Appendix J

UPDATE OF THE ECONOMIC BENEFITS OF THE DISTRICT'S WATERWAYS IN ST. LUCIE COUNTY

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (cont'd)

LIST OF FIGURES

I. INTRODUCTION

The economic benefits of marine-related activities on the Florida Inland Navigation District's (the District) Waterways in St. Lucie County were estimated in *An Economic Analysis of the District's Waterways in St. Lucie County,* dated June 2001 (referred to as the original analysis). Benefits were estimated for existing conditions and two Waterways maintenance scenarios, one assuming a cessation of maintenance and another assuming a higher state of maintenance. The purpose of this analysis is to update the economic benefits of the Waterways in St. Lucie County, as presented in the original analysis, to current values using industry accepted methods. The impact of the 2007-2009 U.S. economic recession on marine-related businesses in the county are also estimated. In addition, fuel taxes and sales tax revenues attributable to activities associated with the Waterways, which were not estimated in the original analysis, are estimated in this analysis. For the purpose of this report, the District's Waterways (the Waterways) are defined as all navigable waterways within the District's boundaries, including the Intracoastal Waterway and all waterways that are physically connected to it.

The purpose of the original analysis was twofold: (1) to identify and quantify the total economic benefits of the Waterways in the county; and (2) to estimate the influence of the Waterways on property values in the county. The original analysis included an explanation of economic benefits, a literature review of economic benefits of marine activities in Florida and in other states, an explanation of the methods used in estimating economic benefits, details of the data collection and manipulation required for the analysis, quantification of direct marine-related business purchases, and estimation of the economic benefits of the Waterways under existing conditions, assuming a cessation of maintenance, and assuming a higher state of maintenance. For this updated analysis, the estimation of the influence of the Waterways on property values in the county will not be addressed.

As the local sponsor of the Waterways, the District shares in the responsibility for the operation and maintenance of the Waterways. With reduced federal funding, the local sponsors of the nation's inland navigation systems are being required to shoulder a larger portion of the maintenance costs. The District has made a decision not to let the Waterways deteriorate by deferring maintenance projects and has elected instead to fund this budgetary shortfall. To meet these responsibilities, the District may invest up to $800 million in maintaining and operating the

Waterways over the next 50 years. With such a large potential investment, the District needs to inform the general public as well as federal, state, and local public officials regarding the economic importance of expending these monies to meet the new needs of the Waterways. This update is intended to address that need.

This analysis is divided into three sections: (1) this introduction; (2) a summary of the findings of the original analysis; and (3) the update of the economic benefits of the Waterways under four scenarios. Section I includes an introduction to the report, a summary of the findings, and a description of the Intracoastal Waterway in St. Lucie County.

Section II summarizes the findings of the original analysis as presented in *An Economic Analysis of the District's Waterways in St. Lucie County*, dated June 2001. Economic benefits are estimated for each of the three scenarios evaluated: (1) prior existing conditions (at the time of the original analysis in 1999); (2) assuming a cessation of maintenance; and (3) assuming a higher state of maintenance. The benefits are presented as measured by changes in business volume, personal income, and jobs.

Section III presents the methodology and findings of the update of the economic benefits of the Waterways. Updated impacts for four scenarios are presented: (1) current existing conditions (which have been affected by the recession); (2) assuming a cessation of maintenance; (3) assuming a higher state of maintenance; and (4) assuming that the 2007-2009 U.S. economic recession did not occur. Impacts are measured as changes in business volume, personal income, jobs, and tax revenues.

Summary of Findings

A summary of the findings of the economic benefits of the four scenarios evaluated are presented in Table J-1. Current updated benefits in 2010 dollars include $186.3 million in business volume, $45.6 million in personal income, 1,184 jobs, and $8.3 million in tax revenues. Compared to the findings in the original analysis, this is a decrease of $77.2 million in business volume, $21.1 million in personal income, and 1,175 jobs. The decrease in benefits is primarily due to decreased spending on marine-related activities in response to the 2007-2009 U.S. economic recession. Tax revenues were not estimated in the original analysis. The economic benefits of the Waterways assuming decreased maintenance of the Waterways include $95.7 million in business volume, $21.9 million in personal income, 569 jobs, and $4.5 million

in tax revenues. This is a 45 to 50 percent decrease in benefits compared to existing conditions. The economic benefits of the Waterways assuming a higher state of maintenance of the Waterways include $205.6 million in business volume, $50.4 million in personal income, 1,317 jobs, and $9.2 million in tax revenues. This is an approximately 10 percent increase in benefits compared to existing conditions. If the 2007-2009 U.S. economic recession had not occurred, economic benefits of the Waterways in 2009 would have been approximately $470.4 million in business volume, $115.4 million in personal income, 2,999 jobs, and $19.2 million in tax revenues. In other words, the recession reduced the benefits of the Waterways in St. Lucie County by $284.4 million in business volume, $69.8 million in personal income, 1,814 jobs, and $11.0 million in tax revenues.

Table J-1. Summary of Total Economic Benefits of the Waterways in St. Lucie County

Activity	Business Volume (Millions)				Personal Income (Millions)				Employment			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Current Existing Impacts	$134.46	$27.36	$24.21	**$186.03**	$28.70	$9.25	$7.66	**$45.60**	724	239	221	**1,184**
Three-Foot Draft Restriction Impacts	$70.44	$13.65	$11.61	**$95.70**	$13.54	$4.65	$3.67	**$21.86**	344	119	106	**569**
Ten-Foot Draft Restriction Impacts	$148.60	$30.23	$26.74	**$205.58**	$31.72	$10.20	$8.46	**$50.37**	809	264	244	**1,317**
Impacts Assuming No Recession	$339.87	$69.30	$61.24	**$470.42**	$72.56	$23.42	$19.37	**$115.35**	1,832	608	559	**2,999**

The Intracoastal Waterway

The Intracoastal Waterway is a 2,640-mile federally and locally maintained system of natural waterbodies and connecting canals paralleling the Atlantic and Gulf coasts of the United States that encompasses the Atlantic Intracoastal Waterway (AIWW) and the Gulf Intracoastal Waterway (GIWW). The purpose of the waterway is to provide a protected environment for vessels moving coastwise, particularly shallow-draft commercial and recreational vessels.

The Gulf Intracoastal Waterway is a 1,100-mile channel between Brownsville, Texas, and St. Marks, Florida, south of Tallahassee. The channel is 150 feet wide and 12 feet deep and runs mainly behind barrier beaches.

The Atlantic Intracoastal Waterway is a 1,391-mile channel between Trenton, New Jersey, and Miami, Florida. A southward extension from Miami to Key West was authorized but never constructed. The channels from Trenton to St. Johns River in Florida, on which Jacksonville is located, are 12 feet deep, 90 feet wide through land areas, and generally 150 or 300 feet wide in open water areas. The section from the Georgia-Florida line to St. Johns River is 125 feet wide. The channel south from St. Johns River was constructed as an independent

project under the title *Intracoastal Waterway, Jacksonville to Miami, Florida*. An early authorization called for a 12-foot by 125-foot channel throughout, but was modified to a 10-foot depth from Fort Pierce south to Miami. The project, which was completed in its modified form in 1965, is 370 miles long and follows coastal rivers and lagoons past numerous tourism-oriented communities.

The Intracoastal Waterway in St. Lucie County

The Intracoastal Waterway extends about 22 miles through St. Lucie County. The waterway enters the county at mile marker 959 in the vicinity of the Town of Lakewood Park and extends the entire length through Indian River. The shorelines of the waterway in the northern third of the county are sparsely populated. Proceeding from the north, Fort Pierce is the first major population center that is encountered on the waterway. Fort Pierce Inlet, located across the waterway from the City of Fort Pierce, is the only outlet to the Atlantic Ocean in the county. South of Fort Pierce, the shorelines are sparsely populated to Port St. Lucie, which is located on the southern boundary of the county.

II. SUMMARY OF FINDINGS OF THE ORIGINAL ANALYSIS

Under existing conditions, the original analysis estimated that the 125 marine-related businesses in St. Lucie County generated direct sales of $186.5 million in 1999. A regional economic impact model (IMPLAN) was used to estimate the direct, indirect, and induced (total) benefits of the marine businesses. The total benefits of marine-related businesses in 1999 were estimated as $253.4 million in business sales, $62.5 million in personal income, and 2,186 jobs. The direct business volume benefits from the original analysis, as presented in Table J-2, were adjusted to reflect the same basis as the direct business volume benefits presented in the updated analysis. In the original analyses conducted before 2007, only the margined portion (that portion that remains in the region to generate indirect and induced benefits) of the retail and wholesale trade business volume was reported in the final report. Subsequent to 2007, the total direct business volume benefit, including the portion that "leaks out" of the local economy, was reported. This change in method of reporting did not impact the indirect or induced business volume or the personal income or employment benefits.

