

# THE ECONOMIC IMPACT OF COASTAL RESTORATION AND HURRICANE PROTECTION

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## Author's Preface

This study was commissioned by Restore Louisiana Now, Inc., but the study and the report are 100% the work of the author. Restore Louisiana Now, Inc., had no substantive input into the study. The study relies upon published work and follows the traditional methodology of regional economic impact studies, of which the author has conducted hundreds of during his career as an economist working in Louisiana. The primary source of data for this study is the State of Louisiana's Comprehensive Master Plan for a Sustainable Coast, 2012, known as the Master Plan.

The methodology employed in the study follows the traditional economic impact methodology in first estimating the direct effects. The data used to estimate the direct effects in this study are drawn from the Master Plan, the Federal Emergency Management Agency (FEMA), and various published sources. Once the direct effects are estimated, the remaining economic impacts (secondary spending, total spending, related employment, and earnings) are derived using United States Bureau of Economic Analysis (BEA) developed regional multipliers. As a result of the government sequester, the BEA was forced to abandon its regional economic impact model, RIMS II. This year, IMPLAN group purchased the BEA RIMS II model and has incorporated it into their modeling efforts. The version of the model that is used in this report is the IMPLAN I-RIMS model for 2011 for Louisiana. State and local tax impacts are estimated using a model developed by the author.

Timothy P. Ryan earned his Ph.D. from the Ohio State University in 1978. He served the University of New Orleans for 34.5 years as a Professor of Economics, Director of Business Research, Dean of the College of Business, and finally Chancellor of the University. During his career at UNO and subsequently as a consulting economist, Dr. Ryan had conducted over 100 economic impact studies of critical economic issues in Louisiana. These studies have been done on behalf of scores of private businesses, government agencies, and not-for-profit organizations. Dr. Ryan has testified before state and federal courts, local government bodies, the State Legislature, and the Congress of the United States about the results of these studies.

## Executive Summary

- It is clear to most observers that the number one economic and social issue facing south Louisiana (in fact, the entire State) is the continuing loss of our coast.
- According to the Louisiana's Comprehensive Master Plan for a Sustainable Coast of 2012, which the State Legislature approved unanimously in 2012, the State has lost 1,880 square miles of land over the past 80 years (a rate of 24 square miles per year). More significantly, the land loss is accelerating. The Master Plan projects additional loss of 1,750 square miles over the next 50 years if nothing is done (a rate of 35 square miles per year).
- The Master Plan calls for an investment of a minimum of \$50.00 billion on coastal restoration and hurricane protection over the next 50 years. This level of expenditure slows but does not stop or reverse land loss. The Master Plan recommends \$100.00 billion as the optimal level, which will yield a net gain of land.
- A major problem confronts us since even the \$50.00 billion level suggested in the Master Plan is not funded at this time. The Master Plan states, "The budget we used for the plan, \$50 billion, reflects existing and **potential** funding sources." [Source: Master Plan, p. 36. Emphasis added] Secure long-term funding for the Master Plan comes chiefly from the GOMESA program, which is estimated at \$100.00 million to \$200.00 million per year beginning in 2017. At the same time, the State must begin paying back \$73.00 million per year for 30 years to the federal government for the State's cost-share for the new flood protection system protecting metro New Orleans.
- In order to achieve just the minimum level of funding, substantial additional funding will be required. The source of that funding is perhaps the most significant issue the State will face. In order to devise a solution to the funding problem, the stakeholders must engage in a public policy debate about the benefits and costs of coastal restoration.
- The purpose of this report is to address the benefits of coastal restoration – specifically to document the economic impact of investing significant funds (\$50.00 Billion to \$100.00 billion) to help restore the coast of Louisiana and provide additional hurricane protection for residents of Louisiana.
- There are four areas of potential economic impacts of the spending of \$50.00 billion to \$100.000 billion on coastal restoration and hurricane protection:
  1. The hard construction activities that would result from the spending. This would involve the actual levee building projects, sediment diversion projects, and the like.
  2. The impact that the new funds would have on developing a new industry in the State. That new industry would focus on coastal science and could be on the forefront of science and engineering studies of coastal restoration and development, not only in Louisiana but also throughout the world.

3. The Master Plan predicts a substantial increase in the storm damage that Louisiana can expect over the next 50 years if nothing is done. If investments in coastal restoration and hurricane protection outlined in the Master Plan are made, we can expect a reduction in storm damages in the future. Those savings will first manifest themselves in lower insurance costs for residents and businesses. Lower insurance costs will impact existing businesses in the area and will attract new businesses to the area that will have greater confidence that hurricanes will not cripple their business as Katrina did.
  4. A fraction of the damages that result from storms are not insured and thus borne by local residents and businesses. The economic savings that would result from reducing uninsured hurricane damage to the State of Louisiana would make up a part of the economic benefits of investing in the Master Plan.
- The economic impact of investing in the Master Plan is broken down into seven categories:
    - New direct spending
    - New secondary spending
    - New total spending (the sum of direct and secondary spending)
    - New jobs for the State
    - New earnings for local residents
    - New tax revenues for local government
    - New tax revenues for State government.
  - The base figures used in this report for the levels of coastal restoration and protection spending are the two levels identified in the Master Plan -- \$50.00 billion over 50 years and \$100.00 billion over 50 years.

**TABLE S1**

**Summary of All Impacts  
Annual Permanent Impacts**

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$6,720.30	\$13,245.02
Secondary Spending	\$5,634.12	\$11,001.97
Total Spending	\$12,354.42	\$24,246.99
Jobs Created	109,360	212,684
Earnings	\$3,612.25	\$7,015.63
Local Tax Revenue	\$280.53	\$545.44
State Tax Revenue	\$476.90	\$927.48
Total Tax Revenue	\$757.43	\$1,472.91

- Table S1 presents a summary of the mid point estimates of the economic impact of spending \$50.00 billion and \$100.00 billion over a 50-year period on hurricane protection and coastal restoration.
- In total, the coastal restoration and hurricane protection projects envisioned in this study create **annual new direct spending** of \$6.72 billion, \$5.63 billion of secondary spending, for a total spending impact of \$12.35 billion annually if \$50.00 billion is invested. If \$100.00 billion is invested, the projects create \$13.25 billion of direct spending, \$11.00 billion of secondary spending, for a total spending impact of \$24.25 billion annually
- After the 50-year period of construction is complete, **the permanent increase in employment is 109,360 jobs and \$3.61 billion in annual earnings if \$50.00 billion is invested and 212,684 new jobs and \$7.02 billion in new earnings if \$100.00 billion is invested.**
- In a study as complicated and comprehensive as this one, it is useful to provide a frame of reference or comparisons, if available. The creation of 109,360 or 212,684 new jobs in Louisiana is clearly a significant economic engine. However, if one looks at the total in comparison to the damage that one storm – Hurricane Katrina – did to the Louisiana economy, the 109,360 new jobs total is certainly reasonable. After the spending of over

\$40 billion dollars of recovery money, the New Orleans MSA still lost 72,500 permanent jobs since Katrina. Clearly, the creation of between 109,360 and 212,684 new jobs as a result of spending between \$50.00 billion and \$100.00 billion to rebuild land and protect not only New Orleans but also the rest of coastal Louisiana from further damage is reasonable.

- The Master Plan references several other studies of job creation as a result of coastal restoration. Those studies predict as many as 450,000 new jobs could be created by an investment in coastal restoration of this magnitude -- \$50.00 billion.

## Introduction

It is clear to most observers that the number one economic and social issue facing the southern part of Louisiana (in fact, the entire State) is the continuing loss of our coast. According to the Louisiana's Comprehensive Master Plan for a Sustainable Coast of 2012 (hereafter, the Master Plan), which the State Legislature adopted in 2012, the State has already lost 1,880 square miles of land over the past 80 years (a rate of 24 square miles per year). More significantly, the land loss is accelerating. The Master Plan projects an additional land loss of 1,750 square miles over the next 50 years if nothing is done (a rate of 35 square miles per year).

Much has been written about the negative economic consequences of this continuing and accelerating loss of our coast. The purpose of this report is to look at the positive economic impact that would result from investing in the restoration of Louisiana's coast. This study documents the economic impact of halting the current land loss and building new land to replace the land lost over the last 80 years. These funds would be invested according to the State of Louisiana's Comprehensive Master Plan for a Sustainable Coast, 2012 (hereafter referred to as the Master Plan). The specific purpose of this report is to estimate the economic impact of **dollars spent on coastal restoration and hurricane protection at the two levels suggested by the 2012 Master Plan -- \$50 billion and \$100 billion.**

The Master Plan argues very forcefully and effectively that the minimum that Louisiana should invest in coastal restoration is \$50.00 billion. At that level, however, the new land built would still not replace the expected land loss over the next 50 years. In other words, the investment of \$50.00 billion would still yield net land loss over the next 50 years [Source: Master Plan, p. 36]. This is not to imply that the spending of \$50.00 billion would not be beneficial to the economy of Louisiana. It would significantly reduce hurricane and flooding damage. At a level of \$100.00 billion, the coastal rebuilding efforts would be able to produce a net land increase over the 50-year period.

The major problem is that even the minimum \$50.00 billion level suggested in the Master Plan **is not funded at this time.** The Master Plan states, "The budget we used for the plan, \$50 billion, reflects existing and **potential** funding sources." [Source: Master Plan, p. 36. Emphasis added] Unfortunately, only a small fraction of the funds needed has been secured. In order to achieve even the minimum level of funding, **significant additional** funding will be required. The source of that funding is perhaps the most significant issue the State will face. In order to devise a solution to the funding problem, the stakeholders must engage in a public policy debate about the benefits and costs of coastal restoration.

