



# Who is Saving Coastal Louisiana? The Workforce and Industry Behind Coastal Protection and Restoration

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# Executive Summary

Louisiana faces a severe coastal land loss crisis, a complex issue driven by subsidence, erosion, and sea-level rise exacerbated by human activities. Despite challenges, progress has been made in coastal protection and restoration efforts. Initiatives such as the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) and funding from the Deepwater Horizon settlement have been instrumental in moving work forward. However, the complexity of defining the industry and its workforce due to overlapping sectors and activities remains a challenge. Workforce development currently relies on a mix of certifications and on-the-job training, each with its unique set of hurdles. A survey of employers reveals a positive outlook on future business. However, concerns about attracting workers and future funding persist. This report recommends enhanced data collection, standardized industry definitions, workforce intermediary programs, advocacy for good jobs, hybrid training programs, educating potential workers, and addressing long-term funding needs for effective coastal protection and restoration.

## Key Findings

- **Workforce composition:** The coastal protection and restoration industry includes a diverse range of professionals, with significant overlap between sectors such as construction, engineering, and environmental science.
- **Challenges in defining the industry:** Defining the coastal protection and restoration industry cluster is difficult due to these overlapping activities and the diverse sectors involved.
- **Workforce development:** Currently, workers receive training via a mix of certification programs and on-the-job training. Challenges exist in providing hands-on experience and securing funding for training programs.
- **Employer outlook:** While employers in the coastal protection and restoration industry express an optimistic business outlook, they also highlight challenges in attracting and retaining a workforce and concerns about future funding declines.
- **Policy recommendations:** The report concludes with recommendations for enhancing data collection, standardizing industry definitions, establishing workforce intermediary



programs, advocating for good jobs, developing hybrid training programs, educating potential workers, and addressing long-term funding needs.



# Introduction

An industry has multiple components, yet discussions frequently concentrate on a particular element. When we talk about auto workers, it is often a shorthand for automobile manufacturing employees. But the auto industry includes more than just manufacturing jobs. There are the workers who sell cars at dealerships, the workers who transport cars across the country, the accountants who manage the companies' finances, and more. Economic literature refers to this interrelated work as clusters ([Porter 1990; Krugman 1991](#)). Some clusters, like the auto industry, are well-defined and their geographies are well-known, from 1950s Detroit to the plants in the South undergoing unionization. However, newer clusters have emerged, with industries being born to tackle the challenges of climate change-related disasters. The geography is apparent, with wildfires sweeping across the West and Pacific Northwest and hurricanes and flooding hitting communities along the Gulf Coast. But less is known about the work and who is doing it.

This report examines a particular cluster in Louisiana, a state that has been ravaged by disasters over the last 100 years. Various factors along the state's coast have resulted in extreme land loss, with smaller communities being submerged by the Gulf waters. Without coastal wetlands to bear the brunt of the Gulf waters during hurricane season, larger cities like New Orleans and Houma face increasingly severe storm surges, making them susceptible to significant damage. In response to this challenge, the state is working to restore coastal land through various state and federally-funded projects. The result is a cluster of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field: coastal protection and restoration.

This report aims to gain a comprehensive understanding of this industry, its key players, and the processes involved in training workers for such specialized work. However, to understand the present, we first must understand the past. The report's first section examines the severe and ongoing issue of land loss in coastal Louisiana, highlighting its historical context, primary causes, and the multifaceted challenges it presents. It details how factors such as subsidence, erosion, river control measures following the 1927 Great Mississippi Flood, and extensive oil and gas infrastructure have contributed to the problem. The section also explains how these issues are



exacerbated by climate change–induced sea–level rise, necessitating urgent and coordinated restoration efforts to protect the region's critical wetlands and coastal areas.

The second section outlines the history and efforts to combat coastal land loss in Louisiana, beginning with early research and advocacy leading to the formation of the Coalition to Restore Coastal Louisiana. It describes the challenges of building political will and securing funding, culminating in the 1990 Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). The section details the collaborative state–federal partnership for wetland restoration, the economic and environmental hurdles faced, and the development of the Coast 2050 initiative for comprehensive ecosystem planning. It also highlights the financial mechanisms currently supporting projects, such as the Gulf of Mexico Energy Security Act (GOMESA) and the Deepwater Horizon oil spill settlement, which provided substantial but finite resources for ongoing and future projects.

The third section uses mixed methods to examine who is doing the work. It relies on Bureau of Economic Analysis data, contract information from state and federal databases, and qualitative data gathered from conversations with instructors and students at technical community colleges throughout southeast Louisiana. Unstructured interviews with instructors, students, and program administrators took place throughout two trips to the New Orleans area in February and April 2024.

To better understand employers in the coastal protection and restoration industry, CEPR also conducted the Gulf Coast Coastal Work Industry Insights Survey between April and May 2024. The survey was initially designed for contractors based in Louisiana. However, the survey was expanded to include employers across and outside the Gulf region. This decision was made in recognition that contractors frequently move across state boundaries; although all contractors contacted have conducted work in Louisiana.

The third section also relies on a database compiled specifically for this report of 103 contracts for projects granted between January 2022 and April 2024 by the US Army Corps of Engineers, Louisiana's Coastal Protection and Restoration Authority (CPRA), and different levee and conservation districts operating through coastal political subdivisions. Data collected from the contracts include contracting activity, the amount awarded, and company data such as industry classification. With some contracts, we delved deeper into project outcome reports to identify





data on subcontractors. We also accessed company data from Mergent Intellect's North American database, which contains information on 97 million US private businesses. Data can be scarce in a relatively new field like coastal protection and restoration. By utilizing diverse data sources, we aimed to better understand the situation on the ground.

The report's final section includes recommendations for various stakeholders involved in coastal protection and restoration. The recommendations are aimed at policymakers, nonprofit organizations, educational institutions, employers, and labor organizations. Given the industry's relative infancy, collaborative efforts among stakeholders are necessary to establish a robust definition and effectively address present and future challenges.

While the type of coastal protection and restoration work done today is a more recent development, the issues it seeks to address have a long history. The challenge of coastal land loss predates current discussions on climate change. To gain a deeper understanding, we must first look at Louisiana's history from a broader perspective.



# Why Does the Coast Need Protection?

*"Once more war is on between the mighty old dragon that is the Mississippi River and his ancient enemy, man. And in the rich valley man is sustaining defeat in his battles with the wily beast as in former flood years."*

Herschel Brickell, New York Times, May 1, 1927 ([Brickell 1927](#))

In October 2011, cartographers with the National Oceanic and Atmospheric Administration (NOAA) conducted a shoreline survey of coastal Louisiana and discovered that 31 named bodies of water had vanished ([Office of Coast Survey 2014](#)). These once-distinct bays, bayous, and canals had been swallowed by the open water of the Gulf, leaving behind an altered coastal landscape. In what has become an often repeated fact in the literature on coastal land loss, Louisiana is home to 40 percent of the US coastal wetlands and accounts for 80 percent of coastal erosion in the country ([Penland and Ramsey 1990](#)).

Researchers have documented land loss in coastal Louisiana since the late 1960s, but only some outside academia and fishing communities understood the issue. It was not until the 1980s that the issue came to the forefront, with researchers such as Sherwood "Woody" Gagliano collecting undeniable evidence that Louisiana was losing land and efforts to mitigate against it should be prioritized by the state ([Theriot 2014](#)). By March 1989, the Coalition to Restore Coastal Louisiana — a group consisting of a broad range of organizations, from the Catholic Social Services to the Audubon Society — released a report titled "Coastal Louisiana: Here Today and Gone Tomorrow?" (1989). The report laid out the issue and stressed that localities, the state, and the federal government must step up. "The purpose of this action program is to delineate a set of bold but realistic resource goals for coastal management and to set forth an action program to attain those goals," adding implementation would require "concerted and active citizen" support ([Coalition to Restore Coastal Louisiana 1989, 64](#)). It was crucial to gain public support,



given that 42 percent of the state's population, less than 2 million people, reside in coastal areas ([US Census Bureau 2022](#)).<sup>1</sup>

An important purpose of this report is to educate the public, and part of that is understanding what is actually happening. When officials and NGOs talk about the work that needs to be done in Louisiana, they talk about restoring the coast. But how do you restore a coast? The act of restoration implies that coastal work aims to bring the land back to its previous state. However, the previous state of coastal Louisiana was not adapted to current conditions. The project's primary objective then shifts to engineering a new coastline to safeguard the existing coast from erosion and other threats, such as sea-level rise and climate-related weather events. This definition aligns more with coastal protection.

This report follows sociologist Summer Gray's definition of coastal protection: "the modification of the shore for the purpose of maintaining or 'improving' human uses of the intertidal zone" ([Gray 2023, 29](#)). It is our view that the presence of significant oil and gas infrastructure in coastal Louisiana has significantly influenced the discussions surrounding and the level of support for coastal protection efforts. This relationship implies that without the economic incentives associated with these resources, the dialogue and level of commitment to coastal work would be substantially different. This factor becomes apparent when looking at the historical context behind the causes of coastal land loss and efforts to halt it.

When it comes to the work being done in coastal Louisiana, there is both protection and restoration work. Flood control structures, such as levees, protect communities and infrastructure and change the land. On the other hand, massive sediment diversion projects and smaller projects involving planting native grasses to prevent erosion combine protection and restoration methods. For that reason, this report will generally refer to the work as "coastal protection and restoration" unless specifically quoting other sources. This definition also explains why we have included what may seem like so many disparate industries, from marine

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<sup>1</sup> Coastal parish population total was calculated based on the sum of the populations of the 20 coastal parishes: Ascension, Assumption, Calcasieu, Cameron, Iberia, Jefferson, Lafourche, Livingston, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Martin, St. Mary, St. Tammany, Tangipahoa, Terrebonne, and Vermilion. The result was divided by the total state population.



dredging to flood mitigation and disaster recovery. All the work shares the same overall goal of coastal protection and restoration.