Table J-2. Summary of 1999 Total Economic Benefits of the Waterways in St. Lucie County, as Presented in the Original Analysis

	Business Volume (Millions)				Personal Income (Millions)				Employment			
Waterway Maintenance Scenario	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
1999 Total Existing Impacts	$192.87	$33.26	$37.11	**$263.24**	$40.34	$12.46	$13.88	**$66.68**	1,377	441	541	**2,359**
1999 Three-Foot Draft Restriction Impacts	$97.10	$11.21	$14.88	**$123.19**	$17.03	$4.06	$5.60	**$26.69**	571	144	218	**933**
1999 Ten-Foot Draft Restriction Impacts	$214.55	$38.91	$41.69	**$295.15**	$44.86	$14.48	$15.58	**$74.92**	1,542	512	608	**2,662**

Non-marine-related businesses also were shown to benefit from marine activities in the county. Boaters in the county purchased a total of $21.6 million in gasoline, food, drinks, and ice for consumption on the county's Waterways. These non-marine-related purchases resulted in a total benefit of $9.8 million in business activity, $4.2 million in personal income, and 173 jobs. The economic benefits of the Waterways under existing conditions (the benefit of marine-related businesses and purchases by recreational boaters) totaled $263.2 million in business volume, $66.7 million in personal income, and 2,359 jobs (see Table J-2). Tax revenues attributable to the Waterways were not estimated in the original analysis.

Marine-related businesses in St. Lucie County were estimated to generate direct sales of $91.6 million in 1999, assuming cessation of maintenance of the Waterways. The total benefit of marine businesses in 1999 under this scenario was estimated as $114.8 million in business sales, $23.1 million in personal income, and 786 jobs. In addition, boaters in the county purchased a total of $21.6 million in gasoline, food, drinks, and ice for consumption on the county's Waterways. These non-marine-related purchases resulted in a total benefit of $8.4 million in business activity, $3.6 million in personal income, and 147 jobs. The total combined economic benefits of the Waterways assuming three-foot vessel draft restrictions, as presented in the original analysis, were $123.2 million in business volume, $26.7 million in personal income, and 933 jobs.

In the original analysis it was estimated that in 1999, marine-related businesses in St. Lucie County would generate direct sales of $208.1 million if vessel draft restrictions were increased to 10 feet MLW. The total benefit of marine-related business under this scenario was estimated as $285.4 million in business sales, $70.7 million in personal income, and 2,489 jobs. Boaters were estimated to purchase a total of $21.6 million in gasoline, food, drinks, and ice for consumption on the county's Waterways, which resulted in a total benefit of $9.8 million in business activity, $4.2 million in personal income, and 173 jobs. The total combined economic benefits of the Waterways, assuming 10-foot vessel draft restrictions, totaled $295.2 million in business volume, $74.9 million in personal income, and 2,662 jobs.

III. UPDATED ECONOMIC BENEFITS OF THE WATERWAYS

Economic Benefits Under Current Existing Conditions

Marine-Related Business Activity

The original analysis stated that total direct business sales (as calculated from the survey-adjusted database of marine-related businesses) were estimated at $186.5 million. The data presented in the original analysis that outlined the direct impact of marine-related businesses in St. Lucie County were updated to current values using the estimated increase in gross sales as recorded by the Florida Department of Revenue (FDOR) Kind Code 28. FDOR classifies businesses by type and reports the gross sales receipts and sales tax collections for each business type. Business types are classified as Kind Codes. Kind Code 28 consists of *Motorboats, Yachts, Marine Parts, Accessories, and Boat Dealers*. According to FDOR, in 1999, the year that the original analysis was conducted, the firms classified as Kind Code 28 reported $42.3 million in gross retail sales. In 2009, the latest year that data is available, Kind Code 28 firms reported total gross sales of $26.7 million. This constitutes a decrease of 37 percent in gross sales over the ten-year period. The percent change in reported Kind Code 28 gross sales was applied to the direct marine-related business activity (obtained from the original analysis) to estimate the direct current impact of marine-related businesses.

Table J-3 presents the 1999 and updated 2009 marine-related business volume, aggregated by business type. As a result of the recession, total marine-related business activity is estimated to have decreased from $186.5 million in 1999 to $117.5 million in 2009.

Table J-3. Total Direct Marine-Related Business Volume in St. Lucie County, Aggregated by Business Type, 1999 and 2009

Business Type	1999 Total Marine Business Volume	2009 Total Marine Business Volume
Boat/Auto/Cycle Dealers	$12,470,258	$7,858,321
Yacht Brokers	$10,000,000	$6,301,651
Marinas	$29,746,469	$18,745,185
Boat Yards	$33,000,000	$20,795,447
Canvas Products/Upholstery	$1,911,552	$1,204,593
Boat/Misc Repairs/Services	$6,994,711	$4,407,822
Outboard Repairs	$1,386,000	$873,409
Marine Equip/Electronics	$5,536,000	$3,488,594
Marine Construction	$2,000,000	$1,260,330
Tackle/Dive Equip	$5,162,476	$3,253,212
Miscellaneous Retail	$2,141,100	$1,349,246
Wholesaler	$5,133,806	$3,235,145
Water Transportation/Business Services	$5,863,000	$3,694,658
Clubs/Associations	$1,742,608	$1,098,131
Engineering/Govt/Other Services	$15,081,378	$9,503,757
Storage	$249,553	$157,260
Boating Services	$2,527,176	$1,592,538
Auto Repair	$495,702	$312,374
General Manufacturing	$43,539,600	$27,437,134
Charter Boats/Rentals	$1,492,000	$940,206
Total	**$186,473,389**	**$117,509,013**

The original analysis included the distribution of business volume for each marine-related business type and is reproduced here as Table J-4. For this analysis, the business activity distribution (Table J-4) for each business type was applied to the 2009 updated marine-related business volume (Table J-3) to quantify the updated dollar value of sales of each business type generated by each type of activity. For instance, as illustrated in Table J-4, on average 62.02 percent of the business volume generated by a boat/auto/cycle dealer would actually be retail trade, 0.84 percent would be construction activities, 10.96 percent would be used boat sales, 0.01 percent would be wholesale trade, 0.03 percent would be financing activities, and 26.1 percent would be services. Applying the percent distribution by business type and activity in Table J-4 to the 2009 updated marine-related business volume of $117.5 million in Table J-3 results in the summary of updated business volume distributed by business activity, as presented in Table J-5

The values presented in Table J-5 are the total business volume of marine-related businesses. For instance, the $19.5 million in retail sales, the $3.5 million in used boat sales, and the $0.88 million in wholesale sales are the amounts that consumers paid (consumer prices) to businesses to purchase goods, rather than the total economic benefit of the retail sector. Regional impact models are developed using producer prices. In order to use the values in Table J-5 in a regional impact model, the consumer prices must be converted to producer prices. This is done within the model using margins that represent the difference between producer prices and consumer prices. When a product is purchased at the retail level, the consumer is paying for the manufacturing, distribution, transportation, and marketing of the product. For instance, if a consumer pays $100 for an item, he may be paying $50 for the manufacture of the product, $5 for the transportation of the product to the wholesaler, $15 to the wholesaler for his services, $5 to transport the item to the retailer, and only $25 to the retailer. If the manufacturer and wholesaler are located outside of the economy being evaluated, then only the retail portion or the retail margin ($25) will result in an economic benefit to the local economy; the remaining portion of the sale ($75) will “leak” out of the economy and actually result in economic benefits in another economy.

Table J-4. Distribution of Direct Marine-Related Business Revenue by Business Type and Business Activities

Business Type	Business Activities							
	Percent Construction	Percent Transportation	Percent Retail Trade	Percent Used Boat Sales	Percent Manufacturing	Percent Wholesale	Percent Finance	Percent Service
Boat/Auto/Cycle Dealers	0.84%	0.00%	62.02%	10.96%	0.00%	0.01%	0.03%	26.13%
Yacht Brokers	0.00%	0.00%	66.75%	33.25%	0.00%	0.00%	0.00%	0.00%
Marinas	5.64%	7.83%	1.07%	0.00%	0.00%	0.88%	0.00%	84.59%
Boat Yards	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
Canvas Products/Upholstery	0.00%	0.00%	0.00%	0.00%	80.00%	0.00%	0.00%	20.00%
Boat/Misc Repairs/Services	3.65%	0.00%	8.59%	0.00%	44.18%	1.79%	0.00%	41.80%
Outboard Repairs	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	50.00%
Marine Equip/Electronics	0.00%	0.00%	56.09%	1.09%	0.00%	13.91%	0.00%	28.91%
Marine Construction	67.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	32.50%
Tackle/Dive Equip	0.00%	0.00%	97.00%	0.00%	0.00%	0.00%	0.00%	3.00%
Miscellaneous Retail	0.00%	0.00%	41.77%	0.00%	0.00%	0.00%	0.00%	58.23%
Wholesaler	0.00%	0.00%	49.03%	0.00%	0.00%	0.00%	0.00%	50.97%
General Manufacturing	0.00%	0.00%	2.87%	0.00%	94.74%	0.00%	0.00%	2.39%
Water Transportation/Business Services	9.30%	9.98%	0.00%	0.00%	3.35%	0.00%	0.00%	77.38%
Clubs/Associations	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	50.00%
Engineering/Govt/Other Services	0.00%	0.00%	0.00%	4.99%	0.00%	0.00%	0.00%	95.01%
Storage	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Boating Services	24.08%	0.00%	41.06%	0.00%	6.96%	3.20%	0.00%	24.70%
Auto Repair	0.00%	0.00%	34.87%	0.00%	0.00%	34.87%	0.00%	30.26%
Charter Boats/Rentals	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Total	**2.44%**	**1.56%**	**16.56%**	**2.95%**	**42.49%**	**0.76%**	**0.00%**	**33.24%**

