

# The Coastal Index

— April 2014 —



THE DATA CENTER

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## About The Data Center

The Data Center is the most trusted resource for data about greater New Orleans and Southeast Louisiana. Since 1997, The Data Center has been an objective partner in bringing reliable, thoroughly researched data to conversations about building a more prosperous, inclusive, and sustainable region.

The Data Center (formerly known as the Greater New Orleans Community Data Center) became the local authority for tracking post-Katrina recovery with *The New Orleans Index*, developed in partnership with the Brookings Institution, Metropolitan Policy Program. Now a biennial publication, *The New Orleans Index* is the go-to resource for national and local media, decisionmakers across all levels of government, and leaders in the private and nonprofit sectors. The Data Center’s expertise in compiling, analyzing, and publishing the most relevant, high-impact data has made it a leader in helping communities and decisionmakers understand the rapid pace of demographic, economic, and environmental change in Southeast Louisiana.

## About The Coastal Index

*New Orleans and coastal Louisiana are tied at the hip. It is impossible to understand New Orleans apart from the coast, and the fate and future of each is inextricably tied to that of the other.*

Excerpt from the edited volume *Resilience and Opportunity: Lessons from the U.S. Gulf Coast after Katrina and Rita* (Chapter 12) by Mark Davis, 2011

On April 20, 2010 – nearly five years after Hurricanes Katrina and Rita wiped away 217 square miles of Louisiana coastland – the Deepwater Horizon oil platform blew up and sank 45 miles from that same coast.<sup>1</sup> Millions of barrels of oil spewed into the Gulf of Mexico for almost three months – fouling wildlife, beaches, and the delicate marshes that are New Orleans’ first line of defense against hurricane storm surge.<sup>2</sup>

Scientists will study the impacts of this historic oil spill for decades to come. And it is important that they do, because the environmental impacts of earlier spills such as the 1989 Exxon Valdez spill are still being uncovered.<sup>3</sup> But this report occupies a different niche.

The purpose of *The Coastal Index* is to serve as a toolkit for measuring progress toward a more sustainable Southeast Louisiana. Its first concern is how wetland deterioration has altered the social geography of the region. It asks: How is the threat of land loss affecting coastal populations? As the inaugural edition, this version of *The Coastal Index* establishes baseline indicators for mapping social changes associated with land loss that can be followed over time.

The second aim of *The Coastal Index* is to track the evolving economic geography of the region by providing key indicators that can be measured over time to assess the emergence of a water management sector. Unquestionably, expertise on how to live with water, and also how to fight it, has accumulated in the region as billions of dollars have been spent since 2005 on levees, berms, barrier islands, and pump stations. *The Coastal Index* investigates whether or not these extensive “water management” activities are diversifying the regional economy by adding an emerging specialization to an economic profile dominated by oil and gas, shipping, and tourism. In addition, this report compares Southeast Louisiana’s water management sector to the other sectors that regional leadership have targeted for growth. The objective in doing so is to provide valuable information on the contributions this sector already makes to the Southeast Louisiana economy and how its further growth can be facilitated.

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## Executive Summary

Fully 39 percent of the U.S. population lives in the sliver of counties that border the U.S. coast.<sup>1</sup> Moreover, the U.S. coast is home to businesses and industry that contribute 42 percent of all national economic output.<sup>2</sup> With sea levels on the rise, protecting coastal assets and population centers will be a central focus of the 21st century. Only a few states and regions have begun to tackle this challenge. Louisiana is in the vanguard.

To be sure, Louisiana faces the greatest risk with relative sea level rise that is outpacing the rest of coastal America.<sup>3</sup> Louisiana has lost 1,880 square miles of coastland over the last 80 years, and scientists expect that if no action is taken to save the coasts an additional 1,750 square miles will disappear by 2064.<sup>4</sup> Louisiana already understands the economic importance of its coastline. It is vital to the state's third-place ranking in national energy production and to the transportation of 20 percent of the nation's waterborne commerce.<sup>5</sup> In 2005, the widespread destruction caused by Hurricanes Katrina and Rita catalyzed significant political support for coastal protection and restoration. The United States Army Corps' Hurricane and Storm Damage Risk Reduction System (HSDRRS) updated 133 miles of levees, floodwalls, gated structures, and pump stations to the tune of \$14 billion.<sup>6</sup> And the Louisiana legislature agreed to dedicate \$1 billion – including nearly the entire state surplus from 2007 – to coastal protection and restoration.<sup>7</sup>

Moreover, in 2007 the state also released its Comprehensive Master Plan for protecting and restoring the coast. The Master Plan (updated every 5 years) is an expensive, large-scale endeavor to halt land loss, and is the centerpiece of thinking on resiliency and sustainability for the region.<sup>8</sup> But, it is also accompanied by other developments that address how we live with water in Southeast Louisiana, such as the Greater New Orleans Urban Water Plan and the City of New Orleans' *Plan for the 21st Century*.<sup>9</sup> Together these activities seek to bolster storm protection and more effectively address the issue of subsidence. These plans still have investment gaps, with confirmed and potential sources of funding including state tax dollars, local tax dollars, federal tax dollars, and, of course, fines from the massive Deepwater Horizon oil spill in 2010.

With billions of dollars spent (and more to come), these developments have introduced an abundance of water-related work to the regional economy. There is no doubt that the main purpose of these activities is to mitigate coastal deterioration and to find better ways to live with water. But they also hold the potential to diversify and strengthen the economy of the region for the long term. Along with a strong coast, an innovative and vibrant water management industry is a real possibility.

Our review of nearly a dozen key indicators highlights the current and ongoing effects of coastal land loss on residents and industry in Southeast Louisiana, and also points to the economic potential of the massive water management activities that are underway. These findings show:

- Unemployment rates in Southeast Louisiana are lower than the nation as a whole, confirming that Louisiana is a working coast. Unemployment in the Houma-Thibodaux metro has hovered below the national average nearly every year since 1990. Since 2007, unemployment in Houma-Thibodaux has remained at least 2 percentage points below the national average. Indeed, largely because of jobs associated with oil and gas extraction and water transportation, coastal areas are second only to Southeast Louisiana cities in having

high ratios of jobs to the number of people who live there.

- Coastal workers are living farther and farther from their work sites. The percent of all workers with jobs in Terrebonne Parish commuting from outside the parish has risen from 42 percent in 2004 to 48 percent in 2011. The share of workers in Lafourche Parish commuting from outside the parish has grown from 41 percent in 2004 to 51 percent in 2011. And in Plaquemines Parish fully 72 percent of all workers commute from outside the parish, up from 69 percent in 2004.
- Several small coastal communities including Theriot, Dulac, Montegut, Chavin, Cut Off, Lafitte, and Port Sulphur have lost occupied households continually since July 2005. And residents who are left behind are more likely to be poor and elderly. In Theriot and Dulac more than 40 percent of the population lives in poverty.
- The water management sector of the economy has been strong for a long period of time, maintaining a location quotient greater than 1.0 since 2004. The water management economy in Southeast Louisiana grew by 7,832 jobs from 2010 to 2013 – outperforming overall national trends and national trends specific to the water management sector.
- Only advanced manufacturing and the energy and petrochemical sector spend more locally to satisfy their production needs, revealing water management as a sector of strong expertise that supports the local economy. At the same time, nearly half of all water management spending goes outside the region – much of this in manufactured goods, showing that the sector is lacking crucial production capacity.
- While offering strong average earnings, especially when compared to other sectors of the Southeast Louisiana economy, the earnings still trail the national average for jobs in water management occupations – dampening the local sector’s ability to attract and retain badly needed workers.

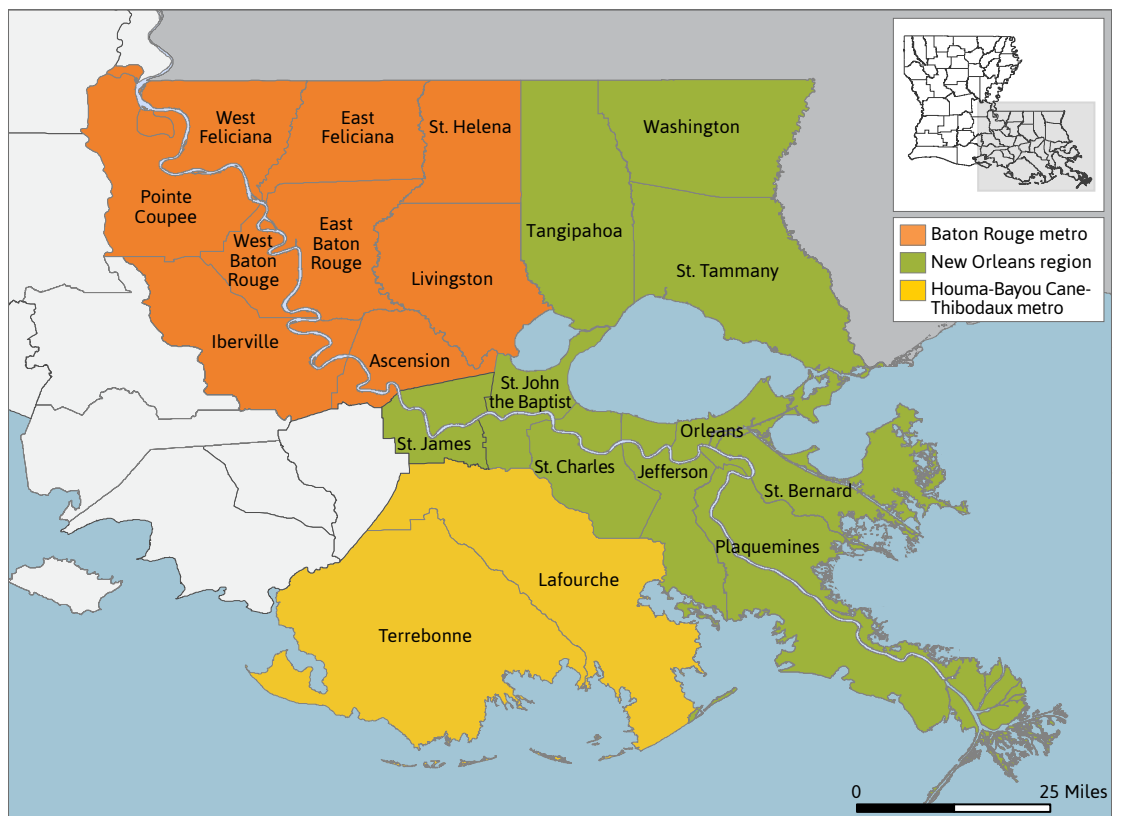
These initial indicators reveal that even though Southeast Louisiana remains strong economically, residents and workers are fleeing coastal areas, driven by land loss and increasing flood risk. The retreat from the coast is real, leading to visible alterations in the composition of coastal communities. However, the scale of restoration activities planned and current momentum around water management have the potential to stem land and population loss and build a diverse economy for the region – an economy that will further the overall goal of long-term sustainability for Southeast Louisiana.