So, why is Louisiana losing land? Explaining land loss is challenging due to its complexity. More than oversimplifying the issue by attributing it solely to climate change is required. Various factors, primarily human-induced, contribute to land loss. Subsidence, erosion, and rising sea levels stand out as the most significant.

## Subsidence and Erosion

Subsidence is quite literally when the ground sinks. The leading causes of subsidence include a wide range of natural processes such as earthquakes, soil compaction or lithication, land movement from glaciers, erosion, and sinkhole formation. In addition, adding water to fine, wind-deposited soils can cause subsidence ([National Oceanic and Atmospheric Administration 2023](#)). To a lesser extent, this geological phenomenon can also be caused by extracting underground resources such as water, oil, natural gas, or minerals through pumping, fracking, or mining.

In the past, southeastern Louisiana was protected from subsidence by its most prominent feature: the Mississippi River. Suppose the Mississippi River is a giant funnel, pulling water from 250 tributaries across one-third of the North American landscape. In that case, the very bottom is where Louisiana meets the Gulf of Mexico. Here, sediments complete up to a 2,340-mile journey to create the Mississippi River delta. So even though the land is sinking, newly deposited sediments would create new layers. That all changed in 1927.

In April 1927, several months of heavy rainfall strained levees along the Mississippi River. The first levee gave way in Illinois, and subsequent failures occurred all the way down to the Gulf of Mexico ([Encyclopedia Britannica 2024](#)). The resulting floodwaters submerged over 23,000 square miles of land, claiming between 250 and 500 lives and displacing hundreds of thousands. While flooding affected states along the river, Mississippi, Louisiana, and Arkansas bore the brunt of the damages ([Storey 2005](#)).

The Great Mississippi Flood of 1927 was considered the worst disaster in US history, and the event would change flood control policy. Engineers recognized that relying solely on levees was



insufficient to prevent disasters like the 1927 flood. They advocated for additional flood control structures, such as gates, spillways, pumps, and reservoirs, to divert water during heavy rainfall ([Bradshaw 2023](#)). In 1928, Congress enacted the Flood Control Act, which regulated the country's levee system and placed the Army Corps of Engineers in charge of flood mitigation projects. The Flood Control Act of 1936 further prioritized flood control ([Federal Emergency Management Agency 2020](#)).

As evidenced by Hurricane Katrina in 2005, the efficacy of these flood control structures in protecting places such as New Orleans can be debated. Those events can be categorized as system failures, but in many ways the system's success in constraining the Mississippi has been far more disastrous.

Going back to the idea of the river as a funnel, without the constraints, the river is free to follow whatever path to the Gulf of Mexico, depositing sediments and building land along the way. In fact, the river has undergone "delta switching" in the past because of this idea of following the path of least resistance. South Louisiana has two delta plains: the Deltaic Plain and the Chenier Plain, **FIGURE 1**.

**Figure 1**



*Source: Louisiana Oil Spill Coordinator's Office and the Coalition to Restore Coastal Louisiana.*

The Deltaic Plain stretches from the Mississippi state line to the Freshwater Bayou, while the Chenier Plain extends from Vermillion Bay to Texas. In the past 7,000 to 10,000 years, the Mississippi River has changed course between the two plains, following whatever route is shorter

and more efficient. Whatever route the river follows, it brings sediment with it, creating land. That process is how the land in coastal Louisiana, particularly the east, has been maintained for thousands of years ([Burby et al. 2000](#); [Coalition to Restore Coastal Louisiana 1989](#)).

However, the construction of river control structures post-1927 locked the Mississippi in place. This action has limited sediment deposition on floodplains and wetlands, transporting sediments into the Gulf and over the edge of the continental shelf. This process deprives wetland soils of necessary building blocks, leading to their degradation. This effect can be seen in places like Terrebonne and Lafourche parishes on the western end of the Deltaic Plain. Without the Mississippi transporting sediments to restore the land, the Gulf is reclaiming it.

That alone would be a giant problem for coastal Louisiana, but logging and the massive presence of the oil and gas industry have further exacerbated the issue. The Gulf of Mexico, a significant US crude oil-producing region, contains sizable oil reserves, and of the Gulf states, Louisiana is one of the top ten producers of oil and gas. The state has a long history of oil and gas exploration and production, dating back to the early 20th century. Oil was first discovered within Louisiana's salt domes in 1901 ([Horowitz 2020](#)), and since then, 207,010 wells have been drilled, of which only 13,012 or 6 percent are currently producing ([MineralAnswers.com 2023](#)). Louisiana currently contributes approximately 10 percent of the total marketed natural gas output in the US and is home to around 7 percent of the country's natural gas reserves. The state's production constitutes about 1 percent of US total oil reserves and production ([US Energy Information Administration 2023](#)).

Many of the nation's biggest oil fields are in federal Outer Continental Shelf (OCS) waters off Louisiana. A substantial portion of federal OCS production in the Gulf of Mexico is transported onshore to Louisiana via pipelines. Additionally, the state is home to ports that handle foreign crude imports, the largest of which is the Louisiana Offshore Oil Port (LOOP). The massive infrastructure necessary to transport oil and gas from the Gulf to destinations across the US dominates Louisiana's landscape. Major oil and gas companies, including ExxonMobil, Chevron, and Shell, have significant operations in the state.

Construction of this infrastructure, while necessary for meeting the US energy needs, has had a devastating impact on wetlands and barrier islands that normally protect coastal Louisiana from storm surges and flooding. One major impact is the excavation of canals for pipe



laying. Louisiana estimates that approximately 10,000 miles of canals were excavated to serve wells; however, this figure is likely an underestimation because permits were not mandated until the 1950s ([Marshall, The Lens, and ProPublica 2014](#)). The gas and oil infrastructure literally cuts through the environment, using, up until recently, a method that did not take into account environmental and habitat protection.



*Natural gas pipeline infrastructure running through the Mandalay National Wildlife Refuge in Houma, LA. Photo by author, February 2024.*

There is no confusing these constructed canals from the actual bayou. They follow straight paths, as opposed to the meandering flow of the bayou, where water follows a route offering minimal resistance. The canals have also grown larger over time. The old method of creating canals utilized mainly from the 1950s to the 1970s was by dredging the bayou and depositing the soil on the banks — called spoil banks. Over time, various factors cause the spoil banks to degrade, from changes in water flow and sediment deposition to even the wake from boat traffic. One report from Louisiana State University researchers found the "estimated lifetime of the shrub-tree vegetation at a representative spoil bank is 81 years, the spoil bank width is 89 years, and the

dredged channel will erode to the center of the spoil bank after 118 years" ([Turner and Swenson 2020](#)).



*A natural gas facility in Terrebonne Parish near Cocodrie, LA, sits at the intersection of several man-made canals, including the Muskrat Line, Blue Water Line, and the Houma Navigation Channel. Source: 2020 NOAA NGS Hurricane Zeta Emergency Response Imagery.*

The problem with the spoil bank method is that once saltwater washes in during high tide or a storm surge, it cannot drain back out. The saltwater then sits in the wetlands, slowly killing vegetation. As the canals get larger, saltwater intrusion increases, substantially modifying both the natural drainage patterns and the functioning of the ecosystem. The environment's gradual



demise is evident across coastal Louisiana parishes, such as Terrebonne, Lafourche, and Plaquemines. Grass has become sparse, and trees now emerge from the water like skeletal claws, signifying the deterioration of the ecosystem.



*Dead and dying trees line LA Highway 1 in Lafourche Parish. The author took this photo in late April 2024.*

Saltwater intrusion is increasingly claiming the wetlands, erasing landmarks such as entire cypress forests. However, coastal Louisiana's difficulties are not restricted to sinking land. To top it all off, sea levels are rising.

## Sea-Level Rise

In Louisiana, researchers were evaluating the effects of sea-level rise long before it became a commonly discussed aspect of climate change. In a 1990 analysis of tide gauge records along the Gulf Coast, researchers found Louisiana was experiencing the highest rates of relative sea-level rise compared to other states, measuring between 1.04 cm to 1.19 cm per year ([Penland and](#)

[Ramsey 1990](#)). At the time, these findings were mostly attributed to subsidence. However, subsidence alone cannot explain recent data. Since 1950, the sea level in coastal Louisiana has increased by 24 inches. In the past decade, the rate of rise has accelerated, with an alarming increase of 1 inch every two years ([Kekeh, Akpınar–Elci, and Allen 2020](#)).

Thanks to subsidence, much of New Orleans and the surrounding area is below sea level, with some places sitting 6.5 to 9.8 feet below sea level ([Janin and Mandia 2012](#)). This attribute has exacerbated the effects of sea level rise. According to climate change scientists Orrin Pilkey and Rob Young, "In areas where the land surface is sinking (or subsiding) [like southern Louisiana], the actual local rate of sea level rise can be much greater than the rate of rise on a stable coast" ([Pilkey and Young 2009, 143](#)). Think of coastal Louisiana as a sinking toy boat in a filling bathtub.

CPRA predicts in its 2023 Coastal Master Plan that sea-level rise over the next 50 years could reach an additional 1.6 to 2.5 feet, depending on the scenario ([Coastal Protection and Restoration Authority of Louisiana 2023](#)).

So, what are the main causes of climate-induced sea level rise? The first is that water expands when it is heated. The observed rise in sea level between 1960 and 1993 can be attributed to this thermal expansion, accounting for approximately 25 percent of the total increase. Similarly, from 1993 to 2009, thermal expansion contributed roughly 30 percent to the observed sea-level rise ([Nicholls and Cazenave 2010](#)). Increases in the volume of a body of water due to thermal expansion depend on several factors, including existing water temperature and salinity. The Gulf of Mexico has historically warmer waters than areas directly on the Pacific or Atlantic oceans, so the expansion is much greater. One study has found the rate of temperature increase in the Gulf of Mexico is approximately double the rate observed in the global ocean ([Wang et al. 2023](#)).