Table J-5. Total Updated Direct Marine-Related Business Revenue by Business

Business Type	Total Marine Business Volume	Construction Volume	Transportation Volume	Retail Trade Volume	Used Boat Sales Volume	Manufacturing Volume	Wholesale Trade Volume	Finance Volume	Service Volume
Boat/Auto/Cycle Dealers	$7,858,321	$66,137	$0	$4,874,048	$861,422	$0	$630	$2,521	$2,053,562
Yacht Brokers	$6,301,651	$0	$0	$4,206,352	$2,095,299	$0	$0	$0	$0
Marinas	$18,745,185	$1,057,591	$1,467,230	$200,058	$0	$0	$164,394	$0	$15,855,911
Boat Yards	$20,795,447	$0	$0	$0	$0	$20,795,447	$0	$0	$0
Canvas Products/Upholstery	$1,204,593	$0	$0	$0	$0	$963,675	$0	$0	$240,918
Boat/Misc Repairs/Services	$4,407,822	$160,787	$0	$378,768	$0	$1,947,185	$78,807	$0	$1,842,276
Outboard Repairs	$873,409	$0	$0	$436,704	$0	$0	$0	$0	$436,704
Marine Equip/Electronics	$3,488,594	$0	$0	$1,956,763	$38,037	$0	$485,252	$0	$1,008,541
Marine Construction	$1,260,330	$850,723	$0	$0	$0	$0	$0	$0	$409,607
Tackle/Dive Equip	$3,253,212	$0	$0	$3,155,764	$0	$0	$0	$0	$97,447
Miscellaneous Retail	$1,349,246	$0	$0	$563,633	$0	$0	$0	$0	$785,613
Wholesaler	$3,235,145	$0	$0	$1,586,326	$0	$0	$0	$0	$1,648,819
Water Transportation/Business Services	$3,694,658	$343,440	$368,647	$0	$0	$123,827	$0	$0	$2,858,744
Clubs/Associations	$1,098,131	$0	$0	$549,065	$0	$0	$0	$0	$549,066
Engineering/Govt/Other Services	$9,503,757	$0	$0	$0	$474,646	$0	$0	$0	$9,029,111
Storage	$157,260	$0	$0	$0	$0	$0	$0	$0	$157,260
Boating Services	$1,592,538	$383,495	$0	$653,861	$0	$110,860	$50,914	$0	$393,408
Auto Repair	$312,374	$0	$0	$108,925	$0	$0	$108,925	$0	$94,525
General Manufacturing	$27,437,134	$0	$0	$787,706	$0	$25,994,308	$0	$0	$655,120
Charter Boats/Rentals	$940,206	$0	$0	$0	$0	$0	$0	$0	$940,206
Total	**$117,509,013**	**$2,862,172**	**$1,835,876**	**$19,457,974**	**$3,469,403**	**$49,935,302**	**$888,923**	**$2,521**	**$39,056,838**

To illustrate, when a boat dealer in St. Lucie County sells a boat and motor for $30,000, that total amount would appear in the marine-related database used in this analysis and in the gross retail sales as reported in FDOR's Kind Code 28. But only a portion of the $30,000, the retail margin (which for boat and automobile dealers is approximately 15 to 18 percent of the purchase price), will remain in the local economy and generate benefits. The boat dealer will use most of the proceeds from the sale to pay the manufacturer for the boat and motor. Because the boat and motor will probably be manufactured outside of the county, most of the proceeds of the sale will immediately leave the local economy. The money remaining after the retailer pays the manufacturer is the retail margin, which is used to pay for items such as wages, rent, utilities, business services, and retained profits. Only the retail margin, 15 to 18 percent of the purchase price in the case of boat dealers, will result in economic stimulus to the local economy. All retail and wholesale trade activity must be margined in this manner to accurately estimate the benefit to the county's economy.

Economic Benefits Generated by Marine-Related Businesses

The 2009 updated estimates of direct marine-related business activity in the county were used in conjunction with the IMPLAN regional economic impact model to estimate the total (direct, indirect, and induced) benefits of the District's Waterways in St. Lucie County. The benefits were measured as changes in business volume, personal income, employment, and tax revenues. As illustrated in Table J-6, sales to consumers (by marine-related businesses in St. Lucie County) generate a total of $168.5 million in business volume (sales), $41.3 million in personal income (wages), and 1,076 jobs. State and local tax revenues were estimated at $6.1 million. Tax revenues were not presented in Table J-6, by business activity, because tax revenues generated by many of the individual business activities are fairly small, especially those generated by indirect and induced impacts, and as a result of rounding to two decimal places in the table, would have been displayed as zeros.

Table J-6. Summary of Economic Benefits of Marine-Related Businesses in St. Lucie County, Under Current Existing Conditions

	Business Volume (Sales) (Millions of Dollars)				Personal Income (Wages) (Millions of Dollars)				Employment (Jobs)			
Business Activity	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**
Construction	2.96	0.73	0.71	4.41	0.85	0.27	0.23	1.34	18	6	7	31
Manufacturing	51.40	12.24	8.91	72.55	9.78	4.20	2.82	16.80	211	110	81	403
Transportation	1.90	0.18	0.74	2.82	1.08	0.08	0.23	1.39	18	2	7	27
Wholesale Trade	0.93	0.06	0.09	1.08	0.12	0.02	0.03	0.16	5	1	1	7
Retail Trade	24.10	1.09	1.72	26.90	2.33	0.36	0.54	3.23	94	9	16	119
Finance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
Services	40.37	10.57	9.78	60.72	11.84	3.48	3.09	18.41	309	91	89	489
Total	**121.66**	**24.88**	**21.95**	**168.49**	**25.99**	**8.41**	**6.94**	**41.34**	**656**	**219**	**200**	**1,076**

The $168.5 million in total business volume generated by marine-related businesses is distributed as a direct benefit of $121.7 million, an indirect benefit of $24.9 million, and an induced benefit of $22 million. The $41.3 million in personal income includes a direct benefit of $8.4 million and indirect and induced benefits of $15.4 million. The 1,076 man-years of employment generated by marine-related businesses include 656 direct jobs, 219 indirect jobs, and 200 induced jobs. The $6.1 million in state and local tax revenues includes $2.9 million generated by direct benefits, and $1.6 million generated by indirect and induced benefits, each.

About 40 percent of the total economic benefits are generated by the manufacturing sector, including $72.6 million in business sales, $16.8 million in personal income, and 403 jobs. The second largest benefits are generated by the service sector, with $60.7 million in sales, $18.4 million in personal income, and 489 jobs.

Purchases of Non-Marine-Related Items

The direct economic benefits generated by marine-related businesses, as estimated above, do not take into account purchases by recreational boaters and fishermen who purchase non-marine-related items for consumption while using the Waterways. These impacts primarily include the purchase of gas for boats and vehicles and the purchase of food, drinks, and ice consumed during boating and fishing trips.

To estimate the economic benefits of non-marine-related items purchased from businesses not located on the Waterways, a randomly generated sample of 2,880 registered boat owners within the District, including 240 boat owners residing in St. Lucie County, was drawn from the Florida Department of Highway Safety and Motor Vehicles boat owner registration

database and sent a questionnaire to determine their boating related spending and use patterns. A total of 784 completed questionnaires were returned by boaters residing within the District's boundaries, of which 31 indicated that they no longer own a boat, 122 indicated that they did not use their boat at all, or did not use their boat on the District's Waterways in the past 12 months, and 11 did not respond to certain questions, resulting in a total of 620 questionnaires with usable data. St. Lucie County boat owners returned a total of 66 completed questionnaires, of which one indicated that they no longer own a boat, 9 indicated that they did not use their boat at all, or did not use their boat on the District's Waterways in the past 12 months, and three did not respond to certain questions, resulting in a total of 53 questionnaires with usable data.

Results from the usable surveys were entered into a database and queried by boat size to determine frequency of use in St. Lucie County and spending patterns for such items as gas, food, drinks, ice, bait, hoist/launch, and other items. Respondents were also asked to differentiate the location of the purchase of these items as being either from establishments located on the Waterways or from establishments not located on the Waterways. This was intended to prevent double counting, because purchases made on the Waterways would have been included in the estimated marine-related business benefits presented in the previous section. To ensure adequate response in each boat size classification, the responses from Indian River, St. Lucie, and Martin counties were combined when estimating the average number of trips on the Waterways that each boater takes per year and the average expenditures per trip for each boat size class.