The purpose of this report is to address the benefits of coastal restoration – specifically to document the economic impact of using dollars generated by various sources to help restore the coast of Louisiana and provide additional hurricane protection for residents of Louisiana. There are four areas of potential economic impact of the use of the coastal restoration and hurricane protection funds:

- The hard construction activities that would result. This would involve the actual levee building projects, sediment diversion projects, and the like. The assumption in this study is that 88% of the total construction costs would be used for hard construction costs.
- The impact that the new funds would have on developing a new industry in the State. That new industry would focus on coastal science and could be on the forefront of science and engineering studies of coastal restoration and development, not only in Louisiana but also throughout the world. The assumption in this study is that 12% of the construction costs would be used for science and engineering costs during the period of construction. After the construction phase is complete, it is assumed that a coastal science industry will have been developed to compete nationally and internationally for coastal projects.
- The Master Plan predicts a substantial increase in the storm damage that Louisiana can expect over the next 50 years if nothing is done. If investments in coastal restoration and hurricane protection outlined in the Master Plan are made, we can expect a reduction in storm damages in the future. Those savings will first manifest themselves in lower insurance costs for residents and businesses. Lower insurance costs will impact existing businesses in the area and will attract new businesses to the area that will have greater confidence that hurricanes will not cripple their business as Katrina did.
- A fraction of the damages that result from storms are not insured and thus borne by local residents and businesses. The economic savings that would result from reducing uninsured hurricane damage to the State of Louisiana would make up a part of the economic benefits of investing in the Master Plan.

This report will identify the following economic impacts associated with the four components identified above:

1. New direct spending associated with the three identified impacts. Direct spending are those dollars that would be spent in the local economy for wages, salaries, local purchases of goods and services, construction, tax payments to state and local governments, and the like for the companies



directly involved in the construction projects or the new firms attracted in the coastal science industry. For those impacts that result in savings to the economy, the direct spending is the redirected dollars that would not be spent on protective expenditures, such as higher insurance premiums.

2. New secondary spending in the State's economy that will be created by the new direct spending identified above. This direct or primary spending produces additional spending in the economy, referred to as indirect and induced spending or the economic multiplier effect. Indirect spending includes the spending of local firms that provide inputs or supplies to the firms involved in the direct spending. The induced spending is a result of the income produced in the local area by the direct and indirect spending. When these dollars are spent, they produce income for someone else in the local economy. The recipients of that income then spend part of their new income in the local economy, thus producing income for still other local residents. The process continues to third, fourth, and further rounds of spending. The indirect and induced spending are added together to produce secondary spending. The secondary spending is sometimes referred to as the "ripple effect" or the multiplier effect. The multipliers used in this study are calculated by IMPLAN Economic Impact Model. IMPLAN is an economic model that was first developed by the U. S. Department of Agriculture as an aid in analyzing the economic impact of their projects. It was subsequently sold to the private sector and is currently owned by IMPLAN Group, LLC. IMPLAN is used by many private consulting firms, economists, and government agencies. In 2013, as a result of the government sequester, the U. S. Bureau of Economic Analysis (BEA) was forced to abandon its regional economic impact model, RIMS II. This year, IMPLAN group purchased the BEA RIMS II model and has incorporated it into their modeling efforts. The version of the model that is used in this report is the IMPLAN I-RIMS model for 2011 for Louisiana. The multipliers are industry specific. Thus, each area of spending -- i.e., spending on wages and salaries, local purchases, services, manufacturing, etc. -- has a different multiplier. Since the economic impact in this report is economy-wide, the average of all multipliers in the Louisiana economy is used.
3. New total spending in the Louisiana economy where total spending is the sum of direct and secondary spending.
4. New jobs created, both direct and secondary jobs. The estimates for the total number of jobs created by a project are based on employment multipliers. The employment multipliers used in this study are from the IMPLAN I-RIMS model for 2011 for Louisiana.

5. New earnings for local residents created. The estimates for the total earnings or income created by a project are based on earnings multipliers. The employment and earnings multipliers used in this study are from the IMPLAN I-RIMS model for 2011 for Louisiana.
6. New state tax revenues created. State and local tax revenues are estimated by the means of a model that this author has developed. That model will be explained in detail later in this report.
7. New local tax revenues created.

### **Base Spending**

The first step in an economic impact study such as this is to determine the magnitude of the potential new spending on hurricane protection and coastal restoration. The base spending amounts used in this study are \$50.00 billion and \$100.00 billion as delineated in the Master Plan.

The Master Plan has studied the issue of total damage to the coast over the past 70 to 80 years as measured by land loss. According to the Master Plan, the State of Louisiana has lost 1,880 square miles of land over the past 80 years or an average of 23.5 square miles per year. The goal of the 2012 Master Plan is the restoration of 800 square miles of coasts over the next 50 years at a cost of \$50.00 billion. The 800 square miles of restoration will cost \$62.50 million per square mile. The Master Plan also estimates the costs of restoring 1,240 square miles of coast at \$100.00 billion, or \$80.65 million per square mile.

### **Component I – The Impact of Hard Construction Costs**

The first component of the economic impact of the proposed new funding is the impact of the hard construction costs that will be supported. Assuming that 88% of the total spent on coastal restoration and hurricane protection will be spent on hard construction costs and 12% will be spent on science and engineering studies, the total to be spent on hard construction costs is \$44.00 billion and \$88.00 billion. Clearly, that total will not be spent in one year. The assumption in this study follows the timetable of the Master Plan and is that the construction will be done over a 50-year period. That results in an average of \$0.88 billion (or \$880.00 million) and \$1.76 billion of construction per year.

In a project of this type, it is typical to use a range of values, and not a single point, to determine the economic impact. For all values in this report, a low, mid, and high range have been estimated with a confidence interval of 20% above and below the mid-range estimate. For simplicity and ease of reading the report, the mid-range values are reported in the main text of the report and the low and high estimates are available in Appendix A (low estimate) and Appendix B (high estimate) to this report.

The economic model that was developed to estimate the economic impact of repairing our coast used a year-by-year analysis of the impact. In order to make this report more readable, the year-by-year impacts of this and other components of the economic impact will not be presented. Instead, summary tables will be used. For every component and for every impact category, there are two sets of tables. The first is the annual averages for the 50-year period for that category. The second is the annual permanent impact, the annual impact accruing every year at the conclusion of the 50-year period, once all investment has been made. As the term implies, this impact will re-occur annually into perpetuity.

Table 1 present the new direct, secondary, and total spending that will be created by the hard construction costs over the 50-year period under both scenarios.

**TABLE 1**

**Spending Impact of Hard Construction Costs  
Annual Average Over 50 Years**

(in millions)

Scenario	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$880.00	\$821.66	\$1,701.66
\$100 Billion Level	\$1,760.00	\$1,643.31	\$3,403.31

Source: Master Plan and Timothy P. Ryan

Over the 50-year period, the hard construction costs of \$0.88 billion and \$1.76 billion will create an additional \$0.82 billion and \$1.64 billion in secondary spending for an average annual spending impact of \$1.70 billion and \$3.40 billion respectively in the Louisiana economy over the life of the 50-year construction period. Since the

construction period will end at the end of 50 years, there is assumed to be no permanent construction impact.

The next two variables to estimate are the employment and earnings created by the hard construction activities. Table 2 presents these estimates.

**TABLE 2**

**Employment and Earnings Impact of Hard Construction  
Costs – Annual Averages Over 50 Years**

(in millions)

<u>Category</u>	<u>Employment</u>	<u>Earnings</u>
\$50 Billion Level	16,661	\$558.10
\$100 Billion Level	33,321	\$1,116.19

Source: Master Plan and Timothy P. Ryan

Over the 50-year period, the hard construction spending will create an annual average of \$0.56 billion in earnings for Louisiana residents and will support an average of 16,661 jobs per year at the \$50.00 billion level. At the \$100.00 billion level, the hard construction spending will create an annual average of \$1.12 billion in earnings for Louisiana residents and will support an annual average of 33,321 jobs per year

The final variables to estimate are state and local tax revenues created by the hard construction activities. The construction companies themselves pays taxes directly to the state of Louisiana and to the local governments in the region. These direct taxes include corporate income, corporate franchise, sales, property, and various miscellaneous taxes. In addition, the economic activity created by the company creates additional state and local tax revenue.

State taxes generated by economic activity are taxes paid on the income generated by those operations and sales taxes paid directly on the sale of construction materials. Out of that income, the recipient pays his state income taxes; in addition,

he buys goods and services and pays the taxes that apply to those goods and services. The retail sales tax applies to the purchase of some of those goods and services. The assumption used to estimate the revenue from all of these taxes is that the recipient of newly created income is no different from the average Louisiana consumer; thus, the proportion of income that is paid in these various taxes is equal to average values for the state as a whole.

State income taxes paid out of the income generated by the company's activities can be estimated by determining the proportion of income that the average person in the state pays in state income taxes. In 2012, the latest year for which data exists, the average job in the Louisiana created \$1,478 of state income taxes (Source: United States Bureau of the Census, State Government Finances: 2012; and Louisiana Workforce Commission, Employment and Wages, 2012).

To estimate the amount of sales tax revenue attributable to the income generated, the same methodology is employed. According to the Census Bureau and the Louisiana Workforce Commission, each job creates \$1,505 in the form of state sales taxes.

The next category of state tax revenue is specific excise taxes paid, sometimes referred to as selective sales taxes. In order to estimate the amount of these taxes paid as a result of the construction activities, we employ a methodology similar to the one used for the personal income tax. The Census Bureau provides estimates of the revenue raised by the state by the various excise taxes enumerated above. Dividing the total of this revenue by total state employment produces the estimate of the amount of excise tax revenue per job -- \$1,108 per worker.

The next category of taxes is business taxes. These include various license and state corporate income and franchise taxes. The sales and profits generated by the project will create significant business tax revenue for the two states. According to the Census Bureau and the Workforce Commission, the total is \$271 per job.

Finally, there are local taxes. The main local taxes are the local sales and property taxes. The methodology used to estimate the local sales tax is to estimate, using the Consumer Expenditure Survey, the percentage of his/her income the average worker spends on goods taxable by local government in Louisiana. That percentage is then multiplied by the earnings created by the project to determine total taxable spending created by the project. Taxable spending is then multiplied by the tax rate

to determine total local sales tax revenue created. Property taxes are estimated assuming that employees related to this project are similar to the average job in the State with respect to homeownership and value of property. Total local property taxes in the State of Louisiana [Source: Louisiana Tax Commission, Annual Report, 2012] are divided by total employment to estimate the local property taxes paid per job. The results of the tax estimates for the construction spending are presented in Table 3.

