth rate, as well as different localized growth rates due to differences in population density, land loss rates, and flood depths. The 2017 Coastal Master Plan considers three population scenarios which include: 1) **Historic Growth Scenario** based on recent historical growth (1990-2000); 2) **Concentrated Growth Scenario**, which assumes future shifts in population and asset growth to more dense areas that are further upland; and 3) **No Growth Scenario**, which yields no net growth coast wide and a general population shift away from areas more exposed to land loss and coastal flooding. The population growth scenarios are based on historical development trends, but also reflect the divergent pathways that future growth could take over the 50-year period of analysis. As number and location of assets are generally assumed to be proportionate to population growth, the population scenarios influence plausible future flood damage to better represent future uncertainty and support the comparison of proposed structural and nonstructural risk reduction projects. See Section 9.0 Scenarios of Future Population and Asset Growth from Attachment C3-25: Storm Surge and Risk Assessment.

12. **What are environmental scenarios and how are they used in the plan development process?**
The objective of the master plan is to evaluate and select restoration and protection projects that build and maintain the landscape and reduce risk to communities from storm surge based flooding. Given the uncertainty associated with future environmental conditions, the technical analysis incorporates several environmental scenarios to reflect such uncertainty. These environmental scenarios affect the coastal Louisiana landscape (total land area), flood depths (the height and extent to future storm surge based flooding), and economic damage (the range of economic impacts on buildings and infrastructure due to different flood depths). This is especially important to decision making when planning long-term (50-year), large-scale (coast wide) restoration and protection efforts for coastal Louisiana.

    For the 2017 Coastal Master Plan, three environmental scenarios reflect differences in six key environmental drivers considered to have uncertain outcomes over the next 50 years. The three environmental scenarios are Low, Medium, and High, which incorporate different assumptions about eustatic sea level rise (global change in sea level), subsidence (sinking of land), tropical storm intensity, tropical storm frequency, evapotranspiration, and precipitation. The values of these variables included in each scenario represent a range of plausible options based on the best available scientific research, and do not necessarily represent "best-case" or "worst-case" environmental conditions.

Future Without Action Land Change at Year 50 for Three Environmental Scenarios- Low, Medium, and High.



The above maps show future land change if we take no further protection or restoration actions at Year 50 under three different environmental scenarios. (Red indicates areas of land loss and green indicates areas of land gain.) The 2017 Coastal Master Plan selected projects based on the High scenario in order to help the state prepare most conservatively for uncertain future conditions. For more information on environmental scenarios, see Chapter 2 Future Scenarios of Appendix C: Modeling.

13. What are risk scenarios and how are they used in the plan development process?

A key update for the 2017 Coastal Master Plan analysis was to develop new risk scenarios, which are based on different assumptions about economic growth and the fragility of structural protection systems. Details about economic growth are included in the discussion of assets at risk and population growth scenarios (see FAQs #9 and #11 above).

Scenarios of levee fragility, or probability of levee structural failure, capture the wide range of uncertainty within protection systems and how they may respond to flood events. The 2017 analysis considers the potential for levee failure through three fragility scenarios to better understand future flood risk and evaluate potential protection projects. Fragility scenarios reflect the probability of levee or floodwall failure due to three failure mechanisms, including seepage, slope stability, and overtopping failure. These scenarios include: 1) No Fragility; 2) IPET Fragility (Interagency Performance Evaluation Task Force, 2007); and 3) MTTG Fragility (Morganza to the Gulf Reformulation Study, 2013); the latter two represent different levee fragility assumptions based on studies conducted by USACE. See Section 4.0 Updates to Levee Fragility and Breaching Approach from Attachment C3-25: Storm Surge and Risk Assessment.

14. How are the nonstructural risk reduction projects developed?

For the 2017 Coastal Master Plan, nonstructural risk reduction project formulation occurs through several steps:

First, 54 candidate nonstructural project areas were created using parish or municipal boundaries as well as current and/or future hurricane protection projects. Within each nonstructural project area, several sets of project variations or mitigation options were developed. These project

variations (termed "variants") specify the nonstructural mitigation measures (i.e., floodproofing, elevation, and acquisition) that take into consideration different flood depths. Different flood depths were determined by a given time period (initial conditions, year 10, or year 25) and environmental scenario (Low, Medium, and High) that the nonstructural measures were designed to mitigate.