These expenditures per trip, which were distributed by boat size, were applied to the number of registered pleasure boats in each boat size class in St. Lucie County. The number of trips taken per year, by boat size, as obtained from the survey of boat owners, was applied to the total expenditures per trip for each boat size class. The total expenditures for each boat size class were then summed to estimate the total expenditures for the county. The total expenditures on non-marine-related items at establishments not located on the Waterways include $9.5 million for gasoline and $3.3 million for food, drinks, and ice.

The regional impact model used in this analysis to estimate the total economic benefits margined the retail sales of gasoline, food, drinks, and ice to estimate the portion of sales that would be produced and distributed by companies located in St. Lucie County. This was

accomplished by distributing the food, drinks, and ice expenditures to various commodities that would tend to be consumed on a boating or fishing trip.

Economic Benefits Generated by Purchases of Non-Marine-Related Items

The $12.8 million in retail purchases ($9.5 million for gasoline sales and $3.3 million for food, drinks, and ice) by recreational boaters from establishments not located on the Waterways were estimated to generate total economic benefits of $17.5 million in business volume, $4.3 million in personal income, 108 jobs, and $2.1 million in tax revenues. As illustrated in Table J-7, the sales generated by these purchases include $12.8 million in direct benefits and $4.7 million in indirect and induced benefits. The total personal income includes $2.7 million in direct benefits and $1.6 million in indirect and induced benefits. The 108 jobs include 68 direct jobs, 20 indirect jobs, and 21 induced jobs. State and local tax revenues include $1.8 million generated by direct activities, $0.13 million generated by indirect activities, and $0.17 million generated by induced activities. The $1.8 million in tax revenues generated by direct activities includes $1.2 million in fuel taxes generated by the sale of $9.5 million in gasoline. The fuel tax revenues were estimated outside of the IMPLAN model and were based on the amount of gasoline sold, assuming an average price of $2.70 per gallon, and the prevailing fuel tax per gallon. The St. Lucie County fuel tax in 2010 was $0.346 per gallon, including $0.16 per gallon in state levied taxes and $0.186 per gallon in locally levied taxes. The state levied taxes include $0.12 per gallon in retail sales tax. To avoid double counting of gasoline retail sales taxes that are included in the fuel tax, the sales taxes generated by direct activities estimated in the IMPLAN model were not incorporated into the tax revenue estimate.

Table J-7. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in St. Lucie County, Under Current Existing Conditions

	Economic Impacts			
Activity	**Direct**	**Indirect**	**Induced**	**Total**
Business Volume (Millions)	$12.79	$2.48	$2.26	**$17.54**
Personal Income (Millions)	$2.71	$0.84	$0.72	**$4.26**
Employment	68	20	21	**108**
Tax Revenues (Millions)	$1.84	$0.13	$0.17	**$2.14**

Combined Economic Benefits

The total economic benefits of the Waterways include the benefits generated by marine-related businesses in St. Lucie County (presented in Table J-6) and the purchase of non-marine-related items for consumption on the Waterways (presented in Table J-7). A summary of these benefits is presented in Table J-8. Total benefits consist of $186 million in business volume, $45.6 million in personal income, 1,184 jobs, and $8.5 million in tax revenue. Total business volume benefits consist of $134.5 million in direct sales and $51.6 million in indirect and induced sales. Total personal income benefits consist of $28.7 million in direct wages and $16.9 million in indirect and induced wages. Total employment benefits consist of 724 direct jobs and 460 indirect and induced jobs. State and local tax revenues include $4.7 million generated by direct activities and $1.8 million generated by indirect and induced activities, each. The $4.7 million generated by direct activity includes $1.2 million in fuel taxes generated by gasoline sales.

Table J-8. Summary of Total Economic Benefits of the Waterways in St. Lucie County, Under Current Existing Conditions

	Total Economic Impacts			
Activity	**Direct**	**Indirect**	**Induced**	**Total**
Business Volume (Millions)	$134.46	$27.36	$24.21	**$186.03**
Personal Income (Millions)	$28.70	$9.25	$7.66	**$45.60**
Employment	724	239	221	**1,184**
Tax Revenues (Millions)	$4.72	$1.75	$1.80	**$8.27**

These benefits represent about a 29 percent decrease from the values presented in the original analysis in business volume, a 32 percent decrease in personal income, and a 50 percent decrease in employment. The decrease is mainly due to the overall decrease in economic activity resulting from the 2007-2009 U.S. economic recession. The overall marine-related economy, or the direct benefit, was estimated to have decreased by 37 percent, based on FDOR tax data.

As can be seen, when the current benefits are compared to the benefits from the original analysis, the percent decreases in personal income and employment benefits are greater than the percent decrease in business volume benefits. This is due to several factors, namely inflation and updates to the IMPLAN model software. Business volume and personal income benefits are

presented in current values. The values in the original analysis are presented in 1999 dollars and the values in the current analysis are presented in 2010 dollars. The influence of inflation between the two periods was not included. The inflation rate, as measured by the Consumer Price Index (CPI) for all wage earners, from 1999 to 2010 was 30.9 percent. In other words, all other factors being held constant, the reported business output would have had to increase by approximately 30.9 percent, from 1999 to 2010, in order to maintain the same personal income and employment levels as reported in 1999. In addition, the total compensation costs for all civilian employees have increased. The exact increase in total compensation costs of employees cannot be estimated for 1999 because the data is only available starting in 2001. Because change since 2001 is 29.9 percent, the change since 1999 would apparently be greater than 29.9 percent. In other words, employee compensation increased at a faster rate than inflation to the point that, in 2010, employees were paid approximately in excess of 29.9 percent more than they were paid in 1999. Therefore, business output and personal income would have to increase in excess of 29.9 percent just to maintain the 1999 employment level. Another reason for the disparity between changes in business volume and employment is the change in output per person. For instance, from 1999 to 2010, output per person in the manufacturing industry experienced a 45.4 percent increase. In other words, in the amount of time it took an employee to produce $1.00 of output in 1999, approximately $1.45 of output could be produced in 2010.

The IMPLAN model is periodically updated to increase the accuracy of estimating economic benefits associated with indirect and induced activities. Each update results in slight changes to how the direct impacts are distributed to industry sectors in the model and how the indirect and induced benefits are estimated. Since the conduct of many of the original analyses, the IMPLAN model has been updated several times; therefore, the impact of each update cannot be traced through the results of each analysis. In general, the latest update had the greatest impact on the method of calculating benefits. One update to the model included adjusting the number of sectors evaluated in the model. Previous versions of IMPLAN included 509 sectors or industries to which direct impacts could be assigned. The updated version of the software includes 440 sectors or industries. As result, several industry sectors in the older version were combined, or industries were divided between two or more of the sectors in the updated version. Consequently, the direct impacts in the current analysis had to be assigned to the new sectors. In most instances, the assignments were straightforward because the industry or sector did not

change between the two versions. However, for some direct impacts, the assignment to industries in the updated version of IMPLAN required the direct impacts to be assigned to sectors that differed, by varying degrees, to the sectors used in the older versions of IMPLAN. As a result, the indirect and induced benefits, as calculated by the new version of IMPLAN, could differ from the benefits developed using the old version of the model.

In addition, the economic multipliers used to generate total economic benefits have been decreasing over time, due in part to increased imports. The total economic benefit of an action is a function of the direct benefit and the total effect multiplier. Due to an increase in the importation of goods and services into the U.S., the multiplier effect may have decreased since the conduct of the original analyses. When domestic income rises, consumers typically purchase more goods and services, some of which are imports. The purchase of imports lowers the demand for U.S. goods and services and allows money to "leak out" of the economy, resulting in fewer "rounds" of spending and thereby less indirect and induced benefits.

For instance, in Duval County, the output multiplier for the IMPLAN Sector "Boat Building" decreased from 1.88 in 2001 to 1.52 in 2008, a decrease of 19 percent, due to changes in the structure of the economy. This decrease is primarily due to the change in imports over this time period. On the other hand, in Broward County, for which the original analysis was conducted more recently, the change in the output multiplier for the Boat Building sector increased from 1.65 in 2006 to 1.7 in 2008, an increase of three percent.

Economic Benefits assuming a Cessation of Maintenance

If maintenance of the Waterways in St. Lucie County was to cease, it is believed that shoaling would eventually result in an effective vessel draft limitation of three feet. This, in turn, would result in a reduction of marine-related business generated by vessels drafting in excess of three feet.

Expected Marine-Related Business Volume

The original analysis estimated total marine-related business volume assuming three-foot draft restrictions (as calculated from the survey-adjusted database of marine-related businesses) at $91.5 million. For this analysis, total business volume assuming three-foot draft restrictions was updated to current values by applying the percent of business sales, by business type, that

are expected to be retained under the three-foot draft scenario (as obtained from the original analysis) to the 2009 updated current total business volume as presented in Table J-3. The resulting updated total business volume, by business type, was distributed to individual business activities using the distribution established in the original analysis.