**TABLE 3**

**State and Local Tax Impact of Hard Construction Costs  
Annual Averages Over 50 Years**

(in millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$42.85	\$72.65	\$115.51
\$100 Billion Level	\$85.70	\$145.31	\$231.01

Source: Master Plan and Timothy P. Ryan

On average, over the 50-year period of construction, the project will create annually \$42.85 million of new local tax revenues and \$72.65 million of new State tax revenue, for a total of \$115.51 million in new annual state and local tax revenues at the \$50.00 billion level. At the \$100.00 billion level, the project will create \$85.70 million of new local tax revenues and \$145.31 million of new State tax revenue, for a total of \$231.01 million in new annual state and local tax revenues Table 4 presents a summary of the construction impacts.

## TABLE 4

### Summary of Construction Impacts Annual Averages Over 50 Years

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$880.00	\$1,760.00
Secondary Spending	\$821.66	\$1,643.31
Total Spending	\$1,701.66	\$3,403.31
Jobs Created	16,661	33,321
Earnings	\$558.10	\$1,116.19
Local Tax Revenue	\$42.85	\$85.70
State Tax Revenue	\$72.65	\$145.31
Total Tax Revenue	\$115.51	\$231.01

Source: Master Plan and Timothy P. Ryan

### Component II – Science and Engineering Impact

The second component of the impact of a \$50.00 billion and \$100.00 billion investment in coastal restoration and hurricane protection is the impact on the State's science and engineering sectors. The assumption is that 12% of the proposed funds will be spent in science and engineering the projects themselves and other research into coastal restoration and hurricane protection. In total, over the 50-year period, the spending will support \$6.00 billion and \$12.00 billion in new science and engineering spending in Louisiana. Unlike the hard construction component, the science and engineering component is expected to have a long-run permanent impact on the Louisiana economy. Also unlike the hard construction spending, the science and engineering component is expected to be larger in the early years and tapering off in the later years of the 50-year period.

Assuming a strict provision that requires a significant local component of any science and engineering studies to be conducted with the science and engineering funds, the expectation is that Louisiana will continue to develop a coastal science industry that is not only capable of doing a larger percentage of the studies suggested in this report but also will be increasingly competitive in national and international science spheres. In other words, the seed work of the science and engineering projects resulting from a funded Master Plan will help spawn a new industry for Louisiana. That industry is already starting to develop without the additional stimulus of the bulk of the Master Plan work and any of the investment discussed here. Pouring billions of dollars into this industry over a 50-year period will surely produce significant results. In addition, it is clear that with worldwide sea-level rise and the fact that an increasing percentage of the world's population will be in harm's way as development continues, the demand for a science and engineering solution to flooding problems around the world will multiply many fold.

The Dutch have already realized this dream and have turned a liability (the fact that most of the country is below sea level and subject to continual flooding) into a significant industry. According to the Netherlands Enterprise Agency, a Division of the Ministry of Economic Affairs of the Dutch government, in 2010 Dutch private business firms did science and engineering studies for export (i.e., the source of the work was other countries) to the tune of \$8.97 billion. [Source: 2013 Netherlands Enterprise Agency, "Dutch Water Expertise Helps Solve Global Water Issues," page 1] This figure is sure to increase substantially over the next 20 to 50 years. This report assumes that over the 50-year period Louisiana businesses could exploit the growth in the industry and carve out a market share that is very modest – 2% of the current Dutch export market in the first year, growing to 15% in the final year of the period for the \$50.00 billion level and 2% in the first year, growing to 20% in the final year of the \$100.00 billion investment. The study does not factor in the potential worldwide growth that will surely occur in the demand for these kinds of professional services over the next 50 years.

Tables 5 – 8 present the economic impact of the science and engineering component over the 50-year construction period. Tables 9 through 12 present the permanent on on-going economic impact of coastal science once all investments have been made.



## 50-Year Annual Average Impacts

This section of the report presents the results for the economic impacts associated with the science and engineering activities during the 50-year construction period.

**TABLE 5**

**Spending Impact of Coastal Science  
Annual Averages Over 50 Years**

(In millions)

<u>Category</u>	<u>Direct Spending</u>	<u>Secondary Spending</u>	<u>Total Spending</u>
\$50 Billion Level	\$882.67	\$798.55	\$1,681.22
\$100 Billion Level	\$1,226.99	\$1,110.05	\$2,337.04

Source: Master Plan and Timothy P. Ryan

Over the 50-year period, the science and engineering spending of \$6.00 billion and \$12.00 billion plus the new spending created by the world-wide export of the science industry will create new direct spending of \$0.88 billion and \$1.23 billion per year during the construction period. That direct spending will create an additional \$0.80 billion and \$1.11 billion per year in secondary spending for a total spending impact of \$1.68 billion and \$2.34 billion respectively in the Louisiana economy.

The next two variables to estimate are the employment and earnings created. Table 6 presents these estimates.

**TABLE 6**

**Jobs and Earnings of Coastal Science  
Annual Averages Over 50 Years**

(Earnings in millions)

<u>Category</u>	<u>Employment</u>	<u>Earnings</u>
\$50 Billion Level	16,341	\$604.94
\$100 Billion Level	22,716	\$840.91

Source: Master Plan and Timothy P. Ryan

Over the 50-year period, the science and engineering spending will create a 50-year annual average of \$604.94 million and \$840.91 million of earnings for Louisiana residents and 16,341 and 22,716 new jobs per year in the State's economy.

The final variables to estimate are state and local tax revenues created by the science and engineering activities. Those estimates are contained in Table 7.

**TABLE 7**

**State and Local Tax Impact of Coastal Science  
Annual Averages Over 50 Years**

(In millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$42.87	\$71.26	\$114.13
\$100 Billion Level	\$59.60	\$99.06	\$158.65

Source: Master Plan and Timothy P. Ryan

On average, over the 50-year period, the science and engineering spending will create \$42.87 million and \$29.60 million of new local tax revenues per year. The science spending will also create \$71.26 million and \$99.06 million of new State tax revenues annually. In total, the coastal science component of the project will create an average of \$114.13 million and \$158.65 million of new revenue for state and local governments in Louisiana over the 50-year period of construction. Table 8 present a summary of the science impacts for the 50-year period.

**TABLE 8**

**Summary of Coastal Science Impacts  
Annual Averages Over 50 Years**

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$882.67	\$1,226.99
Secondary Spending	\$798.55	\$1,110.05
Total Spending	\$1,681.22	\$2,337.04
Jobs Created	16,341	22,716
Earnings	\$604.94	\$840.91
Local Tax Revenue	\$42.87	\$59.60
State Tax Revenue	\$71.26	\$99.06
Total Tax Revenue	\$114.13	\$158.65

Source: Master Plan and Timothy P. Ryan

## Permanent Impacts

This section of the report presents the results for the annual economic impacts associated with the science and engineering activities once the 50-year construction period is finished. These impacts are permanent.

**TABLE 9**

**Spending Impact of Coastal Science  
Annual Permanent Impacts**

(In millions)

<u>Category</u>	<u>Direct Spending</u>	<u>Secondary Spending</u>	<u>Total Spending</u>
\$50 Billion Level	\$1,345.89	\$1,256.66	\$2,602.55
\$100 Billion Level	\$1,794.52	\$1,675.54	\$3,470.06

Source: Master Plan and Timothy P. Ryan

Over the 50-year period, the new science and engineering industry will create new permanent direct spending of \$1.35 billion and \$1.79 billion and will create an additional \$1.26 billion and \$1.68 billion in secondary spending for an average annual spending impact of \$2.60 billion and \$3.47 billion in the Louisiana economy once the 50-year construction period is complete. The investment of \$50.00 billion or \$100.00 billion in restoring our coasts and protecting the residents against storm damage will also create a new high-paying and knowledge-based industry for the State of Louisiana.

Table 10 presents the permanent impact of science and engineering spending on the number of jobs and earnings of residents.

**TABLE 10**

**Jobs and Earnings Impact of Coastal Science  
Annual Permanent Impacts**

(Earnings in millions)

<u>Category</u>	<u>Employment</u>	<u>Earnings</u>
\$50 Billion Level	25,481	\$853.56
\$100 Billion Level	33,975	\$1,138.08

Source: Master Plan and Timothy P. Ryan

Once the 50-year construction period is complete, the science and engineering spending will create an annual average of \$0.85 billion and \$1.14 billion respectively in earnings for Louisiana residents depending on the magnitude of the initial investment. That spending will support an average of 25,481 or 33,975 new jobs per year at the \$50.00 billion level or at the \$100.00 billion level.

Table 11 presents the state and local tax revenue impact of the science and engineering spending.

**TABLE 11**

**State and Local Tax Impact of Coastal Science  
Annual Permanent Impacts**

(In millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$65.54	\$111.12	\$176.66
\$100 Billion Level	\$87.38	\$148.16	\$235.54

Source: Master Plan and Timothy P. Ryan

On a permanent basis, the science and engineering spending will create \$65.54 million of new local tax revenues and \$111.12 million of new State tax revenue, for a total of \$176.66 million in new annual state and local tax revenues at the \$50.00 billion level. At the \$100.00 billion level, the science and engineering component will create \$87.38 million of new local tax revenues and \$148.16 million of new State tax revenue, for a total of \$235.54 million in new annual state and local tax revenues. Table 12 presents a summary of the science impacts.

