

GREATER LAFOURCHE PORT COMMISSION

The Economic Impact of Port Fourchon: An Update

Galliano, Louisiana
October 2014

Prepared for:

The Greater Lafourche Port Commission
16829 East Main Street
Galliano, LA 70354

Prepared by:

Loren C. Scott & Associates, Inc.
743 Woodview Court
Baton Rouge, LA 70810

In Association with:

CB&I Government Solutions, Inc.
4171 Essen Lane
Baton Rouge, LA 70809



A World of **Solutions**
Visit www.CBI.com



THE ECONOMIC IMPACT OF PORT FOURCHON: AN UPDATE

Prepared By:

Loren C. Scott & Associates, Inc.

743 Woodview Court

Baton Rouge, LA 70810

225-751-1707

www.lorencottassociates.com

In Association with:

Chicago Bridge & Iron, Inc.

October 2014

Executive Summary

Port Fourchon is located in Lafourche Parish on the Gulf of Mexico Coast. Firms operating out of the Port service an estimated 90% of the oil and gas exploration activity in the Gulf. The Port is also the host port for the Louisiana Offshore Oil Port. In this report we have examined the economic impact of Port Fourchon on the Houma MSA and State of Louisiana economies. Data were secured on construction spending and annual operating activity at the Port from 17 Port tenants and from the Greater Lafourche Port Commission. Our findings can be summarized as follows:

- **Impact on the Houma MSA:**
 - Construction spending at the Port over the 5-year period from 2009-13 created
 - \$570 million in new sales at firms in the MSA;
 - \$194.8 million in new household earnings for residents of the MSA; and
 - An average of 708 jobs a year for MSA residents.
 - On-going operational activity at the Port in 2013 created:
 - Over \$2.1 billion in sales from firms in the MSA;
 - \$458.1 million in household earnings for MSA residents; and
 - 8,015 jobs for MSA residents.
 - One of every 13 jobs in the MSA can be traced to the presence of the Port.
 - The job multiplier for the MSA is 4.6, meaning for every new job created at the Port 3.6 new jobs are created elsewhere in the MSA.
 - On average the annual wage for these Port-created jobs was \$57,155---27% higher than the average annual wage in Louisiana.
 - In 2013, the combination of construction spending and on-going operations at the Port generated at least \$12.8 million in sales taxes for local governments in the MSA.
- **Impacts on the State of Louisiana:**
 - Construction spending at the Port over the 5-year period from 2009-13 created
 - \$714.5 million in new sales at firms in the State;
 - \$243.1 million in new household earnings for residents of the State; and
 - An average of 708 jobs a year for State residents.
 - On-going operational activity at the Port in 2013 created:
 - Almost \$2.6 billion in sales for firms in the State;
 - \$580.2 million in household earnings for State residents; and
 - 10,804 jobs for State residents.
 - The job multiplier for the State is 6.2, meaning for every new job created at the Port 5.2 new jobs are created elsewhere in the State.
 - On average the annual wage for these Port-created jobs was \$53,702---28% higher than the average annual wage in Louisiana.
 - In 2013, the combination of construction spending and on-going operations at the Port generated at least \$46 million in taxes for the State treasury.

All of these impact estimates should be considered very conservative because they do not include data from firms at the Port that did not respond to our questionnaire.

To measure the economic impact of Port Fourchon on the U.S., we focus on the impact of a disruption. In particular, we use a model developed by Richardson and Scott and the experience from Hurricanes Katrina and Rita to estimate the impact on the U.S. economy of a three-week loss in services from Port Fourchon due to damage from a hurricane, a terrorist attack, or some other destructive phenomenon. The results imply that a three-week loss in services from Port Fourchon would lead to:

- A loss of \$11,226.7 million in sales at U.S. firms;
- A loss of \$3,156.2 million in household earnings in the U.S., and;
- A loss of 65,502 jobs in the nation.

TABLE OF CONTENTS

	Page
I. Introduction.....	1
II. Houma and Louisiana Methodology	2
Measuring the Direct Effects	2
Measuring the Multiplier Effects	4
The Input-Output Table.....	4
III. Impact on the Houma MSA	5
Impacts on the Houma MSA: Construction Spending.....	5
Impacts on the Houma MSA: Annual Operations	8
Impacts on the Houma MSA: Indirect Sales Tax Benefits	11
Impact Changes since 2006 Study.....	12
IV. Impact on the State of Louisiana.....	13
Impacts on the State: Construction Spending.....	13
Impacts on the State: Annual Operations	15
Impacts on the State: Indirect Tax Benefits.....	17
V. Impact on the U.S. National Economy.....	18
The Richardson/Scott Coastal Study.....	19
Accuracy of Richardson/Scott Model---Evidence from Katrina/Rita.....	21
Katrina/Rita Effects as Model for Loss of Port Fourchon.....	24
Estimating the Loss of Port Fourchon Services for Three Weeks.....	26
Industry Impacts of Disruption of Port Activities.....	28
VI. Summary and Conclusions	32

I. Introduction

Located on the Gulf of Mexico (GOM) Coast near the mouth of Bayou Lafourche in Lafourche Parish, Louisiana, Port Fourchon is basically a small city whose existence is absolutely vital to the operations of the offshore exploration/production industry in the Gulf. Some 270 large supply vessels move through the Port's channel each day, servicing about 90% of all the deepwater rigs and platforms in the GOM. Approximately 1,200 trucks per day travel to this Port. These trucks interact with many individual companies at the Port, bringing supplies to support the offshore exploration industry.

Port Fourchon is also the host for the Louisiana Offshore Oil Port (LOOP). LOOP is located about 18 miles south of the Port in the GOM. LOOP is the only port in the U.S. capable of unloading Ultra Large Crude Carriers (ULCCs) or Very Large Crude Carriers (VLCCs) bringing oil to the U.S. from foreign countries. LOOP also receives some crude oil that is directly produced in the GOM. In the last 3 decades, over 11 billion barrels of oil have flowed into LOOP and then to its land base---Port Fourchon---and then on to eight underground salt caverns.¹

It is worthwhile to note that in November 2001, the Greater Lafourche Port Commission--which has jurisdiction over Port Fourchon---acquired the South Lafourche Leonard Miller, Jr. Airport. This airport sits on 359 acres in Galliano, Louisiana and is surrounded by 1,200 acres of commission-owned land slated for industrial development.

In February 2008, an economic impact study of Port Fourchon was conducted by Loren C. Scott & Associates, Inc., entitled "The Economic Impacts of Port Fourchon on the National and Houma MSA Economies." This was the first full-scale study done of the economic impact

¹ www.loopllc.com

of the Port. The purpose of this report is to update that study except that the impacts will be estimated on the Houma MSA, Louisiana, and U.S. national economies.