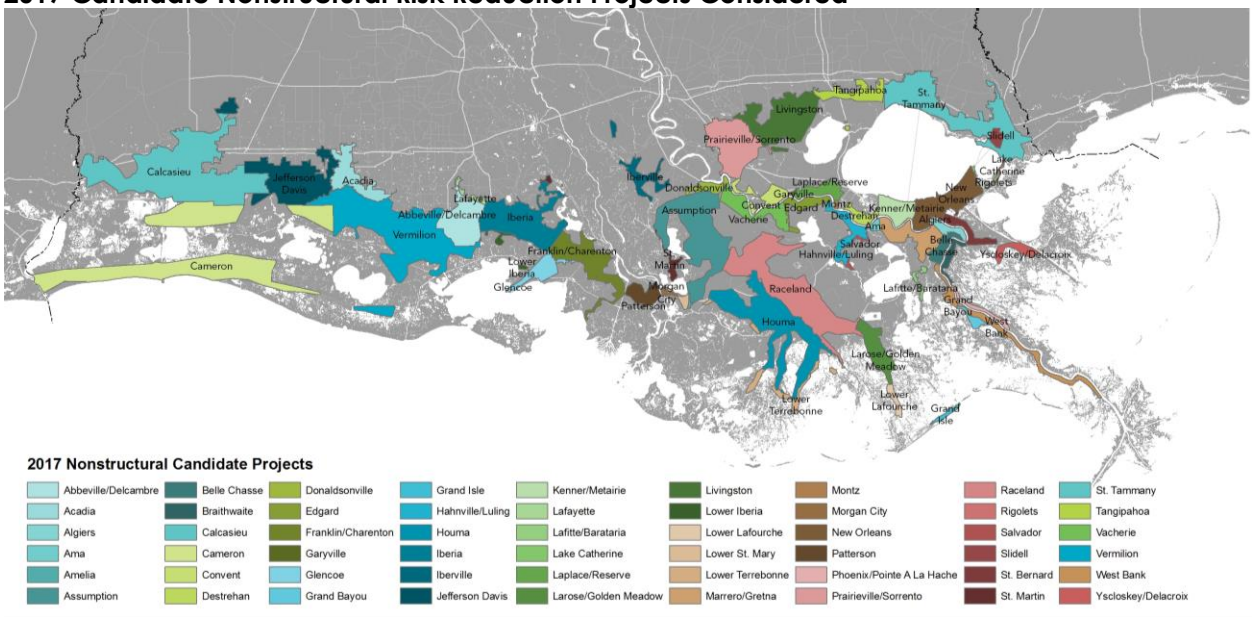
For example, a nonstructural risk reduction project designed to mitigate flood depths for initial conditions may have fewer structures recommended for mitigation than a nonstructural risk reduction project that is based on flood depths at year 25 under the High environmental scenario. For each project variant, the number and cost of floodproofing, elevation, and acquisition mitigation options are summarized in total and by structure type. As with structural risk reduction projects, nonstructural risk reduction project variants are evaluated for their ability to reduce EAD at years 10, 25, and 50, as well as across different environmental and risk scenarios.

After comparing nonstructural project variants to each other, two nonstructural variants were selected. These nonstructural project variants were defined by flood depths occurring at either 1) year 10 or 2) year 25 under the High environmental scenario. Nonstructural risk reduction projects slated for the initial implementation period (years 1-30) are designed to mitigate the impacts of flood depths occurring 10 years into the future, while nonstructural risk reduction projects selected in the last implementation period (years 31-50) are designed to mitigate the impacts of flood depths occurring 25 years into the future. Thus, nonstructural risk reduction projects are designed to mitigate future flood risk and improve the margin of safety over initial conditions.

This group of nonstructural project variants was then analyzed alongside structural protection projects based on different available budget options of $40, $50, and $60 billion for the 2017 Coastal Master Plan (or $17.6, $25, and $30 billion dedicated to risk reduction projects). Projects variants were also compared across different implementation periods as described above.

For more information on how nonstructural risk reduction projects were developed, see Section 8.0 Nonstructural Vulnerability Analysis from Attachment C3-25: Storm Surge and Risk Assessment, and Formulating Nonstructural Projects (Sections 2.5.1 and Section 3.2) from Appendix D: Planning Tool.

2017 Candidate Nonstructural Risk Reduction Projects Considered



To see a list of all nonstructural risk reduction projects considered in the master plan analysis, see Section 1.2.3 Nonstructural Risk Reduction Projects in the Appendix A: Project Definition and Attachment A8: Project Fact Sheets.