**TABLE 12**

**Summary of Coastal Science Impacts  
Annual Permanent Impacts**

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,345.89	\$1,794.52
Secondary Spending	\$1,256.66	\$1,675.54
Total Spending	\$2,602.55	\$3,470.06
Jobs Created	25,481	33,975
Earnings	\$853.56	\$1,138.08
Local Tax Revenue	\$65.54	\$87.38
State Tax Revenue	\$111.12	\$148.16
Total Tax Revenue	\$176.66	\$235.54

Source: Master Plan and Timothy P. Ryan

### Component III – Impact on Insurance Costs

The third component of the impact of spending billions of dollars on hurricane protection and coastal restoration is the impact that such spending will have on reducing insurance costs, for both residents and more importantly businesses.

Congress has recently passed legislation to make national flood insurance rates actuarially sound **going forward**. The implication of this is that as future storms hit Louisiana and the damages are large, flood insurance rates are going to rise to avoid the federal government going into massive debt as it did after Katrina and Sandy. Private insurance rates are already actuarially sound, which means that they will increase as damages go up. That will have a significant impact on insurance rates in Louisiana over the next 50 years, especially if the current trend of more and more damaging storms continues.

Using Hurricane Katrina as a guide, the total storm damage was estimated to be \$90.30 billion. [Source: PCI White Paper, The Hurricane Katrina Experience – A Property Casualty Insurance Perspective: Five Years Later, 2010] According to FEMA, \$16.30 billion of that (or 19.6%) was paid by FEMA, \$25.50 billion (or 28.2%) was paid by private insurers, and \$47.10 billion (or 52.2%) was uninsured or uncovered. Those proportions will be used to estimate the covered and uncovered parts of any new flood damage due to storms in the future.

According to the Master Plan, the average annual storm and flooding damage in Louisiana is \$2.4 billion. [Source: Master Plan page 16] Further, the Plan predicts that if nothing is done to reverse coastal land loss, annual damages will increase to \$23.4 billion by 2061. The annual compound rate of increase implied by this prediction is 4.76%. In order to be conservative, the annual rate is adjusted downward by 50% and by 25% for the \$50.00 billion and \$100.00 billion funding levels respectively. Thus, the actual compound rate of increase used in this analysis is 2.38% and 3.57%.

The methodology used in this section of the report is to assume that the spending of the \$50.00 billion or \$100.00 billion will just limit the **damage increases** once the projects are built. In fact, this is a very conservative assumption. The expectation is that the spending of a total of \$100.00 billion on coastal restoration will actually reduce annual damages below the current \$2.4 billion figure. This report only assumes that the increase will be reduced from the “no action” case. The assumption in this study is that the investment of \$50.00 billion will reduce the increases by 50% and the \$100.00 billion investment will reduce the damages by 75%.

Anyone who doesn't believe that an investment in strategically restoring our coast will limit damages and thereby positively impact the Louisiana economy only needs

to look at the impact of Hurricane Katrina on the New Orleans area economy. Katrina, a Category 3 storm, caused the permanent loss of population of 154,000 people in the New Orleans metro area, 72,500 permanent jobs, and over \$1.81 billion of gross metro product. These figures are after accounting for the \$45.00 billion or so that was spent in post-Hurricane storm restoration. [Source: University of New Orleans Division of Business and Economic Research, Metropolitan Report, August 2013.] One can imagine the impact of a Camille-like, Category 5 storm hitting our depleted coast!

### 50-Year Average Insurance Impacts

Tables 13 through 16 present the economic impacts of reducing rising insurance rates on the Louisiana economy over the 50-year period of construction.

**TABLE 13**

**Spending Impact of Insurance Benefits  
Annual Averages Over 50 years**

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,065.16	\$867.58	\$1,932.74
\$100 Billion Level	\$2,032.11	\$1,655.15	\$3,687.26

Source: Master Plan and Timothy P. Ryan

As Table 13 indicates, by reducing storm damage, the projects will stabilize insurance rates, which will keep local residents and businesses in coastal Louisiana and encourage new residents and businesses to come into the area, as insurance costs are kept low. Over the 50-year period, the insurance component will create new direct spending of \$1.07 billion and \$2.03 billion per year during the construction period. That direct spending will create an additional \$0.87 billion and \$1.66 billion per year in secondary spending for a total spending impact of \$1.93 billion and \$3.69 billion respectively in the Louisiana economy, depending on the level of the initial investment -- \$50.00 billion or \$100.00 billion.



Table 14 presents the employment and earnings impacts of the insurance component.

## TABLE 14

### Jobs and Earnings of Insurance Benefits Annual Averages Over 50 Years

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	16,624	\$546.75
\$100 Billion Level	31,715	\$1,043.08

Source: Master Plan and Timothy P. Ryan

The insurance component also creates an average of 16,624 or 31,715 jobs per year and average annual earnings of \$0.55 billion or \$1.04 billion during the 50-year period of implementation. Table 15 presents the state and local tax impacts of the insurance component over the 50-year construction period.

**TABLE 15**

**State and Local Tax Impact of Insurance Benefits  
Annual Averages Over 50 Years**

(In millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$42.61	\$72.49	\$115.10
\$100 Billion Level	\$81.29	\$138.30	\$219.60

Source: Master Plan and Timothy P. Ryan

The insurance component generates a 50-year average of \$42.61 million or \$81.29 million of new tax revenues for local governments and \$72.49 million or \$138.30 million of new State tax revenues for a total of \$115.10 million or \$219.60 million per year. Table 16 presents a summary of the average annual impacts of Component III.

## TABLE 16

### Summary of Insurance Impacts Annual Averages Over 50 Years

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,065.16	\$2,032.11
Secondary Spending	\$867.58	\$1,655.15
Total Spending	\$1,932.74	\$3,687.26
Jobs Created	16,624	31,715
Earnings	\$546.75	\$1,043.08
Local Tax Revenue	\$42.61	\$81.29
State Tax Revenue	\$72.49	\$138.30
Total Tax Revenue	\$115.10	\$219.60

Source: Master Plan and Timothy P. Ryan

## Permanent Insurance Impacts

Tables 17 through 20 present the permanent impacts of the impact of coastal restoration at \$50.00 billion or \$100.00 billion on insurance rates.

**TABLE 17**

**Spending Impact of Insurance Benefits  
Annual Permanent Impacts**

(In millions)

<u>Category</u>	<u>Direct Spending</u>	<u>Secondary Spending</u>	<u>Total Spending</u>
\$50 Billion Level	\$2,571.15	\$2,094.20	\$4,665.35
\$100 Billion Level	\$5,477.98	\$4,461.81	\$9,939.79

Source: Master Plan and Timothy P. Ryan

Once the 50-year period is complete, the insurance savings will create new permanent direct spending of \$2.57 billion and \$5.48 billion in the Louisiana economy. That new spending will create an additional \$2.09 billion and \$4.46 billion in secondary spending for an annual spending impact of \$4.67 billion and \$9.40 billion in the Louisiana economy once the 50-year construction period is complete.

Table 18 presents the permanent impact of the insurance component on the number of jobs and earnings of residents.

## TABLE 18

### Jobs and Earnings of Insurance Benefits Annual Permanent Impacts

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	40,128	\$1,319.77
\$100 Billion Level	85,495	\$2,811.85

Source: Master Plan and Timothy P. Ryan

Once the 50-year construction period is complete, the insurance savings will create an annual average of \$1.32 billion and \$2.81 billion respectively in earnings for Louisiana residents depending on the magnitude of the initial investment. That spending will support an average of 40,128 or 85,495 new jobs per year at the \$50.00 billion level or at the \$100.00 billion level.

Table 19 presents the state and local tax impacts of the insurance component.

**TABLE 19**

**State and Local Tax Impact of Insurance Benefits  
Annual Permanent Impacts**

(In millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$102.85	\$174.99	\$277.85
\$100 Billion Level	\$219.14	\$372.83	\$591.97

Source: Master Plan and Timothy P. Ryan

On a permanent basis, the insurance component will create \$102.85 million of new local tax revenues and \$174.99 million of new State tax revenue, for a total of \$277.85 million in new annual state and local tax revenues at the \$50.00 billion level. At the \$100.00 billion level, the insurance component will create \$219.14 million of new local tax revenues and \$372.83 million of new State tax revenue, for a total of \$591.97 million in new annual state and local tax revenues.

Table 20 presents a summary of the insurance impacts.

## TABLE 20

### Summary of Insurance Impacts Annual Permanent Impacts

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$2,571.15	\$5,477.98
Secondary Spending	\$2,094.20	\$4,461.81
Total Spending	\$4,665.35	\$9,939.79
Jobs Created	40,128	85,495
Earnings	\$1,319.77	\$2,811.85
Local Tax Revenue	\$102.85	\$219.14
State Tax Revenue	\$174.99	\$372.83
Total Tax Revenue	\$277.85	\$591.97

Source: Master Plan and Timothy P. Ryan

## Component IV – The Impact of Reduction of Uninsured Losses

As mentioned in the previous section, a significant proportion of storm damages, for both residents and businesses, are uninsured and thus must be borne by the residents or businesses themselves. These uninsured damages are perhaps the most devastating to the Louisiana economy, forcing both businesses and homeowners to either start over or leave the area. The reduction in storm damages will create a positive economic impact by reducing the out-of-pocket losses in an analogous manner to rising insurance costs. The same methodology is used to estimate this component as is used to estimate the impact of Component III. The only difference is that this Component looks only at uninsured damages, estimated to be 52.2% of total damages.

### 50-Year Average Impacts of Reducing Uninsured Storm Losses

Tables 21 through 24 present the economic impacts of reducing uninsured storm damages for Louisiana residents during the 50-year period of construction.

**TABLE 21**

**Spending Impact of Reducing Uninsured Losses  
Annual Averages Over 50 years**

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,161.32	\$945.90	\$2,107.22
\$100 Billion Level	\$2,215.56	\$1,804.57	\$4,020.14

Source: Master Plan and Timothy P. Ryan

As Table 21 indicates, the impact of reducing uninsured losses is significant. By reducing storm damage, the projects will reduce uninsured damages, which will keep local residents and businesses in coastal Louisiana and encourage new residents and businesses to come into the area as anticipated damages are kept low. Once the 50-year period, is complete, the average new direct spending created by this component is \$1.16 billion or \$2.22 billion, the new secondary spending is \$0.95



billion or \$1.80 billion, for a total impact of \$2.11 billion or \$4.02 billion, depending on the initial level of investment.