Table J-9 presents the total 2009 marine-related business volume for each business type, the percent of existing business that would be retained if vessel drafts were limited to three feet MLW on the Waterways (as presented in the original analysis), and the resulting total business volume that would be retained with three feet of vessel draft, distributed by business activity.

As can be seen from Table J-9, 49 percent of all business activity would be retained by marine-related businesses if vessel drafts were limited to three feet MLW. Total marine-related business revenue is expected to be $57.7 million if vessel drafts were reduced to three feet MLW, a reduction of $59.8 million from the $117.5 million in current business activity.

Economic Benefits Generated by Marine-Related Businesses

Assuming vessel draft restrictions of three feet MLW on the Waterways, the $57.7 million of marine-related business revenue in St. Lucie County would be expected to generate total benefits of $81.1 million in business volume (sales), $18.3 million in personal income (wages), and 478 jobs (Table J-10). State and local tax revenues are estimated at $2.8 million. The $81.1 million in business volume expected to be generated by marine-related business includes a total direct benefit of $59.8 million and combined indirect and induced benefits of $21.3 million. The $18.3 million in personal income includes a direct benefit of $11.3 million and combined indirect and induced benefits of $7 million. The 478 jobs generated by marine-related businesses include 287 direct jobs, 103 indirect jobs, and 89 induced jobs. State and local tax revenues are estimated to be distributed as $1.2 million generated by direct activities, $0.8 million generated by indirect activities, and $0.7 million generated by induced activities.

Table J-9. Total Marine-Related Business Revenue by Business Type, Distributed by Business Activity, Assuming Three-Foot Vessel Draft Restrictions on the Waterways

Business Type	Total Existing Marine Business Volume	Percent of Business to Remain	Total Marine Business Volume With 3' Drafts	Construction Volume	Transportation Volume	Retail Trade Volume	Used Boat Sales Volume	Manufacturing Volume	Wholesale Trade Volume	Finance Volume	Service Volume
Boat/Auto/Cycle Dealers	$7,858,321	68.95%	$5,418,303	$52,960	$0	$3,763,800	$440,778	$0	$435	$1,739	$1,158,589
Yacht Brokers	$6,301,651	50.00%	$3,150,825	$0	$0	$2,103,176	$1,047,649	$0	$0	$0	$0
Marinas	$18,745,185	22.09%	$4,140,882	$231,536	$321,908	$116,905	$0	$0	$65,578	$0	$3,404,956
Boat Yards	$20,795,447	35.76%	$7,435,948	$0	$0	$0	$0	$7,435,948	$0	$0	$0
Canvas Products/Upholstery	$1,204,593	99.03%	$1,192,888	$0	$0	$0	$0	$954,311	$0	$0	$238,577
Boat/Misc Repairs/Services	$4,407,822	77.11%	$3,399,047	$160,787	$0	$325,614	$0	$1,555,036	$67,260	$0	$1,290,350
Outboard Repairs	$873,409	84.09%	$734,457	$0	$0	$367,229	$0	$0	$0	$0	$367,229
Marine Equip/Electronics	$3,488,594	25.00%	$872,148	$0	$0	$477,375	$13,448	$0	$126,827	$0	$254,498
Marine Construction	$1,260,330	10.00%	$126,033	$85,072	$0	$0	$0	$0	$0	$0	$40,961
Tackle/Dive Equip	$3,253,212	75.08%	$2,442,521	$0	$0	$2,372,269	$0	$0	$0	$0	$70,253
Miscellaneous Retail	$1,349,246	30.89%	$416,741	$0	$0	$266,100	$0	$0	$0	$0	$150,641
Wholesaler	$3,235,145	12.54%	$405,536	$0	$0	$193,082	$0	$0	$0	$0	$212,454
Water Transportation/Business Services	$3,694,658	59.07%	$2,182,262	$26,940	$50,886	$0	$0	$123,355	$0	$0	$1,981,081
Clubs/Associations	$1,098,131	50.87%	$558,673	$0	$0	$279,336	$0	$0	$0	$0	$279,336
Engineering/Govt/Other Services	$9,503,757	20.14%	$1,913,707	$0	$0	$0	$96,466	$0	$0	$0	$1,817,241
Storage	$157,260	100.00%	$157,260	$0	$0	$0	$0	$0	$0	$0	$157,260
Boating Services	$1,592,538	27.93%	$444,827	$94,039	$0	$202,931	$0	$27,229	$12,351	$0	$108,276
Auto Repair	$312,374	75.22%	$234,958	$0	$0	$70,217	$0	$0	$70,217	$0	$94,525
General Manufacturing	$27,437,134	81.99%	$22,495,798	$0	$0	$196,927	$0	$21,748,571	$0	$0	$550,300
Charter Boats/Rentals	$940,206	0.00%	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$117,509,013**	**49.12%**	**$57,722,814**	**$651,334**	**$372,794**	**$10,734,962**	**$1,598,341**	**$31,844,450**	**$342,667**	**$1,739**	**$12,176,528**

Table J-10. Summary of Economic Benefits of Marine-Related Businesses in St. Lucie County, Assuming Vessel Draft Restrictions of Three Feet

	Business Volume (Sales) (Millions of Dollars)				Personal Income (Wages) (Millions of Dollars)				Employment (Jobs)			
Business Activity	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**
Construction	0.67	0.17	0.15	0.99	0.18	0.06	0.05	0.29	4	1	1	7
Manufacturing	32.78	7.79	5.69	46.26	6.25	2.67	1.80	10.73	136	70	52	259
Transportation	0.38	0.03	0.16	0.57	0.23	0.01	0.05	0.29	4	0	1	6
Wholesale Trade	0.36	0.02	0.03	0.41	0.04	0.01	0.01	0.06	2	0	0	2
Retail Trade	12.96	0.56	0.87	14.39	1.18	0.18	0.27	1.64	50	5	8	63
Finance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
Services	12.59	3.01	2.82	18.42	3.39	1.02	0.89	5.30	90	26	26	142
Total	**59.75**	**11.58**	**9.72**	**81.05**	**11.28**	**3.96**	**3.07**	**18.31**	**287**	**103**	**89**	**478**

Comparing current economic benefits to economic benefits expected to occur if vessel drafts were restricted to three feet MLW indicates that the county would realize a total decrease in business volume of nearly $87.4 million, a decrease in personal income of $23 million, a decrease of 598 jobs, and a decrease of $3.4 million in tax revenues.

Expected Purchases of Non-Marine-Related Items

Vessel draft restrictions of three feet MLW will impact the sale of non-marine-related items to recreational boaters and fishermen. The extent of this impact was estimated based on the survey of registered boat owners in St. Lucie County and the distribution of registered vessels by size. The current sales of non-marine-related items to recreational boaters were estimated at $12.8 million ($9.5 million for gasoline sales and $3.3 million for food, drink, and ice). Vessel draft restrictions of three feet will prevent larger vessels from utilizing the Waterways. As a result, retail sales of non-marine-related items from businesses not located on the Waterways are expected to drop to $10.7 million (including $7.9 million for gasoline sales and $2.8 million in food, drink, and ice sales), a reduction of $2.1 million from existing conditions.

Economic Benefits Generated by Purchases of Non-Marine-Related Items

As illustrated in Table J-11, the expected $10.7 million in retail sales of gas, food, drinks, and ice to recreational boaters from businesses not located on the Waterways would generate benefits of $14.7 million in business volume, $3.6 million in personal income, 90 jobs, and $1.8 million in tax revenues. Compared to existing conditions, this is a reduction of about $2.9 million in business volume, $0.7 million in personal income, 18 jobs, and $0.4 million in

tax revenues. Tax revenues generated under this scenario include $1.0 million in fuel taxes distributed as $0.5 million in state levied taxes and locally levied taxes, each.

Table J-11. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in St. Lucie County, Assuming Vessel Draft Restrictions of Three Feet

Activity	Economic Impacts			
	Direct	Indirect	Induced	Total
Business Volume (Millions)	$10.69	$2.07	$1.89	**$14.65**
Personal Income (Millions)	$2.26	$0.70	$0.60	**$3.55**
Employment	57	16	17	**90**
Tax Revenues (Millions)	$1.54	$0.11	$0.14	**$1.78**

Combined Economic Benefits

The total combined economic benefits expected to be generated with three-foot vessel draft restrictions on the Waterways by marine-related businesses and from the purchases of non-marine-related items from businesses not located on the Waterways are presented in Table J-12. The combined benefits include $95.7 million in business volume, $12.9 million in personal income, 569 jobs, and $4.5 million in tax revenues. The $4.5 million in state and local tax revenues includes $1.0 million in fuel taxes generated by gasoline sales to boaters. These benefits are a reduction of over $90.3 million in business volume, $23.7 million in personal income, 616 jobs, and $3.8 million in tax revenues compared to existing conditions on the Waterways and account for 45 to 52 percent of the existing benefits of the Waterways.