Sustainability – indeed viability – has been and will be a continuous pursuit for Southeast Louisiana. Efforts to manage water, which began with the first human inhabitants of this alluvial plain, are at an inflection point. Southeast Louisiana’s challenge now is not only slowing land and population loss, but also formalizing the expertise residents have developed and the hard work they have exerted into a specialized water management economy. By cultivating this economic specialization we can become a national – and even global – leader in showing others how to live with water. Done right, Southeast Louisiana can forever alter perceptions of the region and be recognized as a model others should emulate – a region that preserved valuable pieces of its past while transforming challenges into opportunities in the creation of a diverse, sustainable economy.

# Background Information

## Defining the Southeast Louisiana Super Region

The Southeast Louisiana super region is composed of the three metropolitan statistical areas of Houma-Thibodaux, New Orleans, and Baton Rouge, and the three additional parishes of St. James, Tangipahoa, and Washington. Regional markets are made up of complex, place-based interactions that often result in economic interdependence across proximal metropolitan areas. Our previous research found that the parishes in the super region were highly synergistic and interconnected as evidenced by commuter patterns, industrial specializations, and freight flows.<sup>1</sup> Economic development leaders have formed the “Southeast Super-Region Committee” to collaborate across this broader geography. The economic data in this report reflects all of these parishes as a single unit.





## Defining the Target Sectors of the Super Region

In 2010, Louisiana Economic Development (LED) developed a plan to target industrial sectors that represented the best growth opportunities in the state. This plan, called the “Blue Ocean Initiative,” aspires for Louisiana to capitalize on the state’s unique strengths by targeting emerging sectors of high growth where Louisiana has a clear advantage, and supporting legacy sectors of moderate or low growth where Louisiana has a clear advantage and acceleration is possible. The target industries of each of the major regional economic development organizations in Southeast Louisiana align nicely with the target industries of LED. Specifically, state and regional economic development organizations are aligned in targeting five broad industry sectors: energy and petrochemicals, advanced manufacturing, water management, digital media, and biosciences.<sup>2</sup>

### Alignment of economic development organizations in targeting five industry sectors

	Louisiana Economic Development	Baton Rouge Area Chamber	GNO, Inc.	New Orleans Business Alliance	South Louisiana Economic Council
<b>Energy and Petrochemical Manufacturing</b>	Energy	Chemicals and new energy production	Energy		Marine transport & pipelines
<b>Advanced Manufacturing</b>	Advanced manufacturing	Fabricated structural materials	Advanced manufacturing	Advanced manufacturing	Equipment manufacturing; Metal fabrication
<b>Water Management</b>	Water management	Technical research and consulting	Emerging environmental	Sustainable industries	Environmental & geotechnical services
<b>Digital Media</b>	Digital media and software	Software design	Software and digital	Digital media	
<b>Biosciences</b>	Specialty healthcare		Biosciences	Bioinnovation and health care	

Sources: Louisiana Economic Development, Greater New Orleans Inc., New Orleans Business Alliance, Baton Rouge Area Chamber, and South Louisiana Economic Council.

This report includes the first rigorous definition of the five industrial sectors that have been targeted for growth by regional leadership. We used economic cluster definitions provided by the **U.S. Cluster Mapping Project**, which is a collaborative initiative between the Harvard Business School and the U.S. Department of Commerce’s Economic Development Administration. The Cluster Mapping Project, headed by renowned economist Michael Porter, identified regional cluster economies according to statistically significant locational employment correlations. For unfamiliar industries, the scholars verified linkages by conducting in-depth case studies. Additionally, they examined spending patterns of industries to verify linkages. Based on the Cluster Mapping Project definitions, the target sector definitions in this report differ slightly from our earlier research.

## Defining and Situating the Water Management Sector

In this report, water management refers to all of the water-related work happening off the coasts, such as creating barrier islands and marshes; all the work on the coastlines, mainly levee and breakwater construction; and the work happening inland managing subsidence and storm water deluges, such as building green infrastructure that better stores water. The Cluster Mapping Project does not provide a definition for water management – nor other clusters of the future – because it is based on analysis of trend data. This presents a challenge for defining water management, as there are no well-known regional economies that focus on water management as an industrial specialization.

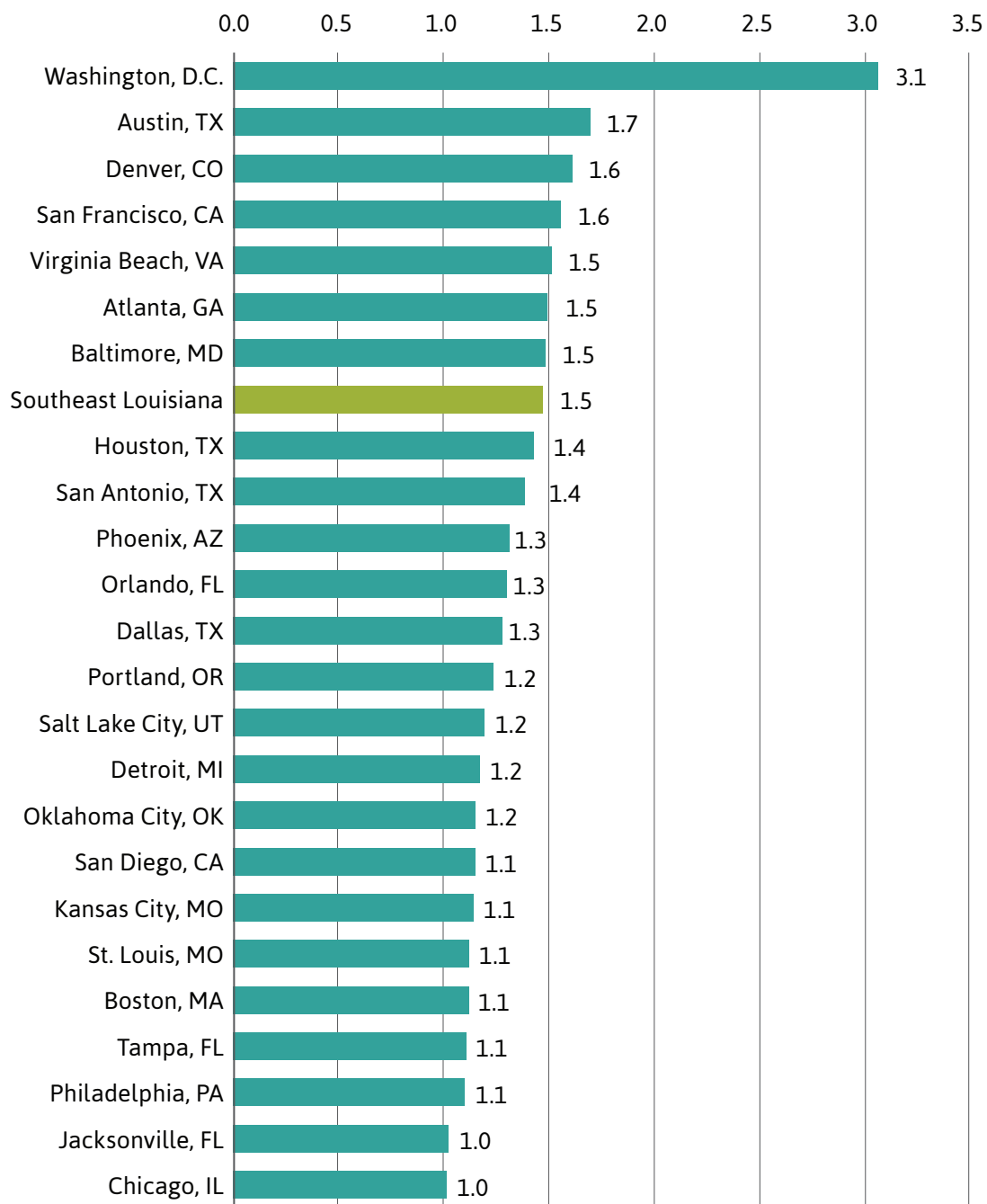
Given the lack of clear, empirically verifiable examples of such an economy in a different metro, we had to create a definition to find potential examples. This was accomplished by identifying those metros with a strong capacity for working with and altering the physical environment. Metros that have this capacity combine a robust construction products and services cluster with a strong business services cluster, as defined by the U.S. Cluster Mapping Project. The business services cluster is needed because it includes sophisticated design and software development firms that elevate the innovative capacities of construction products and services providers, increasing the potential for a regional specialization in the management, design, and building of physical landscapes. First, we isolated metros that have employment that is equal to or greater than the average for all U.S. metro areas in both of these clusters, yielding 38 metros in the U.S. that may have a specialization working with the physical environment. This specialization can have a general focus, such as infrastructure, or a more refined focus, like water management.

Of the 38 metros that combined a healthy business services sector with a robust construction products and services sector, 24 were export-generating economies as evidenced by location quotients greater than “1” – meaning they are likely exporting these services outside their region. Washington, DC, with its location quotient of 3.1 is the leading regional economy within this specialization, but it is a unique case because its strength is more in business services, which are likely connected to the abundance of research and information organizations, including the federal government, rather than in construction. Southeast Louisiana has the eighth strongest location quotient among regions that have a specialization working with the physical environment, and ranks higher than other coastal/port metros that likely have similar water management needs, such as Houston, San Diego, Boston, and Philadelphia. The region’s strong eighth-place ranking in the analysis above confirms that water management is indeed a legitimate sector in our region.

For more information on location quotients, see page 23.

## Location quotients of business services and construction products and services

Metropolitan areas with potential specialization in water management



Source: U.S. Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.