Table 22 presents the employment and earnings impacts of reducing uninsured storm damages.

## TABLE 22

### Jobs and Earnings Impact of Reducing Uninsured Losses Annual Averages Over 50 years

(Earnings in millions)

<u>Category</u>	<u>Employment</u>	<u>Earnings</u>
\$50 Billion Level	18,125	\$596.11
\$100 Billion Level	34,578	\$1,137.25

Source: Master Plan and Timothy P. Ryan

The reduction of uninsured losses component also creates an average of 18,125 or 34,578 new jobs per year and total earnings of \$0.60 billion or \$1.14 billion during the 50-year period of implementation. Table 23 presents the impact of reducing uninsured losses on state and local tax revenues.

**TABLE 23**

**State and Local Tax Impact of Uninsured Losses  
Annual Averages Over 50 years**

(In millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$46.46	\$79.04	\$125.50
\$100 Billion Level	\$88.63	\$150.79	\$239.42

Source: Master Plan and Timothy P. Ryan

The reduction of uninsured losses component generates a 50-year average of 46.46 million of new tax revenues for local governments and \$79.04 million of new State tax revenue for a total of \$125.50 million per year at the \$50.00 million level. The reduction of uninsured losses component generates a 50-year average of \$88.63 million of new tax revenues for local governments and \$150.79 million of new State tax revenue for a total of \$239.42 million per year at the \$100.00 million level.

Table 24 present a summary of the annual average impacts of Component IV.

## TABLE 24

### Summary of Storm Reducing Uninsured Losses -- Annual

(Dollar figures in millions)

Impact	Low Estimate	Mid Estimate
Direct Spending	\$1,161.32	\$2,215.56
Secondary Spending	\$945.90	\$1,804.57
Total Spending	\$2,107.22	\$4,020.14
Jobs Created	18,125	34,578
Earnings	\$596.11	\$1,137.25
Local Tax Revenue	\$46.46	\$88.63
State Tax Revenue	\$79.04	\$150.79
Total Tax Revenue	\$125.50	\$239.42

Source: Master Plan and Timothy P. Ryan

## Permanent Impacts of Reducing Uninsured Storm Losses

Tables 25 through 28 present the permanent annual impacts of reducing uninsured losses.

**TABLE 25**

**Spending Impact of Reducing Uninsured Losses  
Annual Permanent Impacts**

(In millions)

<u>Category</u>	<u>Direct Spending</u>	<u>Secondary Spending</u>	<u>Total Spending</u>
\$50 Billion Level	\$2,803.27	\$2,283.26	\$5,086.53
\$100 Billion Level	\$5,972.52	\$4,864.62	\$10,837.14

Source: Master Plan and Timothy P. Ryan

Once the 50-year period is complete, the reduction of uninsured losses will create new permanent direct spending of \$2.80 billion or \$5.97 billion which will create an additional \$2.28 billion and \$4.86 billion in secondary spending for an average annual spending impact of \$5.09 billion or \$10.84 billion in the Louisiana economy once the 50-year construction period is complete.

Table 26 presents the employment and earnings impact of reducing uninsured storm losses.

**TABLE 26****Jobs and Earnings Impact of Reducing Uninsured Losses  
Annual Permanent Impacts**

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	43,751	\$1,438.92
\$100 Billion Level	93,214	\$3,065.69

Source: Master Plan and Timothy P. Ryan

Once the 50-year construction period is complete, the reduction of uninsured losses will create an annual average of \$1.44 billion and \$3.07 billion respectively in earnings for Louisiana residents depending on the magnitude of the initial investment. That spending will support an average of 43,751 or 93,214 new permanent jobs per year at the \$50.00 billion level or at the \$100.00 billion level.

Table 27 presents the state and local tax impacts of reducing uninsured losses.

**TABLE 27****State and Local Tax Impact of Uninsured Losses  
Annual Permanent Impacts**

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$112.14	\$190.79	\$302.93
\$100 Billion Level	\$238.92	\$406.49	\$645.41

Source: Master Plan and Timothy P. Ryan

On a permanent basis, the reduction of uninsured losses will create \$112.14 million of new local tax revenues and \$190.79 million of new State tax revenue, for a total of \$302.93 million in new annual state and local tax revenues at the \$50.00 billion level. At the \$100.00 billion level, this component will create \$238.92 million of new local tax revenues and \$406.49 million of new State tax revenue, for a total of \$645.41 million in new annual state and local tax revenues.

Table 28 presents a summary of the impacts of reducing uninsured hurricane losses.

## TABLE 28

### Summary of Storm Reducing Uninsured Losses Annual Permanent Impacts

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$2,803.27	\$5,972.52
Secondary Spending	\$2,283.26	\$4,864.62
Total Spending	\$5,086.53	\$10,837.14
Jobs Created	43,751	93,214
Earnings	\$1,438.92	\$3,065.69
Local Tax Revenue	\$112.14	\$238.92
State Tax Revenue	\$190.79	\$406.49
Total Tax Revenue	\$302.93	\$645.41

Source: Master Plan and Timothy P. Ryan

## Total Economic Impact

This section presents the total economic impact of the four Components taken together. Tables 29 through 32 present the average annual impacts during the 50-year construction period. Tables 33 through 36 present the permanent impacts of Components I through IV.

### 50-Year Average Impacts of All Components

**TABLE 29**

**Spending Impact of All Components  
Annual Averages Over 50 Years**

(in millions)

<u>Category</u>	<u>Direct Spending</u>	<u>Secondary Spending</u>	<u>Total Spending</u>
\$50 Billion Level	\$3,989.16	\$3,433.68	\$7,422.84
\$100 Billion Level	\$7,234.65	\$6,213.09	\$13,447.75

Source: Master Plan and Timothy P. Ryan

In total, over the 50-year period, the coastal restoration and hurricane protection projects create an annual average of new direct spending of \$3.99 billion, new secondary spending of \$3.43 billion, for a total impact of \$7.42 billion if we invest \$50.00 billion in coastal restoration and hurricane protection over the next 50 years. If we invest \$100.00 billion, the projects create an annual average of new direct spending of \$7.23 billion, new secondary spending of \$6.21 billion, for a total impact of \$13.45 billion.

Table 30 presents the employment and earnings impacts of the proposed investment of \$50.00 billion or \$100.00 billion in coastal restoration and protection.

**TABLE 30**

**Jobs and Earnings Impact of All Components  
Annual Averages Over 50 Years**

(Earnings in millions)

<u>Category</u>	<u>Employment</u>	<u>Earnings</u>
\$50 Billion Level	67,751	\$2,305.89
\$100 Billion Level	122,331	\$4,137.43

Source: Master Plan and Timothy P. Ryan

In total, the projects create an average of 67,751 new jobs per year and total earnings of \$2.31 billion during the 50-year period of implementation if \$50.00 billion is invested. The projects create an average of 122,331 new jobs per year and total earnings of \$4.14 billion during the 50-year period of implementation if \$100.00 billion is invested.

Table 31 presents the state and local government tax impacts over the 50-year period of construction.

**TABLE 31**

**State and Local Tax Impact of All Components  
Annual Averages Over 50 Years**

(in millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$174.79	\$295.45	\$470.24
\$100 Billion Level	\$315.22	\$533.46	\$848.68

Source: Master Plan and Timothy P. Ryan



On average, over the 50-year period, the four components will create \$174.79 million of new local tax revenues per year and \$295.45 million of new State tax revenues annually for a total of \$470.24 million of new annual tax revenue for state and local governments in Louisiana over the 50-year period of construction if \$50.00 billion is invested. If the initial investment is \$100.00 billion, the four components will create \$315.22 million of new local tax revenues per year and \$533.46 million of new State tax revenues annually for a total of \$848.68 million of new annual tax revenue for state and local governments in Louisiana over the 50-year period of construction. Table 32 presents a summary of the total impacts on an annual basis during the construction period.

**TABLE 32**

**Summary of All Impacts  
Annual Averages Over 50 Years**

(Dollar figures in millions)

Impact	Low Estimate	Mid Estimate
Direct Spending	\$3,989.16	\$7,234.65
Secondary Spending	\$3,433.68	\$6,213.09
Total Spending	\$7,422.84	\$13,447.75
Jobs Created	67,751	122,331
Earnings	\$2,305.89	\$4,137.43
Local Tax Revenue	\$174.79	\$315.22
State Tax Revenue	\$295.45	\$533.46
Total Tax Revenue	\$470.24	\$848.68

Source: Master Plan and Timothy P. Ryan

## Permanent Impacts of All Components

Tables 33 through 36 present the total economic impacts of all four components on a permanent basis. These tables represent the future of the Louisiana economy.

**TABLE 33**

**Spending Impact of All Components  
Annual Permanent Impacts**

(in millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$6,720.30	\$5,634.12	\$12,354.42
\$100 Billion Level	\$13,245.02	\$11,001.97	\$24,246.99

Source: Master Plan and Timothy P. Ryan

Once the 50-year period is complete, the coastal restoration efforts will create new permanent direct spending of \$6.72 billion annually which will create an additional \$5.63 billion in secondary spending for an average annual spending impact of \$12.35 billion in the Louisiana economy if \$50.00 billion is spent. If the spending level is \$100.00 billion, the coastal restoration efforts will create new permanent direct spending of \$13.25 billion annually which will create an additional \$11.00 billion in secondary spending for an average annual spending impact of \$24.25 billion in the Louisiana economy. The investment of \$50.00 billion or \$100.00 billion in restoring our coasts and protecting the residents against storm damage will create billions of dollars of new spending in the Louisiana economy on a permanent basis.

Table 34 presents the employment and earnings impact of the investments.