Another cause of sea-level rise is that heightened global temperatures contribute to melting glaciers and ice sheets. As the water that was previously locked up on these land formations flows into the oceans, it increases global ocean volume, contributing about 60 percent to observed sea-level rise ([Allison et al. 2011](#)). Several factors influence the extent of local-level change resulting from melting glaciers and ice sheets. Therefore, the extent to which the volume in the Gulf of Mexico has increased due to this phenomenon is still being determined.

The point is that broader global phenomena are also shaping the future of coastal Louisiana. These impacts are happening now and will likely persist for centuries, even if global emissions were to be stabilized immediately. The compounding effects of these processes add another layer of complexity to the region's challenges, resulting from decades of intertwined environmental changes and human interactions. The steady erosion of wetlands is a haunting illustration of the coastal landscape's ongoing transformation. Although endeavors to tackle the land loss problem have gathered steam in recent years, the issue's magnitude continues to grow. The following section highlights restoration measures the state, with the federal government's support, has enacted to protect the coast.



# Restoring and Protecting Coastal Louisiana

*"The Delta and the Delta plains took 10, 15, 20,000 years to create, and we screwed them up pretty good in 70 to 80 years. It's going to take a lot of time to rebuild."*

Woody Crews, member of the Jefferson Parish Marine Fisheries Advisory Board ([Louisiana Coastal Wetlands Conservation and Restoration Task Force 1999](#))

Though it would take a while to accumulate funding and political will, advocates have had a good idea about how to move forward thanks to years of research conducted by Gagliano and others. The three basic goals of the Coalition to Restore Coastal Louisiana's 1989 proposal were ([Coalition to Restore Coastal Louisiana 1989, 18](#)):

1. Implementation of Mississippi and Atchafalaya river diversions to enhance sediment and freshwater input in areas of the coastal zone that are losing land.
2. Using dredged material to repair wetlands and barrier islands affected by existing canals.
3. Reducing and eventually phasing out all new and expanded canal construction.

Previous to the coalition's report, the state and federal governments had made minimal efforts to address land loss in Louisiana. Existing regulations, especially those aimed at oil companies, lacked strength, and there were no immediate incentives for these significant economic stakeholders to change. Lastly, the lack of political will at the state level resulted in even less willpower at the federal level.

## The Breaux Act or CWPPRA

In the late 1980s, coastal protection efforts faced two significant obstacles: building political will and finding money to do the work. Concerns were rising in the state about the ability of the deteriorating wetlands to support local economic activities such as fishing and shrimping and more infrastructure for newer deepwater wells discovered offshore. Former Louisiana Senator John Breaux, an advocate for the state's coastal and marine resources, leveraged his position in Congress to establish a link between ongoing land loss and broader national energy interests.

After years of introducing legislation aimed at securing funding to restore the wetlands, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) of 1990, also known as the "Breaux Act," was approved by Congress and signed into law by former President George H. W. Bush.

CWPPRA served as the country's first directive for restoring coastal wetlands, providing a model for "designing, funding, and building experimental restoration projects in Louisiana" ([Theriot 2014, 163](#)). CWPPRA also solidified a state–federal partnership to protect coastal wetlands by creating a collaboration between the state and federal agencies, such as the US Army Corps of Engineers, the Environmental Protection Agency, the US Fish and Wildlife Service, the Department of Agriculture, and the National Oceanic and Atmospheric Administration.

As previously noted, the Army Corps of Engineers has handled flood control projects across the US since the 1928 Flood Control Act. CWPPRA expanded the agency's responsibilities by putting it in the business of saving wetlands. Specifically, the law "directed the head of the Army Corps of Engineers to convene a task force to prepare and submit to Congress each year a priority list of wetland restoration projects based on cost–effectiveness and environmental benefits" (169).

Funding for project planning is covered entirely by the federal government, but once approved, project costs are split between Louisiana and the federal government. On the state side, CPRA is the local cost–share partner, matching 15 percent of all federal funding using state funds. The federal government's portion of funding for CWPPRA is derived from the Sport Fish Restoration and Boating Safety Trust Fund. Funding for the trust fund comes from excise taxes on sport fishing equipment and fuel, import duties on tackle and boats, and earned interest, with 19 percent of funds going toward CWPPRA ([USGS National Wetlands Research Center 2023; Government Accountability Office 2022](#)).

CWPPRA's annual operating budget has fluctuated between approximately \$30 million and \$80 million, prioritizing projects based on need, benefits, and budget. The project selection process follows a yearlong cycle known as the Priority Project List, during which anyone can propose a project for funding consideration. Agency partners vote to narrow down the presented projects initially to around 20. The CWPPRA Technical Committee then votes to refine the list of projects, aiming to narrow it down to 10. Agency sponsors visit the project sites to determine impact, and at the end of the process, the committee then recommends four projects for the final priority list.



Throughout the process, the public can submit comments ([USGS National Wetlands Research Center 2023](#)).

While this process has allowed CWPPRA to determine the best projects to fund using a cost-benefit analysis, it has also limited the scope of restoration, like consulting a committee to place Band-Aids on an open wound. By 2000, projects funded by the law preserved, created, or restored around 75,000 acres of wetlands, but the state was still expected to lose more than 600,000 acres over the next 50 years ([Theriot 2014](#)). Several issues have hindered CWPPRA's overall success, including disputes over property rights, legal challenges from the fishing community, and contention between the involved agencies. These issues led to a need for a clear vision for the restored coast.

## Coast 2050

In 1997, the CWPPRA task force commissioned a study that later became the basis for the Coast 2050 initiative. Coast 2050 took the opposite approach of CWPPRA's small-scale, project-by-project planning by looking at the needs of the entire ecosystem based on decades of research. Coast 2050 also recognized that some coastal areas are lost to the Gulf ([Theriot 2014; Burby et al. 2000](#)). While the task force, which consisted of federal, state, and local government officials and the 20 coastal parishes adopted the initiative in 1999, funding it proved to be a challenge.

In 2000, the Coalition to Restore Coastal Louisiana released another report, titled "No Time to Lose: Facing the Future of Louisiana and the Crisis of Coastal Land Loss" (2000). The report laid out five fundamental principles of coastal restoration:

1. Coastal restoration efforts should be expanded beyond CWPPRA, which was only a partial solution. That law's gains should be the foundation for a more comprehensive approach.
2. Louisiana and the nation must invest in coastal restoration, with Louisiana leading the financial commitment to attract national support.
3. Economic, cultural, and physical considerations must be integrated into coastal restoration alongside ecological concerns, recognizing the importance of barrier shorelines and wetlands to coastal communities.

4. Coastal restoration should establish a sustainable balance by combining natural processes and human engineering rather than recreating past wetland acreage.
5. Restoration and protection of wetlands and barrier shorelines are essential and interconnected components of effective coastal stewardship.

The coalition sent a not-so-subtle message to the oil and gas industry that it had as much to lose as others who rely on the coast for their livelihoods. However, the estimated \$14 billion cost ([Louisiana Coastal Wetlands Conservation and Restoration Task Force 1999](#)) to implement Coast 2050 was a high barrier, even with the oil and gas industry onboard. It took a series of hurricanes and the Deepwater Horizon oil spill to move efforts forward.

## Hurricanes

It is not within the scope of this report to go into all the details of Hurricanes Katrina, Rita, Gustav, and Ike's impact on the Louisiana coast. But their timing, a three-year period starting with Katrina in 2005, motivated stakeholders to take action. The solutions put in place post-Katrina built on ideas long advocated by the Coalition to Restore Coastal Louisiana and similar organizations.

Of the most powerful storms to hit the Mississippi Deltaic Plain since 1893, Hurricanes Katrina and Rita rank fourth and fifth, respectively. However, both storms provided valuable insights into the protective role of wetlands against storm surges. While Katrina's storm surge passed unimpeded through lagoons, manmade channels, and degraded wetlands straight to New Orleans, Rita's surge encountered 18 to 30 miles of Chenier Plain wetlands before reaching populated areas ([Day et al. 2007](#)). This barrier consisting of literal barrier islands, shoals, and wetlands significantly reduced the impact in some — but not all — areas. This type of defense is called soft infrastructure, which uses natural, adaptable processes to control flooding. The opposite is hard infrastructure, the rigid, manmade structures people typically associate with flood control, like levees, flood gates, and surge barriers. Post-Katrina, there was also a focus on substantial hard infrastructure projects, particularly in light of the failure of New Orleans' levee system.

During Katrina, a massive 30-foot storm surge swept through Lake Borgne and into the manmade Inner Harbor Navigational Canal, overtaking the levees and inundating nearby areas



such as the Lower Ninth Ward and St. Bernard Parish. In response to this catastrophic event, Louisiana established the Southeast Flood Protection Authority. The authority's goal is to manage a comprehensive, multi-parish hurricane storm surge and flood control system on both sides of the Mississippi River to prevent future disasters of this magnitude.

The largest project managed by the Flood Protection Authority–East is the Inner Harbor Navigational Canal (IHNC)–Lake Borgne Surge Barrier, which spans almost two miles and is the largest continuous surge barrier in the world. The project originated in 2006 as a Congressional directive issued to the US Army Corps of Engineers and was constructed for \$1.3 billion. In 2013, the Army Corps handed over the operation and management of the barrier to the Flood Protection Authority–East.