II. Houma and Louisiana Methodology

Our objective in this report is to first measure the economic impact of Port Fourchon on both the Houma MSA and State of Louisiana economies. The servicing of the offshore oil and gas industry did not have to be centered at this Port. The GOM exploration companies could just have easily been serviced out of a Texas, Mississippi or Alabama based port. Louisiana (and the Houma region) was fortunate due to its strategic geographic location which made it an ideal jumping off point for servicing the GOM industries. This fortune was significantly enhanced by the actions of the Greater Lafourche Port Commission and the State of Louisiana to produce a port that could effectively meet the needs of companies operating offshore.

Because Port Fourchon is the center of offshore oil and gas servicing, the State of Louisiana and the Houma MSA economies gain in two ways. First, they enjoy all the **direct spending** the companies at the Port bring to the region and state. Secondly, they enjoy the **multiplier effect** of all that spending.

Measuring the Direct Effects

How much activity do the Port tenants bring directly to the Port? To answer this question we employed the same tool used in the earlier 2008 study. A questionnaire was prepared requesting from the tenants three key pieces of information: (1) how much did the tenant spend on **capital projects** each year over the 5-year period from 2009 to 2013; what was the firm's **annual revenues** in 2013; and (3) how many **people were employed** by the tenant at the Port site in 2013? The questionnaire was sent to the tenants in an electronic format so their answers

could be sent and tabulated electronically by the CFO of the Port. Port personnel kept up with the responses to the questionnaire so that emails could be sent and phone calls made to non-responders to encourage them to provide the necessary data. Respondents were assured that all data would be aggregated in such a way that no one firm's data could be isolated from the total.

The data being requested was obviously very sensitive, so there were no illusions that a 100% response rate would be achieved (nor was it achieved in the 2008 study). When the data procurement process was shut down, **17 tenants** at the Port had responded to the questionnaire (as had 17 in 2008). Several indicators generate confidence in the quality of this response group. First, **annual revenues across these 17 firms summed to over \$1.4 billion** in 2013---a key statistic suggesting the larger players had participated in the survey. Indeed, there were four firms whose annual revenues exceeded \$100 million each. Secondly, the Port collects annual lease revenues from tenants at the Port. These seventeen responding firms made up over **60% of all Port revenues from its tenants.**

It is tempting to treat these respondents as a very representative sample and blow up their data results to what the data would be for the total population of the tenants at the Port. Data on the total lease payments by all tenants at the Port are available, but unfortunately, no correlation could be found between those Port lease payments and individual tenant revenues. The result is that our impact results are based just on these 17 tenants. This means **our impact results will be significantly conservative and understated** because we are missing data from the non-respondents.

Measuring the Multiplier Effects

Just estimating these direct impacts alone would significantly understate the role of the Port in the MSA and State. The reason is that these tenants also buy from, and sell to, many other firms in the economy. The interactions caused by these purchases and expenditures are magnified by the spending of employees of the firms at the Port who earn income from the firms and the affected businesses and then spend these monies at car dealerships, grocery stores, movie theaters, etc.

Thus, any change in the activity of a particular firm **indirectly** affects these other buyers and sellers, which in turn affects firms that buy from and sell to these buyers and sellers, etc. For example, when a decision is made by a firm that creates a new job, a chain-reaction is started which works its way throughout the economy. This chain-reaction (**multiplier effect**) causes even more jobs to be created. The analogy is of a rock being tossed into a pond. Not only is there an initial splash (the direct effect), but ripples are created that spread throughout the pond (the multiplier effect). The purpose of this report is to capture and measure these direct and indirect effects on the MSA and State economies from the activities at the Port.

The Input-Output Table

A major difficulty lies in attempting to quantify these indirect impacts. Fortunately, a technique has been developed for precisely this purpose---an **input-output (I/O) table**. An I/O table is a matrix of coefficients describing the interactions between all industries in a geographical area. The I/O table provides a complete picture of the flows of products and services in an economy for a given year, illustrating the relationship between producers and consumers and the interdependencies of industries in a region.

I/O tables for the Houma MSA and the State economies have been constructed by the Bureau of Economic Analysis (BEA) in the U.S. Department of Commerce. The BEA is the government agency responsible for measuring the nation's gross domestic product each quarter. This model is referred to as the RIMS II model and is similar to the IMPLAN or REMI models. To find the direct and indirect (spillover) effects of a particular firm or industry on other firms and workers within a given geographical area, the firm's annual revenues were inserted into these I/O tables. In the present case, revenues provided by the firms operating at the Port were plugged into the RIMS II model to estimate the annual impacts on: (1) *new sales* for firms in the MSA/State, (2) *new household earnings* for residents in the MSA/State, (3) *new jobs* in the MSA/State, and (4) *tax collections* by local governments and the State.

III. Impact on the Houma MSA

In this section we address the economic impact of Port Fourchon on the Houma MSA. The Houma MSA is defined as Terrebonne and Lafourche Parishes. The impact of construction spending and the impact of annual operations are analyzed separately.

Impacts on the Houma MSA: Construction Spending

As seen in Figure 1, construction spending at Port Fourchon over 2009-13 has been both impressive in size and somewhat variable. Spending has ranged from a low of \$46.9 million in 2011 to a high of just under \$109 million in 2013. The lower figure for 2011 was no doubt due to uncertainties in the immediate aftermath of the BP spill and moratorium on drilling in 2010. In fact, almost half the construction spending at the port in that year was done only by the Port Commission.

Spending has been especially robust the past two years as the Port Commission and tenants at the port have reacted to actual---and projected---increases in exploration activity in the deep waters of the GOM. Private companies at the Port have taken on a much larger role in construction spending there. In 2012, Port Commission construction spending comprised only 19% of total spending, and that percentage dropped to only 9% in 2013.