# The Problem

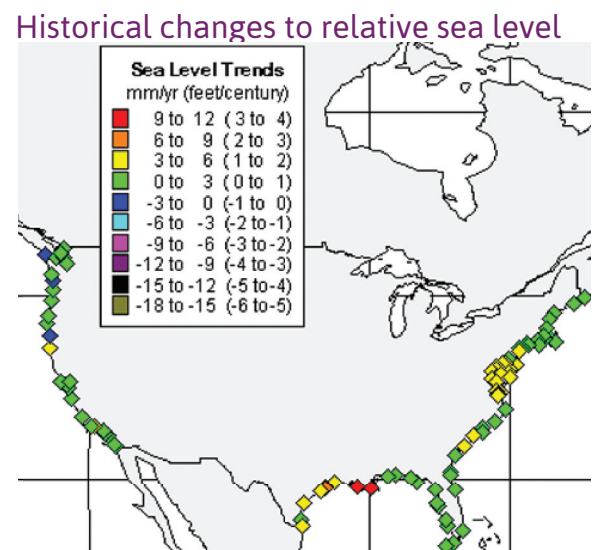
*The massive marshland coast of this watery southern state is vanishing from the face of the earth. The whole ragged sole of the Louisiana boot, an area the size of Connecticut—three million acres—is literally washing out to sea, surrendering to the Gulf of Mexico.*

Excerpt from *Bayou Farewell* by Mike Tidwell, 2003

The coastline of the United States is a major asset for our national economy. The sliver of counties that border the U.S. coast contribute approximately 42 percent of all national economic output or \$5.7 trillion in 2007.<sup>3</sup> The coasts' seaports alone contribute approximately 22 percent of all national economic output.<sup>4</sup> In addition, the country's extremely important energy sector has been concentrated along the coasts.<sup>5</sup> Refineries cluster on the coastlines of the United States, especially in the Gulf Coast where nearly half of the nation's refining capacity is concentrated. Just off the coast, offshore drilling requires extensive pipelines, platforms, and other extraction equipment – most of which are manufactured and serviced by companies located on the coasts.<sup>6</sup>

The economic value of the Louisiana coast is particularly prominent. In 2011, Louisiana ranked third out of all states in total energy production. The Louisiana Offshore Oil Port (LOOP) is the nation's only deepwater oil port. Additionally, Louisiana's 19 refineries account for nearly one-fifth of the country's refining capacity.<sup>7</sup> In 2005, 18 percent of all waterborne commerce in the United States flowed through Louisiana's ports.<sup>8</sup> Finally, the coast of Louisiana is the heart of the nation's seafood industry with commercial catches accounting for one-quarter of the total yield in the lower 48 states.<sup>9</sup>

Coastal wetlands nationwide are important not only for their economic value but for their protective role. Wetlands serve as a first line of defense against storms by reducing wave action and acting as "speed bumps" to storm surge. All told, coastal wetlands provide an estimated \$23 billion in storm protection services annually to the United States.<sup>11</sup> Man-made defenses, such as levees and floodwalls, are insufficient without the natural lines of defense provided by healthy marshes, natural ridges, cypress swamps, and barrier islands.<sup>12</sup>

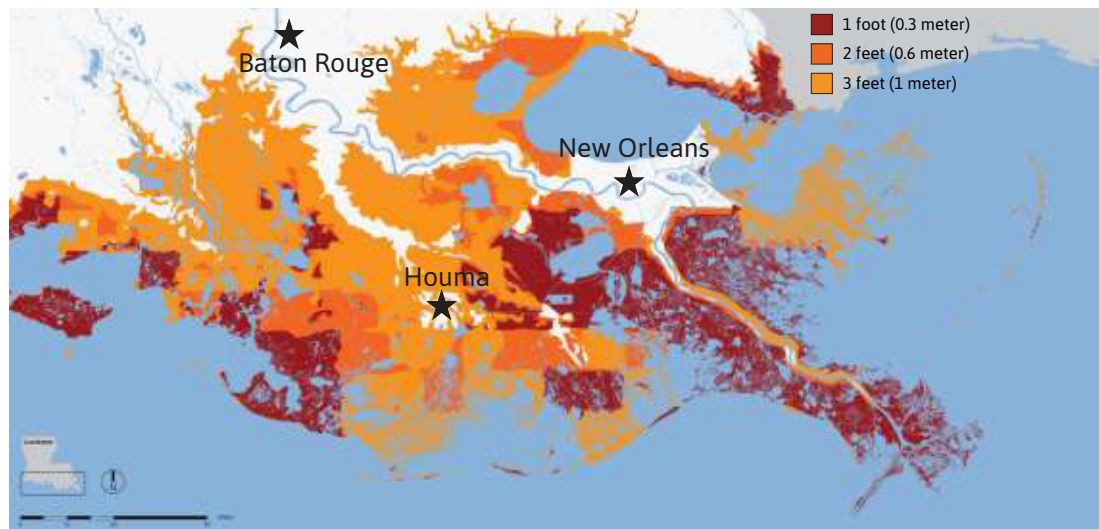


Source: NOAA<sup>10</sup>

In Louisiana, wetlands are disappearing at a rapid pace – having been damaged repeatedly by natural and man-made causes over time. From 1932 to 2010 coastal Louisiana lost approximately 1,883 square miles of land. Nearly 95 percent of these losses are considered “persistent” – that is, they show no likelihood of converting back to land.<sup>13</sup> A host of human factors have contributed to this loss. The construction of massive levees has redirected sediment carried by the Mississippi River far into the Gulf Coast, depriving wetlands of sediment needed for healthy growth. In addition, dredged canals, which were meant to facilitate oil and gas exploration and commercial boat traffic, scar the state’s coastal wetlands. These canals have allowed saltwater to intrude brackish and freshwater wetlands, ultimately destroying them. Human settlement made possible by levees and flood-protection systems have reduced the size of the wetlands, as has purposeful draining for agricultural purposes. These human factors are compounded by natural factors including sea level rise, subsidence, storm frequency and intensity, and rainfall, all of which have contributed to land loss as well.<sup>14</sup>

Looking into the future, if these natural and human factors were to intensify dramatically over the next 50 years, and Louisiana took no further action to restore the coast, scientists predict an estimated 1,750 square miles of additional land would be lost. If these factors were to experience only milder increases, scientists predict 770 square miles of land would be lost over this time.<sup>15</sup> Even in this best case scenario, without action, billions of dollars of economic assets as well as critical population centers in Southeast Louisiana will be exposed to persistent and devastating flooding. Recent estimates of relative sea level rise (from the combined effect of subsidence and global sea level rise) project the Gulf of Mexico will be anywhere between two and six feet higher by 2100, which would make New Orleans an island city and Baton Rouge a coastal one (see map below).<sup>16</sup> The costs would be high. Depending on the fluctuations in intensity of natural and human factors, the costs of damages to population centers and business infrastructure are predicted to be \$7.7 to \$23.4 billion annually by 2060.<sup>17</sup> New Orleans is particularly vulnerable, ranking seventh among all cities globally in the value of the economic production that is at risk of being lost due to storm surge.<sup>18</sup>

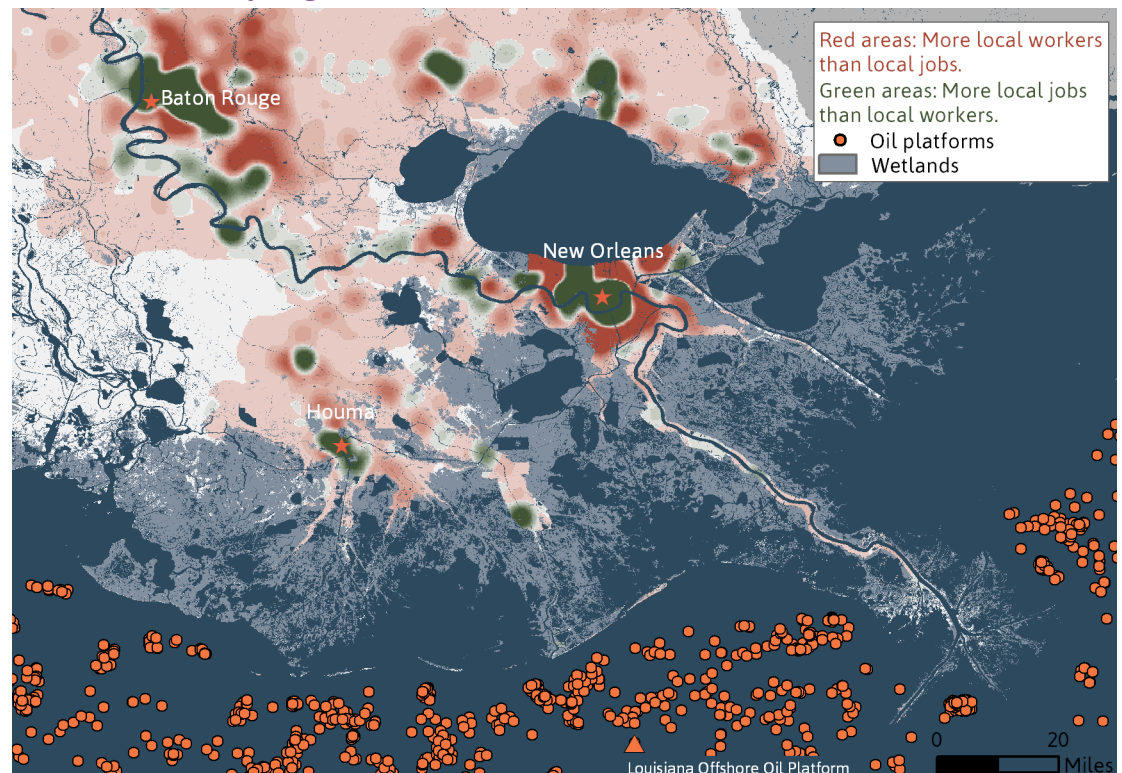
### Predicted Louisiana land loss with 1.0 to 3.3 feet relative sea level rise by 2100



Source: Carbonell, A. & Meffert, D.J. (2009). Climate change and the resilience of New Orleans: The adaptation of deltaic urban form. World Bank.

The below map further illustrates the economic importance of the Louisiana coast. A concentration of jobs is often related to geographically based assets of value to business and industry. While residences may be dispersed throughout a region, workplaces tend to be clustered near historic trade routes or other important geographic assets. A high ratio of jobs to people indicates that an area is an important job center.<sup>19</sup> This map represents the density of where employed people live compared to where their jobs are located. Of particular interest are the green areas, which had more jobs than employees who lived there. The orange dots in the Gulf of Mexico represent offshore oil platforms. Largely because of jobs associated with oil and gas extraction, coastal areas are second only to inner cities in terms of having high ratios of jobs to the number of people who live there.<sup>20</sup>

### Coastal areas as job generators, 2011



See source notes on page 30 for technical details.

Source: U.S. Census Bureau: Local Employment Dynamics, 2011.

In short, the Southeast Louisiana coast is a working coast. However, the threat to the Southeast Louisiana coast is among the most severe. Our analysis reveals:

- Southeast Louisiana has had consistently lower unemployment rates in all three metros than the nation since 2007.
- Coastal communities are losing population and commutes to work are getting longer for the labor force.
- The poor are being left behind in the migration from the coasts, as every coastal community that has lost population since 2005 also has lower per capita income than the national average. And, Theriot and Dulac have poverty rates of more than 40 percent.