*Construction of the IHNC–Lake Borgne Surge Barrier. Source: Southeast Flood Protection Authority–East.*

Another vast undertaking that gained traction during this time was the Mid–Barataria Sediment Diversion. This project started as a medium diversion at Myrtle Grove, approved by Congress in the Water Resources Development Act of 2007, with an estimated cost of \$278,300,000 ([Rep. Oberstar 2007](#)). The idea of a diversion is to slightly loosen the stranglehold on the Mississippi River, using a combination of hard and soft infrastructure to divert a portion of the river in



another direction and restore land. As the distributary follows its path to the Gulf, it brings along sediment to areas deprived since the 1920s, rebuilding vital wetlands. A diversion at Myrtle Grove would allow sediments to travel into the Barataria Basin, which sits west of the Mississippi and contains Lafourche Parish. Like the IHNC–Lake Borgne Surge Barrier, the Mid–Barataria Sediment Diversion project is massive. But unlike the surge barrier, the diversion has yet to be completed as construction began in 2023 ([Restore the Mississippi River Delta 2021](#)). At least coastal protection and restoration efforts were moving in the right direction.

In 2008, the smaller flood control projects had their first test when Hurricanes Gustav and Ike hit. When Gustav made landfall in September, the storm had weakened from a Category 4 to a Category 2 and veered west of New Orleans into Terrebonne and Lafourche Parishes. The levees held and New Orleans was spared, but Houma and surrounding communities experienced extensive wind damage and power outages ([Skilton 2022a](#)). Still, as the first test of post–Katrina projects, Gustav showed that efforts to protect Louisiana were on the right path. The problem was that Hurricane Ike hit a week later, with communities still scrambling to recover from Gustav.

In a pattern reminiscent of Hurricane Rita, Ike swept farther west of New Orleans, hitting Texas and western Louisiana. And like Gustav, the storm weakened to a Category 2 before landfall. But Ike was much larger, covering more area, and the storm surge passed through wetlands recovering from the previous week. In Cameron Parish, almost the entire coastal area was submerged as the powerful storm surge swept almost 30 miles inland, reaching as far as Lake Charles ([Skilton 2022b](#)). While Gustav and Ike alone would have been major storms for the region to contend with, the one–two punch of both sent a message that more work was necessary. Moreover, even with the federal government on board, the issue of funding all the work persisted.

In a book on lessons learned from Hurricane Ike on the Texas side, researchers at the Severe Storm Prediction, Education, and Evacuation from Disasters Center at Rice University warned that future federal budgetary challenges could cut off funding for vital projects. Depending on what is happening with the national economy, the researchers wrote that austerity measures at the federal level could mean "the availability of extensive federal funding for major structural flood control projects will be limited to the extent that they are available at all" ([Bedient et al.](#)

[2012, 159](#)). Due to the inconsistent nature of federal funding, the state could only depend partially on it for the funding required for ongoing and future restoration, protection, and maintenance projects.

## Gulf of Mexico Energy Security Act

In 2006, a significant funding source emerged due to persistent lobbying efforts by Louisiana politicians in Congress. The Gulf of Mexico Energy Security Act (GOMESA) marked a pivotal moment in Louisiana's quest for financial compensation for offshore oil and gas exploration. Going back to the 1940s, states such as California, Texas, and Louisiana have fought to claim that resource extraction from offshore lands should be managed by the states, not the federal government. In 1945, President Harry Truman took significant steps to establish federal control over the continental shelf and its resources. Through Proclamation Number 2667 and Executive Order 9633, Truman asserted federal authority over "subsoil and sea bed of the continental shelf within or outside of the three-mile limit" and designated the Secretary of the Interior as the managing authority for the resources within this area ([Truman 1945a; 1945b](#)). Almost immediately, the federal government sued California for trespassing on federal offshore lands, with the Supreme Court ruling two years later that rights to resources mined off the California coast were under federal control.

The government began building a similar case against Louisiana, which had been financing over one-third of the state's operating budget with revenues accruing from offshore exploration ([Horowitz 2020](#)). The federal government initially proposed a deal with the state, but it was rejected. Both Texas and Louisiana went on to lose cases against the federal government. By 1953, Congress had passed the Submerged Lands Act and Outer Continental Shelf Lands Act, which permanently fixed states' boundaries to three miles off the coast.

Bringing offshore revenues back to Louisiana involved revisiting the issue in court over 50 years later. In 2006, then-Louisiana Gov. Kathleen Blanco filed suit against the Department of the Interior, *Blanco v. Burton*, asking for an injunction to prevent the federal government "from opening bids or awarding leases in connection with a federal lease sale plan for oil and natural gas operations pursuant to the Outer Continental Shelf Lands Act" ([United States District Court for](#)



[the Eastern District of Louisiana 2006](#)). The state argued that Louisiana was not receiving its fair share of revenues from offshore leases and that the federal government had not adequately considered the environmental impacts and infrastructure challenges of offshore operations.

The court denied the injunction; however, the judge added that the state had a "substantial likelihood of success" of winning a case based on some of its claims ([Theriot 2014, 206](#)). The situation on the coast had changed significantly since 1953. More and more research was linking oil and gas activities to coastal land loss. The outcome of *Blanco v. Burton* propelled efforts in Congress to establish a revenue-sharing mechanism for Gulf Coast states, and GOMESA was born.

GOMESA allocates a share of federal revenues generated from offshore oil and gas exploration in the Gulf of Mexico to four coastal states: Louisiana, Mississippi, Alabama, and Texas. These states, along with specific coastal political subdivisions, are permitted by GOMESA to utilize these revenues for specific purposes ([Comay 2022](#)):

- Projects and activities related to coastal protection.
- Mitigation of environmental damage.
- Implementation of a federally recognized conservation management strategy.
- Offsetting offshore activities with onshore infrastructure.
- Administrative costs for GOMESA compliance.

Revenue sharing was split into two phases. The first phase began in fiscal year 2007, distributing 37.5 percent of qualified revenues from offshore leases among four states and allocating 12.5 percent to the Land and Water Conservation Fund's state assistance program. Funds for phase one began disbursement pending final regulations issued in December 2008, making 2009 the first year for disbursements. Phase two expanded disbursement to leases issued after 2006 and areas previously subject to a moratorium ([Bureau of Ocean Energy Management 2009](#)). These additions explain the large disbursement increase for Louisiana between fiscal year 2017 and fiscal year 2018, as seen in **FIGURE 2**. In most years, the aggregate amount is distributed to all Gulf states, and the fund is capped at \$500 million ([Comay 2022](#)).

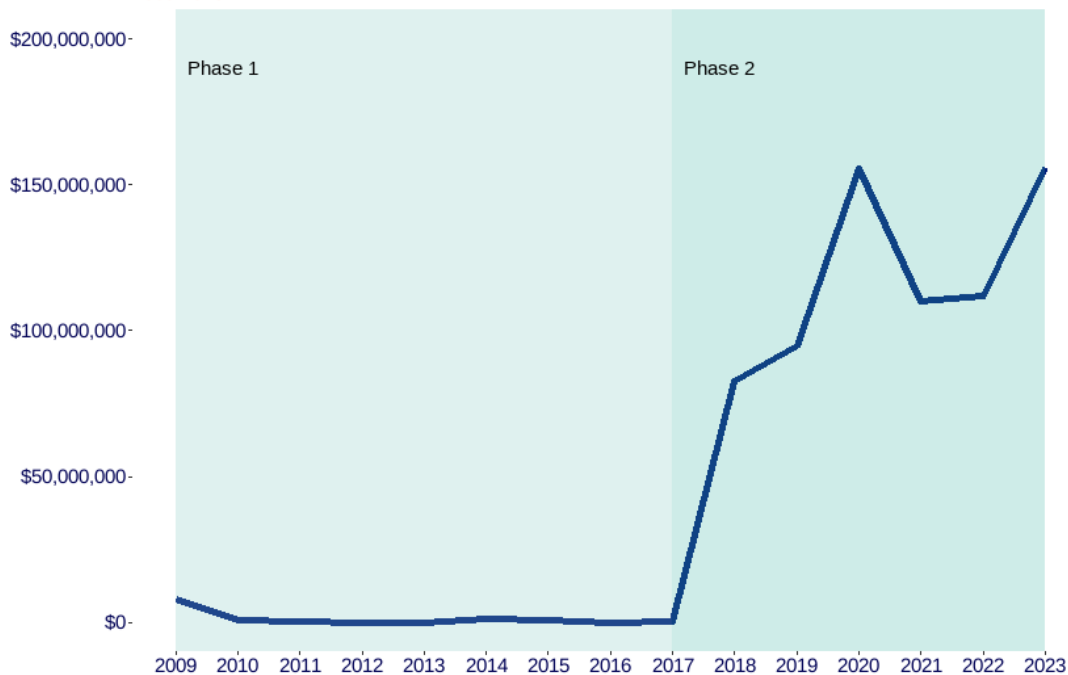
The introduction of GOMESA funding represented a significant turning point for Louisiana, providing a consistent and substantial source of revenue dedicated to restoration efforts. Over

the years, the state has allocated over half a billion dollars in GOMESA disbursements to support essential infrastructure projects. These projects have focused on improving transportation, such as road and bridge construction, as well as enhancing flood control systems and restoring coastal areas ([Grow Louisiana Coalition 2022](#)). However, the long-term viability of GOMESA funding remains a subject of debate. Oil and gas are finite resources. If oil and gas revenue ever declines, so will revenue sharing.