Fig. 1: Construction Spending at Port Fourchon

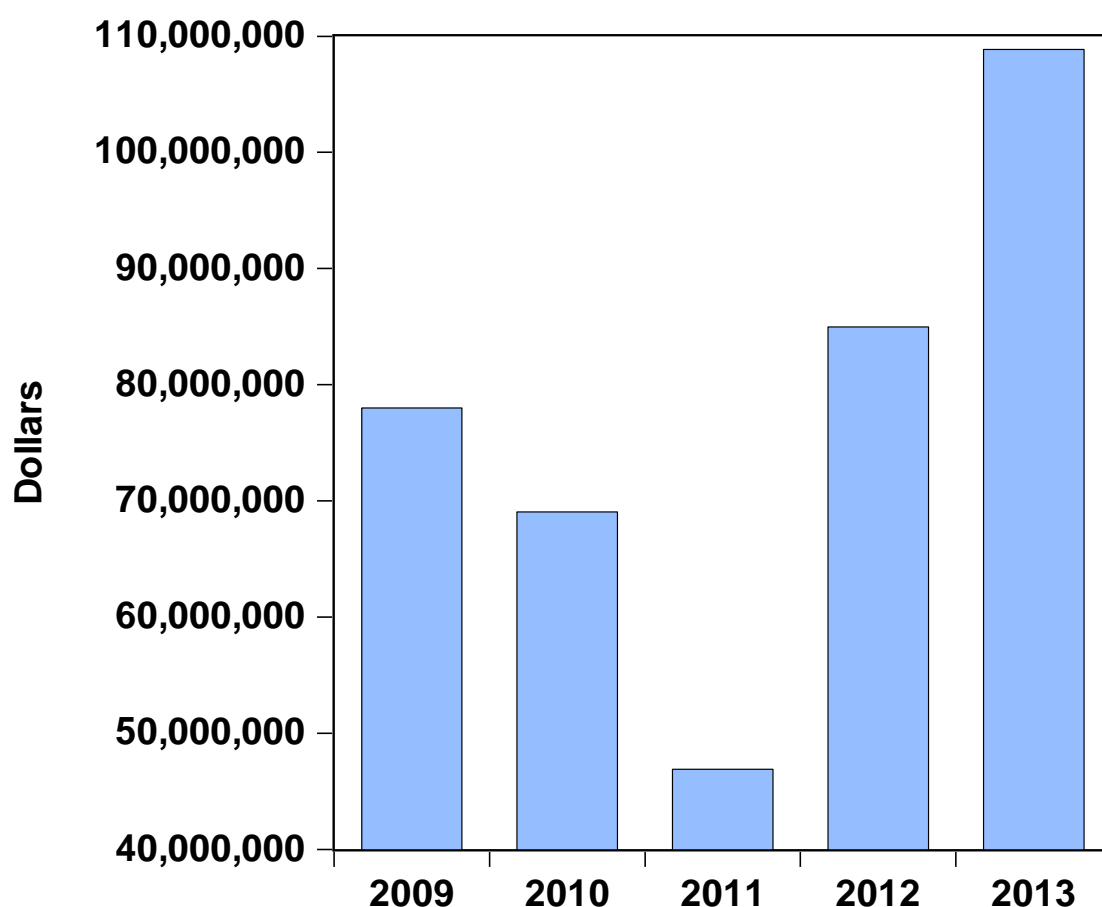


Table 1 shows the I/O estimates of the impact of this construction spending on the Houma MSA economy. Note that the impacts by year follow the same pattern as the bar chart in Figure 1, dropping to a low in 2011, followed by more robust numbers in 2012-13. In the peak year of construction activity (2013), this spending created (1) \$158.1 million in new sales at

firms in the MSA, (2) \$54 million in new household earnings for MSA residents, and (3) 975 new jobs for MSA residents. **Over the entire 5-year construction cycle: (1) over half a billion dollars (\$570 million) in new sales were created for firms in the MSA, (2) \$194.8 million in new household earnings were created for citizens of the MSA, and (3) an average of 708 jobs a year were provided for MSA residents.** Is an average of 708 jobs a year significant? Perhaps a reference point would be helpful. That number is larger than total employment in Lafourche Parish's wholesale trade sector (656) and just under total employment in that Parish's finance and insurance sectors combined (743).²

Table 1
Economic Impact of Port Fourchon Construction
Projects on the Houma MSA Economy
(Sales and Earnings in Millions)

Year	Sales	Earnings	Jobs
2009	\$112.7	\$38.5	695
2010	\$108.6	\$37.1	660
2011	\$57.0	\$19.5	435
2012	\$133.7	\$45.7	773
2013	\$158.1	\$54.0	975
Total	\$570.0	\$194.8	708*

Source: BEA Rims II Input-Output multipliers and author's calculations. *The total figure for jobs is the average number of jobs generated across the five-year period.

² www.laworks.com. Comparative data are for 2012---the latest data available.

Before leaving this subsection, it is important to restate that the impact numbers in Table 1 are based on data from only 17 port tenants and the Port Commission. If data had been available for the entire population of tenants at the Port, the impact numbers would have been much larger.

Impacts on the Houma MSA: Annual Operations

While the construction spending impacts shown in Table 1 are impressive, they pale in comparison to the impacts generated by the on-going operations of the firms at the Port. Annual revenues accruing to the 17 firms responding to our questionnaire totaled over **\$1.4 billion** in 2013. The I/O table estimates of the impact of this activity on the Houma MSA are detailed in Table 2.

Table 2
Economic Impact of 2013 Port Fourchon Operations
On the Houma MSA
(Sales and Earnings in Millions of Dollars)

Category	Houma, MSA
Sales	\$2,121.2
Earnings	\$458.1
Jobs	8,015

Source: BEA Rims II Input-Output multipliers and author's calculations.

The results are obviously very impressive. According to the I/O table, in 2013 annual operations of these 17 firms, and the Port Commission, supported: **(1) over \$2.1 billion in sales at MSA firms; (2) \$458.1 million in earnings for MSA residents; and (3) 8,015 jobs for**

residents of the MSA. This means about one of every 13 jobs in the MSA can be traced back to operations of these firms and the Commission.³ These 17 reporting units indicate they employed 1,738 people at the Port. This means the job multiplier for these entities is 4.6 (8,015/1,738). **This means that every time a new job is created at the port, another 3.6 jobs is created elsewhere in the MSA economy.**

Finally it is noteworthy that the I/O table estimates imply these must be very good jobs that are being created in the MSA via the Port. By dividing the total household earnings generated (\$458.1 million) by the total number of jobs generated (8,015) an **average annual earnings per job of \$57,155** results. By contrast, the average annual wage in Louisiana in December 2013 was \$41,805---\$15,350 a year or 27% lower.⁴ Again, the data in Table 2 represent a very conservative estimate of the operations impact of the port because it is not based on a complete census of firms operating there.

Readers may be interested in knowing which industry sectors in the MSA benefit the most from the presence of the Port. Table 3 provides I/O table estimates of how the \$2.1 billion in sales generated by operations at the Port (see the first line of Table 2) are distributed across various sectors of the MSA economy. It will come as no surprise that the biggest winners (at \$967.9 million) are firms in the transportation/warehousing sector which---among other things---is the sector that contains the Port's largest client, Edison Chouest. Edison Chouest operates a large number of supply vessels out of the Port. Firms in the mining sector are the second largest beneficiaries at \$499.3 million in sales. The mining sector contains firms in the oil and gas

³ There were 103,831 people employed in this MSA in December 2013. "Louisiana Workforce at a Glance", Louisiana Workforce Commission, February 3, 2014, p. 16.

⁴ Ibid. p. 17.

exploration and service industries. Manufacturing firms get a large boost as well with \$196.6 million in supported sales.

Table 3
2013 Impact of Port Fourchon Operations
Projects on Houma MSA Sales by Industry
(Millions)

Category	Sales
Transportation and warehousing	\$967.9
Mining	\$499.3
Manufacturing	\$196.6
Real estate and rental and leasing	\$72.6
Administrative and waste management services	\$62.3
Health care and social assistance	\$54.4
Retail trade	\$53.5
Professional, scientific, and technical services	\$41.5
Wholesale trade	\$39.9
Other services	\$31.2
Total	\$2,121.2

Notes: Only industries with over \$40 million in new 2013 sales created are included. The total is the sum over all 20 industries.