15. How are risk reduction alternatives developed?

The Planning Tool is a computer program that helps the Planning Team to compare the relative benefits or drawbacks of hundreds of different risk reduction and restoration project options. These projects can be compared both individually and based on how they work together in groups (termed "alternatives"). The Planning Tool first compared the benefits of individual risk reduction projects on their ability to maximize near-term (year 25) and long-term (year 50) EAD reduction. The Planning Tool was then used to develop sets of risk reduction projects, or alternatives, to implement in two time periods (years 1-30 and 31-50) that best achieve CPRA's risk reduction goals. This procedure ensures that the projects that provide the greatest risk reduction (constrained by available funding) are selected in the first time period and those with reduced benefits in the next period. This approach takes into account the significant uncertainty about how precisely the master plan will be implemented over the coming decades, and the importance to implement projects now that will most efficiently put Louisiana on a trajectory of increased resilience.

The Planning Tool was used to identify a robust, adaptive alternative that performs well across many plausible futures. The Planning Team used the tool to specify how project selection would change or adapt depending on how the future unfolds. For nonstructural risk reduction and structural projects, the Planning Tool formulated various alternatives that maximize EAD reduction for different environmental, risk, and funding scenarios. Comparisons of projects across the alternatives were reviewed to identify low-regret projects, or projects that are always selected across the three future environmental scenarios. For more information about the Planning Tool, see Section 2.5.3 Formulating Alternatives and Section 3.4 Alternative Formulation in the Appendix D: Planning Tool.

16. How are nonstructural risk reduction projects evaluated?

Nonstructural risk reduction and structural protection projects were evaluated by how well the project can reduce a given area's EAD within a given budget. Risk regions are used as a common geographic area to compare the effects of nonstructural risk reduction and structural protection projects. Each of the 54 candidate nonstructural risk reduction projects is contained within one risk region, while structural projects may impact one or more risk regions.

Effects on EAD are determined by the difference in EAD for a risk region for the "Future with Project" compared against the "Future without Project." Economic damage is generated by the CLARA model for initial conditions and years 10, 25, 50, and across all of the environmental and risk scenarios. Different nonstructural project variants are compared to each other as well as to the structural risk reduction projects to determine which projects provide the greatest risk reduction. In general, all risk reduction projects were evaluated based on the same risk metric (EAD). Additionally, ten nonstructural risk reduction projects were identified as prerequisites for structural projects that result in increased flood depths outside the levee system. When a structural project was recommended in the master plan that resulted in induced flooding in areas outside the levee, the associated prerequisite nonstructural risk reduction projects was also recommended in the same implementation period to mitigate the area of induced flooding. For more information about comparing nonstructural risk reduction projects, see Section 3.3 Comparison of Individual Projects and Section 3.4 Alternative Formulation in the Appendix D: Planning Tool.

17. How is project "cost-effectiveness" determined?

The Planning Tool determines individual projects' cost-effectiveness based on estimates of their effects on the coast scaled by total project cost. For structural protection and nonstructural risk

reduction projects, a project's effect on the coast is measured as the difference between the "Future with Project" and "Future without Project" EAD for a particular area (one or more risk regions) at a point in time. The Planning Tool calculates cost-effectiveness for the mid-term (year 25) and the long-term (year 50). To calculate cost-effectiveness, the effects are scaled using 50-year project costs, which include planning, design, and construction costs, plus operations and maintenance costs through the 50-year time horizon. As noted in FAQ #16, EAD reduction is the decision driver used to evaluate the effects of risk reduction projects. The cost-effectiveness metric, while informative, was not used to make decisions about nonstructural risk reduction project selection. For more information on cost-effectiveness, see Section 2.5.2 Comparing Projects in the Appendix D: Planning Tool.

18. How are nonstructural risk reduction project cost estimates derived?

The 2017 Coastal Master Plan refines the nonstructural risk reduction project attributes and cost estimates to aid in evaluating potential flood mitigation projects. In general for floodproofing, elevation, and voluntary acquisition projects, most cost estimates are developed using data and approaches provided in RSMeans® Building Construction Cost Data 2014, 72nd Annual Edition. A Geographic Adjustment Factor was applied to adjust cost based on variable economic conditions in different types of areas (e.g., generally higher labor rates in or near urban areas associated with higher costs of living). These cost estimates were then compared to estimates from local parishes which received recent contractor bids to validate the cost assumptions. For instance, elevation project costs range from $82-$104/square foot in the 2017 Coastal Master Plan, while recent project estimates from local parishes show costs ranging from $55-$106/square foot.

All nonstructural measures are voluntary in nature, and the anticipated participation rates are a critical component of the evaluation process. While CPRA will make every effort to include as many property owners as possible, past experience indicates that the participation rate will be less than 100%. For the 2017 Coastal Master Plan, an assumed participation rate of 80% is used. For more information on nonstructural risk reduction project costs, please see Section 3.10 Nonstructural Risk Reduction in the Appendix A: Project Definition.

19. Are non-federal levees considered in the flood risk reduction analysis (or just federal levees)?

Both federal and non-federal levees are considered within the flood risk assessment, and flood depths reflect any benefits that may (or may not) be afforded by local levees.

