# Appendix N

# UPDATE OF THE ECONOMIC BENEFITS OF THE DISTRICT'S WATERWAYS IN MIAMI-DADE COUNTY

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# I. INTRODUCTION

The economic benefits of marine-related activities on the Florida Inland Navigation District's (the District) Waterways in Miami-Dade County were estimated in *An Economic Analysis of the District's Waterways in Miami-Dade County,* dated April 2007 (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 Miami-Dade 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 Miami-Dade County.

Section II summarizes the findings of the original analysis as presented in *An Economic Analysis of the District's Waterways in Miami-Dade County*, dated April 2007. Economic benefits are estimated for each of the three scenarios evaluated: (1) prior existing conditions (at the time of the original analysis in 2006); (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. The economic benefits presented in this section are based on two data sources. The benefits arising from marine-related businesses, excluding firms involved in commercial fishing, and the benefits from boater related purchases at non-marine-related firms were originally estimated in *An Economic Analysis of the District's Waterways in Miami-Dade County*. The benefits arising from businesses involved in commercial fishing were originally estimated in the *Biscayne Bay Economic Study*, conducted for the South Florida Water Management District in 2005. The direct benefits presented in the *Biscayne Bay Economic Study* were updated to current values using the percent change in gross sales of all Kind Codes for the State of Florida. The analyses and results are presented separately for the two components, with a summary presenting the total economic benefits of the combined components.

**Summary of Findings**

A summary of the findings of the economic benefits of the four scenarios evaluated are presented in Table N-1. Economic benefits were developed for marine-related businesses activity, retail purchases of non-marine-related items by recreational boaters, and commercial fishing activities in Biscayne Bay. Current updated benefits in 2010 dollars include $1.21 billion in business volume, $294.3 million in personal income, 7,094 jobs, and $54.0 million in tax revenues.

Compared to the findings in the original analysis, this is a decrease of $1.366 billion in business volume, $492.5 million in personal income, and 13,660 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 $547.7 million in business volume, $136.6 million in personal income, 3,275 jobs, and $25.8 million in tax revenues. This represents approximately a 54 percent decrease in benefits compared to existing conditions.

The economic benefits of the Waterways assuming a higher state of maintenance of the Waterways include $1.362 billion in business volume, $335.2 million in personal income, 8,100 jobs, and $61.1 million in tax revenues. This is an approximately thirteen to fourteen 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 $2.185 billion in business volume, $536.2 million in personal income, 12,929 jobs, and $96.8 million in tax revenues. In other words, the recession reduced the benefits of the Waterways in Miami-Dade County by $976.2 million in business volume, $242.0 million in personal income, 5,836 jobs, and $42.8 million in tax revenues.

**Table N-1. Summary of Total Economic Benefits of the Waterways in Miami-Dade County**

| | Business Volume (Millions) | | | | Personal Income (Millions) | | | | Employment | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity | Direct | Indirect | Induced | Total | Direct | Indirect | Induced | Total | Direct | Indirect | Induced | Total |
| Current Existing Impacts | 824.4 | 201.1 | 183.5 | **1,208.9** | 164.3 | 70.6 | 59.4 | **294.3** | 4,271 | 1,414 | 1,409 | **7,094** |
| Three-Foot Draft Restriction Impacts | 376.3 | 86.2 | 85.2 | **547.7** | 78.9 | 30.0 | 27.6 | **136.6** | 2,026 | 594 | 655 | **3,275** |
| Ten-Foot Draft Restriction Impacts | 925.0 | 227.7 | 208.9 | **1,361.7** | 187.2 | 80.3 | 67.6 | **335.2** | 4,884 | 1,611 | 1,605 | **8,100** |
| Impacts Assuming No Recession | 1,480.2 | 366.8 | 338.1 | **2,185.2** | 298.1 | 128.8 | 109.5 | **536.3** | 7,753 | 2,579 | 2,597 | **12,929** |

**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 Miami-Dade County**

The Intracoastal Waterway enters Miami-Dade County in the vicinity of Mile 1075. For the first two miles, the waterway in Miami-Dade County is a channel through Dumfoundling Bay, then in Biscayne Creek in the vicinity of North Miami Beach and Bakers Haulover Inlet, the northernmost inlet allowing offshore access in Miami-Dade County. South of the inlet the waterway begins its traverse of Biscayne Bay. In general, Biscayne Bay is more sheltered in northern Miami-Dade County where islands to the east shelter the bay. In the southern portion of the county, the bay is bounded by reefs and shoals to the east, and therefore the Intracoastal Waterway is less protected from seas. Upon entering Biscayne Bay, the waterway proceeds southwest, towards the western shore of the bay. The waterway then proceeds along the western

side of the bay, past Miami Beach on the east and the city of Miami on the west, to Government Cut. Government Cut allows offshore access through the main channel of the Port of Miami.

South of Government Cut, Miami River flows from the Everglades and empties into Biscayne Bay. Approximately four miles of the river are navigable and the river's banks are lined with terminals serving shallow ocean-going vessels and recreational boat builders, repair facilities, and marinas.

Proceeding south from the Miami River, the waterway veers east towards the middle of the bay. The waterway proceeds past Virginia Key and Key Biscayne. Bear Cut, passing between Virginia Key and Key Biscayne, allows offshore access to smaller vessels that can pass under a 16-foot fixed bridge. Offshore access is also available south of Key Biscayne via Cape Florida Channel and Biscayne Channel. South of Key Biscayne, the waterway proceeds through the open waters of the bay, reaching the waters protected on the east by the Florida Keys. The waterway proceeds south through Biscayne National Park, with the relatively undeveloped portion of Miami-Dade on the west and the Florida Keys to the east.