Table J-12. Summary of Total Economic Benefits of the Waterways in St. Lucie County, Assuming Vessel Draft Restrictions of Three Feet

Activity	Total Economic Impacts			
	Direct	Indirect	Induced	Total
Business Volume (Millions)	$70.44	$13.65	$11.61	**$95.70**
Personal Income (Millions)	$13.54	$4.65	$3.67	**$21.86**
Employment	344	119	106	**569**
Tax Revenues (Millions)	$2.75	$0.91	$0.86	**$4.53**

Economic Benefits Assuming a Higher State of Maintenance

The full implementation of the District's Dredge Material Management Plan would result in a higher state of maintenance of the Waterways and an increase in vessel draft restrictions in St. Lucie County to 10 feet MLW. This increase in draft allowance would permit deeper draft vessels to fully utilize the Waterways in St. Lucie County. This, in turn, would increase the business volume of marine-related businesses in the county. The sale of non-marine-related items by businesses not located on the Waterways would not experience a significant impact under this maintenance scenario because deepening the Waterways would result in increased use by deeper draft vessels (drafting between 6.5 to 10 feet) that are typically stored in the water and tend not to be trailered. Owners of those vessels typically do not purchase many items from businesses not located on the Waterways, but rather purchase almost all of their supplies from businesses with waterway access.

Expected Marine-Related Business Volume

The original analysis estimated total marine-related business volume assuming 10-foot draft restrictions (as calculated from the survey-adjusted database of marine-related businesses) at $208.1 million. Total business volume assuming 10-foot draft restrictions was updated to current values by applying the expected percent increase in business sales, by business type, under the 10-foot draft scenario (as obtained from the original analysis) to the updated current total business volume as presented in Table J-3. The resulting updated total business volume, by business type, was distributed to individual business activities using the distribution established in the original analysis.

Table J-13 presents the total 2009 marine-related business volume for each business type, the expected percent increase in existing business that would result if vessel drafts were increased to 10 feet MLW on the Waterways (as presented in the original analysis), the resulting total business volume assuming 10-foot vessel drafts, and the business volume assuming 10-foot vessel drafts distributed by business activity.

As can be seen from the table, business activity would be expected to increase by 11.6 percent if vessel drafts were increased to 10 feet MLW. Total marine-related business revenue is expected to be $131.2 million, an increase of $13.7 million from the $117.5 million in existing business activity.

Table J-13. Total Marine-Related Business Revenue by Business Type, Distributed by Business Activity, Assuming 10-Foot Vessel Draft Restrictions on the Waterways

Business Type	Total Existing Marine Business Volume	Percent Increase in Business	Total Marine Business Volume With 10' Drafts	Construction Volume	Transportation Volume	Retail Trade Volume	Used Boat Sales Volume	Manufacturing Volume	Wholesale Trade Volume	Finance Volume	Service Volume
Boat/Auto/Cycle Dealers	$7,858,321	9.02%	$8,566,900	$73,223	$0	$5,313,367	$939,366	$0	$630	$2,521	$2,237,792
Yacht Brokers	$6,301,651	16.67%	$7,351,978	$0	$0	$5,012,473	$2,339,505	$0	$0	$0	$0
Marinas	$18,745,185	29.98%	$24,364,747	$1,368,996	$1,967,297	$253,203	$0	$0	$198,995	$0	$20,576,253
Boat Yards	$20,795,447	13.64%	$23,631,189	$0	$0	$0	$0	$23,631,189	$0	$0	$0
Canvas Products/Upholstery	$1,204,593	1.00%	$1,216,639	$0	$0	$0	$0	$973,313	$0	$0	$243,328
Boat/Misc Repairs/Services	$4,407,822	5.58%	$4,653,629	$160,787	$0	$393,268	$0	$2,019,685	$82,029	$0	$1,997,860
Outboard Repairs	$873,409	4.44%	$912,183	$0	$0	$456,091	$0	$0	$0	$0	$456,091
Marine Equip/Electronics	$3,488,594	44.52%	$5,041,572	$0	$0	$2,960,026	$46,950	$0	$657,297	$0	$1,377,299
Marine Construction	$1,260,330	0.00%	$1,260,330	$850,723	$0	$0	$0	$0	$0	$0	$409,607
Tackle/Dive Equip	$3,253,212	1.02%	$3,286,395	$0	$0	$3,188,232	$0	$0	$0	$0	$98,162
Miscellaneous Retail	$1,349,246	12.17%	$1,513,467	$0	$0	$595,142	$0	$0	$0	$0	$918,326
Wholesaler	$3,235,145	0.00%	$3,235,145	$0	$0	$1,586,326	$0	$0	$0	$0	$1,648,819
Water Transportation/Business Services	$3,694,658	13.32%	$4,186,801	$500,981	$526,188	$0	$0	$138,467	$0	$0	$3,021,165
Clubs/Associations	$1,098,131	13.67%	$1,248,226	$0	$0	$624,112	$0	$0	$0	$0	$624,114
Engineering/Govt/Other Services	$9,503,757	0.50%	$9,551,115	$0	$0	$0	$475,111	$0	$0	$0	$9,076,003
Storage	$157,260	0.00%	$157,260	$0	$0	$0	$0	$0	$0	$0	$157,260
Boating Services	$1,592,538	27.34%	$2,027,999	$442,960	$0	$878,981	$0	$138,581	$63,536	$0	$503,941
Auto Repair	$312,374	9.91%	$343,340	$0	$0	$124,408	$0	$0	$124,408	$0	$94,525
General Manufacturing	$27,437,134	0.88%	$27,679,211	$0	$0	$905,862	$0	$26,112,464	$0	$0	$660,885
Charter Boats/Rentals	$940,206	0.00%	$940,206	$0	$0	$0	$0	$0	$0	$0	$940,206
Total	**$117,509,013**	**11.62%**	**$131,168,335**	**$3,397,670**	**$2,493,485**	**$22,291,492**	**$3,800,933**	**$53,013,700**	**$1,126,895**	**$2,521**	**$45,041,635**

Economic Benefits Generated by Marine-Related Business

If maintenance of the Waterways was increased to reflect the full implementation of the District's Dredge Material Management Plan, resulting in increased vessel drafts to 10 feet MLW, marine-related businesses in the county would be expected to generate a total of $188.0 million in business volume, $46.1 million in personal income, and 1,209 jobs (Table J-14). State and local tax revenues were estimated at $7.0 million. The sales expected to be generated by marine-related businesses under this scenario include a direct benefit of $135.8 million and combined indirect and induced benefits of $52.2 million. The total personal income generated under this maintenance scenario includes a direct benefit of $29.0 million and combined indirect and induced benefits of $17.1 million. Total employment benefits include 741 direct jobs, 244 indirect jobs, and 223 induced jobs. The $7.0 million in state and local tax revenues includes $3.4 million generated by direct benefits and $1.8 million generated by indirect and induced benefits, each.

Table J-14. Summary of Economic Benefits of Marine-Related Businesses in St. Lucie County, Assuming Vessel Draft Restrictions of 10 Feet

	Business Volume (Sales) (Millions of Dollars)				Personal Income (Wages) (Millions of Dollars)				Employment (Jobs)			
Business Activity	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**
Construction	3.52	0.87	0.84	5.23	1.00	0.32	0.27	1.58	21	8	8	36
Manufacturing	54.57	13.00	9.46	77.03	10.38	4.46	2.99	17.83	224	117	86	428
Transportation	2.57	0.25	1.00	3.82	1.45	0.11	0.31	1.87	24	3	9	36
Wholesale Trade	1.18	0.08	0.11	1.38	0.15	0.03	0.04	0.21	7	1	1	9
Retail Trade	27.42	1.27	2.00	30.69	2.71	0.42	0.63	3.76	111	11	18	139
Finance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
Services	46.54	12.28	11.08	69.89	13.33	4.03	3.50	20.86	354	106	101	561
Total	**135.81**	**27.75**	**24.48**	**188.04**	**29.01**	**9.36**	**7.74**	**46.11**	**741**	**244**	**223**	**1,209**

Comparing current total economic benefits to expected benefits assuming a higher state of maintenance reveals that the county would realize an increase of $19.6 million in business volume, $4.8 million in personal income, 133 jobs, and $0.9 million in tax revenues.

Economic Benefits Generated by Purchases of Non-Marine-Related Items

This maintenance scenario should not significantly impact the sale of non-marine-related items by businesses that are not located on the Waterways. These benefits should be equivalent to those under current Waterways conditions. Under this assumption, retail sales of non-marine-

related items should generate total economic activity equal to $17.5 million in business volume, $4.3 million in personal income, and 108 jobs (Table J-15). The $2.1 million in tax revenues generated under this scenario includes $1.2 million in fuel taxes distributed as $0.6 million in state levied taxes and $0.7 million in locally levied taxes.