20. How do you compare benefits of levees versus nonstructural risk reduction projects? Do nonstructural risk reduction projects mitigate some increased flood risk outside proposed levee protection systems?

As described above, the Planning Tool considered EAD reduction for structural and nonstructural risk reduction projects together for a particular budget. The Planning Tool assumed additive risk reduction when a nonstructural risk reduction and structural project affects the same region, with the total risk reduction capped at the amount of risk in the future without action. In other words, the Planning Tool did not count benefits after EAD is eliminated.

The Planning Team also specified in certain instances that a structural and nonstructural risk reduction project pair must be selected together. For example, if a structural project was selected but also increased flood depths outside the levee system, then a nonstructural risk reduction project would automatically be selected to mitigate the area of induced flooding. A total of 10 nonstructural risk reduction projects were selected in conjunction with structural protection projects. Here, the nonstructural risk reduction project would be implemented alongside the structural protection project. See Table 11 in the Appendix D: Planning Tool. These projects include:

- **001.HP.08: Lake Pontchartrain Barrier**
  - ORL.01N: Rigolets

- STB.02N: St. Bernard
- **002.HP.06: Upper Barataria Risk Reduction**
  - JEF.02N: Lafitte/Barataria
  - LAF.02N: Larose to Golden Meadow
  - LAF.03N: Raceland
  - STC.05N: Salvador
- **03a.HP.20: Larose to Golden Meadow**
  - JEF.01N: Grand Isle
  - LAF.01N: Lower Lafourche
- **03a.HP.103: Morganza to the Gulf**
  - LAF.01N: Lower Lafourche
  - LAF.02N: Larose to Golden Meadow
  - TER.01N: Lower Terrebonne
- **03b.HP.14: Iberia/St. Mary Upland Levee**
  - VER.01N: Vermilion

It is also possible that some risk regions will not receive a nonstructural risk reduction or structural project; these would be areas that have relatively low future flood risk, or where projects provide minimal risk reduction or do not fit within the available budget.

21. How does the 2017 Coastal Master Plan give consideration to the needs of low to moderate income households?

Low to moderate income (LMI) households are 50-80% below the median income level as defined by the United States Department of Housing and Urban Development (HUD). (See https://www.huduser.gov/portal/datasets/il.html#2016_query for more details.) LMI families may be particularly vulnerable to the impacts of flooding. CPRA recognizes the challenges of LMI households and has designed the Flood Risk and Resilience Program framework to require that parishes target and prioritize LMI properties during the nonstructural implementation process. CPRA will work with parishes to develop a consistent process of prioritizing structures by household income and will offer several options to receive proof of LMI consideration during the application process.

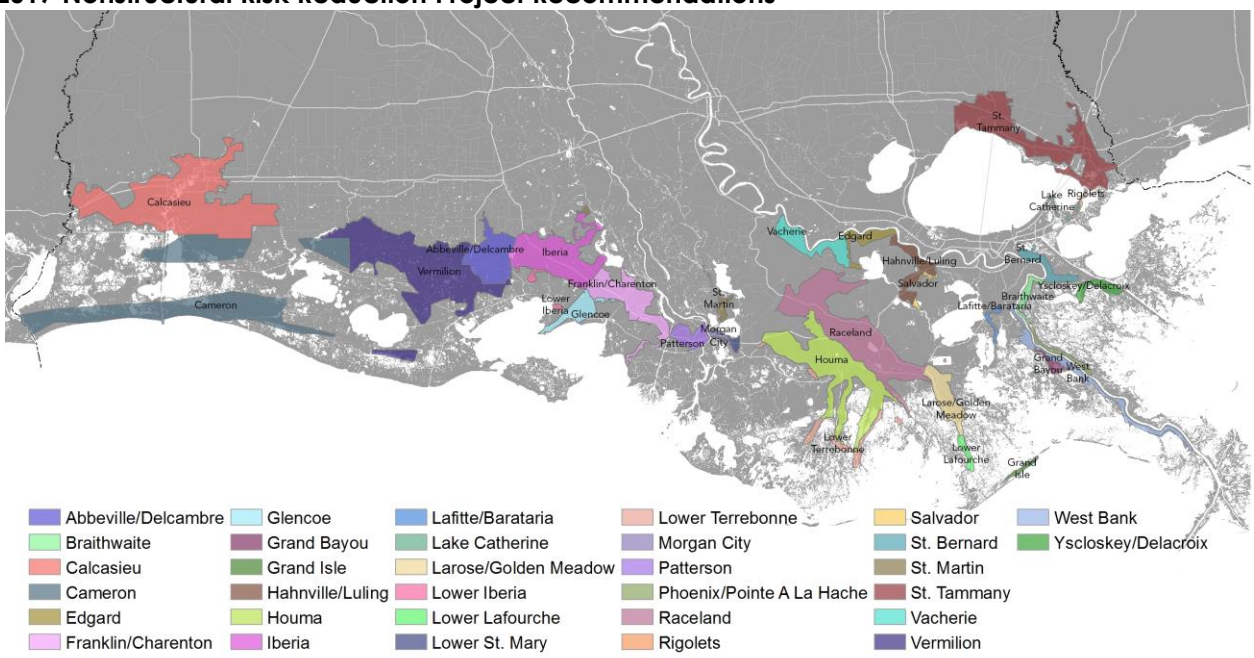
In terms of the nonstructural risk reduction project development process, LMI was initially considered as an evaluation criterion. However, requiring households to be LMI to be eligible for mitigation proved to severely limit the scope and size of the nonstructural program, and hence effectiveness at reducing flood risk. Thus, the LMI criterion was not utilized to make nonstructural risk reduction project recommendations. The intent of the master plan is to recommend projects that provide the greatest risk reduction benefit. Restricting the program to only LMI structures would significantly reduce the ability of the program to address flood risk within coastal Louisiana. LMI households will, nevertheless, be more likely to need external funding to support risk reduction. As such, CPRA has required LMI as part of the prioritization process in the nonstructural application, as described above, to ensure that LMI households are given preference in the nonstructural implementation process. For more information of how LMI households are included in the Flood Risk and Resilience Program, please see Section 4.2.2 Phase II: Initial Assessment in the Appendix E: Flood Risk and Resilience Program Framework and Section 2.4 Prioritizing Mitigation of LMI Structures in Attachment E4: Parish Applicant's Handbook.