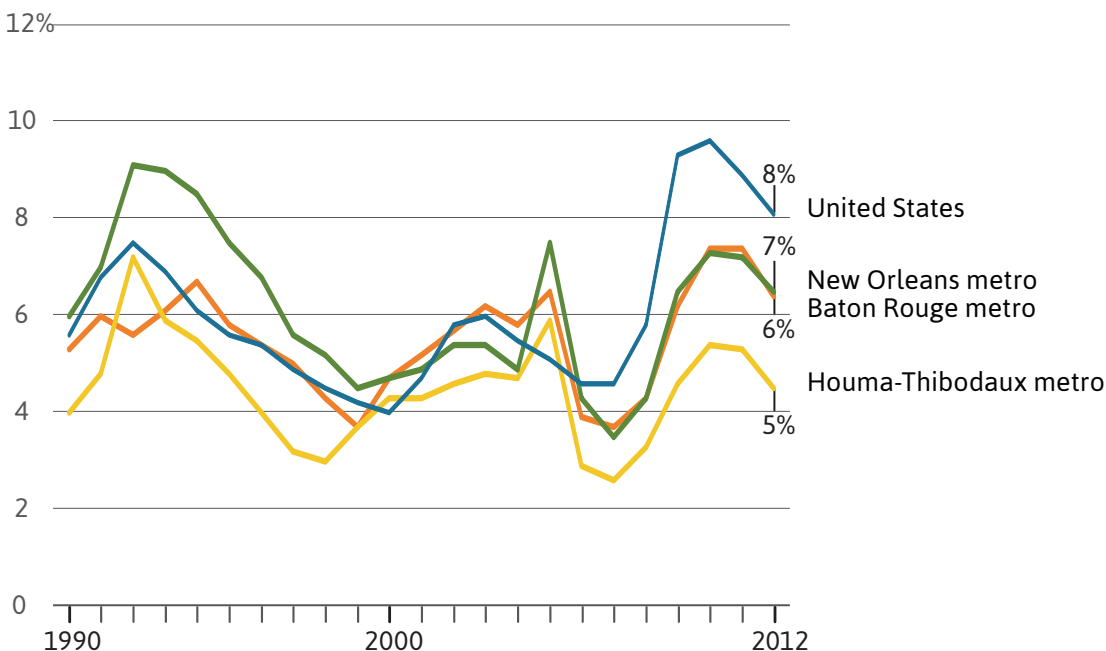
## Unemployment Rate

**Why is this important?** The unemployment rate is commonly used to assess the strength of the economy. The Bureau of Labor Statistics measures the number of people unemployed by counting those who do not have a job, but are actively looking for work.<sup>21</sup> A low unemployment rate means that the economy is strong enough to provide jobs for everyone who is seeking work.

### How is Southeast Louisiana doing?

**In 2012, the unemployment rate in the Houma-Thibodaux metro was 5 percent, in Baton Rouge it was 6 percent, and in New Orleans it was 7 percent, compared to the national rate of 8 percent.** From 1990 to 1999, the unemployment rate in the New Orleans metro exceeded the national average, while in Houma-Thibodaux it was consistently below the national average. In the Baton Rouge metro, unemployment roughly mirrored the national average from 1990 to 1999. Since Katrina struck in 2005, unemployment across Southeast Louisiana has remained well below the national average. Houma-Thibodaux exhibited the strongest economy with unemployment rates two to five percentage points below the national average. Houma-Thibodaux’s extremely low unemployment rate indicates a very strong economy that is the source of significant job generation in a tight labor market.

### Unemployment rate by metro Southeast Louisiana and the United States



Source: U.S. Bureau of Labor Statistics

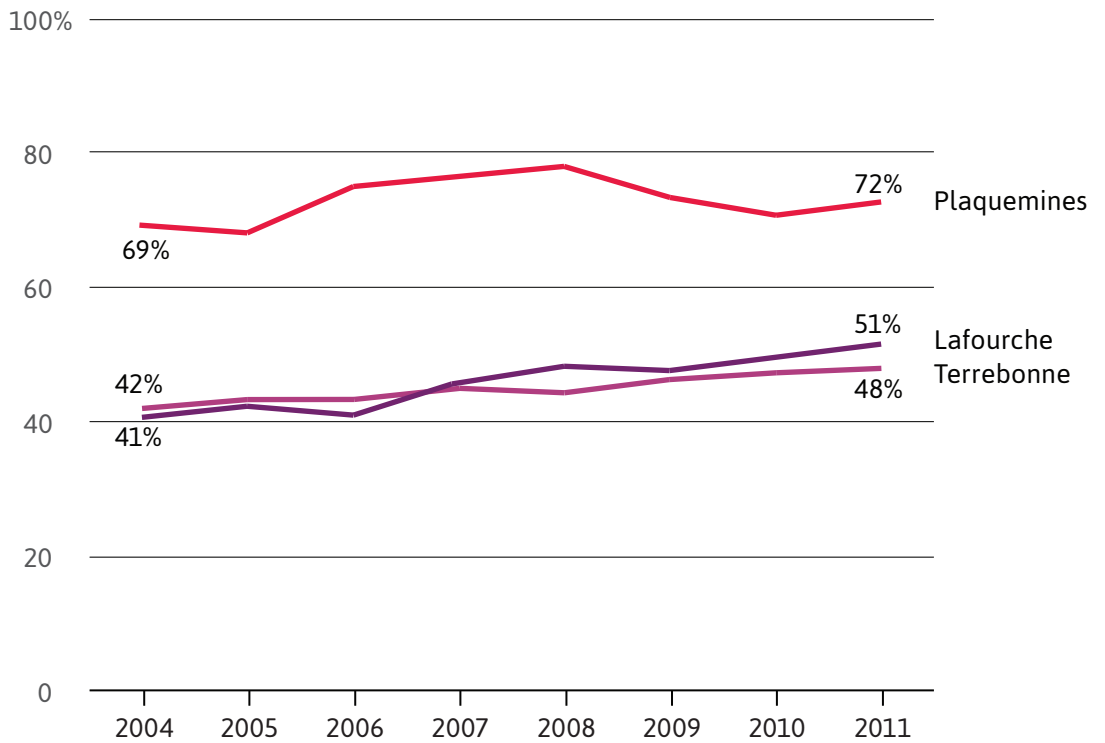
# Percent of Employees Commuting from Other Parishes

**Why is this important?** The growing percent of employees who work in a parish but live outside the parish suggests that more workers may be commuting longer distances to work.

## How is Southeast Louisiana doing?

**Coastal workers are increasingly choosing to live farther from their work sites.** The percent of all workers with jobs in Terrebonne Parish commuting from outside the parish has risen from 42 percent in 2004 to 48 percent in 2011. The percent of workers commuting into Lafourche Parish has grown from 41 percent to 51 percent. And in Plaquemines Parish fully 72 percent of all workers commute from outside the parish, up from 69 percent in 2004.

## Percent of workers that work in parish and live outside of parish Select parishes



See source notes on page 30 for technical details.

Source: U.S. Census Bureau: Local Employment Dynamics, 2011



## Population Change

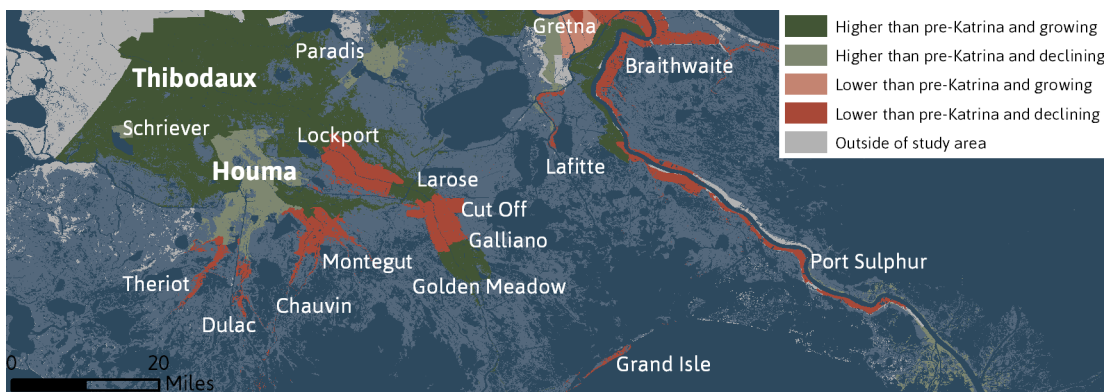
**Why is this important?** Recent research has shown that coastal populations facing rising sea levels are moving to higher ground. Repeated flooding, frequent evacuations, and inability to get insurance are all factors that have contributed to residents' decisions to migrate inland.<sup>22</sup> The population left behind is on average older, poorer, or otherwise vulnerable.<sup>23</sup>

### How is Southeast Louisiana doing?

**At least three small coastal communities have lost 70 or more occupied households each since July 2005.** As the wetlands have eroded, residents in Southeast Louisiana have begun a gradual retreat from the coastline. Between July 2005 and January 2014, coastal ZIP codes in Terrebonne, Lafourche, and Plaquemines parishes lost households while ZIP codes inland within the same parishes grew. Several coastal communities, including Theriot, Dulac, Montegut, Chauvin, Lafitte, and Port Sulphur, have lost occupied households continually since July 2005.

In every one of the coastal communities that has lost households since 2005, per capita income is below the national average of \$28,051, and even below the southeast Louisiana average of \$25,837. In Theriot, per capita income is only \$12,753. The coastal communities that are losing population also exhibit high poverty rates. In Theriot and Dulac, more than 40 percent of the population lives in poverty.

### Increases and decreases in households receiving mail, July 2005-January 2014 ZIP codes in coastal parishes



		70397 (Theriot)	70353 (Dulac)	70377 (Montegut)	70344 (Chauvin)	70067 (Lafitte)	70083 (Port Sulphur)	Southeast Louisiana	United States
Active residential addresses	July 2005	552	586	1,327	2,373	1,161	843		
	Jan. 2014	482	493	1,311	2,335	1,139	658		
	Change	-70	-93	-16	-38	-22	-185		
Percent elderly (65+)	2010	11.6%	13.1%	11.7%	13.9%	12.4%	13.0%	11.7%	13.0%
Poverty rate	2008-12	44.0%	41.8%	15.4%	17.0%	14.6%	15.6%	17.5%	14.9%
Per capita income	2008-12	\$12,753	\$19,301	\$21,699	\$19,942	\$22,316	\$15,566	\$25,837	\$28,051
Disability rate	2008-12	25.1%	20.9%	20.7%	17.2%	13.4%	12.4%	14.1%	12.0%

See source notes on page 30 for technical details.