**Figure 2**

### GOMESA Disbursements to Louisiana and Coastal Political Subdivisions

2009-2023



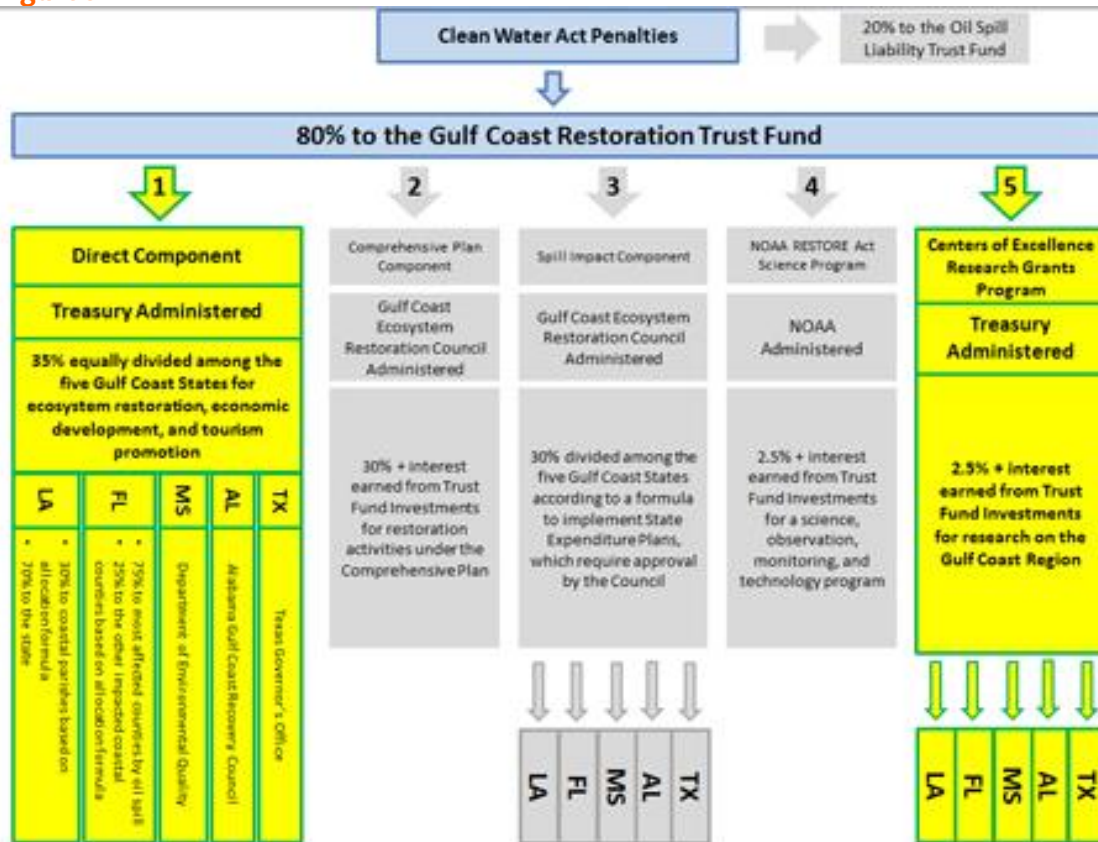
<https://cepr.net>  
Source: US Department of the Interior, Natural Resources Revenue Data.

Also, while currently stable, GOMESA funding, being split between the state and the many coastal political subdivisions, cannot fully cover necessary large-scale projects such as the IHNC-Lake Borgne Surge Barrier or the Mid-Barataria Sediment Diversion. Securing funding for such projects would require additional support and financing sources. The answer to this issue came a few years after Gustav and Ike but at a terrible price.

# Deepwater Horizon

On April 20, 2010, an explosion on the Deepwater Horizon oil rig, a massive drilling platform off the southeast coast of Louisiana, released an unprecedented 134 million gallons of oil into the Gulf. The Deepwater Horizon environmental disaster is widely regarded as one of the most severe in US history, and it left lasting impacts on the ecosystems, coastlines, and communities of the region ([United States: President of the United States et al. 2010](#)). It is no surprise that lawsuits against the rig’s owners and operators — BP, Anadarko, TransOcean, and Halliburton — immediately followed. Congress anticipated the distribution of civil penalties when it passed the RESTORE Act in 2012, dedicating 80 percent of any settlement to ecological and economic recovery efforts in the Gulf. The money would go into the Gulf Coast Restoration Trust Fund, which contained buckets for various programs. Of the trust fund, 35 percent is dedicated to the five Gulf Coast states, with Louisiana splitting its share between projects for the coast parishes and the overall state ([US Department of the Treasury 2020](#)).

Figure 3



Source: US Treasury

By April 2016, nearly six years after the disaster, a Federal District judge rendered a landmark decision, authorizing the largest environmental damage settlement in US history: \$20.8 billion ([US Department of Justice 2015](#); [National Oceanic and Atmospheric Administration 2017](#)). Of the civil penalties under the Clean Water Act included in the settlement, \$1.86 billion went into the direct component for use by Gulf Coast states (see **FIGURE 3**). The largest part of the settlement includes \$8.1 billion for natural resource damages, of which BP had already pledged \$1 billion to cover early restoration for joint use by the federal and state trustees. Additionally, under criminal penalties, BP entered into separate agreements to pay \$4.9 billion to the five Gulf states and up to \$1 billion to several hundred local governmental bodies to settle claims for economic damages. The National Fish and Wildlife Foundation received \$2.54 billion for its Gulf Environmental Benefit Fund, with half of the money dedicated to the creation or restoration of barrier islands off Louisiana's coast and the financing of potential river diversion projects on the Mississippi and Atchafalaya rivers, including the Mid-Barataria Sediment Diversion ([National Oceanic and Atmospheric Administration 2017](#)).

With the Deepwater Horizon settlement, coastal protection and restoration projects are seeing a significant increase in funding. However, it is important to note that a part of the funding was allocated to addressing the damages caused by the disaster rather than those stemming from approximately 70 to 80 years of mismanagement in the region. The other issue is that the settlement will be paid out over 15 years, with funding potentially terminating in 2031 depending on the amount of interest accrued on the unpaid balance. There will still be funding for work through CWPPRA and GOMESA, but losing the Deepwater Horizon settlement money will be a major blow to coastal restoration.

Challenges persist despite considerable progress thanks to initiatives like CWPPRA, GOMESA, and the Deepwater Horizon settlement. The interplay between economic interests, especially those of the oil and gas sector, and environmental imperatives continues to influence restoration discussions. While significant achievements have been made, such as wetland preservation and the construction of essential flood control infrastructure, Louisiana still faces significant challenges, including erosion, subsidence, and rising sea levels.

Over \$1 billion worth of work is currently underway along the Louisiana coast — a huge investment in state and federal money. However, understanding who is doing the actual work

and how that money gets distributed is complicated. The next section analyzes current workforce statistics to comprehend the economic impact of this ongoing work.

# Who is Doing the Work?

This report follows three separate but linked areas related to coastal protection: wetland restoration, flood mitigation, and disaster recovery. Even though this report may refer to these areas as the "coastal protection and restoration industry," there is no federally recognized industry within government data. This lack of recognition makes tracking trends challenging. Compounding the challenge in analyzing workforce statistics for those areas is the considerable overlap of those activities and the variety of sectors within them.

The workforce involved in coastal protection and restoration comprises a wide range of professionals, including but not limited to environmental scientists, engineers, construction workers, and maritime operations specialists. Significant overlap exists among these areas, as the same individuals and organizations may be involved in multiple aspects of coastal work. For example, the construction industry is crucial in building and maintaining flood mitigation infrastructure, restoring damaged ecosystems, and rebuilding structures and infrastructure after hurricanes.

Analyzing workforce statistics for coastal protection requires a comprehensive approach considering the overlap of activities, the diverse range of industries involved, and the specific skills and expertise required for each area. One such approach involves identifying an industry cluster comprising interconnected economic activities. The challenge is mapping that cluster.

## The Coastal Protection and Restoration Industry Cluster

A 2004 report from The National Ocean Economics Project attempted to identify the US ocean and coastal economy cluster, but it included sectors and industries outside the scale of this report, such as tourism and recreation. The other issue with relying on their method is that they used zip codes to identify "industries whose production processes and products directly involve the use of ocean resources" (Colgan 2004, 25). The main problem with using zip codes is that their boundaries are not fixed over time, requiring constant monitoring. A 2019 report by the Southeast Louisiana-based research group The Data Center used a different method by monitoring the "shocks" associated with the 2005 hurricanes and the 2010 Deepwater Horizon





settlement to assess which industries were sensitive to the influx of funding ([Habans 2019](#)). The report recognized specific industries as the core of a potential coastal protection and restoration cluster, with employment under the Other Heavy and Civil Engineering Construction classification as a primary indicator of the coastal restoration economy's health. As money was funneled to the state post-Katrina and through the Deepwater Horizon settlement, employment grew in sectors in a way that outpaced average US job growth in the same areas.

The Data Center's method is not the only way to measure which companies are doing the work. Our examination of 103 contracts granted between January 2022 and April 2024 by the US Army Corps of Engineers, CPRA, and different levee and conservation districts<sup>2</sup> operating through coastal political subdivisions found companies clustered into various sectors, identified by North American Industry Classification System (NAICS) codes in federal data. This pattern supports The Data Center's findings. The analysis revealed that just under half (46 percent) of the bids awarded were to companies categorized as Other Heavy and Civil Engineering Construction. At 11 percent, the second-largest share went to companies under the Highway, Street, and Bridge Construction classification, which is not included in The Data Center's definition of a water management cluster or subgroups. This statistic illustrates how varied the employers in this field of work can be.

Other "core cluster" classifications that appeared in the contracts include Asphalt Paving Mixture and Block Manufacturing (8 percent) and Engineering Services (5 percent), while Site Preparation Contractors (6 percent) do not appear in The Data Center's cluster. These statistics do not imply that The Data Center's methodology needs to be revised. As Habans states in the conclusion of his report, "the water management cluster is difficult, perhaps impossible, to define in a concrete, consistent manner" ([Habans 2019, 29](#)).