Impacts on the Houma MSA: Indirect Sales Tax Benefits

It is possible to use the data in Tables 1 and 2 to estimate the indirect sales taxes that local governments in the MSA collected in 2013 as a result of the construction spending and operations activities of the seventeen responding firms and the Port Commission. Note in Table 1 that in 2013 construction spending generated an estimated \$54 million in household earnings for residents of the MSA, and in Table 2 operational activities at the Port produced \$458.1 million in household earnings. That is a total of \$512.1 million in household earnings in the MSA that can be traced back to the existence of the Port in the MSA.

By examining data on local sales tax collections and total household earnings in these two parishes, it will be discovered that for every dollar of new household earnings generated in the MSA, local governments collect approximately 2.5 cents in sales tax collections. That means the \$512.1 million in earnings associated with activity at the Port resulted in **\$12.8 million (\$512.1 million X 2.5%) in indirect sales taxes for local governments** in the two-parish MSA.

This \$12.8 million figure should be considered a very conservative estimate of the impact of the Port on local government revenues for three reasons. First, note that the word “indirect” was used in the last paragraph. This \$12.8 million figure does not include any direct sales taxes these firms may have paid to local governments on their purchases. Secondly, the \$12.8 million is only an estimate of the impact on sales taxes. We were unable to estimate either the direct or indirect property taxes local governments collected in 2013 due to the presence of the Port.

Finally, it must be re-emphasized that the \$12.8 million number does not include any direct or indirect taxes generated by the firms at the Port that did not respond to our survey.⁵

Impact Changes Since 2006 Study

Readers may be interested to see how the Port's impacts on the Houma MSA have changed since our initial impact study done in 2006. Table 4 illustrates the differences between the 2013 impacts and those in 2006. The second column of numbers shows the total impacts on the MSA of both construction spending in 2013 (from the 2013 line in Table 1) and operational spending (from Table 2). The first column of numbers provides the comparable data for 2006, and the last column shows the percentage change over the 7-year period. It should be pointed out that a precise apples-to-apples comparison is not possible because the same 17 entities did not respond to the questionnaire in both years.

Table 4
Impacts of Construction & Operational Spending at Port Fourchon:
2006 & 2013

	Impacts: 2006	Impacts: 2013	Percent Change
Sales*	\$1,501.0	\$2,279.3	+51.9%
Household Earnings*	\$351.4	\$512.1	+45.7%
Jobs	8,169	8,990	+10.1%

*Millions of dollars

Not surprisingly, the growth in economic activity at the Port over this 7-year period has been significant. Business sales in the Houma MSA are up over 50% due to increased activity at the Port and household earnings have jumped nearly 46%. Jobs generated by the Port are up by

⁵ This \$12.8 million is over 45% higher than the \$8.8 million number in 2006. It should be noted that the 2006 sales tax collections number was erroneously reported as \$12.1 million due to a math error.

a smaller, but still significant percentage (over 10%), which is expected since firms have been becoming more capital-intensive over time. Becoming more capital-intensive means (1) the firms tend to use fewer workers and (2) they pay those workers more. Note that the average annual wage of the jobs created via Port activity jumped 32%, from \$43,016 in 2006 (\$351.4 million divided by 8,169) to \$56,963 in 2013 (\$512.1 million divided by 8,990).

IV. Impact on the State of Louisiana

In this section we change the geographic area of impact to the State of Louisiana. Since the economic “pond” is larger than the Houma MSA, the impacts of Port Fourchon will tend to be larger.

Impacts on the State: Construction Spending

Table 5 contains the I/O table estimates of the impact of construction spending over 2009-13 on the Louisiana economy. As expected the impacts across years again follow the same pattern as historical construction spending illustrated back in Figure 1. There, spending reached a low point in 2011 and then reached much higher levels in 2012-13. That same pattern is depicted in Table 5. Note that over this 5-year period, **construction spending at the Port generated (1) \$714.5 million in new sales for Louisiana firms, (2) \$243.1 million in new household earnings for State citizens, and (3) an average of 708 jobs a year for state residents.** These are obviously very significant gains for Louisiana citizens.

There is one oddity in Table 5. Typically, when one increases the size of the geographic area from MSA to State, the impacts uniformly get larger. However, if the careful reader compares the data in Table 5 to those back in Table 1 it will be found that in the first three years the construction impacts are actually larger at the MSA level than at the State level. The reason

for this anomaly is that in the first three years, a large part of the construction spending at the Port by the Port Commission was funded by the State---typically via the Port Priority Fund. While these funds represent new dollars injected into the MSA, they do not represent new dollars injected into the State, but rather a moving around of dollars within the State. Because these State-funded monies do not represent new dollars to the State, they are not included in the impact results in Table 5.

Table 5
Economic Impact of Port Fourchon Construction
Projects on the Louisiana Economy
(Sales and Earnings in Millions of Dollars)

Year	Sales	Earnings	Jobs
2009	\$121.3	\$41.3	630
2010	\$129.5	\$44.1	664
2011	\$75.8	\$25.8	377
2012	\$160.8	\$54.7	784
2013	\$227.1	\$77.3	1,085
Total	\$714.5	\$243.1	708

Source: BEA Rims II Input-Output multipliers and author's calculations. *The total figure for jobs is the average number of jobs generated across the five-year period.

Even with the state-funded monies omitted, the impacts in Table 5 remain impressive. Too, these should be considered very conservative impact estimates because they do not include construction spending by firms that did not respond to the survey.

Impacts on the State: Annual Operations

Table 6 contains the data on the I/O table estimates of the impact of on-going operations at the Port on the State. Because there is no peculiarity regarding state-funded monies involved, the numbers for the State are uniformly larger in Table 6 than the comparable numbers for the MSA back in Table 2. These impacts are quite large. In 2013, **on-going activities at the Port generated (1) almost \$2.6 billion in sales at firms in the State, (2) \$580.2 million in household earnings for State citizens, and (3) 10,804 jobs for Louisianans.**

Table 6
Economic Impact of 2013 Port Fourchon Operations
On the Louisiana Economy
(Sales and Earnings in Millions of Dollars)

Category	Louisiana
Sales	\$2,580.9
Earnings	\$580.2
Jobs	10,804

Source: BEA Rims II Input-Output multipliers and author's calculations.

The 10,804 jobs figure is especially impressive. There are 30 parishes in Louisiana where total employment is not that high. The figure is slightly greater than total employment in West Baton Rouge Parish (10,728).⁶ Recall that the 17 reporting units indicated they employed 1,738 people at the Port in 2013. This means the state job multiplier for these entities is 6.2 (10,804/1,738). **This means that every time a new job is created at the port, another 5.2**

⁶ Louisiana Workforce at a Glance, March 28, 2014, p.16.

jobs is created elsewhere in the State's economy. Having conducted over 200 economic impact studies our research team can affirm that this is an unusually high multiplier effect.