Source: U.S. Postal Service Delivery Statistics; U.S. Census Bureau: 2010 Census; 2008-2012 American Community Survey

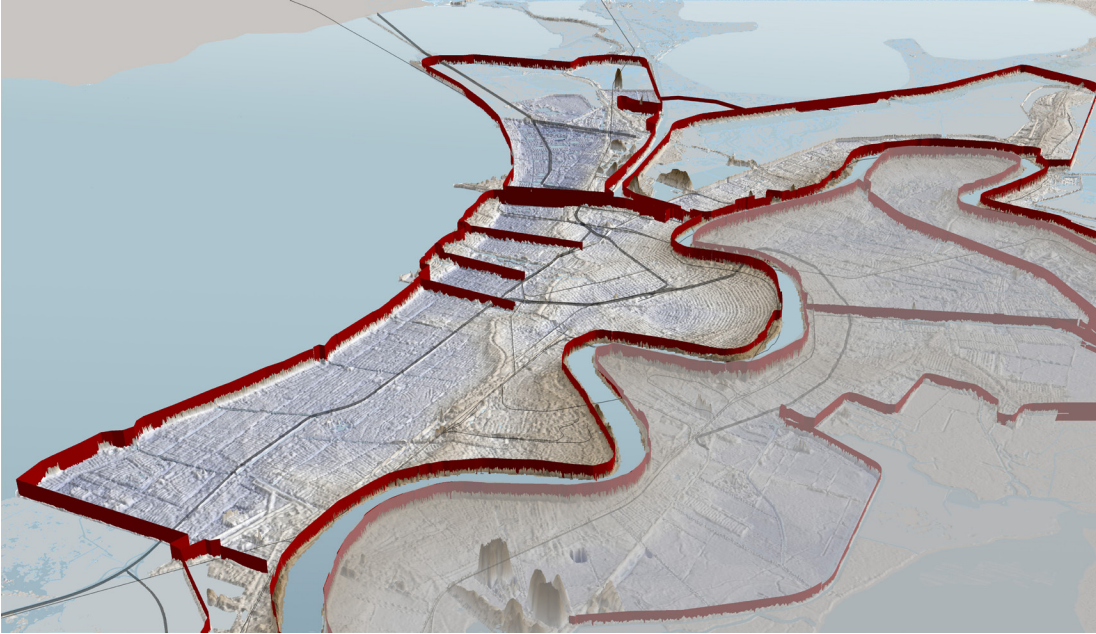
# The Possibility

*Creative cities develop new exports that take place of the old. Indeed, replacements of old imports and shifts to new ones by other cities afford creative cities great new opportunities. Their own new and unprecedented exports can find new and growing markets.*

Excerpt from *The Economy of Cities* by Jane Jacobs, 1969.

Historically, Southeast Louisianans have made this region habitable and economically productive by implementing a complex combination of levees, canals, drainage pipes, and pumps. Construction on flood protection intensified after Hurricane Betsy, whose destruction to the region led to the Federal Flood Control Act of 1965. The Act authorized substantial upgrades to the flood protection system for Orleans, Jefferson, St. Charles, and St. Tammany parishes from hurricanes of Category 3 magnitude.<sup>24</sup> In addition, the U.S. Army Corps of Engineers was instructed to protect the coastal areas around Franklin, Morgan City, and Golden Meadow in St. Mary, St. Martin, and Lafourche parishes – home to important developing industries. The post-Betsy plans were a federal, state, and local effort in which the federal government paid 70 percent of the costs. The proposed projects were designed and built by the Army Corps, but operation and maintenance was then delegated to local interests.<sup>25</sup> Even before construction began on authorized projects, thinking changed within the Corps on which features were necessary to fully protect the region from flooding, and the process of construction would be continually hindered by design changes, cost increases, and local and environmental challenges to particular features of the federal plans.<sup>26</sup> As a result, the comprehensive vision for the region remained incomplete when Katrina struck in 2005.

Not only was the pre-Katrina approach to flood control incomplete, but the pre-Katrina methods of water management can arguably be described as reactive. They treated water only as a threat. Water was something that needed to be diverted, flushed, and impeded. The people of the region did not so much live with water but rather they fought water, living separately from it, keeping it away, and getting rid of it quickly when it got too close. Today, Southeast Louisianans recognize that new tools are needed to address the current water challenge. Rising sea levels and the inward creep of the coasts can only be contained by the old methods for so long. Indeed, continued reliance on the old methods exacerbates some of the problems. For example, pumping water contributes to subsidence, literally pulling land to lower elevations. Hence, there is a need to develop a more harmonious relationship with water – a way to “live with water.” Southeast Louisianans come to the problem today with a continually expanding toolkit that includes new ways of living with water and is being implemented by different actors working at various levels of water management from levee construction, to coastal restoration, to subsidence reduction.



Source: Greater New Orleans Urban Water Plan

Importantly, the new toolkit does not remove the old tools. Following Katrina, significant investments were made to add to and improve existing hurricane and storm protection work that had already been implemented within the region. The Army Corps' Hurricane and Storm Damage Risk Reduction System (HSDRRS) updated 133 miles of levees, floodwalls, gated structures, and pump stations.<sup>27</sup> Overall, the upgrades cost \$14 billion, but they did not protect the entirety of the coast and upgrades are still needed on non-federal levees, such as those protecting Plaquemines Parish.

Louisiana's 2012 Comprehensive Master Plan for a Sustainable Coast is an effort of extraordinary scale to protect and restore the state's coastal wetlands, combining the use of nonstructural and structural projects. The nonstructural projects are actions that citizens can take on their own, including elevating homes, and also includes state acquisition of particularly vulnerable properties. The structural projects make up the bulk of the state's Master Plan – 109 different projects. Some of the structural projects include old tools such as levees, breakwaters, shoreline protection, and pumps. These features are needed to further protect those communities and economic assets that lie outside of the HSDRRS. But, for the most part, the Master Plan relies on nature to rebuild the wetlands. The Master Plan requires working with the water to direct sediment deposits into new land mass. The new approach is used in diversions, marsh creation, barrier island restoration, and hydrologic restoration.<sup>28</sup>



Source: Greater New Orleans Urban Water Plan

Source: Greater New Orleans Urban Water Plan

Working with water is not just happening on the coasts, it is also happening inside the levees. Projects like the Greater New Orleans Urban Water Plan, which focuses on storm and ground water within the levee system, complements existing efforts to manage water but also introduces new strategies, such as alterations to the physical landscape to store water rather than pump it out.<sup>29</sup> It also experiments with natural water management systems, like flora and fauna, to store and filter water. Overall, the plan recognizes that trying to live without water, where it is inescapable, is costly and actually facilitates further subsidence. Thus, it is best to supplement old approaches with new ones that recognize water as an inescapable fact of life in Southeast Louisiana. The City of New Orleans has taken similar steps as well. With its newly adopted *Plan for the 21st Century* it seeks to retrofit parks and built infrastructure in ways that better retain and store water. It also looks into using the Mississippi River as a potential source for managing groundwater levels and reducing subsidence.<sup>30</sup>



The work described above does not just exist in plans that are yet to be implemented. Much work has already been done. The U.S. Army Corps of Engineers' HSDRRS is a finished \$14 billion federal project.<sup>31</sup> The Coastal Protection and Restoration Authority (CPRA) has made progress building barrier islands and new marsh lands while also completing structural protection projects, such as coastal breakwaters. This is just the start of protection and restoration work, as the most recent 2012 Plan calls for \$50 billion in spending disbursed over 50 years. CPRA has spent approximately \$2 billion on completed projects thus far. The envisioned sources of funding for the Master Plan include the federal government, state surpluses, and the oil and gas industry.<sup>32</sup> The Sewerage and Water Board of New Orleans estimates \$3 billion is needed to implement their water plan, and has implemented rate hikes over the next 10 years to support their work.<sup>33</sup> Overall, a significant amount of money has been spent on water management already and a number of key projects have been completed – laying a foundation for a water management economy.

With this foundation in place, economic development leaders from across the region have started to visualize a future of sustainable industrial development. The activities described above require various kinds of work that are just as exciting as the amount of money that is being directed towards water management. All of the kinds of work suggest a cluster economy, or regional specialization, within water management is a possibility. Living with water involves sophisticated engineering and architectural services. Supporting these services are designers, software providers, and consultants. The raw materials for the work range from crushed rock and sediment to complex plastics, such as geosynthetics. Industrial machinery, like amphibious vehicles, dredges, and marine vessels are required. Moreover some of this equipment needs to be



Source: Greater New Orleans Urban Water Plan

fitted with advanced tools, such as fabricated cutter heads, and all of the industrial equipment needs to be serviced on occasion, calling for skilled technicians and machinists. Finally, this is building activity, requiring construction companies as well as construction products and services providers. To be sure, water management is complex, and when combined with the scale of the efforts that are being put into this kind of work in Southeast Louisiana, it holds the potential to significantly boost economic growth and diversification. Moreover, this work is exportable. Hurricane Sandy has demonstrated a need, as did unexpected flooding in Colorado. Louisiana-bred experts and companies have been called to assist in these hard hit areas. What were once thought of as local survival tactics are becoming recognized as exportable expertise that have the potential to redefine not just how we live with water but also what our future looks like in regards to economic activity.

The foundation that exists for water management offers a unique possibility to make the economy of Southeast Louisiana more economically and environmentally sustainable. But much work remains to be done. Our analysis reveals:

- Since the official end of the Great Recession in 2010, the water management sector in Southeast Louisiana added more jobs than all of the other sectors regional leadership targeted for growth, and with 64,587 jobs in water management in 2013, it is the second largest sector. In fact, the growth of this sector regionally exceeded projections from national economic trends and national trends for the sector.
- From 2004 to 2011, the energy and petrochemical sector has maintained a regional advantage with a location quotient consistently greater than 4.0. The second strongest regional specialization has been in water management, which, unlike other targeted sectors, has a location quotient greater than 1.0.
- The water management sector provides good-paying jobs for moderate levels of training. With 75 percent of jobs in occupations paying \$15 an hour or higher, water management offers greater returns than the Southeast Louisiana economy in general, where 53 percent of jobs are in occupations that offer similar pay.
- While offering strong average earnings, especially when compared to other sectors of the Southeast Louisiana economy, the earnings still trail the national average for jobs in water management occupations – indicating the sector will struggle to attract and retain labor.
- The water management sector spends \$2.4 billion locally and an additional \$2 billion outside of the region. Most of the out-of-region spending is in manufactured goods, showing that the sector is lacking crucial production capacity.

## Job Growth in Target Sectors

**Why is this important?** Job growth is a commonly used indicator to assess the economic growth of a metro or region. When examined by sector, it can reveal resiliency, stagnation, or growth. Job growth is important in order to raise standards of living, provide opportunities for an expanding labor force, and increase the tax base. It is also important for highlighting how well an economy is diversifying.