22. What are the nonstructural recommendations for the 2017 Coastal Master Plan?

The 2017 Coastal Master Plan includes 32 nonstructural risk reduction projects recommended to mitigate over 26,000 structures at a cost of $6 billion over the next 50 years. This includes approximately 1,400 non-residential floodproofings, 22,400 residential elevations, and 2,400

residential voluntary acquisitions. The 32 recommended nonstructural risk reduction projects vary in project area size, number and cost of mitigation measures, and other details.

2017 Nonstructural Risk Reduction Project Recommendations



For more information about the 2017 Coastal Master Plans' recommended nonstructural risk reduction projects, see the Attachment E3: Nonstructural Model Results, as well as Attachment A8: Project Fact Sheets.

23. How are the nonstructural recommendations for the 2017 Coastal Master Plan different from the 2012 Coastal Master Plan?

The 2012 Coastal Master Plan recommended 42 nonstructural risk reduction projects areas at a cost of $10 billion, while the 2017 Coastal Master Plan recommends 32 nonstructural risk reduction projects areas at a cost of $6 billion. The updated master plan was refined to narrow the scope of the nonstructural mitigation to focus on areas of highest flood risk. Updated structural datasets provided by GOHSEP and OCD were used to identify structures that have already been mitigated through other programs, and new parcel level data from three recent USACE studies were also incorporated into the analysis.

Local Implementation and Capacity Building

24. What role do parishes have in nonstructural risk reduction project implementation? How much flexibility will parishes have in refining CPRA recommendations?

Coastal parishes play a key role in the Flood Risk and Resilience Program and nonstructural mitigation implementation. The Flood Risk and Resilience Program application has been designed with substantial input from parishes, and CPRA and parishes will continue to work closely to develop and implement projects.

It is important to remember that the 2017 Coastal Master Plan's recommended nonstructural risk reduction projects contain aggregated information for counts of non-residential floodproofing, residential elevations, , and/or residential voluntary acquisition projects. These counts do not represent mitigations to specific buildings or structures. Parishes are responsible for refining CPRA's

nonstructural recommendations by formulating a more detailed list of specific, prioritized structures in order to promote efficient project implementation, effectively reduce flood risk, and tailor the program to the parish's local needs and goals.

To support local decision making, CPRA will provide the parishes with the results of the 2017 Coastal Master Plan nonstructural risk reduction project evaluation, which contains information on current/future flood risk and identifies the number/type of structures recommended to be mitigated in each project area and the associated project cost estimates. The parishes will then need to determine which specific structures within the project area can be mitigated first with the available funding.

25. How is CPRA supporting the implementation of nonstructural risk reduction projects for households with low to moderate income?