Finally it is noteworthy that the I/O table estimates imply these must be very good jobs that are being created in the State via on-going operations at the Port. By dividing the total household earnings generated (\$580.2 million) by the total number of jobs generated (10,804) an **average annual earnings per job of \$53,702** results. Recall that the average annual wage in Louisiana in December 2013 was \$41,805---\$11,897 a year or 28% lower.⁷ Again, the data in Table 6 represent a very conservative estimate of the operations impact of the Port because it is not based on a complete census of firms operating there.

Table 7 illustrates how the nearly \$2.6 billion in new sales for firms across the State is distributed across various industries. Firms in the transportation/warehousing sector---which houses the many supply ships operating out of the Port---are the biggest winners with \$997 million in sales due to the presence of the Port.

These firms are followed by firms in the mining sector, which contains the oil and gas exploration and service firms, with \$513.6 million in sales attributable to the Port. Rounding out those firms enjoying over \$100 million in sales are firms in Louisiana's manufacturing sector which pick up an estimated \$344.6 million in sales and real estate/rental/leasing with \$112.9 million in new sales via Port-generated operations activity.

⁷Ibid, p. 17.

Table 7
2013 Impact of Port Fourchon Operations
On Louisiana Sales by Industry
(Millions)

Category	Sales
Transportation and warehousing*	\$997.0
Mining	\$513.6
Manufacturing	\$344.6
Real estate and rental and leasing	\$112.9
Health care and social assistance	\$78.4
Administrative and waste management services	\$74.9
Professional, scientific, and technical services	\$71.2
Retail trade	\$65.8
Finance and insurance	\$65.5
Wholesale trade	\$60.0
Other services*	\$44.1
Total	\$2,580.9

Notes: Only industries with over \$40 million in new 2013 sales created are included. The total is the sum over all 20 industries.

Impacts on the State: Indirect Tax Benefits

It is possible from the data in Tables 5 and 6 to estimate the impact on indirect state revenue collections of construction spending and on-going operational activity at the Port in 2013. In Table 5, I/O estimates indicated \$77.3 million in household earnings were created in

Louisiana due to construction spending at the Port in 2013, and in Table 6, I/O analysis indicated operational activity at the Port produced another \$580.2 million in household earnings in the State. That is a total of \$657.5 million in household earnings attributable to the presence of the Port in Louisiana. Officials with Louisiana's Legislative Fiscal Office report that for every dollar of new earnings produced in the State, the state treasury collects seven cents in revenues from various revenue sources, such as income taxes, sales taxes, gasoline taxes, etc. **That means that in 2013, the state treasury collected at least \$46 million in taxes (\$657.5 million X .07) due to the presence of the Port.**

Note that the phrase "at least" was used in that last sentence. This is a very conservative estimate because (1) it does not include direct taxes paid to the state by these firms and (2) it includes only the impacts of the 17 reporting units and omits any tax effect from the firms that did not respond to the questionnaire.

V. Impact of Port Fourchon on the National Economy

There is an important distinction between the impact of Port Fourchon on the local and state economies and its impact on the nation as a whole. In addition to spending at the port itself, Port Fourchon plays a crucial role in supplying the nation's energy. For the local and state computations, we focused on the economic impact of spending at the port. For the nation as a whole, Port Fourchon's role in the energy supply chain is the key to its economic impact. In particular, we focus on the potential impact of **losing the services of Port Fourchon for a period of time**.

Intuitively, the impact follows from a basic supply and demand model for crude and natural gas. The loss of Port Fourchon disrupts the supply of crude oil and natural gas, raising the

price of both. A large literature in economics⁸ establishes a strong linkage between energy price shocks and the economy. More specifically, as Edelstein and Kilian note:

“There is growing evidence that the primary effect of energy price shocks on the U.S. economy involves a reduction in consumer spending.”⁹

Lower consumer spending then decreases the demand for goods and services. This translates into a contraction of the overall economy. While economists generally agree on the channel that leads energy price increases to harm the U.S. economy, studies typically focus on energy prices in general and not a location such as Port Fourchon. Fortunately, Dr. James Richardson and Dr. Loren Scott’s February 2004 report “The Economic Impact of Coastal Erosion on State, Regional, and National Economies” focuses on the potential economic impact of losing the services of Port Fourchon.

The Richardson/Scott Coastal Study

Richardson and Scott focused on losses in access to Louisiana’s oil and natural gas production. They evaluated two scenarios, a three week and a five week disruption in supplies. For simplicity, we focus on the three week scenario.

With regard to crude oil, the Richardson and Scott study focused only on the largest economic cost---rising gasoline prices. They argue that a three week disruption to Louisiana’s pipeline system would raise gasoline prices by 21.6 cents per gallon or 16.6% nationwide. Over a three- week period, this translated into a \$1.74 billion cost to consumers in 2004.

⁸ See for example, Hamilton, James D. "Oil and the Macroeconomy." *The New Palgrave Dictionary of Economics Palgrave Macmillan, London. Available online at <http://www.dictionaryofeconomics.com/dictionary>. Jiménez-Rodríguez, Rebeca and Marcelo Sánchez (2005): 201-228 or Taylor, John B. "The lack of an empirical rationale for a revival of discretionary fiscal policy." *The American Economic Review* (2009): 550-555.*

⁹ Edelstein, Paul and Lutz Kilian, "How Sensitive are Consumer Expenditures to Retail Energy Prices," *Journal of Monetary Economics*, Vol 56, 2009, page 766.

When consumers spend more on gasoline, they tend to cut spending elsewhere to balance the budget, causing the shock to gasoline prices to echo throughout the US economy. Richardson and Scott used the US Bureau of Economic Analysis (BEA) input-output tables to compute the total impact of this disruption in access to Louisiana crude to various parts of the US economy.

According to Richardson/Scott, the three week disruption would cost the U.S economy (1) nearly \$4 billion in lost business sales, (2) over \$1.1 billion in lost household earnings, and (3) 30,800 jobs.

Richardson and Scott also considered a similar exercise based on a three-week disruption in supplies of **natural gas** from Louisiana. Overall, they project the disruption would lead to an 11.4 percent increase in the price of natural gas. They estimated that the total increased cost to residential, commercial, industrial, and electric power generation users would be approximately \$740 million. The natural gas disruption would cost the total U.S economy (1) nearly \$1.7 billion in lost business sales, (2) \$489 million in lost household earnings, and (3) 13,099 jobs.

It is important to note that these computations are for the U.S. economy in 2004, not 2014. However, the general methodology can be applied to estimate the impact of such a disruption in 2014. Before updating this study, the period 2004-2014 supplies one important test of the key assumption of the Richardson/Scott model. In particular, they assert that losing oil and gas supplies from Louisiana would lead to a substantial increase in energy prices. Unfortunately, in August and September of 2005 Hurricanes Katrina and Rita created just such a disruption.