### How is Southeast Louisiana performing?

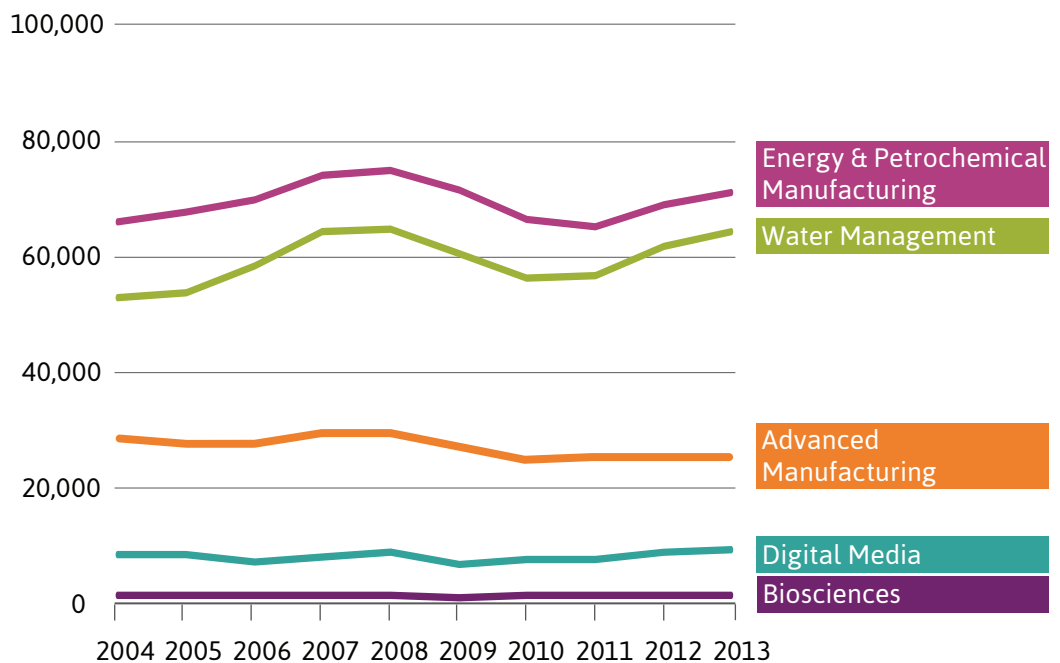
**Employing 64,587 in 2013, water management is the second largest of the economic sectors that regional leadership has targeted for growth, and importantly, since 2010 (the end of the Great Recession), it has added 7,832 jobs – more than any of the other sectors.** The energy and petrochemicals sector is the largest sector in Southeast Louisiana, employing 71,194 in 2013. It had the second largest growth since 2010, adding 4,320 jobs. These sectors are clearly the strongest clusters in Southeast Louisiana, employing double the amount in the rather stagnant advanced manufacturing sector, which added only 394 jobs since the recession. In 2013, the smaller target sectors of digital media and biosciences employed 10,510 and 825, respectively. Digital media added 1,646 jobs since the official conclusion of the Great Recession. Biosciences lost 161 jobs. Overall, the growth of the water management and digital media sectors is a positive sign for diversification efforts, and water management has been the strongest-performing sector since the Great Recession, revealing its importance to the regional economy.



For the detailed definition of each target sector, see the downloadable data tables accompanying this report at [datacenterresearch.org](http://datacenterresearch.org)

### Employment by target sector

Southeast Louisiana



See source notes on page 30 for technical details.

Source: EMSI

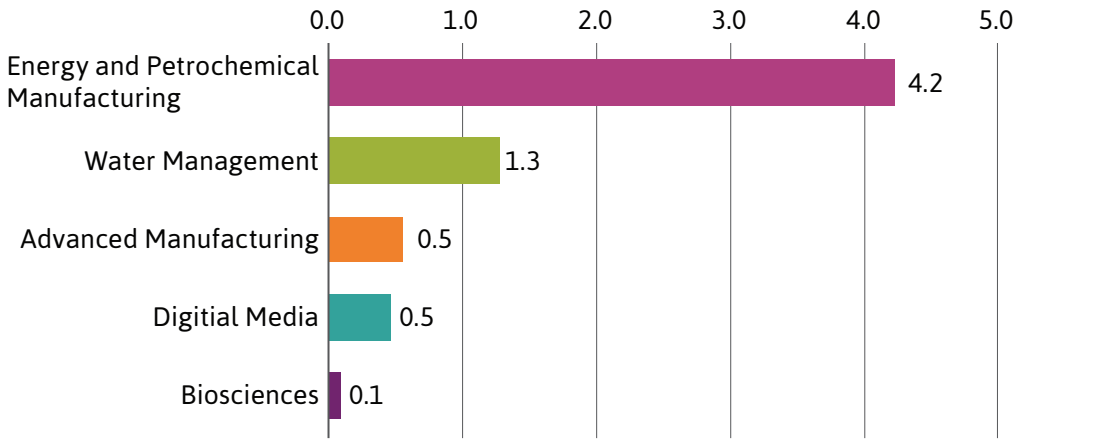
# Location Quotient for Target Sectors

**Why is this important?** Location quotients are a ratio of an industry’s share of employment in the local economy over that industry’s share in the national economy. It serves as an important indicator of economic specialization. If a metro has a location quotient equal to 1.0 for a particular industry, it has the same share of total jobs in that industry as the United States. Values greater than 1.0 show excess employment, which researchers assume generates exports for the regional economy. A region’s economic strength is closely tied to its ability to generate exports, and therefore, location quotients greater than 1.0 are a leading indicator of economic specializations.

## How is Southeast Louisiana performing?

**Water management is already a leading sector, and it holds the most promise for further development of all emerging target sectors.** Besides energy and petrochemicals, which had a location quotient of 4.2 in 2013, water management has been a leader in regional economic diversification efforts. With a location quotient in 2013 of 1.3 – more than double the location quotient for all other target industries – it is already a strong regional specialization that is poised to grow. The location quotients for advanced manufacturing, digital media, and biosciences are all below 1.0 in 2013, showing that Southeast Louisiana does not hold a competitive advantage in these sectors.

Location quotient by target sector, 2013  
Southeast Louisiana



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Energy and Petrochemical	4.2	4.4	4.6	4.5	4.4	4.5	4.4	4.2	4.2	4.2
Water Management	1.3	1.3	1.4	1.4	1.4	1.3	1.2	1.2	1.3	1.3
Advanced Manufacturing	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
Digital Media	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5
Biosciences	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

See source notes on page 30 for technical details.

Source: EMSI

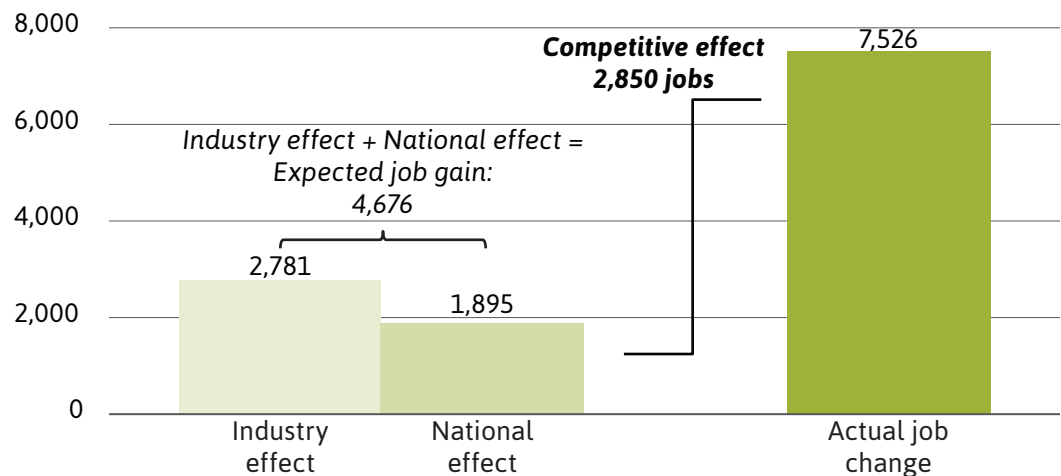
## Shift Share Analysis of the Target Sectors

**Why is this important?** There are several drivers of regional economic growth. The national economy can be expanding, and as a result, all regions benefit. Industries can experience booms, such as the current boom in the energy industry, and propel growth. Finally, regional economies can have a strong competitive advantage in a particular type of work, which makes them resilient to general and industrial downturns. Shift share analysis parcels out the effects of these drivers of growth, and in doing so, highlights the extent to which regions possess local advantages that make them economically distinct.

### How is Southeast Louisiana performing?

**The water management economy in Southeast Louisiana grew by 7,526 jobs from 2011 to 2013 – outperforming overall national trends and national trends specific to water management.** Nationally, the economy started its rebound out of the Great Recession, and this should have impacted Southeast Louisiana’s water management sector to the predicted gain of 1,895 jobs. Similarly, water management, as a sector, expanded nationally. If Southeast Louisiana followed the sector trend, the regional water management economy would have gained an additional 2,781 jobs. Overall then, the regional water management sector should have gained a total of 4,676 jobs, but instead, it far outpaced predicted growth and experienced a gain of 7,526 jobs. This performance signifies a competitive effect specific to the region that produced an additional 2,850 jobs. Indeed, this growth is buoyed by significant post-Katrina storm protection investments made in the region, but these local-serving projects are the foundation for further developing a competitive advantage that could lead to exportable expertise, goods, and services from Southeast Louisiana.

### Shift share of the water management industry, 2011-2013 Southeast Louisiana



See source notes on page 30 for technical details.

