

# County Level Approaches to Coastal Resilience

## Background/Significance

Disasters, whether natural or man-made, have significant impacts on counties across the United States. When a disaster strikes, counties are the first government entity to cope with any damages or threat to human life associated with the disaster. To decrease the chances of loss of life, and post-disaster recovery costs, county governments have focused their efforts on pre-disaster mitigation efforts which have proven returns on investment at the state and federal level. There have been many studies and reports documenting how investments in mitigation can reduce post-disaster recovery costs. The most notable of those studies -- [the National Institute of Building Sciences Mitigation Saves Report](#) -- found that every dollar spent on mitigation, saves \$6 on future disaster losses. Additionally, a study by Pew Charitable Trusts found similar ratios when examining this data at the state level. With this understanding that proactive measures for managing natural disasters provide monetary benefits to all levels of government, this project set out with the goal of identifying what mitigation strategies local levels of government are adopting to help mitigate their risk to natural disasters and the cost effectiveness of those efforts.

## Methods

### Counties of Interest

We chose to move forward with an analysis of resilience efforts for counties that were right on the water in the Gulf of Mexico states of Louisiana, Mississippi, and Alabama. Additionally, we included counties that were a part of NACo's [Strengthening Coastal Counties' Resilience Program](#). The counties included in this study are:

Mississippi: Hancock, Harrison, and Jackson counties.

Alabama: Baldwin and Mobile counties.

Louisiana: Calcasieu, Cameron, Iberia, Jefferson, Lafourche, Orleans, St. Bernard, St. Charles, St. Mary, Terrebonne, and Vermillion parishes.

Florida: Santa Rosa County

Texas: Cameron County

### County Plans

The process for assessing the county plans included assigning county objectives and actions for mitigating against natural disasters to different mitigation action types. A mitigation action is a specific action, project, activity, or process taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. The different mitigation action types used for this assessment are derived from [FEMA's 2013 Mitigation Action Form](#) and the [Beyond the Basics Mitigation Guide](#). They include:

- Local plans and regulations
- Structural and infrastructure projects
- Natural systems protection
- Education and awareness programs
- Preparedness and response actions

### Mitigation Benefits

The metric used to demonstrate the value of county investment in mitigation was the return on investment metric (ROI) of structure and infrastructure projects. For this project, the ROI is calculated as benefit (monetization of potential losses avoided by the mitigation project) divided by the cost to implement the project.

**Total Project Costs:** An excel sheet template was created and sent to select counties to solicit county net spend data on a sample of the mitigation projects outlined county plans.

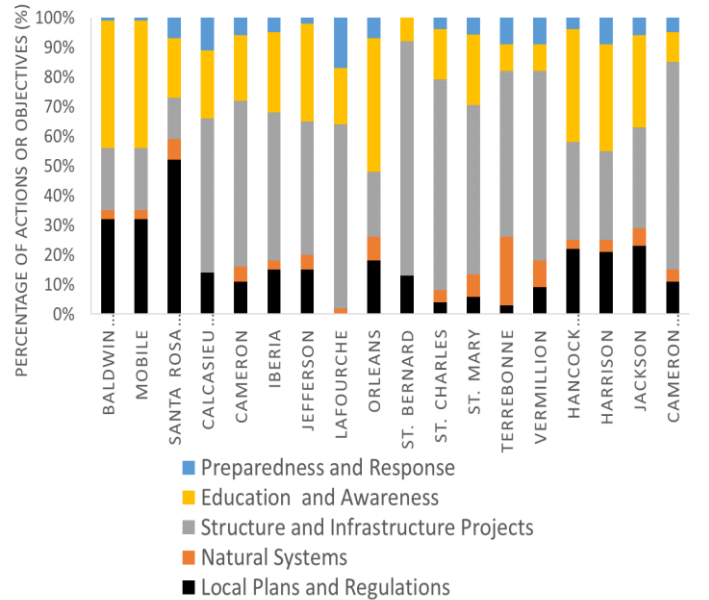
**Losses Avoided:** FEMA's Benefit-Cost Analysis (BCA) tool was used to determine losses avoided for select mitigation projects in county plans.