Table J-15. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in St. Lucie County, Assuming Vessel Draft Restrictions of 10 Feet

Activity	Economic Impacts			
	Direct	Indirect	Induced	Total
Business Volume (Millions)	$12.79	$2.48	$2.26	**$17.54**
Personal Income (Millions)	$2.71	$0.84	$0.72	**$4.26**
Employment	68	20	21	**108**
Tax Revenues (Millions)	$1.84	$0.13	$0.17	**$2.14**

Combined Economic Benefits

The combined total benefits of marine-related businesses and purchases of non-marine-related items from businesses not located on the Waterways under this scenario are presented in Table J-16. Combined benefits include $205.6 million in business volume, $50.4 million in personal income, 1,317 jobs, and $9.2 million in tax revenues. State and local tax revenues include $1.2 million in fuel taxes generated by gasoline sales to boaters. These benefits are an increase of $19.6 million in business volume, $4.8 million in personal income, 133 jobs, and $0.9 million in tax revenues compared to current existing conditions on the Waterways.

Table J-16. Summary of Total Economic Benefits of the Waterways in St. Lucie County, Assuming Vessel Draft Restrictions of 10 Feet

Activity	Total Economic Impacts			
	Direct	Indirect	Induced	Total
Business Volume (Millions)	$148.60	$30.23	$26.74	**$205.58**
Personal Income (Millions)	$31.72	$10.20	$8.46	**$50.37**
Employment	809	264	244	**1,317**
Tax Revenues (Millions)	$5.23	$1.93	$1.99	**$9.15**

The combined business volume generated from the Waterways assuming 10-foot vessel draft restrictions includes a direct benefit of $148.6 million, an indirect benefit of $30.2 million,

and an induced benefit of $26.7 million. Combined personal income generated under this scenario consists of $31.7 million in direct benefits, $10.2 million in indirect benefits, and $8.5 million in induced benefits. Combined employment includes 809 direct jobs, 264 indirect jobs, and 244 induced jobs. State and local tax revenues include $5.2 million generated by direct activities, $1.9 million generated by indirect activities, and $2.0 million generated by induced activities. The $5.2 million in tax revenues generated by direct activity includes $1.2 million in fuel taxes.

The Impact of the 2007-2009 U.S. Economic Recession

In December 2007, the U.S. economy entered a recession that would last 18 months, until June 2009, the longest recession since World War II. The impact of the recession was evident in the FDOR recorded gross sales throughout Florida and in the marine industries as measured by Kind Code 28. The downturn in the economy, as evidenced in the decrease in total gross sales in the State in general and specifically in the decrease in gross sales in Kind Code 28, indicated a need to estimate the impact of the recession on marine-related businesses. The methodology developed for this analysis for estimating the impact of the recession on marine-related businesses in an individual county within the District was based on estimating the trend in gross sales of Kind Code 28 established over the 20-year period prior to the onset of the recession. This trend in gross sales was used as a proxy to estimate the theoretical gross sales in a county had the recession not occurred and gross sales had continued to increase at the rates experienced over the previous 20-year period. These gross sales, assuming the recession did not occur, were used to estimate the non-recession change in direct sales in the county and the total economic benefits of the Waterways assuming no recession. However, FDOR reported gross sales for Kind Code 28 were not available for St. Lucie County for the years from 1987 through 1995. To estimate the impact of the recession in St. Lucie County, the trend in gross sales of Kind Code 28 established over the 10-year period prior to the onset of the recession was used to estimate the theoretical gross sales in St. Lucie County had the recession not occurred and gross sales had continued to increase at the rates experienced over the previous 10-year period. These values were compared to the estimated total economic benefits based on the change in actual reported gross sales for Kind Code 28 in 2009 to estimate the total impact of the recession on marine-related business in the county.

Estimating Gross Sales Assuming That the Recession Did Not Occur

Figure J-1 graphically illustrates the gross sales for Kind Code 28 for St. Lucie County from 1996 through 2009. Gross sales peaked in 2006 at $67.3 million and declined to $26.7 million in 2009.

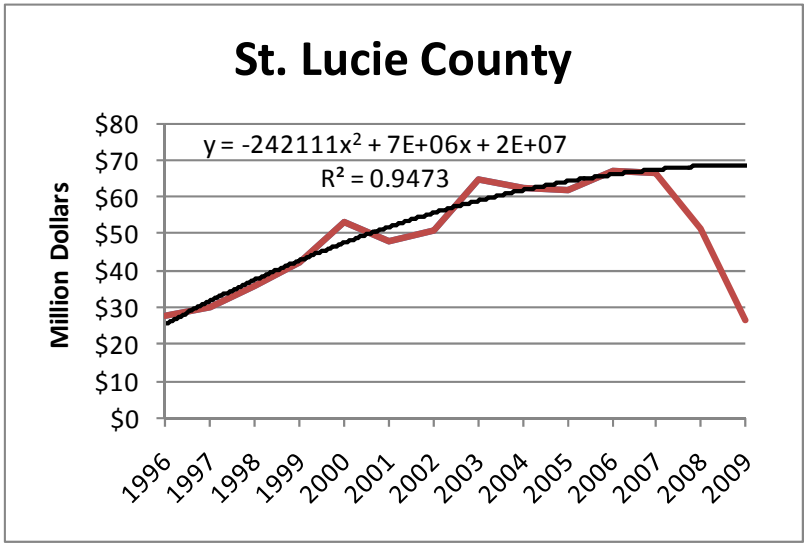

Figure J-1. St. Lucie County, FDOR Reported Gross Sales of Kind Code 28, 1996 Through 2009

The black line on the graph is the trend line exhibited by the gross sales for Kind Code 28 from 1996 to 2007. The trend line is based on the following polynomial equation:

$Y = 242{,}111x^2 + 7E+06x + 2E+07$

Where:

Y = expected value

x = known value (year, expressed as year for which expected value is being estimated minus the base year of 1996)

E+ = times 10 raised to the power following the "+" sign

With an R^2 value of 0.9473.

The R^2 value explains how well the regression line, or equation, approximates the known data points. The closer the R^2 value is to 1, the higher the correlation of the trend line is to the data.

The polynomial equation presented above was used to estimate the gross retail sales for Kind Code 28 for the county for 2009 assuming that the recession did not occur. Excluding the impact of the recession, gross sales in 2009 should have trended at $70.5 million, 164 percent greater than actual reported sales. In other words, the recession reduced marine-related gross sales, as reported to FDOR, by $43.8 million in 2009.

The gross sales reported in Kind Code 28 in the year that the original analysis was conducted (1999) was compared to the estimated theoretical gross sales in the county if the recession had not occurred to calculate the percent change between the two values. This percent change was applied to the direct marine-related business activity (as presented in the original analysis) to estimate the direct current impact of marine-related businesses if the recession had not occurred. As illustrated in Table J-17, if the recession had not occurred, total direct marine-related business sales would have increased from $186.5 million in 1999 to $310.8 million in 2009. The updated Table J-17 data were combined with the distribution of marine revenues by type (as obtained from the original analysis and presented in Table J-4 in this report) to develop updated estimates of total non-recession marine-related business revenues (see Table J-18). These updated values were input into the IMPLAN regional economic impact model to estimate the total (direct, indirect, and induced) benefits of the District's Waterways in St. Lucie County measured as increases in business volume, personal income, employment, and tax revenues.

If the recession had not occurred, business activity would have been 165 percent greater than estimated for 2009. Total marine-related business revenue, assuming no recession, would have been approximately $310.8 million in 2009, an increase of $193.3 million from the $117.5 million in current business activity.

Table J-17. Total Marine-Related Business Volume in St. Lucie County, Aggregated by Business Type, 1999 and 2009, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur

Business Type	1999 Total Marine Business Volume	2009 Total Marine Business Volume
Boat/Auto/Cycle Dealers	$12,470,258	$20,783,653
Yacht Brokers	$10,000,000	$16,666,578
Marinas	$29,746,469	$49,577,185
Boat Yards	$33,000,000	$54,999,708
Canvas Products/Upholstery	$1,911,552	$3,185,903
Boat/Misc Repairs/Services	$6,994,711	$11,657,790
Outboard Repairs	$1,386,000	$2,309,988
Marine Equip/Electronics	$5,536,000	$9,226,618
Marine Construction	$2,000,000	$3,333,316
Tackle/Dive Equip	$5,162,476	$8,604,081
Miscellaneous Retail	$2,141,100	$3,568,481
Wholesaler	$5,133,806	$8,556,298
Water Transportation/Business Services	$5,863,000	$9,771,615
Clubs/Associations	$1,742,608	$2,904,331
Engineering/Govt/Other Services	$15,081,378	$25,135,497
Storage	$249,553	$415,919
Boating Services	$2,527,176	$4,211,938
Auto Repair	$495,702	$826,166
General Manufacturing	$43,539,600	$72,565,615
Charter Boats/Rentals	$1,492,000	$2,486,653
Total	**$186,473,389**	**$310,787,333**

