APPENDIX P
REGIONAL ECONOMIC DEVELOPMENT ANALYSIS

Appendix P
Comprehensive Environmental Document Phase II
Greater New Orleans Hurricane Storm Damage and Risk Reduction System
Regional Economic Development (RED) Analysis

Background

This analysis estimates the regional economic development (RED) effects of implementing the components of the HSDRRS. The Regional Economic System (RECONS) impact area of the New Orleans metropolitan statistical areas was selected based on the labor market, commuter-shed, and population centers serving the project area. According to RECONS' 2008 data, the population of the study area is 1,166,214. The number of households is 437,374. Total personal income is $50,818 million (table 1).

Table 1
CED
Study Area

County	Area (mi^2)	Population	Households	Total Personal Income (1,000,000)
Jefferson	496	439,261	169,681	$19,446
Orleans	349	326,968	124,294	$15,261
Plaquemines	1,041	27,039	9,364	$895
St Bernard	488	29,365	11,218	$1,224
St Charles	410	53,810	18,475	$1,969
St John The Baptist	348	48,996	16,546	$1,618
St Tammany	1,110	240,775	87,796	$10,406
Total	**4,243**	**1,166,214**	**437,374**	**$50,818**

Total Personal Income includes all income received, both earned and unearned.

Methodology:

The RED analysis employs input-output economic analysis, which measures the interdependence among industries and workers in an economy. This analysis uses a matrix representation of a region's economy to predict the effect of changes in one industry on others. The greater the interdependence among industry sectors, the larger the multiplier effect on the economy. Changes to government spending drive the input-output model to project new levels of sales (output), value added (GRP), employment, and income for each industry.

The specific input-output model used in this analysis is RECONS. This model was developed by the Institute for Water Resources (IWR), Michigan State University, and the Louis Berger Group. RECONS uses industry multipliers derived from the commercial input-output model IMPLAN to

estimate the effects that spending on USACE projects has on a regional economy. The model is linear and static, showing relationships and impacts at a certain fixed point in time. Spending impacts are composed of three different effects: direct, indirect, and induced.

Direct effects represent the impacts the new federal expenditures have on industries which directly support the new project. Labor and construction materials can be considered direct components to the project. Indirect effects represent changes to secondary industries that support the direct industries. Induced effects are changes in consumer spending patterns caused by the change in employment and income within the industries affected by the direct and induced effects. The additional income workers receive via a project may be spent on clothing, groceries, dining out, and other items in the regional area.

The inputs for the RECONS model are expenditures that are entered by work activity or industry sector, each with its own unique production function. See table 2 for the breakdown of sectors. The baseline data used by RECONS to represent the regional economy of Louisiana are annual averages from the Bureau of the Census, the Bureau of Labor Statistics, and the Bureau of Economic Analysis for the year 2008. The model results are expressed in 2014 dollars.

Table 2
Input Spending Assumptions

Category	Percentage	Spending
Aggregate Materials	10.07%	$ 1,203,679,271
Cement Materials	0.67%	$80,603,468
Construction Labor	32.45%	$3,880,023,680
Construction of Other New Nonresidential Structures	0.00%	$387,537
Equipment	31.86%	$3,809,719,200
Industrial and Machinery Equipment Rental and Leasing	0.01%	$660,126
Lumber Materials	0.17%	$20,150,867
Metals and Steel Materials	1.52%	$181,433,340
Other Materials	1.39%	$165,927,195
Planning, Environmental, Engineering and Design Studies and Services	0.11%	$12,934,792
Private Sector Labor or Staff Augmentation	0.01%	$666,694
Repair and Maintenance Construction Activities	0.01%	$738,947
Repair and Maintenance of Levees and Floodwalls	21.61%	$2,583,996,000
USACE Overhead	0.05%	$5,457,891
USACE Wages and Benefits	0.09%	$11,063,522
Total	100%	$11,957,442,530

Assumptions

Input-output analysis rests on the following assumptions. The production functions of industries have constant returns to scale, so if output is to increase, inputs will increase in the same proportion. Industries face no supply constraints; they have access to all the materials they can use. Industries have a fixed commodity input structure; they will not substitute any commodities or services used in the production of output in response to price changes. Industries produce their commodities in fixed proportions, so an industry will not increase production of a commodity without increasing production in every other commodity it produces. Furthermore, it is assumed that industries use the same technology to

produce all of its commodities. Finally, since the model is static, it is assumed that the economic conditions of 2008, the year of the socio-economic data in the RECONS model database, will prevail during the years of the construction process.