Parishes will need to prioritize properties in the following order of importance - structures benefitting low to moderate income households, properties that are owner occupied/primary residences, properties contiguous to one another (or that complete an area of contiguous mitigation), and properties with the highest flood depths. Parishes may also want to consider prioritizing based on repetitive or historical flood loss (with or without insurance). Should funding only be available for a portion of the project, CPRA will prioritize properties that meet those above criteria for mitigation. The parish may also include additional criteria that address parish-specific issues, but should also keep in mind that percentage of households that qualify as low to moderate income is a required feature in CPRA's project prioritization process. For more information on the application process see Section 2.0 Parish Application Process in Attachment E4: Parish Applicant's Handbook.

26. Is there currently funding available from CPRA to implement nonstructural risk reduction projects?
There is not yet funding allocated to CPRA's Flood Risk and Resilience Program. CPRA's overall goal is to effectively utilize different funding sources as they become available to reduce risk and to effectively implement the nonstructural risk reduction projects identified in the 2017 Coastal Master Plan. While there is still significant uncertainty in the total funding amount and timing, this funding will likely come from several existing and potential future sources. Potential and existing funding sources that could be used for nonstructural risk reduction project implementation include the Gulf of Mexico Energy and Security Act (GOMESA), and the Title VII Water Resource Development Act (WDRA)/ Energy and Water Appropriation Act. For more information on the potential future funding sources available, see Section 5.0 Description of Potential Funding Sources in Appendix E: Flood Risk and Resilience Program Framework.

After the 2017 Coastal Master Plan is approved, the CPRA Board Flood Risk and Resilience Subcommittee will continue to meet to review potential funding sources, recommended nonstructural risk reduction projects, and coordinate on other state or federal mitigation projects.

27. How is the Flood Risk and Resilience Program advancing towards the implementation of nonstructural risk reduction projects?
In order to advance the Flood Risk and Resilience Program, CPRA has developed a nonstructural application process and associated guidance and materials that could be used to administer nonstructural risk reduction project funding from CPRA to local parishes. CPRA created the nonstructural application process in preparation for future funding streams, which is detailed in Attachment E4: Parish Applicant's Handbook and CPRA's nonstructural application package. These documents will assist in efficiently and effectively implementing nonstructural risk reduction projects with monies that may become available in coming years. A well-developed process will greatly improve the agency's ability to shorten the grants management process, reduce bureaucratic inefficiencies, and quickly build projects that reduce risk for coastal Louisiana residents. CPRA is also "test driving" the application process through the Parish Pilot Project, which

will allow CPRA to better coordinate and collaborate with local parishes and work together to develop a coast wide mitigation program.

Through the Parish Pilot Program, CPRA partnered with Jefferson Parish to review Flood Risk and Resilience Program related documents and the application package. The pilot program was undertaken to ensure that the nonstructural application process took into consideration more detailed local feedback. The parish's floodplain manager and staff provided recommendations that were incorporated to clarify the application materials and adjust the application process to better serve local parish needs. CPRA will continue to refine the nonstructural application process with feedback from other state agencies and parishes. For more information on the nonstructural application process and Parish Pilot Program, see Attachment E4: Parish Applicant's Handbook.

28. How is CPRA using data sharing to improve resilience planning, flood risk reduction, and nonstructural implementation?

CPRA produces a substantial amount of data and technical flood risk information that may be valuable to parishes for other flood risk reduction or resilience planning activities. This data is available by request through CPRA and can be downloaded from the Master Plan Data Viewer. In addition, CPRA has compiled information on all of the coastal parishes (24) as a resource in other planning efforts in Attachment E2: Parish Profiles. Data and information from the 2017 Coastal Master Plan's modeling effort could be useful to parishes that are updating their local comprehensive plans, hazard mitigation plans, CRS Flood Mitigation Plans, and Threat and Hazard Identification and Risk Assessments (THIRA). In addition, CPRA's flood risk information could be included as a hazard mitigation element as part of a comprehensive plan in order to better align state and local planning processes. For instance, CPRA's flood risk data were utilized by the Office of Community Development when developing the Louisiana's Strategic Adaptations for Future Environments (LA SAFE) plan.

CPRA will continue to make the 2017 Coastal Master Plan modeling data and other relevant information available to assist with these types of efforts; encourage expanded use and application of master plan flood depth and damage data by local officials, planners, and residents for planning and decision making; provide education and technical support for data access and interpretation; and improve and better coordinate data sharing across agencies, which is likely to contribute to major cost savings for communities, states, federal agencies, and individuals. For more information, see Section 4.3.4 Capacity Building Measures and Leveraging Data Resources in Appendix E: Flood Risk and Resilience Program Framework.