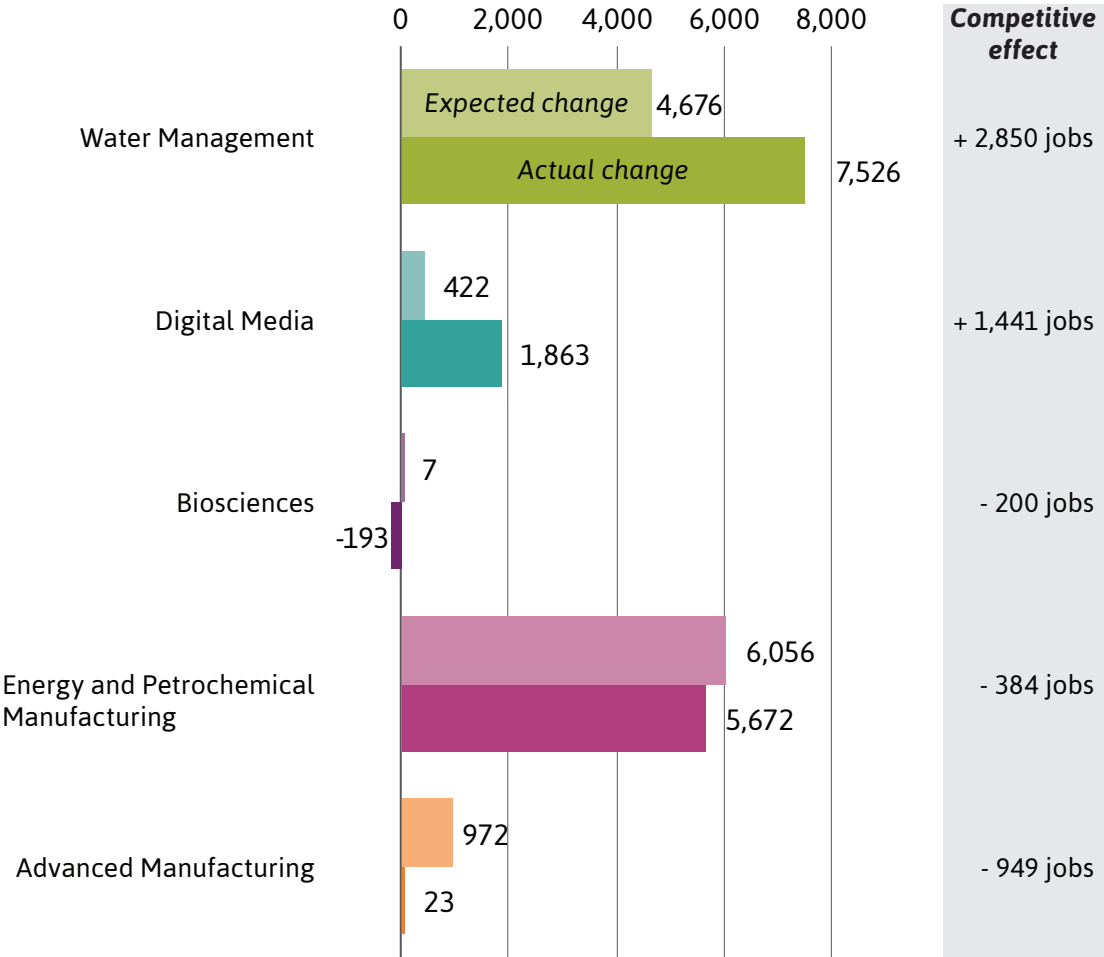
Source: EMSI



## Shift Share Analysis of the Target Sectors, continued

In comparison to the other targeted sectors, only digital media shows a competitive effect. It added 1,441 jobs more than national and industrial trends predicted from 2011 to 2013. All other sectors did not show a regional, competitive effect, providing more evidence that water management – and, to a lesser extent, digital media – are key diversifiers of the regional economy.

Shift share by target sector, 2011-2013  
Southeast Louisiana



See source notes on page 30 for technical details.

Source: EMSI

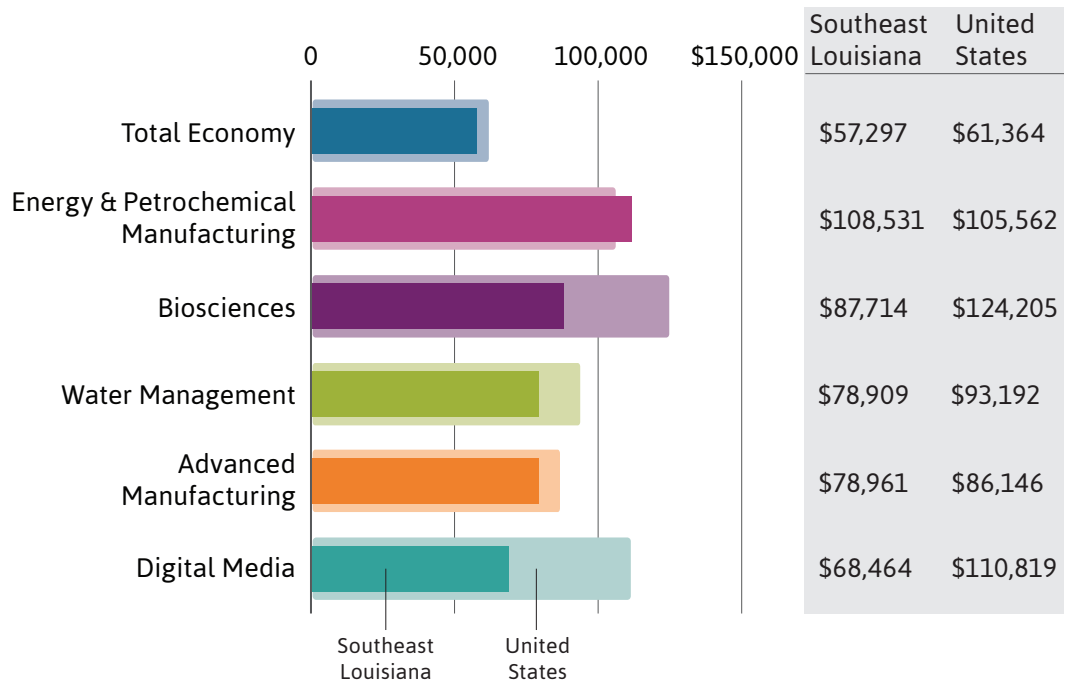
## Earnings for Target Sectors

**Why is this important?** Earnings are central to developing a high quality of life for residents in Southeast Louisiana. They are also important for retaining existing talent in our workforce and luring new talent into the region. As such, higher wages boost economic growth. In the same vein, low salaries and wages stifle economic growth.

### How is Southeast Louisiana performing?

**With average earnings in 2013 of \$78,909, the water management sector offered average earnings higher than the average for the Southeast Louisiana economy but lower than the sector's national average of \$93,192 and the averages for all other target sectors, except digital media.** With the exception of average earnings in the energy and petrochemical sector, which, at \$108,531, exceeds the national average by about \$3,000, all of Southeast Louisiana's targeted sectors lag behind national averages in earnings. For digital media and biosciences, the differences between regional and national average earnings are \$42,355 and \$36,491, respectively. Such gaps are a challenge for keeping and luring needed workers to further develop the sectors. Fortunately, the \$14,283 gap between the region and nation is not as wide for water management, but still wide enough to potentially stifle a sector that, according to other indicators, offers the greatest potential for future growth.

### Earnings by target sector, 2013 Southeast Louisiana



See source notes on page 30 for technical details.

Source: EMSI

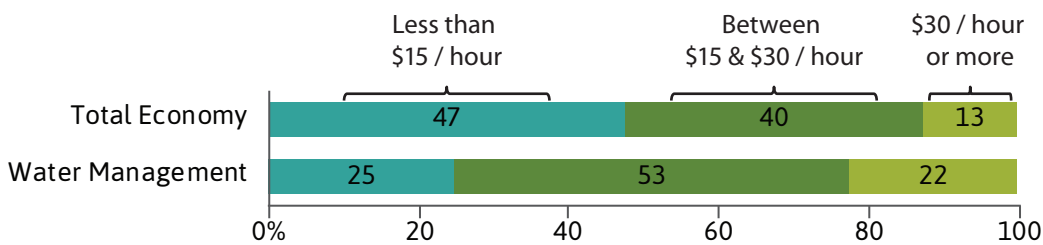
## Wages by Training Level in Water Management Occupations

**Why is this important?** Industrial sectors that provide good pay for little training offer opportunities to wider segments of the population. As such, they are important for raising standards of living and key to building a strong middle class.

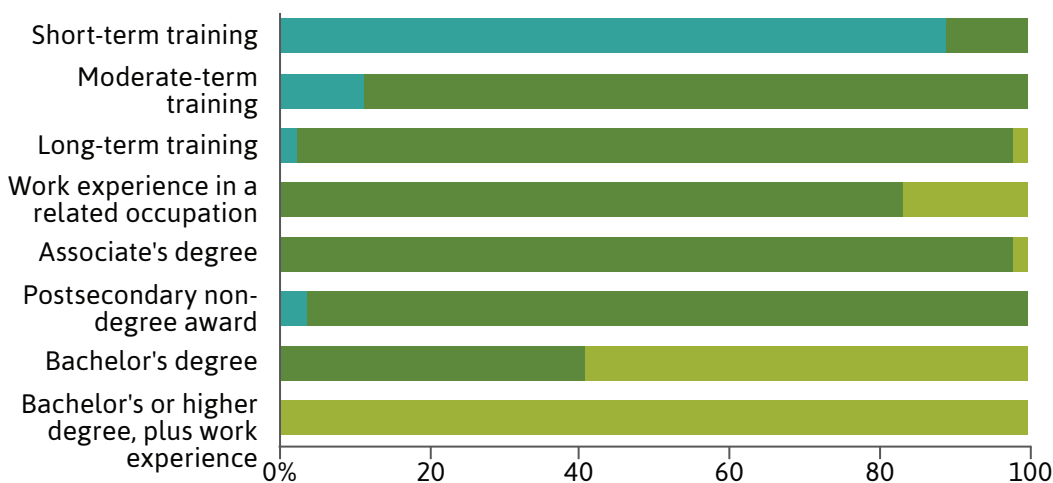
### How is Southeast Louisiana performing?

**With 75 percent of jobs in occupations offering hourly wages of \$15 or higher, the water management sector outperforms the total economy of Southeast Louisiana, where only 53 percent of jobs are in occupations that offer the same hourly pay.** In the water management sector, jobs in occupations offering wages in the \$15 to \$30 an hour range can be acquired with as little as a high school diploma supplemented by various levels of on-the-job training. Those that acquire a bachelor's degree and supplement it with experience earn over \$30 an hour on average. Overall, the opportunities afforded by this sector and its ease of accessibility shows that water management holds promise for boosting quality of life for a wide spectrum of workers.

### Percent of jobs by wage level, 2013 Southeast Louisiana



### Percent of jobs by wage level by training in water management, 2013 Southeast Louisiana



See source notes on page 30 for technical details.