Description of metrics

"Output" is the sum total of transactions that take place as a result of the construction project, including both value added and intermediate goods purchased in the economy. "Labor Income" includes all forms of employment income, including employee compensation (wages and benefits) and proprietor income. "Gross Regional Product (GRP)" is the value-added output of the study regions. This metric captures all final goods and services produced in the study areas because of the project's existence. It is different from output in the sense that one dollar of a final good or service may have multiple transactions associated with it. "Jobs" is the estimated worker-years of labor required to build the project.

Results

For the region including the study area, the construction stimulus of $11,957,422,530 has generated 182,553 worker-years of labor, $9,237,425,543 in labor income, $18,767,621,427 in output, and $12,549,863,287 in Gross Regional Product. For the state of Louisiana as a whole, the construction stimulus would generate 194,141 worker-years of labor, $9,716,436,624 in labor income, $20,341,170,507 in output, and $13,373,115,470 in Gross Regional Product (see table 3).

The impact area captures about 87% of the direct spending on the project. About 6% of the spending leaks out into other parts of the state of Louisiana. The rest of the nation captures about 6%.

The secondary impacts, the combined indirect and induced multiplier effects, account for nearly 44% of the total output, about 34% of jobs, 33% of labor income, and almost 41% of gross regional product in the impact area.

Table 3
Summary of Economic Impacts

	Regional	State	National
Spending	$11,957,442,528	$11,957,442,528	$11,957,442,528
Direct Impact			
Output	$10,424,493,728	$11,073,789,799	$11,886,548,732
Jobs	121,330	123,919	128,074
Labor Income	$6,189,020,459	$6,369,995,979	$6,703,951,751
GRP	$7,441,091,627	$7,799,982,597	$8,241,535,049
Secondary Impacts			
Output	$8,343,127,699	$9,267,380,708	$19,920,464,235
Jobs	61,223	70,222	124,063
Labor Income	$3,048,405,084	$3,346,440,645	$6,626,219,550

GRP	$5,108,771,660	$5,573,132,873	$11,408,378,676
Total Impact			
Output	$18,767,621,427	$20,341,170,507	$31,807,012,967
Jobs	182,553	194,141	252,137
Labor Income	$9,237,425,543	$9,716,436,624	$13,330,171,301
GRP	$12,549,863,287	$13,373,115,470	$19,649,913,725

Results reflect the totals for the parishes shown on Table 1.

In addition to the construction expenditures above, an additional $481 million is projected to be spent through FY18 on levee armoring and environmental mitigation. The results are shown in Table 4. This additional spending creates an additional 6,396 jobs from 2015 to 2018.

Table 4
Summary of Economic Impacts

	Regional	**State**	**National**
Spending	$481,642,900	$481,642,900	$481,642,900
Direct Impact			
Output	$407,864,413	$441,296,037	$480,336,295
Jobs	3,937	4,183	4,529
Labor Income	$244,690,472	$267,875,522	$285,584,031
GRP	$281,453,213	$308,403,889	$328,691,861
Secondary Impacts			
Output	$330,242,834	$364,035,058	$818,423,791
Jobs	2,459	2,802	5,050
Labor Income	$123,402,846	$134,020,808	$270,075,137
GRP	$204,783,772	$222,806,548	$466,255,402
Total Impact			
Output	$738,107,247	$805,331,095	$1,298,760,086
Jobs	6,396	6,985	9,579
Labor Income	$368,093,318	$401,896,330	$555,659,168
GRP	$486,236,985	$531,210,437	$794,947,263