Flood Risk and Resilience Program Policy Questions

29. Does CPRA consider community-scale "managed retreat" or relocation?

CPRA's mandate is to develop, implement, and enforce a comprehensive coastal protection and restoration master plan. The 2017 Coastal Master Plan only addresses voluntary residential acquisition, not community-scale relocation or managed retreat. CPRA analyzes the number of acquisitions and associated costs proposed for each nonstructural project area. Areas recommended for voluntary residential acquisition in the 2017 Coastal Master Plan are determined by EAD reduction for 100-year (1-percent annual chance) flood depths (as modeled by the CLARA model, 10 or 25 years into the future, under the High environmental scenario). Areas with flood depths over 14 feet (i.e., 12 feet plus two feet of required freeboard) are recommended for voluntary residential acquisition. In all cases, these are general recommendations at a scale of a census block or a 1 x 1 km grid and not recommendations for an individual structure or parcel. Areas that are recommended for voluntary residential acquisition through the Flood Risk and Resilience Program are locations where assets should be removed due to very high vulnerability and expected flood depths. Additionally, community resettlement or managed retreat is

discussed within Appendix B: People and the Landscape, which identifies communities that may experience permanent inundation over the next 50 years.

Large-scale community retreat is not a CPRA-only role; many other state, federal, and local agencies, as well as the public, will need to work together to consider such plans. The nonstructural risk reduction and structural protection projects, flood risk data, and policy recommendations developed through the 2017 Coastal Master Plan are just several elements of many that will need to be considered. For instance, the 2017 Coastal Master Plan may provide a better understanding of the potential need for community resettlement and/or locations where conversations about community resettlement may need to happen. To further this collaborative approach, in 2015, CPRA supported OCD by providing flood risk data for the application package for the Isle de Jean Charles Resettlement project, which won a $48 million grant from HUD. Any community relocation plans should first come from interested residents/communities at the local level.

30. How are nonstructural programmatic measures different than nonstructural risk reduction projects? How does CPRA support programmatic measures?

Programmatic measures pertain to any activities, not involving physical construction, that use knowledge, practice, or agreement to reduce risks and impacts, in particular through policies and laws, raising public awareness, training, and education. CPRA understands that effectively reducing storm surge flood risk through nonstructural efforts requires the implementation of both physical projects and programmatic measures. Programmatic measures are often implemented through planning or policy initiatives and can include land use planning, hazard mitigation planning, flood ordinances, and building codes. These activities reduce risk to future development within communities, and therefore are integral elements of achieving risk reduction goals across coastal Louisiana. As part of the 2017 Coastal Master Plan, CPRA has developed Attachment E1: Flood Risk and Resilience Program Policy Recommendations, which describes key policy recommendations that can advance a community's collective ability to reduce flood risk through methods beyond the mitigation of individual structures. The recommendations are categorized into five sections comprising:

- Planning: Comprehensive, Multi-Jurisdictional, Land Use, and Recovery Plans
- Hazard Mitigation Plans
- Regulatory Tools: Local Ordinances, National Flood Insurance Program, and Coastal Zone Management Program
- Infrastructure and Building Standards
- Capital Improvement Plans and Incentives

Within each topic, various recommendations are specifically addressed to a relevant entity that may be best able to enact change including the Louisiana Legislature, other state agencies, parish/municipal governments, and academic/nonprofit groups. The aim is to provide a robust resource of information about the range of pertinent policies and opportunities for action, to frame the Flood Risk and Resilience programmatic recommendations that most urgently need to be addressed, and to generate new ideas about the actionable steps that could be implemented to promote a more resilient coastal Louisiana. See Attachment E1: Flood Risk and Resilience Program Policy Recommendations.

31. How do CPRA's recommendations compare to federal resilience policy recommendations?

CPRA recommends that parishes take into account federal resilience policies, such as Executive Order 13690, when planning for critical facilities. To promote action, CPRA will provide reduced cost share for nonstructural risk reduction project implementation if a parish meets the below requirement:

- Adopt local policies that focus infrastructure investment and development in areas outside of a flood zone, such as policies including a property tax reduction or a higher density allowance in low risk areas. When facilities must be located in a flood zone, implement the following or similar measures:
    - Require floodproofing of power generation facilities, water/sewage infrastructure, power transmission infrastructure, transportation infrastructure, or other critical facilities.
    - Siting and design of these facilities must take into consideration impacts from climate change, including increasing winds, storm surge, and sea level rise, to protect public and private investment and the welfare and safety of current and future populations.
    - Any new facilities must be built to the 500-year flood elevation to be consistent with the standard for critical actions in 44 CFR Part 9 (Floodplain Management and Protection of Wetlands) and in anticipation of the requirements of Executive Order 13690 (Federal Flood Risk Management Standard).