Source: EMSI

## Input Satisfaction for the Water Management Sector

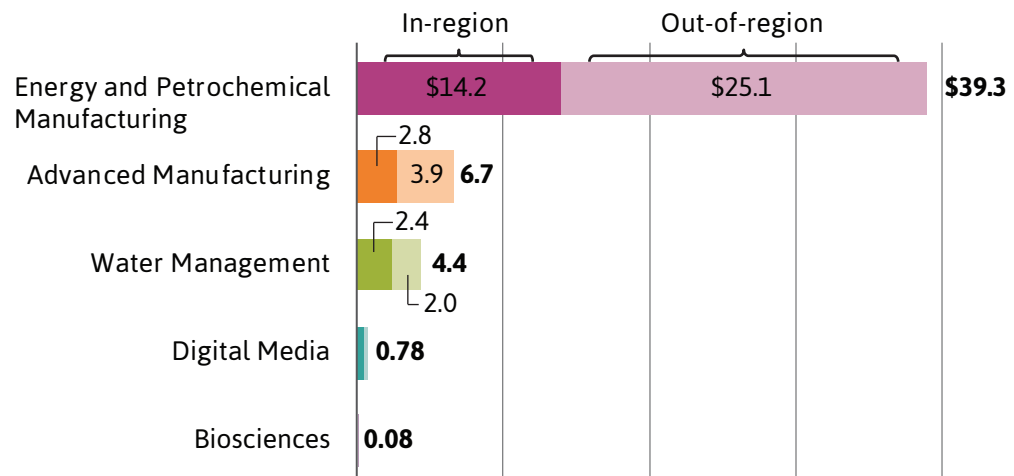
**Why is this important?** The inputs of a sector highlight inter-industry linkages that are at the heart of a specialized, regional economy. The quantity of inputs that can be satisfied locally shows a clustering of related expertise and production. Inputs that are satisfied locally reveal strengths within the cluster while those satisfied outside of the region are weaknesses. This information can be used to chart the development of economic clusters and to guide economic development efforts by clearly highlighting industrial strengths that can be bolstered as well as weaknesses that need to be improved upon.

### How is Southeast Louisiana performing?

**The water management sector spends \$4.4 billion total with \$2.4 billion spent locally and \$2.0 billion going outside of the region – a level of spending that is overmatched by the older, more established clusters of advanced manufacturing and the energy and petrochemical sector.** In comparison to the newer clusters identified for future growth – digital media and biosciences – water management is the larger contributor to the local economy.

When spending in water management is disaggregated into its component pieces, it is clear that the bulk of in-region spending goes to services, such as architectural and engineering; management, scientific, and technical consulting; and legal. These industries are the current strengths of the water management sector in the region, forming a firm foundation that can be built upon to further the region's competitive advantage. Out-of-region spending tends to go to manufacturing industries, such as architectural and structural metals; plastics; and iron and steel mills. The out-of-region spending reveals a specific part of the water management specialization that can be targeted to further facilitate its growth: manufacturing. Most of the out-of-region spending goes into products that are used in water management, and therefore, upgrading local manufacturing can provide a stronger, more competitive cluster.

### In-region and out-of-region supply chain spending by target sector, 2012 in billions of dollars, Southeast Louisiana



See source notes on page 30 for technical details.

Source: EMSI

## Input Satisfaction for the Water Management Sector, continued

### Top 10 in-region supply chain spending by 4-digit NAICS industry for the water management sector, 2012

#### Southeast Louisiana

NAICS Code	Description	Total Amount	In-Region	Out-of-Region	In-Region%	Out-of-Region %
5413	Architectural, Engineering & Rel. Serv.	\$331,220,377	\$284,273,710	\$46,946,667	86%	14%
3241	Petroleum & Coal Products Manufacturing	\$359,446,015	\$256,736,133	\$102,709,882	71%	29%
5221	Depository Credit Intermediation	\$156,510,487	\$124,482,121	\$32,028,366	80%	20%
5613	Employment Services	\$102,877,557	\$90,008,067	\$12,869,490	87%	13%
3273	Cement & Concrete Product Manufacturing	\$136,212,530	\$82,061,531	\$54,150,999	60%	40%
5311	Lessors of Real Estate	\$102,773,757	\$79,742,223	\$23,031,534	78%	22%
5416	Management, Scientific, & Tech. Consulting Serv.	\$125,681,477	\$75,760,041	\$49,921,436	60%	40%
5411	Legal Services	\$77,356,855	\$68,980,059	\$8,376,796	89%	11%
5324	Commercial & Industrial Machinery & Equipment Rental & Leasing	\$74,282,232	\$53,900,658	\$20,381,574	73%	27%
3329	Other Fabricated Metal Product Manufacturing	\$76,012,114	\$53,343,291	\$22,668,823	70%	30%

### Top 10 out-of-region supply chain spending by 4-digit NAICS industry for the water management sector, 2012

#### Southeast Louisiana

NAICS Code	Description	Total Amount	In-Region	Out-of-Region	In-Region%	Out-of-Region %
3323	Architectural & Structural Metals Manufacturing	\$152,132,936	\$32,739,892	\$119,393,044	22%	78%
3241	Petroleum & Coal Products Manufacturing	\$359,446,015	\$256,736,133	\$102,709,882	71%	29%
3261	Plastics Product Manufacturing	\$74,323,489	\$6,718,118	\$67,605,371	9%	91%
3311	Iron & Steel Mills & Ferroalloy Manufacturing	\$69,287,348	\$8,060,426	\$61,226,922	12%	88%
3273	Cement & Concrete Product Manufacturing	\$136,212,530	\$82,061,531	\$54,150,999	60%	40%
5416	Management, Scientific, & Technical Consulting Services	\$125,681,477	\$75,760,041	\$49,921,436	60%	40%
5415	Computer Systems Design & Related Services	\$74,479,483	\$26,803,509	\$47,675,974	36%	64%
5413	Architectural, Engineering, & Related Services	\$331,220,377	\$284,273,710	\$46,946,667	86%	14%
5511	Management of Companies & Enterprises	\$82,990,226	\$37,169,481	\$45,820,745	45%	55%
2123	Nonmetallic Mineral Mining & Quarrying	\$53,650,877	\$10,441,392	\$43,209,485	19%	81%

See source notes on page 30 for technical details.

Source: EMSI

# Technical Notes on Data Sources

## **COASTAL AREAS AS JOB GENERATORS and PERCENT OF EMPLOYEES COMMUTING FROM OTHER PARISHES**

The source for the map of 2011 jobs and the percent commuting from outside of parish is information filed by employers with the State of Louisiana for the purpose of administering unemployment insurance taxes. The state, in turn, supplies this data to the U.S. Census Bureau, where it is aggregated to census blocks and broken down by three wage levels, three employee-age levels, and twenty economic sectors. State unemployment insurance programs have relatively comprehensive coverage in the United States labor force. Approximately 96 percent of the wage and salary civilian labor force and 98 percent of nonagricultural employment are covered by state unemployment insurance laws, and so are reflected in the data. The prime exclusions to coverage are self-employed individuals, agriculture workers, U.S. Armed Forces military personnel, and work-study students. Self-employment in the fishing industry, which is critical to the economies of coastal parishes, is heavily undercounted due to these limitations. One additional limitation of this dataset is that some jobs, in particular government-sector jobs, may be reported at a central administrative office rather than where the compensated activity actually occurs.

## **POPULATION CHANGE**

The U.S. Postal Service (USPS) defines a residential address as actively receiving mail if mail has been picked up within the previous 90 days. In rural areas, mail is frequently delivered to rural route boxes and P.O. boxes rather than street addresses, and thus may lead to an undercount compared to Census Bureau occupied housing units. The most common city or place is listed along with the ZIP code.

The poverty rate is statistically significant at the 95% confidence interval for Dulac and Theriot, but not for Montegut, Chauvin, Port Sulphur, and Lafitte compared to Southeast Louisiana and the United States.

The per capita income is statistically significant at the 95% confidence interval for all geographies compared to Southeast Louisiana and the United States, except for between Dulac and Southeast Louisiana.

The disability rate is statistically significant at the 95% confidence interval for Theriot and Montegut compared to Southeast Louisiana and the United States. The disability rate for Chauvin is statistically significant at the 95% confidence interval compared to the United States but is not significant compared to Southeast Louisiana. All other values are not statistically significant.

## **EMSI**

The data used for the economic indicators in this report come from Economic Modeling Specialists, Intl. (EMSI). EMSI is a private data provider that compiles high quality employment data by removing the suppressions that are characteristic of publicly available county-level datasets. In addition to relying on federal datasets, EMSI uses data from the Louisiana Workforce Commission to improve their measurement of local industries, occupations, wages, skills, education, and training.

## **WAGES BY TRAINING LEVELS IN WATER MANAGEMENT OCCUPATIONS**

Staffing patterns of the water management industry were used to conduct this analysis. Occupations were classified as earning less than \$15 per hour; earning between \$15 and \$30 per hour; and earning \$30 per hour or more based on the median earnings for the occupation. Once the occupations were classified by wage level, the employment was aggregated based on the level of education typically needed for entry into the occupation.

## **INPUT SATISFACTION FOR THE WATER MANAGEMENT SECTOR**

The source of all input-output models in the United States comes from the Industry Economic Accounts, primarily the Annual and Benchmark Input-Output Accounts produced by the Bureau of Economic Analysis (BEA). To develop this model, the BEA uses data from other federal agencies to look at which industries produce and consume which commodities (including services). In addition, the models account for household and government consumption as well as taxes, profits, exports and imports, and more. These input-output models are then regionalized by EMSI, estimating how much of each industry's inputs are obtained locally and how much of each industry's outputs are exported outside of the region.

# Endnotes

## About The Coastal Index

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8. Coastal Protection and Restoration Authority of Louisiana. (2012).
9. Waggoner and Ball Architects. (2013). Greater New Orleans urban water plan. Retrieved March 10, 2014, from <http://livingwithwater.com/reports/>.

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1. Ortiz, E. & Plyer, A. (2013). Economic synergies across Southeast Louisiana. The Data Center. Retrieved April 10, 2014, from [https://gnocdc.s3.amazonaws.com/reports/GNOCDC\\_EconomicSynergiesAcrossSoutheastLouisiana.pdf](https://gnocdc.s3.amazonaws.com/reports/GNOCDC_EconomicSynergiesAcrossSoutheastLouisiana.pdf).
2. *Ibid.*; Our previous research identified Clean Tech as a sixth target sector. However, relying on the Cluster Mapping Project, this sector was omitted. The Cluster Mapping Project recognizes that overlap exists between industries in different clusters. For example, some industries in the plastics cluster overlap with the oil and gas cluster. This is to be expected, as plastics are petroleum-based products. In most cases, such overlap is not a problem, and actually, it is a realistic portrayal of regional economies. However, in the case of the clean tech cluster in Southeast Louisiana, there was too much overlap with

## Endnotes, continued

the other sectors that leadership targeted for growth, mainly energy and petrochemicals, advanced manufacturing, and water management. In effect, clean tech is not a stand-alone sector, but rather, a subcomponent of the other three. As a result, it is omitted from the analyses in this report.

### The Problem

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**The Data Center** is the most trusted resource for data about greater New Orleans and Southeast Louisiana. Since 1997, The Data Center has been an objective partner in bringing reliable, thoroughly researched data to conversations about building a more prosperous, inclusive, and sustainable region.

The Data Center (formerly known as the Greater New Orleans Community Data Center) became the local authority for tracking post-Katrina recovery with *The New Orleans Index*, developed in partnership with the Brookings Institution.