Accuracy of Richardson/Scott Model---Evidence from Katrina/Rita

Of course, the accuracy of the impact results shown in Tables 10 through 13 below depends crucially on the accuracy of the underlying assumptions of the models. Hurricanes Katrina and Rita provide an obvious test of these assumptions.

Figure 2 graphs the daily price of crude oil from July 1 2005 to the end of 2005. The line reflects, August 29, 2005, the day Katrina made landfall. Figure 3 contains a similar graph of the spot price of gasoline in cents, measured at New York Harbor. Both clearly reflect the impact of Hurricane Katrina on the crude oil market and price of gasoline---a fact that is generally consistent with the predictions of Richardson and Scott.

Figure 2

2005 Spot Price of Oil Pre-Storm and Post-Storm

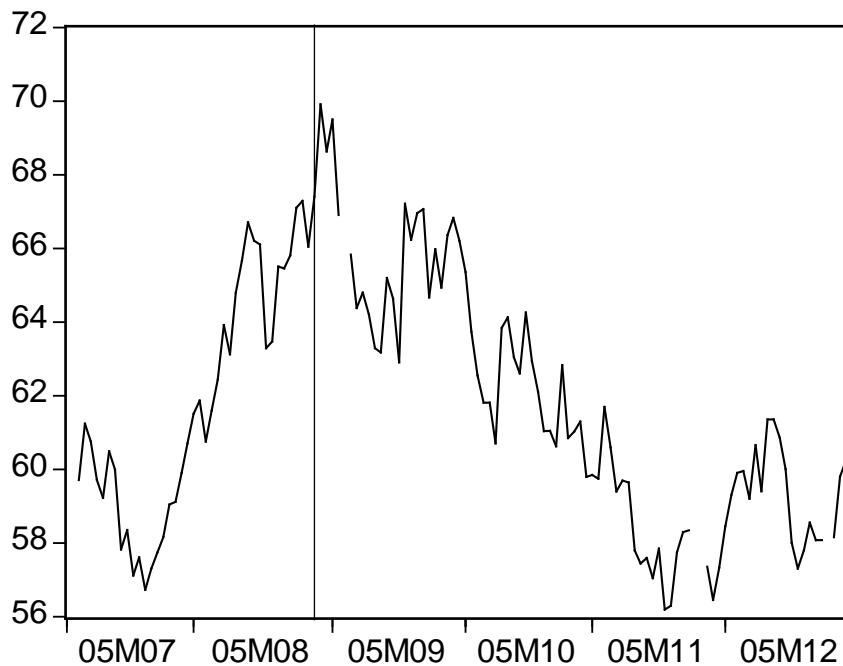
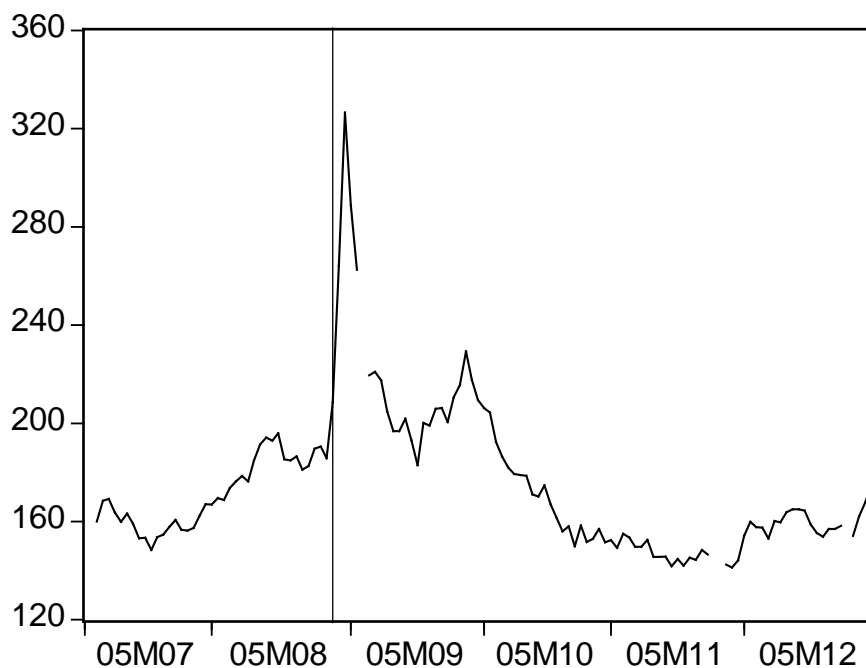


Figure 3
2005 Spot Price of Gasoline Pre-Storm and Post-Storm



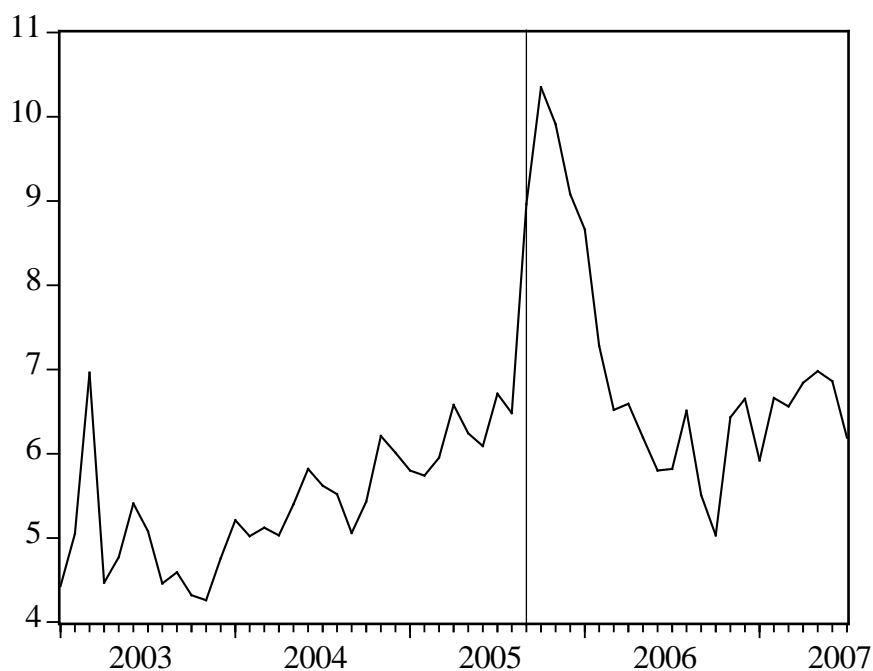
Looking more closely at the data, we can compare the magnitudes of the impacts observed during Hurricanes Katrina and Rita to those projected by Richardson and Scott. Table 8 contains the weekly spot price of gasoline for the three major spot markets reported by the US Energy Information Administration. The results show an average increase of 75 cents, over triple the 21.6 cent increase used by Richardson and Scott, during the first week immediately following Hurricane Katrina. Prices fell during the week of 9/16/2005 and then rose again near the onset of Hurricane Rita. **Overall, the results indicate that Hurricanes Katrina and Rita had a larger and longer lasting impact than the three-week 21.6 cent increase used by Richardson and Scott.**