**TABLE 34**

**Employment and Earnings Impact of All Components  
Annual Permanent Impacts**

(Earnings in millions)

<u>Category</u>	<u>Employment</u>	<u>Earnings</u>
\$50 Billion Level	109,360	\$3,612.25
\$100 Billion Level	212,684	\$7,015.63

Source: Master Plan and Timothy P. Ryan

Once the 50-year construction period is complete, the science and engineering spending will create an annual average of \$3.61 billion or \$7.01 billion respectively in earnings for Louisiana residents depending on the magnitude of the initial investment. **That spending will support an average of 109,360 or 212,684 new jobs per year at the \$50.00 billion level or at the \$100.00 billion level.**

Table 35 presents the state and local tax revenue impacts.

**TABLE 35**

**State and Local Tax Impact of All Components  
Annual Permanent Impacts**

(in millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$280.53	\$476.90	\$757.43
\$100 Billion Level	\$545.44	\$927.48	\$1,472.91

Source: Master Plan and Timothy P. Ryan

On a permanent basis, the coastal restoration and protection efforts will create \$280.53 million annually of new local tax revenues and \$476.90 million of new State tax revenue, for a total of \$757.43 million in new annual state and local tax revenues at the \$50.00 billion level. At the \$100.00 billion level, the efforts will create \$545.44 million of new local tax revenues and \$927.48 million of new State tax revenue, for a total of \$1.47 billion in new annual state and local tax revenues.

Table 36 presents a summary of the permanent employment impacts by Component.

### TABLE 36

#### Summary of All Impacts Annual Permanent Impacts

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$6,720.30	\$13,245.02
Secondary Spending	\$5,634.12	\$11,001.97
Total Spending	\$12,354.42	\$24,246.99
Jobs Created	109,360	212,684
Earnings	\$3,612.25	\$7,015.63
Local Tax Revenue	\$280.53	\$545.44
State Tax Revenue	\$476.90	\$927.48
Total Tax Revenue	\$757.43	\$1,472.91

Source: Master Plan and Timothy P. Ryan

## Comparisons

In a study as complicated and comprehensive as this one, it is useful to provide a frame of reference or comparisons, if available. The creation of over 100,000 permanent new jobs in Louisiana is clearly a significant economic engine. However, if one looks at the total in comparison to the damage that one storm – Hurricane Katrina – did to the Louisiana economy, the 109,360 new jobs total is certainly reasonable.

The New Orleans MSA had 604,500 people working in the quarter before Katrina hit. [Source: University of New Orleans Division of Business and Economic Research, Metropolitan Report, August 2013.] In that same quarter of 2013, there were only 532,000 people employed in the area. Thus, after the spending of over \$40 billion dollars of recovery money, the MSA still has lost 72,500 permanent jobs. Clearly, the creation of 109,360 new jobs as a result of spending \$50.00 billion to rebuild land and protect not only New Orleans but also the rest of coastal Louisiana from further damage is reasonable.

The Master Plan identifies several studies that attempt to estimate the job creation impact of spending money on coastal restoration and hurricane protection. One study, done by Duke University, projects that in order to create new jobs, Louisiana needs to maintain a steady investment in restoration efforts so that relevant firms will have an incentive to scale up their investments. [Source: Master Plan, Page 170.]

A second study, done by Restore America's Estuaries found that restoring our coasts can create more than 30 jobs for each million dollars invested. [Source: Master Plan, Page 170.] Extrapolating that total to the proposed spending of the smaller of the two spending targets -- \$50.00 billion -- (and discounting by 70% to account for economies of scale) produces an estimate of the creation of 450,000 jobs in the Louisiana economy.

A third study, done by LSU/Louisiana Workforce Commission, concluded that the \$618 million spent by the State of Louisiana in 2010 on coastal restoration created a total of 8,900 jobs in the State. Extrapolating that to the \$50.00 billion and discounting by 70% for economies of scale produces a job impact of 212,019.

The estimate of this report – 109,360 new jobs at the \$50.00 billion level – is clearly conservative and any rational reader would conclude that the actual jobs impact would be larger.

Finally, some mention must be made of the claim made by some that the oil and gas industry will remove jobs out of Louisiana if any attempt to get funds from the

industry goes forward. It is hard to believe that this will actually happen. The oil and gas industry has been in Louisiana for 100 years, extracting natural gas and oil from our State because it is profitable to do so. Even in the face of a lawsuit, it will remain profitable to do so. It defies economic logic for a profit maximizing business to make a decision that is clearly not in its own best interests. However, if such a decision were made, the impact of the spending of \$50.00 million on coastal restoration is still the better economic alternative for Louisiana. Counting all direct and secondary jobs, the oil and gas industry currently accounts for 35,482 jobs in the State of Louisiana. We all hope that we will retain all of those jobs and produce more as the State and the oil industry works together to solve the number one problem facing the State of Louisiana.

## **Conclusion**

The case could not be clearer. Louisiana has a chance now to address the number one social and economic issue facing the people of Louisiana – restoring our coast. From an economic point of view, it must happen.

The economic benefits of investing \$50.00 billion to \$100.00 billion in coastal restoration and hurricane protection are significant. Once the 50-year construction period is complete, the science and engineering spending will create an annual average of \$3.61 billion or \$7.01 billion respectively in earnings for Louisiana residents depending on the magnitude of the initial investment. **That spending will support an average of 109,360 or 212,684 new jobs per year at the \$50.00 billion level or at the \$100.00 billion level.**

# Appendix A

(Low Estimates)

## TABLE A1

### Spending Impact of Hard Construction Costs Annual Averages Over 50 Years -- Low

(In millions)

Scenario	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$704.00	\$657.32	\$1,361.32
\$100 Billion Level	\$1,408.00	\$1,314.65	\$2,722.65

Source: Master Plan and Timothy P. Ryan

## TABLE A2

### Employment and Earnings Impact of Hard Construction Costs Annual Averages Over 50 years -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	13,328	\$446.48
\$100 Billion Level	26,657	\$892.95

Source: Master Plan and Timothy P. Ryan



### TABLE A3

#### State and Local Tax Impact of Hard Construction Costs Annual Averages Over 50 years -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$34.28	\$58.12	\$92.40
\$100 Billion Level	\$68.56	\$116.25	\$184.81

Source: Master Plan and Timothy P. Ryan

### TABLE A4

#### Summary of Construction Impacts Annual Averages Over 50 Years -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$704.00	\$1,408.00
Secondary Spending	\$657.32	\$1,314.65
Total Spending	\$1,361.32	\$2,722.65
Jobs Created	13,328	26,657
Earnings	\$446.48	\$892.95
Local Tax Revenue	\$34.28	\$68.56
State Tax Revenue	\$58.12	\$116.25
Total Tax Revenue	\$92.40	\$184.81

Source: Master Plan and Timothy P. Ryan

## TABLE A5

### Spending Impact of Coastal Science Annual Averages Over 50 Years -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$706.14	\$659.32	\$1,365.46
\$100 Billion Level	\$981.59	\$916.51	\$1,898.10

Source: Master Plan and Timothy P. Ryan

## TABLE A6

### Jobs and Earnings of Coastal Science Annual Averages Over 50 Years -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	13,369	\$447.83
\$100 Billion Level	18,584	\$622.52

Source: Master Plan and Timothy P. Ryan

## TABLE A7

### State and Local Tax Impact of Coastal Science Annual Averages Over 50 Years -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$34.39	\$58.30	\$92.68
\$100 Billion Level	\$47.80	\$81.04	\$128.84

Source: Master Plan and Timothy P. Ryan

## TABLE A8

### Summary of Coastal Science Impacts Annual Averages Over 50 Years -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$706.14	\$981.59
Secondary Spending	\$659.32	\$916.51
Total Spending	\$1,365.46	\$1,898.10
Jobs Created	13,369	18,584
Earnings	\$447.83	\$622.52
Local Tax Revenue	\$34.39	\$47.80
State Tax Revenue	\$58.30	\$81.04
Total Tax Revenue	\$92.68	\$128.84

Source: Master Plan and Timothy P. Ryan

## TABLE A9

### Spending Impact of Coastal Science Annual Permanent Impacts -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,076.71	\$1,005.33	\$2,082.04
\$100 Billion Level	\$1,435.62	\$1,340.43	\$2,776.05

Source: Master Plan and Timothy P. Ryan

## TABLE A10

### Jobs and Earnings Impact of Coastal Science Annual Permanent Impacts -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	20,385	\$682.85
\$100 Billion Level	27,180	\$910.47

Source: Master Plan and Timothy P. Ryan

## TABLE A11

### State and Local Tax Impact of Coastal Science Annual Permanent Impacts -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$52.43	\$88.89	\$141.33
\$100 Billion Level	\$69.91	\$118.53	\$188.43

Source: Master Plan and Timothy P. Ryan

## TABLE A12

### Summary of Coastal Science Impacts Annual Permanent Impacts -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,076.71	\$1,435.62
Secondary Spending	\$1,005.33	\$1,340.43
Total Spending	\$2,082.04	\$2,776.05
Jobs Created	20,385	27,180
Earnings	\$682.85	\$910.47
Local Tax Revenue	\$52.43	\$69.91
State Tax Revenue	\$88.89	\$118.53
Total Tax Revenue	\$141.33	\$188.43

Source: Master Plan and  
Timothy P. Ryan

## TABLE A13

### Spending Impact of Insurance Benefits Annual Averages Over 50 years -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$852.13	\$454.10	\$1,306.23
\$100 Billion Level	\$1,625.69	\$866.33	\$2,492.01

Source: Master Plan and Timothy P. Ryan

## TABLE A14

### Jobs and Earnings of Insurance Benefits Annual Averages Over 50 years -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	11,743	\$454.83
\$100 Billion Level	22,404	\$867.72

Source: Master Plan and Timothy P. Ryan

## TABLE A15

### State and Local Tax Impact of Insurance Benefits Annual Averages Over 50 Years -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$31.10	\$51.21	\$82.31
\$100 Billion Level	\$59.34	\$97.70	\$157.04