# Results

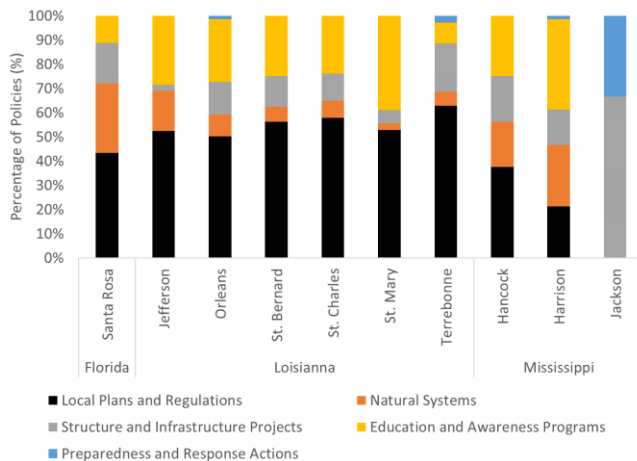
## County Plans

Across all the hazard mitigation plans included in the assessment, the counties included in this assessment tend to employ structure and infrastructure projects, education and awareness efforts, and local plans and regulations as their dominant mitigation method against hazards. Reliance on natural systems and preparedness and response actions are less frequently used typically accounting for less than ten percent of county objectives and action items outlined in plans. Preparedness and Response actions tend to be incorporated more heavily in emergency management plans, which makes their identification within hazard mitigation plans a potential indication of resilience efforts integrated across multiple planning tools.

## County Plan Trends: Hazard Mitigation



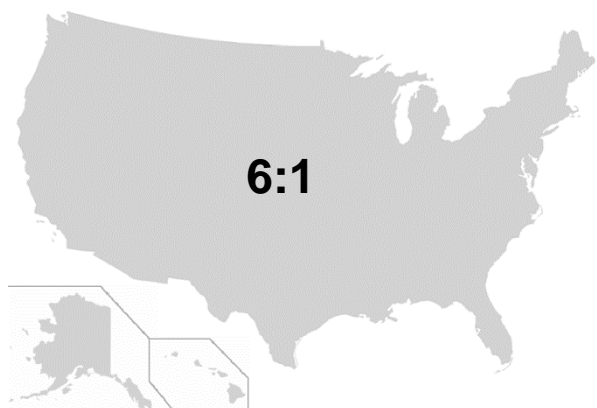
## County Plan Trends: Comprehensive



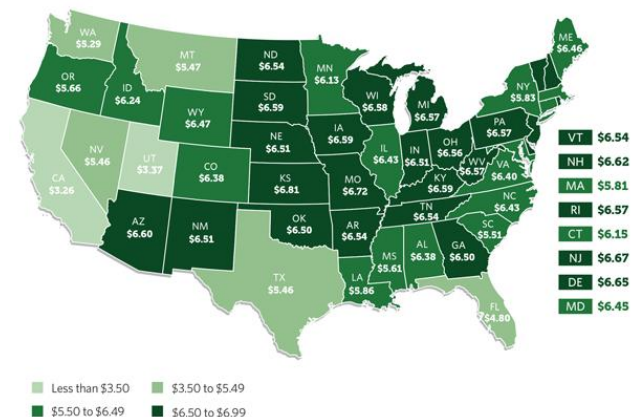
The 10 counties included in the assessment of the comprehensive plans are outlined on the x-axis and include Santa Rosa county, FL, Jefferson, Orleans, St. Bernard, St. Charles, St. Mary, Terrebonne parishes in Louisiana, and Hancock, Harrison, and Jackson counties in Mississippi. The total number of actions and policies identified across the ten county and parish comprehensive plans was 2,842. Out of the total number of policies, 592 (or on average 19% of the policies) were specific to hazard mitigation. Most counties included in this assessment relied on local plans and regulations to mitigate against hazards. The exceptions to this trend were Harrison and Jackson County, MS. The dominant ways in which counties are using local plans and regulations is through planning mechanisms and zoning and ordinances.