Table 8
Effects of Hurricanes Katrina and Rita on the Price of Gasoline

Date	New York Harbor	US Gulf Coast	Los Angeles	Average	Average Increase
8/26/2005	\$ 1.86	\$ 1.83	\$ 2.02	\$ 1.91	
9/2/2005	\$ 2.70	\$ 2.61	\$ 2.65	\$ 2.65	\$ 0.75
9/9/2005	\$ 2.16	\$ 2.20	\$ 2.14	\$ 2.16	\$ 0.26
9/16/2005	\$ 1.94	\$ 1.85	\$ 2.11	\$ 1.97	\$ 0.06
9/23/2005	\$ 2.02	\$ 2.25	\$ 2.23	\$ 2.17	\$ 0.26
9/30/2005	\$ 2.17	\$ 2.77	\$ 2.28	\$ 2.40	\$ 0.50
10/7/2005	\$ 1.94	\$ 2.18	\$ 2.04	\$ 2.05	\$ 0.15
10/14/2005	\$ 1.76	\$ 1.86	\$ 1.89	\$ 1.83	\$(0.07)

Source: US Energy Information Administration

With regard to natural gas prices, the US Energy Information Administration only reports monthly prices. The wellhead spot price of natural gas rose from \$6.48 MCF in August 2005 to \$8.96 in September 2005, \$10.35 in October 2005, and \$9.91 in November 2005. Just as with gasoline, the increases due to Katrina and Rita significantly outpaced the 11.4% increase in the price of natural gas used by Richardson and Scott.

Figure 4**Wellhead Price of Natural Gas Pre-Storm and Post-Storm****Katrina/Rita Effects as Model for Loss of Port Fourchon**

Both Richardson and Scott (2004) and the movie *Oil Storm* focus on Port Fourchon as the possible source of a major disruption to U.S. crude oil and natural gas supplies. We would argue that the impacts of Hurricanes Katrina and Rita serve as a reasonably accurate model of what would happen if the services of Port Fourchon were lost

Some credence for this model can be found in comparing the oil and natural gas lost due to these hurricanes with the production flowing through Port Fourchon. If the amounts are reasonably comparable, that is reassuring evidence that the Richardson/Scott model can be used to estimate the loss of Port Fourchon. We find the average daily production of rigs serviced by Port Fourchon is just over 1 million barrels of oil per day. In terms of natural gas, just under 5

billion cubic feet per day of production is serviced by the port. Another 2 million barrels per day of imported oil flow through the LOOP.

How does 1 million barrels of crude oil per day production (plus another 2 million b/d in the LOOP) and 5 billion cubic feet of natural gas production compare to losses during Hurricanes Katrina and Rita? Table 9 contains a synopsis of the estimated amounts of crude oil and natural gas lost to the U.S. during Hurricanes Katrina and Rita. The level of oil shut in slightly exceeds the production serviced by Port Fourchon but never approaches the sum of production plus the LOOP pipeline. It makes sense that the oil losses would be more associated with the amount serviced by the port versus the amount flowing through LOOP, since LOOP production was hardly impacted by the hurricanes. Though the LOOP pipeline flows through the port, most of the activity at the port is associated with servicing offshore platforms.

Table 9

Effects of Hurricanes Katrina and Rita on U.S. Access to Crude oil and Natural Gas

Week	Crude oil shut in	Natural Gas shut in
2. Aug. 28-Sept. 3	1.4 million barrels/day	8.8 billion cubic feet/day
3. Sept. 4-10	1.2 million barrels/day	5.8 billion cubic feet/day
4. Sept. 11-17	934,000 barrels/day	3.8 billion cubic feet/day
5. Sept. 18-24	1.5 million barrels/day	7.5 billion cubic feet/day
6. Sept. 25-Oct. 1	1.5 million barrels/day	8.05 billion cubic feet/day
7. Oct. 2-Oct.8	1.4 million barrels/day	7.5 billion cubic feet/day
8. Oct. 9-Oct.17	1.06 million barrels/day	6.04 billion cubic feet/day

Source: U.S. Department of Energy, www.energy.gov/news/2404.htm

Note in Table 9 that natural gas shut in hovers at levels slightly above the 5 billion cubic feet level serviced by Port Fourchon. This can be explained by the fact that some of the gas shut

in was outside of the port's servicing limit. **The bottom line is that the evidence from the impact of Katrina/Rita on oil and gas production suggests the Richardson/Scott model would be a reasonable tool for estimating the loss of Port Fourchon for a period of time.**

Estimating the Loss of Port Fourchon Services for Three Weeks

Conceptually, our approach is identical to the previous study. Dr. James Richardson and Dr. Loren Scott's analysis of this scenario in their report "The Economic Impact of Coastal Erosion in Louisiana on State, Regional, and National Economies" in February 2004 is used to establish a baseline and the figures.

The primary mechanism for the economic impact is an increase in crude oil, gasoline, and natural gas prices as a result of a potential disruption. While conceptually simple, updating the 2004 figures to 2014 requires several steps. First, the percentage change in prices from the earlier study is applied to 2013 average annual prices to estimate the impact on U.S. consumers. Computations are based on the 2013 retail price of gasoline and residential, commercial, and industrial natural gas prices. The prices are then combined with consumption figures obtained from the U.S. Energy Information Administration web page. Computations are based on a 21-day period. Finally, input-output tables from the U.S. Bureau of Economic Analysis are used to determine the impact of these losses in consumer income on sales, earnings and jobs in other sectors of the U.S. economy. The results are presented below in Table 10.

Table 10

**The Estimated Total Impact of a Three-Week Louisiana Oil and Natural Gas
Disruption on Sales, Earnings, and Employment in the Continental U.S.**

Item	Lost Sales (Millions \$)	Lost Earnings (Millions \$)	Lost Employment
Lost Oil Impacts	\$8,828.6	\$2,482.0	51,510
Lost Natural Gas Impacts	\$2,398.1	\$674.2	13,992
Total Impacts	\$11,226.7	\$3,156.2	65,502

The disruption would cost the U.S. economy \$11.2 billion in sales, over \$3.1 billion in earnings, and 65,502 jobs. As stated in the 2008 report, the validity of these results depends crucially on the underlying assumptions.

A comparison of these results to those in the 2008 study reveals a smaller estimated impact from the shock to natural gas prices, but a larger impact of the crude oil shock. The total impact is a larger loss to the U.S. economy in terms of sales and earnings, but a slightly smaller job impact. Intuitively, wages have risen over time so slightly higher 2014 earnings translate into slightly fewer jobs.