Table J-18. Total Marine-Related Business Revenue by Business Type, Distributed by Business Activity, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur

Business Type	Total Marine Business Volume	Construction Volume	Transportation Volume	Retail Trade Volume	Used Boat Sales Volume	Manufacturing Volume	Wholesale Trade Volume	Finance Volume	Service Volume
Boat/Auto/Cycle Dealers	$20,783,653	$174,919	$0	$12,890,862	$2,278,285	$0	$1,667	$6,667	$5,431,251
Yacht Brokers	$16,666,578	$0	$0	$11,124,941	$5,541,637	$0	$0	$0	$0
Marinas	$49,577,185	$2,797,112	$3,880,523	$529,114	$0	$0	$434,789	$0	$41,935,646
Boat Yards	$54,999,708	$0	$0	$0	$0	$54,999,708	$0	$0	$0
Canvas Products/Upholstery	$3,185,903	$0	$0	$0	$0	$2,548,723	$0	$0	$637,180
Boat/Misc Repairs/Services	$11,657,790	$425,248	$0	$1,001,763	$0	$5,149,906	$208,429	$0	$4,872,442
Outboard Repairs	$2,309,988	$0	$0	$1,154,994	$0	$0	$0	$0	$1,154,994
Marine Equip/Electronics	$9,226,618	$0	$0	$5,175,239	$100,599	$0	$1,283,393	$0	$2,667,386
Marine Construction	$3,333,316	$2,249,988	$0	$0	$0	$0	$0	$0	$1,083,328
Tackle/Dive Equip	$8,604,081	$0	$0	$8,346,352	$0	$0	$0	$0	$257,727
Miscellaneous Retail	$3,568,481	$0	$0	$1,490,695	$0	$0	$0	$0	$2,077,786
Wholesaler	$8,556,298	$0	$0	$4,195,508	$0	$0	$0	$0	$4,360,789
Water Transportation/Business Services	$9,771,615	$908,329	$974,995	$0	$0	$327,498	$0	$0	$7,560,793
Clubs/Associations	$2,904,331	$0	$0	$1,452,164	$0	$0	$0	$0	$1,452,167
Engineering/Govt/Other Services	$25,135,497	$0	$0	$0	$1,255,342	$0	$0	$0	$23,880,155
Storage	$415,919	$0	$0	$0	$0	$0	$0	$0	$415,919
Boating Services	$4,211,938	$1,014,265	$0	$1,729,327	$0	$293,202	$134,658	$0	$1,040,484
Auto Repair	$826,166	$0	$0	$288,083	$0	$0	$288,083	$0	$249,999
General Manufacturing	$72,565,615	$0	$0	$2,083,322	$0	$68,749,635	$0	$0	$1,732,657
Charter Boats/Rentals	$2,486,653	$0	$0	$0	$0	$0	$0	$0	$2,486,653
Total	**$310,787,333**	**$7,569,860**	**$4,855,518**	**$51,462,365**	**$9,175,863**	**$132,068,673**	**$2,351,019**	**$6,667**	**$103,297,357**

Economic Benefits Generated by Marine-Related Business

If the recession had not occurred and spending patterns for marine-related goods and services had continued on the trend established over the previous 20-year period, marine-related businesses in the county would be expected to generate a total of $445.6 million in business volume, $109.3 million in personal income, and 2,846 jobs (Table J-19). State and local tax revenues would have been $16.2 million. This is an increase of $277.1 million in business volume, $68.0 million in personal income, 1,770 jobs, and $10.1 million in tax revenues compared to estimated existing conditions. The sales expected to be generated by marine-related businesses under this scenario include a direct benefit of $321.8 million and combined indirect and induced benefits of $123.9 million. The total personal income generated under this maintenance scenario includes a direct benefit of $68.7 million and combined indirect and induced benefits of $40.6 million. Total employment benefits include 1,735 direct jobs, 580 indirect jobs, and 530 induced jobs. The $16.2 million in state and local tax revenues includes $7.6 million generated by direct benefits and $4.3 million generated by indirect and induced benefits, each.

Table J-19. Summary of Economic Benefits of Marine-Related Businesses in St. Lucie County, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur

	Business Volume (Sales) (Millions of Dollars)				Personal Income (Wages) (Millions of Dollars)				Employment (Jobs)			
Business Activity	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**
Construction	7.84	1.94	1.89	11.67	2.25	0.70	0.60	3.55	49	17	17	82
Manufacturing	135.94	32.38	23.57	191.88	25.86	11.11	7.46	44.43	559	292	215	1,066
Transportation	5.01	0.48	1.95	7.45	2.85	0.21	0.62	3.67	48	5	18	71
Wholesale Trade	2.47	0.16	0.23	2.86	0.31	0.05	0.07	0.43	14	1	2	17
Retail Trade	63.73	2.89	4.54	71.16	6.16	0.96	1.44	8.55	249	24	41	315
Finance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
Services	106.78	27.95	25.87	160.59	31.31	9.21	8.18	48.70	817	242	236	1,294
Total	**321.77**	**65.80**	**58.05**	**445.61**	**68.74**	**22.24**	**18.36**	**109.33**	**1,735**	**580**	**530**	**2,846**

Purchases of Non-Marine-Related Items

The survey of registered boat owners conducted as part of this analysis included questions concerning the impact that the recession had on the number of boating trips taken over the previous 12-month period and the amount spent on each boating trip. Review of the responses concerning the amount of money boaters would have spent per boating trip, had the recession not occurred, revealed that the question may not have been answered in a consistent

manner. It appears that the question was answered in one of four ways: (1) reporting the additional amount (above the amount actually spent) that would have been spent on the average trip had the recession not occurred (which was the intent of the question); (2) reporting the additional amount (above the amount actually spent) that would have been spent on all trips for the entire previous 12-month period had the recession not occurred; (3) reporting the total amount (including the amount actually spent) that would have been spent on the average trip if the recession had not occurred; (4) reporting the total amount (including the amount actually spent) that would have been spent on all trips for the entire previous 12-month period had the recession not occurred. Because of the inconsistent manner in which the question was answered, the recession-related expenditure data was not used in the analysis. The impact of the recession was based solely on the number of additional trips that would have occurred without the recession.

To ensure adequate response in each boat size classification, the responses from Indian River, St. Lucie, and Martin counties were combined when estimating the average impact of the recession on number of trips of each boat size class. The average number of additional trips that boaters would have taken, by boat size, were added to the number of trips per year that were taken, to obtain the total number of trips, per boater, per year had the recession not occurred. The total number of trips per boater was applied to the number of registered pleasure boats in each boat size class in St. Lucie County that used the Waterways over the past 12 months to estimate the total number of trips on the Waterways per year. The total number of trips on the Waterways per year was applied to the total expenditures per trip for each boat size class. The total expenditures, assuming that the recession had not occurred, of non-marine items at establishments not located on the Waterways include $13.4 million for gasoline and $4.8 million for food, drinks, and ice.

Economic Benefits Generated by Purchases of Non-Marine-Related Items

As illustrated in Table J-20, the expected $18.2 million in retail sales of gas, food, drinks, and ice to recreational boaters from businesses not located on the Waterways would generate benefits of $24.8 million in business volume, $6.0 million in personal income, and 153 jobs. State and local tax revenues would have been $3.0 million, including $2.6 million generated by direct activities that includes $1.7 million in fuel taxes. Compared to existing conditions, these

benefits would have been an increase of about $7.3 million in business volume, $1.8 million in personal income, 45 jobs, and $0.9 million in tax revenues.

Table J-20. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in St. Lucie County, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur

Activity	Economic Impacts			
	Direct	Indirect	Induced	Total
Business Volume (Millions)	$18.10	$3.50	$3.20	**$24.80**
Personal Income (Millions)	$3.83	$1.18	$1.01	**$6.02**
Employment	96	28	29	**153**
Tax Revenues (Millions)	$2.60	$0.18	$0.24	**$3.02**

Combined Economic Benefits

The combined total benefits of marine-related businesses and purchases of non-marine-related items from businesses not located on the Waterways under the "No Recession" scenario are presented in Table J-21. Combined benefits would have included $470.4 million in business volume, $115.4 million in personal income, 2,999 jobs, and nearly $19.2 million in state and local tax revenues. State and local tax revenues would have included $1.7 million in fuel taxes generated by the sale of gasoline. This is a difference of $284.4 million in business volume, $69.8 million in personal income, 1,814 jobs, and $11.0 million in tax revenues compared to current existing conditions on the Waterways.

Table J-21. Summary of Total Economic Benefits of the Waterways in St. Lucie County, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur

Activity	Total Economic Impacts			
	Direct	Indirect	Induced	Total
Business Volume (Millions)	$339.87	$69.30	$61.24	**$470.42**
Personal Income (Millions)	$72.56	$23.42	$19.37	**$115.35**
Employment	1,832	608	559	**2,999**
Tax Revenues (Millions)	$10.22	$4.47	$4.56	**$19.24**