For this report, we follow The Data Center's recommendation of using the Other Heavy and Civil Engineering and Construction classification as a primary indicator of the coastal protection and restoration economy. As **FIGURE 4** shows, job growth in this classification has followed events in previous chapters, from post-Hurricane Katrina projects to the Deepwater Horizon spill and its

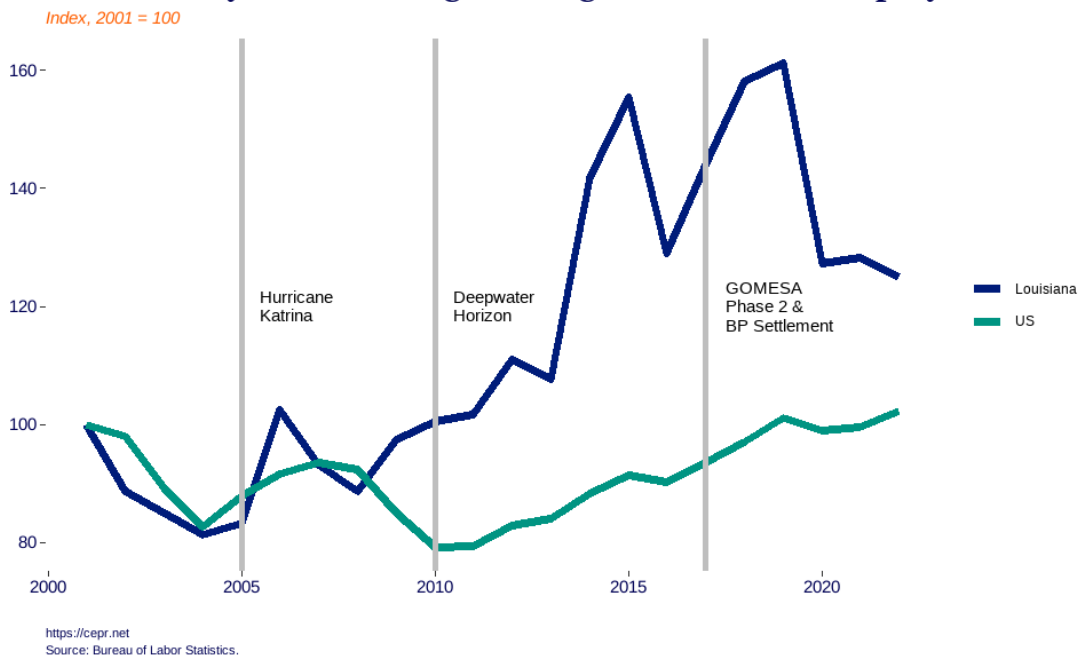
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<sup>2</sup> Data was obtained from CPRA's online archive (<https://coastal.la.gov/resources/rfps-rsiqs-contracts/archive-contracts-bids/archives-bids/>), Army Corps contract bulletins (<https://www.defense.gov/News/Contracts>), and the Louisiana Coastal Technical Assistance Center.



associated settlement. In recent years, employment has declined, but job growth in the state since 2001 remains above the overall US total.

**Figure 4**  
**Other Heavy and Civil Engineering Construction Employment**



Data are much harder to come by at a regional level when using federal datasets. The Census County Business Patterns dataset breaks down employment for subsectors by parish and metropolitan statistical areas, but the results are prone to errors at this level. The County Business Patterns data relies on payroll and employment data from administrative records for single-unit companies and a mix of records and surveys for multi-unit companies. These data can have nonsampling errors from data collection methods, influencing the accuracy ([US Census Bureau 2023](#)).

CEPR conducted the Gulf Coast Coastal Work Industry Insights Survey to supplement what little federal data we could acquire.

## Survey Results

The survey was conducted in three stages. First, emails were sent to contacts obtained from state licensing board databases. Second, contractors were contacted by phone to administer the

survey. Lastly, additional emails were sent to both previously contacted individuals and new contacts gained through the phone calls.

Out of a list of 75 active contractors, seven employers responded, a 9.3 percent response rate. The 91 percent non-response rate suggests caution in interpreting results given the potential for significant non-response bias. Many nonresponses resulted from refusals, confusion about who in the company was best suited to participate, concerns about revealing company information in a small industry, or time constraints. The size of the company likely influenced the reasons for nonresponse. For larger companies, screeners or routed calls to multiple regional offices were common, with calls directed to Louisiana offices when applicable. Conversely, smaller companies typically had receptionists who would either forward calls to a supervisor's voicemail or attempt to locate supervisors busy in the field. Of those who responded to the survey, three were mid-sized companies (between 50 and 199 employees) compared with two responses from both companies with fewer than 50 employees and 200 or more employees. So while the overall response rate was low, respondents may represent thousands of workers.

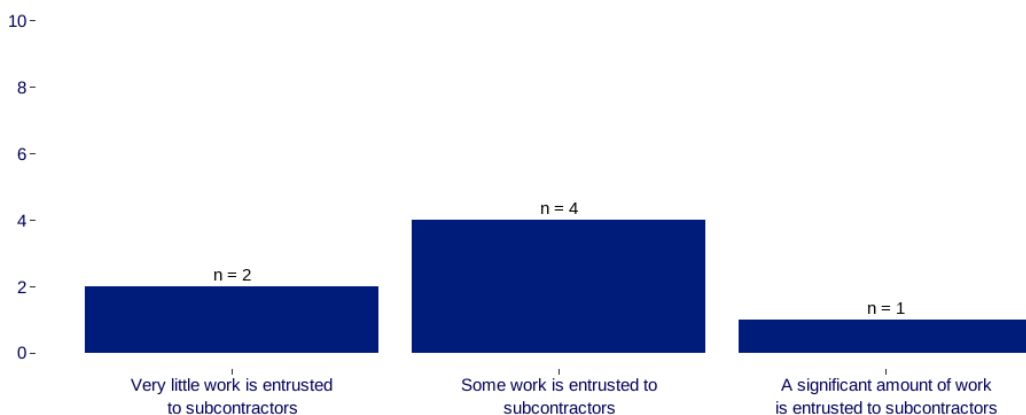
Respondents were asked how they would categorize their work, with options for "dredging," "marine contracting," "other contracting related to coastal restoration and hurricane protection," "disaster response," and "other." Four respondents selected multiple categories, while three respondents indicated "other," specifying "heavy civil construction" and "installation of native species of grass."

Of course, as previously mentioned, protection and restoration projects can involve various companies classified under different sectors. One hypothesis is that smaller firms without the in-house capacity for certain tasks, such as engineering and surveying, may engage subcontractors. As part of the survey, we asked respondents how much they use subcontractors in their work. According to the results, most respondents entrust some work to subcontractors (see **FIGURE 5**). However, we would need a larger sample size to test if the connection between the size of firms and subcontracting is independent.

**Figure 5**

### Indicate the extent to which your company entrusts work to subcontractors

Number of respondents



<https://cepr.net>  
Source: Gulf Coast Coastal Work Industry Insights Survey.

### Workforce Development

With specialized work often conducted by employers in varying sectors, there is a question of how employees receive training in coastal protection and restoration work. One method is a certification through an accredited institution. Based on data from the Louisiana Board of Regents, 25 active degree and certificate programs address coastal and civil construction work across the state's public academic institutions.<sup>3</sup> The Louisiana Community and Technical College System currently maintains 10 active certificate and associate's degree programs across its campuses that address workforce development needs within the coastal protection and restoration industry.

Some programs are specific to coastal work, such as the coastal studies and GIS program at Nunez Community College, which serves St. Bernard and Plaquemines parishes. Other programs fall under PRO Louisiana, a state-led workforce development initiative that funds training courses for occupations vital to flood recovery, such as heavy equipment operations, resilient construction methods, and flood risk analysis ([Louisiana Watershed Initiative 2022b](#)). Currently,

<sup>3</sup> Programs were filtered by the keywords "coastal", "civil" and "heavy equipment" and then narrowed down by CTC, CTS and AAS programs.



only heavy equipment operator training is offered through the PRO Louisiana courses, and only three programs are listed as active.

These certification programs have multiple benefits. They can provide access to specialized knowledge and skills that might not be available in the workplace. Technical courses and certifications often require a structured learning environment. One example is safety training through the Occupational Safety and Health Administration (OSHA), which is often required for employment in the construction industry ([Rosenberg 2020](#)). These certifications follow the worker from job to job.

While these programs have benefits, they also have certain drawbacks. One significant challenge is incorporating real-world experiences to complement the classroom components. Many professors and administrators we interviewed emphasized the struggles associated with providing students with hands-on, practical experiences essential for their professional development. Simple tasks such as transporting students to project sites can add substantial costs to the program budget.

Funding for these programs is another major concern. They often rely on a combination of sources, including grants, appropriated state funds, and student tuition. While tuition assistance is often offered by the program, mainly through initiatives like PRO Louisiana ([Louisiana Watershed Initiative 2022a](#)), securing additional funding streams is crucial to sustain the program's operations and ensure the quality of education.

However, a certificate or associate's degree is only one of many ways workers can learn. Another training method is on-the-job training, which utilizes the accumulated knowledge and expertise within the company. According to UNESCO's Interagency Group on Technical and Vocational Education and Training, on-the-job training is the most common form of work-based learning, which includes apprenticeships and internships ([Interagency Group on Technical and Vocational Education and Training 2017](#)). It involves learning and acquiring skills directly on the worksite, under the guidance and supervision of a more experienced colleague or mentor. This type of training is effective for job-specific skills and encourages their use in a real-world setting. On the other hand, some on-the-job training can resemble informal apprenticeships, which, while offering valuable hands-on experience, often come with drawbacks that can limit their effectiveness. On-the-job training may lack the structured curriculum, standardized

assessment, and qualified instructors found in accredited training programs, resulting in inconsistent and incomplete skill development. This type of training may also be unregulated, meaning there is no guarantee of a systematic learning process or recognized qualifications upon completion ([International Labor Organization 2021](#)). With a certification, workers can transfer skills to another employer.