Source: Master Plan and Timothy P. Ryan

## TABLE A16

### Summary of Insurance Impacts Annual Averages Over 50 Years -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$852.13	\$1,625.69
Secondary Spending	\$454.10	\$866.33
Total Spending	\$1,306.23	\$2,492.01
Jobs Created	11,743	22,404
Earnings	\$454.83	\$867.72
Local Tax Revenue	\$31.10	\$59.34
State Tax Revenue	\$51.21	\$97.70
Total Tax Revenue	\$82.31	\$157.04

Source: Master Plan and Timothy P. Ryan

## TABLE A17

### Spending Impact of Insurance Benefits Annual Permanent Impacts -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$2,056.92	\$1,096.13	\$3,153.05
\$100 Billion Level	\$4,382.38	\$2,335.36	\$6,717.75

Source: Master Plan and Timothy P. Ryan

## TABLE A18

### Jobs and Earnings of Insurance Benefits Annual Permanent Impacts -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	28,346	\$1,097.89
\$100 Billion Level	60,394	\$2,339.12

Source: Master Plan and Timothy P. Ryan



## TABLE A19

### State and Local Tax Impact of Insurance Benefits Annual Permanent Impacts -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$75.08	\$123.61	\$198.69
\$100 Billion Level	\$159.96	\$263.37	\$423.32

Source: Master Plan and Timothy P. Ryan

## TABLE A20

### Summary of Insurance Impacts Annual Permanent Impacts -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$2,056.92	\$4,382.38
Secondary Spending	\$1,096.13	\$2,335.36
Total Spending	\$3,153.05	\$6,717.75
Jobs Created	28,346	60,394
Earnings	\$1,097.89	\$2,339.12
Local Tax Revenue	\$75.08	\$159.96
State Tax Revenue	\$123.61	\$263.37
Total Tax Revenue	\$198.69	\$423.32

Source: Master Plan and Timothy P. Ryan

## TABLE A21

### Spending Impact of Reducing Uninsured Losses Annual Averages Over 50 Years -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$929.06	\$756.72	\$1,685.78
\$100 Billion Level	\$1,772.45	\$1,443.66	\$3,216.11

Source: Master Plan and Timothy P. Ryan

## TABLE A22

### Jobs and Earnings Impact of Reducing Uninsured Losses Annual Averages Over 50 Years -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	14,500	\$476.89
\$100 Billion Level	27,663	\$909.80

Source: Master Plan and Timothy P. Ryan

## TABLE A23

### State and Local Tax Impact of Uninsured Losses Annual Averages Over 50 Years -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$37.17	\$63.23	\$100.40
\$100 Billion Level	\$70.90	\$120.63	\$191.54

Source: Master Plan and Timothy P. Ryan

## TABLE A24

### Summary of Storm Reducing Uninsured Losses Annual Averages Over 50 Years -- Low

(Dollar figures in millions)

Impact	Low Estimate	Mid Estimate
Direct Spending	\$929.06	\$1,772.45
Secondary Spending	\$756.72	\$1,443.66
Total Spending	\$1,685.78	\$3,216.11
Jobs Created	14,500	27,663
Earnings	\$476.89	\$909.80
Local Tax Revenue	\$37.17	\$70.90
State Tax Revenue	\$63.23	\$120.63
Total Tax Revenue	\$100.40	\$191.54

Source: Master Plan and Timothy P. Ryan

## TABLE A25

### Spending Impact of Reducing Uninsured Losses Annual Permanent Impacts -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$2,242.61	\$1,826.61	\$4,069.22
\$100 Billion Level	\$4,778.02	\$3,891.69	\$8,669.71

Source: Master Plan and Timothy P. Ryan

## TABLE A26

### Jobs and Earnings Impact of Reducing Uninsured Losses Annual Permanent Impacts -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	35,001	\$1,151.13
\$100 Billion Level	74,571	\$2,452.56

Source: Master Plan and Timothy P. Ryan

## TABLE A27

### State and Local Tax Impact of Uninsured Losses Annual Permanent Impacts -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$89.71	\$152.63	\$242.34
\$100 Billion Level	\$191.13	\$325.19	\$516.33

Source: Master Plan and Timothy P. Ryan

## TABLE A28

### Summary of Storm Reducing Uninsured Losses Annual Permanent Impacts -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$2,242.61	\$4,778.02
Secondary Spending	\$1,826.61	\$3,891.69
Total Spending	\$4,069.22	\$8,669.71
Jobs Created	35,001	74,571
Earnings	\$1,151.13	\$2,452.56
Local Tax Revenue	\$89.71	\$191.13
State Tax Revenue	\$152.63	\$325.19
Total Tax Revenue	\$242.34	\$516.33

Source: Master Plan and Timothy P. Ryan

## TABLE A29

### Spending Impact of All Components Annual Averages Over 50 Years -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$3,191.33	\$2,310.64	\$5,501.97
\$100 Billion Level	\$5,787.72	\$4,127.50	\$9,915.22

Source: Master Plan and Timothy P. Ryan

## TABLE A30

### Jobs and Earnings Impact of All Components Annual Averages Over 50 Years -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	51,535	\$1,841.77
\$100 Billion Level	92,625	\$3,323.04

Source: Master Plan and Timothy P. Ryan

## TABLE A31

### State and Local Tax Impact of All Components Annual Averages Over 50 Years -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$134.24	\$224.73	\$358.97
\$100 Billion Level	\$241.46	\$403.92	\$645.38

Source: Master Plan and Timothy P. Ryan

## TABLE A32

### Summary of All Impacts Annual Averages Over 50 Years -- Low

(Dollar figures in millions)

Impact	Low Estimate	Mid Estimate
Direct Spending	\$3,191.33	\$5,787.72
Secondary Spending	\$2,310.64	\$4,127.50
Total Spending	\$5,501.97	\$9,915.22
Jobs Created	51,535	92,625
Earnings	\$1,841.77	\$3,323.04
Local Tax Revenue	\$134.24	\$241.46
State Tax Revenue	\$224.73	\$403.92
Total Tax Revenue	\$358.97	\$645.38

Source: Master Plan and Timothy P. Ryan

### TABLE A33

#### Spending Impact of All Components Annual Permanent Impacts -- Low

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$5,376.24	\$3,404.69	\$8,780.93
\$100 Billion Level	\$10,596.02	\$6,452.42	\$17,048.43

Source: Master Plan and Timothy P. Ryan

### TABLE A34

#### Employment and Earnings Impact of All Components Annual Permanent Impacts -- Low

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	80,338	\$2,969.89
\$100 Billion Level	154,913	\$5,783.14

Source: Master Plan and Timothy P. Ryan



## TABLE A35

### State and Local Tax Impact of All Components Annual Permanent Impacts -- Low

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$210.71	\$350.34	\$561.05
\$100 Billion Level	\$407.13	\$675.55	\$1,082.68

Source: Master Plan and Timothy P. Ryan

## TABLE A36

### Summary of All Impacts Annual Permanent Impacts -- Low

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$5,376.24	\$10,596.02
Secondary Spending	\$3,404.69	\$6,452.42
Total Spending	\$8,780.93	\$17,048.43
Jobs Created	80,338	154,913
Earnings	\$2,969.89	\$5,783.14
Local Tax Revenue	\$210.71	\$407.13
State Tax Revenue	\$350.34	\$675.55
Total Tax Revenue	\$561.05	\$1,082.68

Source: Master Plan and Timothy P. Ryan

# Appendix B

## (High Estimates)

## Table B1

### Spending Impact of Hard Construction Costs Annual Averages Over 50 Years -- High

(In millions)

Scenario	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,056.00	\$985.99	\$2,041.99
\$100 Billion Level	\$2,112.00	\$1,971.97	\$4,083.97

Source: Master Plan and Timothy P. Ryan

## Table B2

### Employment and Earnings Impact of Hard Construction Costs Annual Averages Over 50 Years -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	19,993	\$669.72
\$100 Billion Level	39,985	\$1,339.43

Source: Master Plan and Timothy P. Ryan

### Table B3

#### State and Local Tax Impact of Hard Construction Costs Annual Averages Over 50 Years -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$51.42	\$87.18	\$138.61
\$100 Billion Level	\$102.84	\$174.37	\$277.21

Source: Master Plan and Timothy P. Ryan

### Table B4

#### Summary of Construction Impacts Annual Averages Over 50 Years -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,056.00	\$2,112.00
Secondary Spending	\$985.99	\$1,971.97
Total Spending	\$2,041.99	\$4,083.97
Jobs Created	19,993	39,985
Earnings	\$669.72	\$1,339.43
Local Tax Revenue	\$51.42	\$102.84
State Tax Revenue	\$87.18	\$174.37
Total Tax Revenue	\$138.61	\$277.21

Source: Master Plan and Timothy P. Ryan

## Table B5

### Spending Impact of Coastal Science Annual Averages Over 50 Years -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,059.21	\$988.98	\$2,048.19
\$100 Billion Level	\$1,472.38	\$1,374.76	\$2,847.15

Source: Master Plan and Timothy P. Ryan

## Table B6

### Jobs and Earnings of Coastal Science Annual Averages Over 50 Years -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	20,053	\$671.75
\$100 Billion Level	27,876	\$933.79

Source: Master Plan and Timothy P. Ryan

## Table B7

### State and Local Tax Impact of Coastal Science Annual Averages Over 50 Years -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$51.58	\$87.45	\$139.03
\$100 Billion Level	\$71.70	\$121.56	\$193.26

Source: Master Plan and Timothy P. Ryan

## Table B8

### Summary of Coastal Science Impacts Annual Averages Over 50 Years -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,059.21	\$1,472.38
Secondary Spending	\$988.98	\$1,374.76
Total Spending	\$2,048.19	\$2,847.15
Jobs Created	20,053	27,876
Earnings	\$671.75	\$933.79
Local Tax Revenue	\$51.58	\$71.70
State Tax Revenue	\$87.45	\$121.56
Total Tax Revenue	\$139.03	\$193.26

Source: Master Plan and Timothy P. Ryan

## Table B9

### Spending Impact of Coastal Science Annual Permanent Impacts -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,615.07	\$1,507.99	\$3,123.06
\$100 Billion Level	\$2,153.42	\$2,010.65	\$4,164.08