The intuition behind the larger impact of the shock to oil prices and smaller impact of natural gas stems from the change in prices of the two commodities over time. Gasoline prices roughly doubled since the last report from \$1.75 per gallon as a national average in April 2004 to

\$3.59 per gallon in April 2014.¹⁰ With large supplies hitting the U.S. market due to the advent of hydraulic fracturing, natural gas prices have fallen slightly over the same time period.

Industry Impacts of the Disruption of Port Activities

Table 10 contains the estimated total impact of a disruption at Port Fourchon on U.S. business sales, household earnings and jobs. Tables 11-13 break these total impacts into the impact that would be felt by different industries.

Table 11 contains the estimated sales at firms in the U.S. that would be lost as a result of the disruption by industry. The biggest losers are firms in manufacturing with a \$1.8 billion reduction in sales. A reduction in the demand for products as consumers tighten their belts combines with an increase in input costs in some areas to reduce manufacturing activity. Sales in real estate, finance, insurance, and health care also fall by over a billion dollars as a result of the disruption and subsequent energy price surge. Just over \$900 million in retail sales would be lost as a result of the disruption.

Tables 12 and 13 provide the impacts by industry for household earnings and jobs. In terms of earnings, workers in health care are projected to take the biggest loss at \$539 million. This is followed by a reduction of earnings for finance and insurance workers by \$379 million and over \$300 million in earnings losses for both retail trade and manufacturing.

In terms of jobs, Table 13 shows that an estimated annual equivalent of over 9,700 jobs in both retail trade and health care would be lost. Roughly 6,000 real estate jobs would be lost and over 5,000 workers in food services and finance and insurance would be impacted.

¹⁰ Source: U.S. Department of Energy: Energy Information Administration

Table 11
Impact of Three-Week Disruption at Port Fourchon on
Continental Sales at Firms in the US by Industry

Category	Sales (Millions)
Manufacturing	\$1,812.1
Real estate and rental and leasing	\$1,693.0
Finance and insurance	\$1,252.7
Health care and social assistance	\$1,128.5
Retail trade	\$903.8
Information	\$611.0
Professional, scientific, and technical services	\$507.8
Wholesale trade	\$495.9
Other services	\$494.2
Transportation and warehousing	\$390.9
Food services and drinking places	\$363.1
Administrative and waste management services	\$298.4
Utilities	\$268.4
Management of companies and enterprises	\$238.3
Total	\$11,226.7

Source: U.S. Bureau of Economic Analysis Rims II Input –Output multipliers and author’s computations. This table includes only those industries with over \$200 million in sales impact. The total reflects all 20 Industry categories.

Table 12
Impact of Three-Week Disruption at Port Fourchon on
Continental US Household Earnings by Industry

Category	Earnings (Millions)
Health care and social assistance	\$539.5
Finance and insurance	\$379.0
Retail trade	\$318.3
Manufacturing	\$317.1
Professional, scientific, and technical services	\$240.0
Wholesale trade	\$162.3
Other services	\$154.3
Information	\$141.3
Transportation and warehousing	\$139.6
Administrative and waste management services	\$131.1
Real estate and rental and leasing	\$119.7
Food services and drinking places	\$117.4
Total	\$3,156.2

Source: U.S. Bureau of Economic Analysis Rims II Input –Output multipliers and author’s computations. This table includes only those industries with over \$100 million in earnings impact. The total reflects all 20 Industry categories.

Table 13
Impact of Three-Week Disruption at Port Fourchon on
Continental US Employment by Industry

Category	Jobs
Retail trade	9,745
Health care and social assistance	9,739
Real estate and rental and leasing	6,013
Food services and drinking places	5,334
Finance and insurance	5,030
Manufacturing	4,852
Administrative and waste management services	4,213
Other services	3,265
Professional, scientific, and technical services	3,028
Transportation and warehousing	2,477
Wholesale trade	1,945
Arts, entertainment, and recreation	1,768
Information	1,744
Educational services	1,497
Total	65,502

Source: U.S. Bureau of Economic Analysis Rims II Input –Output multipliers and author’s computations. This table includes only those industries with over 1000 jobs impacted. The total reflects all 20 Industry categories.

VI. Summary & Conclusions

Port Fourchon is located in Lafourche Parish on the Gulf of Mexico Coast. Firms operating out of the Port service an estimated 90% of the oil and gas exploration activity in the Gulf. The Port is also the host port for the Louisiana Offshore Oil Port. In this report we have examined the economic impact of Port Fourchon on the Houma MSA and State of Louisiana economies. Data were secured on construction spending and annual operating activity at the Port from 17 Port tenants and from the Greater Lafourche Port Commission. Our findings can be summarized as follows:

- Impact on the **Houma MSA**:
 - Construction spending at the Port over the 5-year period from 2009-13 created
 - \$570 million in new sales at firms in the MSA;
 - \$194.8 million in new household earnings for residents of the MSA; and
 - An average of 708 jobs a year for MSA residents.
 - On-going operational activity at the Port in 2013 created:
 - Over \$2.1 billion in sales from firms in the MSA;
 - \$458.1 million in household earnings for MSA residents; and
 - 8,015 jobs for MSA residents.
 - One of every 13 jobs in the MSA can be traced to the presence of the Port.
 - The job multiplier for the MSA is 4.6, meaning for every new job created at the Port 3.6 new jobs are created elsewhere in the MSA.
 - On average the annual wage for these Port-created jobs was \$57,155---27% higher than the average annual wage in Louisiana.

- In 2013, the combination of construction spending and on-going operations at the Port generated at least \$12.8 million in sales taxes for local governments in the MSA.
- **Impacts on the State of Louisiana:**
 - Construction spending at the Port over the 5-year period from 2009-13 created
 - \$714.5 million in new sales at firms in the State;
 - \$243.1 million in new household earnings for residents of the State; and
 - An average of 708 jobs a year for State residents.
 - On-going operational activity at the Port in 2013 created:
 - Almost \$2.6 billion in sales for firms in the State;
 - \$580.2 million in household earnings for State residents; and
 - 10,804 jobs for State residents.
 - The job multiplier for the State is 6.2, meaning for every new job created at the Port 5.2 new jobs are created elsewhere in the State.
 - On average the annual wage for these Port-created jobs was \$53,702---28% higher than the average annual wage in Louisiana.
 - In 2013, the combination of construction spending and on-going operations at the Port generated at least \$46 million in taxes for the State treasury.

All of these impact estimates should be considered very conservative because they do not include data from firms at the Port that did not respond to our questionnaire.

- Impacts on the **U.S. National Economy**:

For this task, we use a model developed by Richardson and Scott and the experience from Hurricanes Katrina and Rita to estimate the impact on the U.S. economy of a three-week loss in services from Port Fourchon due to damage from a hurricane, a terrorist attack, or some other destructive phenomenon. The results imply that a three-week loss in services from Port Fourchon would lead to:

- A loss of \$11,226.7 billion in sales at U.S. firms;
- A loss of \$3,156.2 million in household earnings in the U.S., and;
- A loss of 65,502 jobs in the nation.