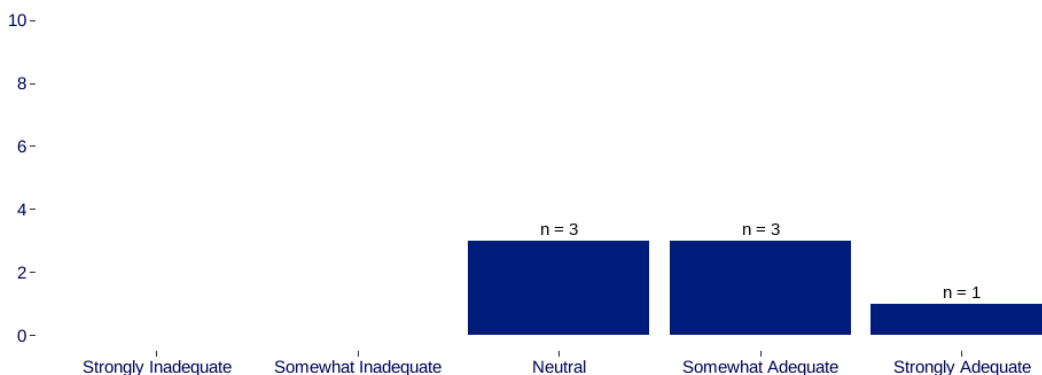
In the survey, we asked respondents how current nonsupervisory employees receive training, with options for “on-the-job training,” “certifications through an accredited institution”, or “other.” The majority responded with “on-the-job training,” and even though three responded “other,” the text answers all indicated a combination of “on-the-job training and certifications through an accredited institution.”

Respondents were mostly positive when describing the adequacy of current training methods, whether on-the-job training or a combination of on-the-job training and through an accredited institution (see **FIGURE 6**). With three respondents answering “neutral,” one hypothesis is that firms utilizing only on-the-job training would be more neutral about the adequacy of that training compared with those who used the combination method. Again, with a larger sample size, we could test that relationship.

**Figure 6**

**How would you characterize the adequacy of training provided to nonsupervisory employees in their respective roles, whether in-house or through a subcontractor?**

*Number of respondents*



<https://cepr.net>  
Source: Gulf Coast Coastal Work Industry Insights Survey.

## *Current and Future Business Outlook*

Considering the somewhat tenuous state of funding for coastal protection and restoration projects, we asked employers about their current and future outlook. When asked about their business outlook, an overwhelming majority responded they have a “very positive” outlook. However, the findings may not accurately reflect employees' true feelings as participants might have responded in a manner they believed would please their boss, potentially introducing response bias. Even though the survey was anonymous, it does not guarantee honest responses, as employees may still feel pressure to conform to perceived expectations. Additionally, this finding conflicts with responses to further questions pertaining to concerns and challenges for employers.

For example, when asked about the biggest challenges facing the respondents' companies, an overwhelming majority responded, “Attracting and retaining a workforce” (see **FIGURE 7**). This could be explained by low unemployment rates in coastal parishes. From January to April 2024, the average unemployment rate (not seasonally adjusted) was 4.2 percent for New Orleans – Metairie – Hammond metro statistical area, 3.6 percent for the Baton Rouge metro statistical area, 3.7 percent for the Houma – Thibodaux metro statistical area, and 4.2 percent for the Lafayette – Opelousas – Morgan City metro statistical area. While these are all higher than the seasonally adjusted average unemployment rate for the South (3.4 percent) over the same period of time, they are significantly lower than unemployment rates around the country just three years ago.

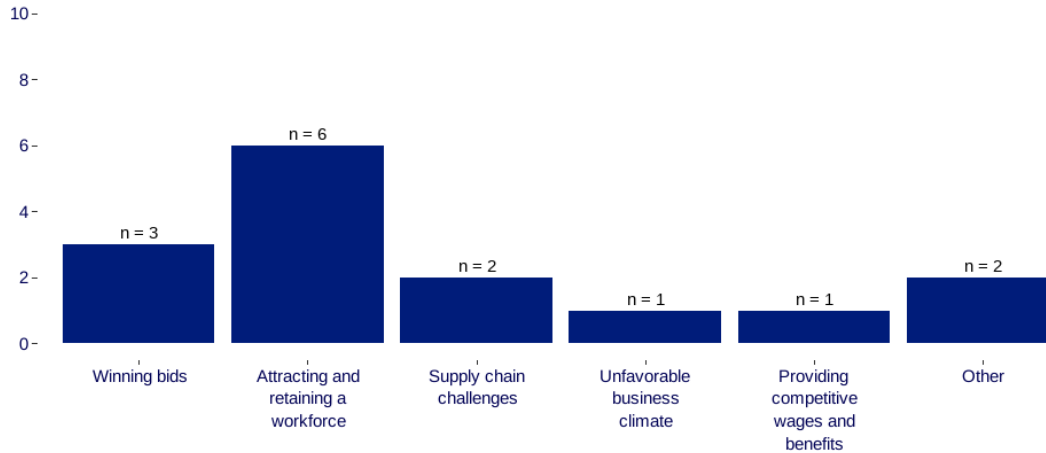
Anecdotally, driving through Terrebonne and Lafourche parishes, we noticed many billboards advertising job opportunities at companies conducting coastal work. This visual representation of the labor market crisis echoes the struggles faced by employers in similar work across the US. A 2023 survey conducted by the Associated General Contractors of America and Autodesk revealed that a substantial 85 percent of construction companies are struggling to fill open positions, with 68 percent of firms reporting that applicants lack the skills needed to work in construction ([Turmail 2023](#)).



**Figure 7**

### What are the biggest challenges your company is facing right now?

Number of respondents



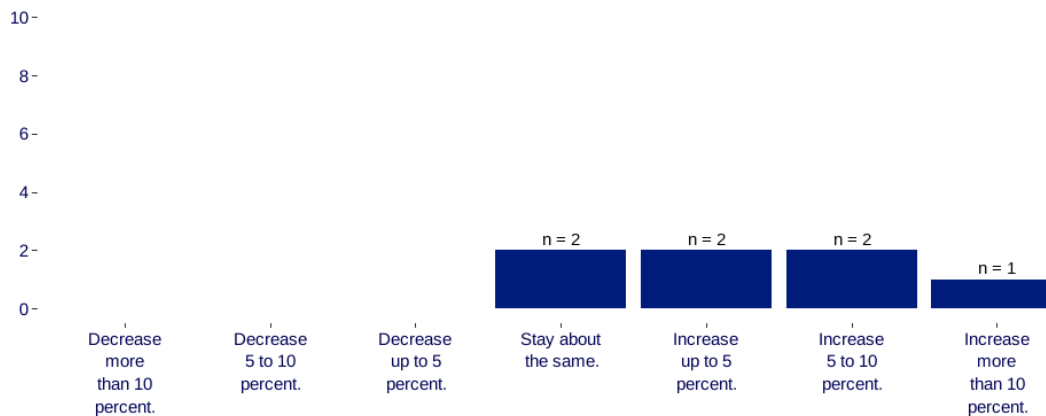
<https://cepr.net>  
Source: Gulf Coast Coastal Work Industry Insights Survey.

One interesting note about the challenge of attracting a workforce is that when asked what the companies expected to happen to wages over the next year, most respondents expected some kind of increase (see **FIGURE 8**). The expectation that wages will increase aligns with goals to attract and retain a workforce. Higher wages can be an essential tool employers use to remain competitive in the labor market. Increasing wages helps employers attract qualified candidates and retain existing employees.

**Figure 8**

### Over the next year, what do you expect to happen to nonsupervisory employee wages?

Number of respondents



<https://cepr.net>  
Source: Gulf Coast Coastal Work Industry Insights Survey.

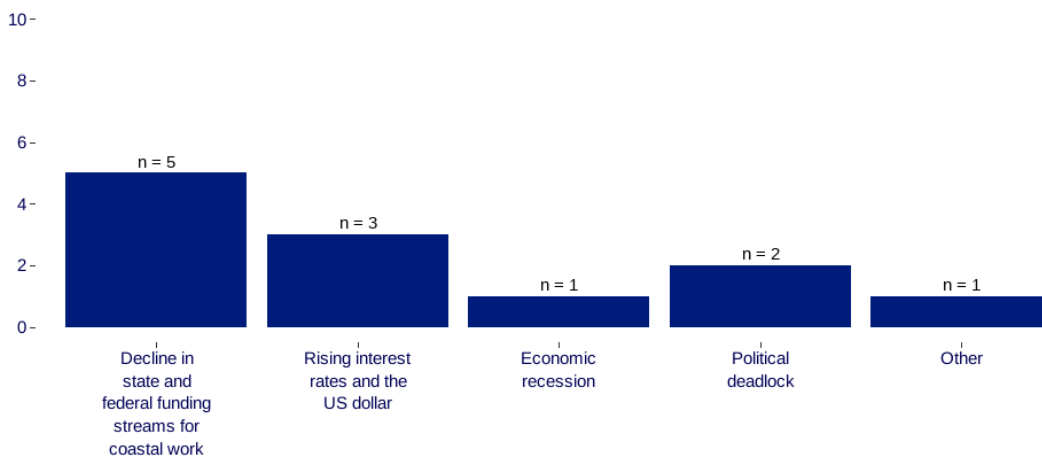


Also, when asked about their major concerns for their company's future, a majority responded, “Decline in state and federal funding streams for coastal work” (see **FIGURE 9**). This finding matches our conversations with NGOs, where people expressed concerns regarding the end of the BP settlement funding stream. CWPPRA and GOMESA funding will continue, but as previously stated, their long-term availability is uncertain. If state and federal funding diminishes, so will the work.