Source: Master Plan and Timothy P. Ryan

## Table B10

### Jobs and Earnings Impact of Coastal Science Annual Permanent Impacts -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	30,577	\$1,024.28
\$100 Billion Level	40,770	\$1,365.70

Source: Master Plan and Timothy P. Ryan

## Table B11

### State and Local Tax Impact of Coastal Science Annual Permanent Impacts -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$78.65	\$133.34	\$211.99
\$100 Billion Level	\$104.86	\$177.79	\$282.65

Source: Master Plan and Timothy P. Ryan

## Table B12

### Summary of Coastal Science Impacts Annual Permanent Impacts -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,615.07	\$2,153.42
Secondary Spending	\$1,507.99	\$2,010.65
Total Spending	\$3,123.06	\$4,164.08
Jobs Created	30,577	40,770
Earnings	\$1,024.28	\$1,365.70
Local Tax Revenue	\$78.65	\$104.86
State Tax Revenue	\$133.34	\$177.79
Total Tax Revenue	\$211.99	\$282.65

Source: Master Plan and Timothy P. Ryan



### Table B13

#### Spending Impact of Insurance Benefits -- Annual Averages Annual Averages Over 50 Years -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,278.20	\$681.15	\$1,959.34
\$100 Billion Level	\$2,438.53	\$1,299.49	\$3,738.02

Source: Master Plan and Timothy P. Ryan

### Table B14

#### Jobs and Earnings of Insurance Benefits -- Annual Average Annual Averages Over 50 Years -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	17,615	\$682.24
\$100 Billion Level	33,605	\$1,301.58

Source: Master Plan and Timothy P. Ryan

## Table B15

### State and Local Tax Impact of Insurance Benefits -- Annual Averages Annual Averages Over 50 Years -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$46.65	\$76.82	\$123.47
\$100 Billion Level	\$89.01	\$146.55	\$235.55

Source: Master Plan and Timothy P. Ryan

## Table B16

### Summary of Insurance Impacts -- Annual Averages Annual Averages Over 50 Years -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$1,278.20	\$2,438.53
Secondary Spending	\$681.15	\$1,299.49
Total Spending	\$1,959.34	\$3,738.02
Jobs Created	17,615	33,605
Earnings	\$682.24	\$1,301.58
Local Tax Revenue	\$46.65	\$89.01
State Tax Revenue	\$76.82	\$146.55
Total Tax Revenue	\$123.47	\$235.55

Source: Master Plan and Timothy P. Ryan

## Table B17

### Spending Impact of Insurance Benefits -- Permanent Annual Permanent Impacts -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$3,085.38	\$1,644.19	\$4,729.57
\$100 Billion Level	\$6,573.58	\$3,503.05	\$10,076.62

Source: Master Plan and Timothy P. Ryan

## Table B18

### Jobs and Earnings of Insurance Benefits -- Permanent Annual Permanent Impacts -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	42,520	\$1,646.84
\$100 Billion Level	90,590	\$3,508.68

Source: Master Plan and Timothy P. Ryan

## Table B19

### State and Local Tax Impact of Insurance Benefits -- Permanent Annual Permanent Impacts -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$112.62	\$185.42	\$298.04
\$100 Billion Level	\$239.94	\$395.05	\$634.98

Source: Master Plan and Timothy P. Ryan

## Table B20

### Summary of Insurance Impacts -- Permanent Impacts Annual Permanent Impacts -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$3,085.38	\$6,573.58
Secondary Spending	\$1,644.19	\$3,503.05
Total Spending	\$4,729.57	\$10,076.62
Jobs Created	42,520	90,590
Earnings	\$1,646.84	\$3,508.68
Local Tax Revenue	\$112.62	\$239.94
State Tax Revenue	\$185.42	\$395.05
Total Tax Revenue	\$298.04	\$634.98

Source: Master Plan and Timothy P. Ryan

## Table B21

### Spending Impact of Reducing Uninsured Losses -- Annual Annual Averages Over 50 Years -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$1,393.59	\$1,135.08	\$2,528.67
\$100 Billion Level	\$2,658.67	\$2,165.49	\$4,824.16

Source: Master Plan and Timothy P. Ryan

## Table B22

### Jobs and Earnings Impact of Reducing Uninsured Losses -- Annual Annual Averages Over 50 Years -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	21,750	\$715.33
\$100 Billion Level	41,494	\$1,364.70

Source: Master Plan and Timothy P. Ryan

## Table B23

### State and Local Tax Impact of Uninsured Losses-- Annual Annual Averages Over 50 Years -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$55.75	\$94.85	\$150.60
\$100 Billion Level	\$106.35	\$180.95	\$287.30

Source: Master Plan and Timothy P. Ryan

## Table B24

### Summary of Storm Reducing Uninsured Losses -- Annual Annual Averages Over 50 Years -- High

(Dollar figures in millions)

Impact	Low Estimate	Mid Estimate
Direct Spending	\$1,393.59	\$2,658.67
Secondary Spending	\$1,135.08	\$2,165.49
Total Spending	\$2,528.67	\$4,824.16
Jobs Created	21,750	41,494
Earnings	\$715.33	\$1,364.70
Local Tax Revenue	\$55.75	\$106.35
State Tax Revenue	\$94.85	\$180.95
Total Tax Revenue	\$150.60	\$287.30

Source: Master Plan and Timothy P. Ryan

## Table B25

### Spending Impact of Reducing Uninsured Losses -- Permanent Annual Permanent Impacts -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$3,363.92	\$2,739.91	\$6,103.83
\$100 Billion Level	\$7,167.02	\$5,837.54	\$13,004.56

Source: Master Plan and Timothy P. Ryan

## Table B26

### Jobs and Earnings Impact of Reducing Uninsured Losses -- Permanent Annual Permanent Impacts -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	52,501	\$1,726.70
\$100 Billion Level	111,856	\$3,678.83

Source: Master Plan and Timothy P. Ryan

## Table B27

### State and Local Tax Impact of Uninsured Losses-- Permanent Annual Permanent Impacts -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$134.57	\$228.95	\$363.51
\$100 Billion Level	\$286.70	\$487.79	\$774.49

Source: Master Plan and Timothy P. Ryan

## Table B28

### Summary of Storm Reducing Uninsured Losses -- Permanent Annual Permanent Impacts -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$3,363.92	\$7,167.02
Secondary Spending	\$2,739.91	\$5,837.54
Total Spending	\$6,103.83	\$13,004.56
Jobs Created	52,501	111,856
Earnings	\$1,726.70	\$3,678.83
Local Tax Revenue	\$134.57	\$286.70
State Tax Revenue	\$228.95	\$487.79
Total Tax Revenue	\$363.51	\$774.49

Source: Master Plan and Timothy P. Ryan



## Table B29

### Spending Impact of All Components Annual Averages Over 50 Years -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$4,786.99	\$3,465.96	\$8,252.95
\$100 Billion Level	\$8,681.59	\$6,191.24	\$14,872.83

Source: Master Plan and Timothy P. Ryan

## Table B30

### Jobs and Earnings Impact of All Components Annual Averages Over 50 Years -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	77,302	\$2,762.66
\$100 Billion Level	138,937	\$4,984.56

Source: Master Plan and Timothy P. Ryan

## Table B31

### State and Local Tax Impact of All Components Annual Averages Over 50 Years -- High

(In millions)

Category	Local Tax Revenue	State Tax Revenue	State & Local Tax Revenue
\$50 Billion Level	\$201.36	\$337.10	\$538.46
\$100 Billion Level	\$362.18	\$605.88	\$968.06

Source: Master Plan and Timothy P. Ryan

## Table B32

### Summary of All Impacts Annual Averages Over 50 Years -- High

(Dollar figures in millions)

Impact	Low Estimate	Mid Estimate
Direct Spending	\$4,786.99	\$8,681.59
Secondary Spending	\$3,465.96	\$6,191.24
Total Spending	\$8,252.95	\$14,872.83
Jobs Created	77,302	138,937
Earnings	\$2,762.66	\$4,984.56
Local Tax Revenue	\$201.36	\$362.18
State Tax Revenue	\$337.10	\$605.88
Total Tax Revenue	\$538.46	\$968.06

Source: Master Plan and Timothy P. Ryan

## Table B33

### Spending Impact of All Components Annual Permanent Impacts -- High

(In millions)

Category	Direct Spending	Secondary Spending	Total Spending
\$50 Billion Level	\$8,064.36	\$5,107.03	\$13,171.40
\$100 Billion Level	\$15,894.02	\$9,678.62	\$25,572.65

Source: Master Plan and Timothy P. Ryan

## Table B34

### Employment and Earnings Impact of All Components Annual Permanent Impacts -- High

(Earnings in millions)

Category	Employment	Earnings
\$50 Billion Level	120,507	\$4,454.84
\$100 Billion Level	232,370	\$8,674.71

Source: Master Plan and Timothy P. Ryan

## Table B35

### State and Local Tax Impact of All Components Annual Permanent Impacts -- High

(In millions)

<u>Category</u>	<u>Local Tax Revenue</u>	<u>State Tax Revenue</u>	<u>State &amp; Local Tax Revenue</u>
\$50 Billion Level	\$316.06	\$525.51	\$841.57
\$100 Billion Level	\$610.69	\$1,013.32	\$1,624.02

Source: Master Plan and Timothy P. Ryan

## Table B36

### Summary of All Impacts Annual Permanent Impacts -- High

(Dollar figures in millions)

Impact	\$50 Billion Level	\$100 Billion Level
Direct Spending	\$8,064.36	\$15,894.02
Secondary Spending	\$5,107.03	\$9,678.62
Total Spending	\$13,171.40	\$25,572.65
Jobs Created	120,507	232,370
Earnings	\$4,454.84	\$8,674.71
Local Tax Revenue	\$316.06	\$610.69
State Tax Revenue	\$525.51	\$1,013.32
Total Tax Revenue	\$841.57	\$1,624.02

Source: Master Plan and Timothy P. Ryan