Property Owner Questions

32. Is there a list of structures recommended for nonstructural mitigation? How do I get on the list?
CPRA does not have a list of specific structures recommended for mitigation or that qualify for nonstructural funding. The 2017 Coastal Master Plan's nonstructural recommendations are meant to be for coast wide planning purposes based on estimates of how many structures are in a given project area and the flood depths in that project area. These project locations will be further examined by parishes and local officials for the implementation of floodproofing, elevation, and/or voluntary acquisition for particular structures.

33. If I live in an area with a recommended nonstructural risk reduction project, must I elevate my house?
No, all non-residential floodproofing, residential elevation, and residential acquisition projects are 100% voluntary.

34. If I live in an area with a recommended elevation project, can I be considered for a voluntary acquisition instead?
The Flood Risk and Resilience Program is designed to flexibly meet homeowner and overall community needs. If your home is located in an area recommended for elevation, you may discuss the option of voluntary acquisition with your parish floodplain manager. The 2017 Coastal Master Plan nonstructural risk reduction projects are designed to provide high-level recommendations of total potential costs, number of structures that could be mitigated, and timeline for implementation to parishes which then refine the project based on location specific details, homeowner interest, contractor bids, or other local priorities.

35. Can people participate in the program if they do not have clear title? Are there any resources to help address this challenge?
Homeowners will need to have a clear title to their property if they wish to participate in a voluntary acquisition project. An acquisition project's real estate transaction includes a title search/title insurance to confirm ownership of the parcel. Participation in elevation projects also will require proof of ownership. CPRA requires participating properties to have a clear title and will work to assist parishes with obtaining the resources needed to establish ownership to maximize the number of participating homeowners. Resources available to assist homeowners with title and proof of ownership issues include:

Legal Services:

- Access to Justice (http://apply.lanonprofitjustice.org/)

- Acadiana Legal Service Corporation (http://la-law.org/ or 1-800-256-1175)
- Louisiana Civil Justice Center (http://laciviljustice.org/ or 1-800-310-7029)
- Southeast Louisiana Legal Services (http://slls.org/ or 1-504-529-1000)
- New Orleans Title Clearing Initiative (https://lawyerscommittee.org/wp-content/uploads/2015/07/Katrina-Report-August-2-2010-Version.pdf)
- Pro Bono Project (http://probono-no.org/)

Educational Services:

- Louisiana Appleseed Network (http://louisianaappleseed.org/ or 1-504-561-7304)

For more information about heir property and clear title, please visit: http://appleseedla.wpengine.com/wp-content/uploads/2016/03/Protect_Your_Property-with-updated-address.pdf

36. If property is sold through voluntary acquisition, can it be resold or redeveloped?

Due to the extreme flood depths of properties that are recommended for acquisition, no future development or redevelopment involving residential or non-residential structures or paved surfaces will be allowed on these properties, and the property will be set aside as open space or for other compatible uses. For example, contiguous parcels are excellent candidates for local community parks, recreational areas, or water retention areas.

37. If property is sold through voluntary acquisition, can the landowners retain the mineral rights?

Yes. When the State acquires property, the landowner has the right to reserve the mineral rights under La. Mineral Code Article 149. However, such mineral right reservation must be expressly contained in the acquisition deed.

38. How can I learn more about the program or the projects being recommended in my area?

- To explore 2017 Coastal Master Plan data or projects in your area, please look at our Master Plan Data Viewer: cims.coastal.louisiana.gov/masterplan/
- For updates on the nonstructural risk reduction projects, the 2017 Coastal Master Plan, or other CPRA work, sign up for emails at: coastal.la.gov
- For an overview of the Flood Risk and Resilience Program and more resources, please visit our Flood Risk and Resilience Program webpage: http://coastal.la.gov/our-plan/2017-coastal-master-plan/flood-risk-and-resilience-program/

39. Where can I get more technical information and learn more about the nonstructural-related details?

- For more technical details of the 2017 flood risk assessment, please see Attachment C3-25: Storm Surge and Risk Assessment.
- For technical details on nonstructural risk reduction project development process, see Attachment C3-25 noted above and Appendix D: Planning Tool.
- For technical details on project definitions and cost estimates, see Appendix A: Project Definition.
- For technical details on the Flood Risk and Resilience Program and nonstructural risk reduction projects, see:
    - Appendix E: Flood Risk and Resilience Program Framework
    - Attachment E1: Flood Risk and Resilience Program Policy Recommendations
    - Attachment E2: Parish Profiles
    - Attachment E3: Nonstructural Model Results
    - Attachment E4: Parish Applicant's Handbook
- For more information on how the 2017 Master Plan impacts communities, see Appendix B: People and the Landscape.