Mitigation Benefits

Federal | State



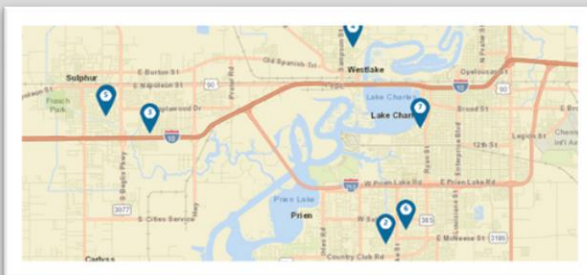
Return on Investment From Mitigation Activities Varies by State  
 Money saved on average per dollar spent for select federal mitigation programs, 1993-2016



From: Data Highlight State by State Benefits of Federal Natural Disaster Mitigation Grants | The Pew Charitable Trusts (pewtrusts.org)

*Pre-disaster mitigation efforts have proven returns on investment at the federal and state level.*

County Example: Calcasieu Parish, LA



Example Projects are focused around the Lake Charles region of Calcasieu Parish

This subset of projects represents the types of mitigation projects most implemented in the state of Louisiana, flood control management, acquisition, and elevations (Gall and Friedland 2019). Such example projects displayed a return on investment ranging from 13-56% within the first few years and losses avoided are anticipated to increase over time.

County/Parish	Mitigation Project	Project Completion Date	Total Losses Avoided (\$)	Project Investment (\$)	Project ROI (%)	Average ROI(%)
Calcasieu Parish	Acquisition Project 1	2017	5,805	\$41,920.42	13.8	34.4
	Acquisition Project 2	2019	4,666	\$10,409.32	44.8	
	Acquisition Project 3	2016	24,364	\$0.00	--	
	Elevation Project 1	2018	8,484	\$15,213.94	55.8	
	Elevation Project 2	2018	3,310	\$16,234.94	20.4	
	Elevation Project 3	2017	31,047	\$0.00	--	
	Elevation Project 4	2017	31,374	\$84,310.54	37.2	

## Importance of Community Wide Mitigation Efforts

Disaster mitigation specific return on investment analyses tend to focus heavily on the economic benefits of structure and infrastructure projects. These types of projects are often the easiest to attach a return on investment value to and thus help justify the benefits they serve to a jurisdiction. A review of Gulf coastal county and parish hazard mitigation and comprehensive plans revealed that investments in structure and infrastructure projects are significant, but not limited to this mitigation strategy. Counties and parishes in the Gulf of Mexico have at least one project that falls into four remaining mitigation strategies including local plans and regulations, natural systems, preparedness and response and education and awareness. Such diversification in mitigation strategies is essential for enhancing coastal resilience, especially for those jurisdictions with a substantial socially vulnerable population in the hazard zone. This is especially true considering output from a recent study on mitigation efforts in the state of Louisiana, which found that reliance on one type of mitigation strategy such as structure and infrastructure projects may not always be enough to stabilize natural disaster damage trajectory costs (Gall and Friedland 2019). The types of mitigation projects implemented, the scale at which they are implemented, and how interconnected those projects are matter more in mitigating post disaster recovery costs (Gall and Friedland 2019). Such findings are applicable to other coastal jurisdictions as it reinforces the need for managing disaster with the whole community in mind. Additionally, such findings highlight the need for accurate disaster spending tracking at the county level, so counties are better able to prioritize efforts that serve as much of their population as possible while also yielding substantial economic benefits. Counties position themselves to benefit the most from hazard mitigation when the focus shifts from quantifying the benefits of individual projects to the network of projects that serve greater areas of the jurisdiction.

### Sources

Gall, M and Friedland, C.J. (2019). If Mitigation Saves \$6 Per Every \$1 Spent, Then Why Are We Not Investing More? A Louisiana Perspective on a National Issue. *National Hazards Review* 21(1). [https://doi.org/10.1061/\(ASCE\)NH.1527-6996.0000342](https://doi.org/10.1061/(ASCE)NH.1527-6996.0000342).