**Figure 9**

**Which of the following are major concerns for your company?**

*Number of respondents*



<https://cepr.net>  
Source: Gulf Coast Coastal Work Industry Insights Survey.

The other major concern for respondents can be categorized as “inflation,” with three responding “Rising interest rates and the US dollar” and one respondent responding “inflation” under “other.” Several factors likely drive this concern. Rising interest rates can make it more expensive for businesses to borrow money. A stronger US dollar can also make imported goods cheaper, hurting local manufacturing companies. These factors can affect the supply chain portion of the industry cluster.

Again, though the survey’s response rate was low, we cannot ignore that the respondents potentially represent several thousand workers in the coastal protection and restoration industry. We can glean from this data, along with other data collected, that challenges exist within the industry around workforce attraction, retention, and future funding. The underlying focus of stakeholders should be improving workforce readiness and addressing economic and logistical challenges to sustain the industry's growth and effectiveness in what are certainly



increasing climate-related challenges. The following section aims to assist in these goals by making recommendations for the various stakeholders involved in the coastal protection and restoration industry.

# Recommendations

Based on our analysis, we offer the following recommendations.

- **More data is necessary** from employers. As previously mentioned, the response rate to our survey was low, so the results may not be generalizable. While future surveys could offer incentives to increase the response rate, a more concrete method of collecting data would be for the federal government and Louisiana to require employers bidding on Army Corps, CPRA, or levee district contracts to provide additional workforce data. Some data exist within bids, project completion reports, and private databases. The 2012 Louisiana First Hiring Act, for example, requires contractors who win CPRA bids to provide certain Louisiana resident workforce and labor information to the Louisiana Workforce Commission. This data includes the number and types of jobs anticipated for the project, skill level of jobs, wage or salary range, and methods contractors will take to recruit unemployed persons or persons employed in low wage jobs to fill openings ([Louisiana First Hiring Act 2012](#)). But obtaining the data requires a public records request, and not all data are available. Even then, CPRA contract data are only a sample of the overall picture. In our analysis of 103 contracts, CPRA contracts made up 21 percent of the total number of projects. Implementing a requirement for employers to provide standardized workforce data as part of the bidding process at the federal, state, and local levels would ensure that comprehensive and comparable data are available for analysis. This approach offers several advantages. Firstly, it would provide a more accurate and comprehensive representation of the workforce engaged in projects. Secondly, it would allow for a more robust analysis of workforce trends, demographics, and outcomes. Thirdly, it would facilitate better planning and decision-making regarding workforce development initiatives and policies.
- **Standardize a definition of coastal work.** Louisiana is not the only state funding these projects. As noted previously, GOMESA funding and BP settlement money are being distributed to all of the Gulf Coast states for this particular type of work. From Texas to Florida, coastal protection and restoration projects are happening. But everyone has a different name for it. In The Data Center's report, they label it as a "water management" cluster ([Habans 2019](#)), but for this report, we chose "coastal protection and restoration." A federally standardized name and definition would make it easier to track employment trends and economic impacts and identify specific workforce needs. In the future, coastal protection and restoration work should be as easy to track as work in the auto industry. If the industry is easier to track, workforce development programs would be able to target specific needs and skills gaps better.



- Establish a formal workforce intermediary program.** Local labor markets can be mired in a lack of regulatory clarity and an array of overlapping and competing programs. This can lead to a “fractured system with multiple entry points, bureaucratic rules, conflicting priorities, inconsistent and non-representative employer participation, poor coordination and missed opportunities for labor market upgrading” ([Dresser and Rogers 1998](#)). Labor market intermediaries, such as academic institutions, temp agencies, the federal workforce development system, chambers of commerce, and industry trade associations, can address and remedy these shortcomings. But workforce intermediaries differ from labor market intermediaries in that they are “organizations or networks of organizations that offer workforce development services to members of a community composed of individuals or firms (e.g. worker centers, community organizations, faith-based organizations, and some chambers of commerce)” ([Giloith 2003, 8](#)). In Louisiana, there are economic development agencies such as Greater New Orleans, Inc. (GNO, Inc.) that work to match employers with programs at accredited institutions. The state could do more to support these types of intermediaries. Between 2004 and 2010, Pennsylvania created an Industry Partnership program that invested \$100 million in developing a collaborative network of close to 80 industry partnerships, engaging approximately 6,000 businesses and 80,000 trained workers. This venture led to the emergence of partnerships that successfully identified shared concerns and challenges through collaborative efforts ([Dedrick 2014](#)). According to state data, workers who completed training experienced an average 6.6 percent wage gain within the first year ([Green 2010](#)). Pennsylvania could be a case study for how a formalized workforce intermediary would benefit Louisiana’s coastal protection and restoration industry.
- Advocate for “good jobs” within the industry.** A formal workforce intermediary also could work as a mechanism for advocating for “good jobs” within the industry. A 2020 literature review from the Urban Institute on “good jobs” found that pay and working conditions were common criteria in defining these jobs ([Congdon et al. 2020](#)). Most definitions gave particular emphasis to the level of compensation and the extent to which it was predictable, while working conditions often focused on the stability and predictability of hours and the flexibility to balance work-life demands. To that point, evidence supports that union jobs are safer and better-paying jobs. For example, workplace safety is particularly important to the coastal protection and restoration industry as some jobs fall under “construction,” which ranks as one of the most dangerous industries in the US ([National Safety Council 2020](#)). An investigation of over 37,000 OSHA inspections conducted in the construction industry during 2019, including more than 2,800 inspections at union worksites and nearly 34,200 inspections at nonunion worksites, found that union worksites consistently exhibit a significantly lower rate of violations compared to their nonunion counterparts ([Manzo IV, Jekot, and Bruno 2021](#)). Additionally, research has found that unionized workers, on average, receive a 13.2 percent higher wage than non-unionized workers in the same sector with comparable education, occupation,

and experience ([Bivens et al. 2017](#)). A workforce intermediary could champion the removal of barriers at the state and market levels that hinder the creation of "good jobs" in the industry.

- Continuing with the prior suggestions, a formal workforce intermediary could help **develop hybrid training programs** that combine the structured curriculum of certification programs with the practical, hands-on experience of on-the-job training. A hybrid framework can provide the best of both worlds regarding training, ensuring comprehensive skill development and formal recognition. It could also establish an internship program linking institutions to employers. To prevent the problems associated with informal apprenticeships, the state could also develop standardized guidelines and assessment criteria for on-the-job training to ensure consistent and high-quality skill development. Lastly, it is imperative to emphasize the need for longitudinal research that tracks students through programs, from enrollment to the work site. As one person told us, "If we drive up to a work site, will we see Louisiana license plates?" Program administrators need more data to assess the outcomes of training programs, and that data needs to include where students went after classes were done.
- **Educate potential workers about climate and local issues to enhance engagement.** In conversations with instructors and students at Nunez Community College, the idea of linking coastal land loss issues to a sense of place came up as a method of attracting workers to coastal protection and restoration work. The concept revolves around fostering a deep connection between individuals and the coastal environment, leveraging the emotional and historical ties that people have with their communities. This type of place-based education could be folded into the curriculum across various disciplines, such as organizing field trips and activities that allow students to experience the threat of coastal land loss. Ecotourism is another aspect of educating the public about Louisiana's coast. By visiting the region and seeing firsthand the impacts of sea-level rise and coastal erosion, visitors can become more informed about the importance of protecting the coast. This can lead to increased support for conservation policies and funding, which can help ensure the long-term sustainability of Louisiana's coastal ecosystem. One notable example of this model is the integration of ecotourism with conservation efforts in Florida's Everglades National Park.
- The state must continue to **address the long-term funding needs** of coastal protection and restoration. This could involve exploring new funding sources, such as public-private partnerships or dedicated taxes. It could also involve advocating for increased federal funding for programs such as CWPPRA and GOMESA. One such effort was the Reinvesting In Shoreline Economies and Ecosystems (RISEE) Act of 2023. The bill would have split revenue from offshore wind projects leased from January 1, 2022, onwards between the US Treasury, the National Oceans and Coastal Security Fund, and adjacent coastal states. Currently, generated revenue goes directly to the US Treasury Department. The bill also



would have lifted the cap on GOMESA revenue sharing from offshore oil and gas leases with states. Unfortunately, the bill failed to gain traction in 2022. In 2023, it encountered further setbacks, remaining in committee in both the House and Senate and failing to advance further. As the US transitions to more renewable energy, coastal states deserve the same rights and opportunities for revenue sharing applied under GOMESA.

**Overall, these recommendations aim to enhance and optimize workforce development and resource allocation for coastal protection and restoration projects. By improving data collection and standardization, establishing structured workforce intermediary programs, educating and engaging potential workers, and ensuring sustainable funding sources, we can create a more efficient, informed, and well-supported workforce to effectively address the challenges and needs of coastal protection and restoration.**



# Conclusion

Coastal land loss in Louisiana is a complex phenomenon, and understanding the work aimed at reversing the damage is just as complicated. The exploration of who is doing the work to protect and restore the coast reveals a diverse landscape of stakeholders, including contractors, construction workers, engineers, NGOs, and academic institutions. The challenges they face are multifaceted, encompassing workforce shortages, funding uncertainties, and the need for specialized training programs.

While more data are necessary to better assess employers and their needs, this report provides some recommendations that can assist in preparing stakeholders for challenges to come. These recommendations include enhancing data collection, workforce development, and long-term funding strategies, and emphasizing the importance of collaboration and innovation in securing the future of Louisiana's coastal areas. By implementing these strategies, Louisiana can build a more resilient and effective framework for coastal protection and restoration, ensuring that both the workforce and communities are well-supported in the face of ongoing and future challenges.



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