# II. SUMMARY OF FINDINGS OF THE ORIGINAL ANALYSIS

Under existing conditions, the original analysis estimated that the 901 marine-related businesses in Miami-Dade County generated direct sales of $1.358 billion in 2006. 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 2006 were estimated as $2.511 billion in business sales, $754.6 million in personal income, and 19,925 jobs. The direct business volume benefits from the original analysis, as presented in Table N-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.

Non-marine-related businesses also were shown to benefit from marine activities in the county. Boaters in the county purchased a total of $33.1 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 $35.5 million in business activity, $14.8 million in personal income, and 360 jobs. The economic benefits of the Waterways under existing conditions (the benefit of marine-related businesses and purchases by recreational boaters) totaled $2.547 billion in business volume, $769.4 million in personal income, and 20,285 jobs (see Table N-2). Tax revenues attributable to the Waterways were not estimated in the original analysis.

The economic benefits of commercial fishing were presented as estimated in the *Biscayne Bay Economic Study*. The $10.1 million in direct commercial fishing activities were estimated to generate total economic benefits of $28.3 million in business volume, $17.4 million in personal income, and 469 jobs.

Total economic benefits to Miami-Dade County as presented in the original analysis resulting from waterway activities, including sales by marine-related businesses, boater purchases of non-marine-related items, and commercial fishing, were estimated at $2.575 billion in business volume, $786.8 million in personal income, and 20,754 jobs (Table N-2).

**Table N-2. Summary of 2006 Total Economic Benefits of the Waterways in Miami-Dade County, as Presented in the Original Analysis**

| Waterway Maintenance Scenario | Business Volume (Millions) | | | | Personal Income (Millions) | | | | Employment | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Direct | Indirect | Induced | Total | Direct | Indirect | Induced | Total | Direct | Indirect | Induced | Total |
| 2006 Total Existing Impacts | 1,392.7 | 339.0 | 843.1 | **2,574.8** | 295.4 | 128.7 | 362.8 | **786.8** | 9,450 | 2,840 | 8,464 | **20,754** |
| 2006 Three-Foot Draft Restriction Impacts | 618.7 | 147.0 | 369.6 | **1,135.3** | 135.4 | 55.2 | 159.3 | **350.0** | 4,383 | 1,216 | 3,881 | **9,480** |
| 2006 Ten-Foot Draft Restriction Impacts | 1,565.8 | 385.4 | 955.3 | **2,906.5** | 333.7 | 146.9 | 410.7 | **891.3** | 10,644 | 3,250 | 9,587 | **23,481** |

Assuming cessation of maintenance of the Waterways, marine-related businesses in Miami-Dade County were estimated to generate direct sales of $1.358 billion in 2006. The total benefit of marine businesses in 2006 under this scenario was estimated as $1.086 billion in business sales, $323.6 million in personal income, and 8,794 jobs. In addition, boaters in the county purchased a total of $20.0 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 $21.4 million in business activity, $8.9 million in personal income, and 217 jobs. The total combined economic benefits of the Waterways assuming three-foot vessel draft restrictions, as presented in the original analysis, were $1.107 billion in business volume, $332.5 million in personal income, and 9,011 jobs.

The economic benefit of commercial fishing in the Biscayne Bay Economic Study did not estimate the impacts for varying Intracoastal Waterway depths. However, the depth of the District's Waterways should have a minimal effect on the overall production of fisheries in the region. Therefore, the benefits to commercial fishing were assumed to equal those estimated under current conditions. Commercial fishing benefits include $28.3 million in total business volume, $17.4 million in total personal income, and 469 jobs. Total economic benefits to Miami-Dade County under the reduced maintenance scenario, including sales by marine-related businesses, boater purchases of non-marine-related items, and commercial fishing and related activities, are estimated at $1.135 billion in business volume, $350.0 million in personal income, and 9,480 jobs (Table N-2). This is a decrease of $1.44 billion in business volume, $436.9 million in personal income, and 11,274 jobs compared to current existing conditions.

In the original analysis it was estimated that in 2006 marine-related businesses in Miami-Dade County would generate direct sales of $1.537 billion if vessel draft restrictions were increased to 10 feet MLW. The total benefit of marine-related business under this scenario was estimated as $2.845 billion in business sales, $859.0 million in personal income, and 22,652 jobs. Boaters were estimated to purchase a total of $33.1 million in gasoline, food, drinks, and ice for

consumption on the county's Waterways, which resulted in a total benefit of $33.5 million in business activity, $14.8 million in personal income, and 360 jobs. The total combined economic benefit of the Waterways, assuming 10-foot vessel draft restrictions, totaled $2.878 billion in business volume, $873.8 million in personal income, and 23,012 jobs.

The economic benefit of commercial fishing as presented in the Biscayne Bay Economic Study did not estimate the impacts for varying Intracoastal Waterway depths. However, the depth of the District's Waterways should have a minimal effect on the overall production of fisheries in the region. Therefore, the benefits to commercial fishing were assumed to equal those estimated under current conditions. Commercial fishing benefits include $28.3 million in total business volume, $17.4 million in total personal income, and 469 jobs. Total economic benefits to Miami-Dade County under the increased maintenance scenario, including sales by marine-related businesses, boater purchases of non-marine-related items, and commercial fishing and related activities, are estimated at $2.907 billion in business volume, $891.3 million in personal income, and 23,481 jobs (Table N-2). This is an increase of $331.7 million in business volume, $104.4 million in personal income, and 2,727 jobs compared to current existing conditions.

# 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 $1.358 billion. The data presented in the original analysis that outlined the direct impact of marine-related businesses in Miami-Dade 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 2006, the year that the original analysis was conducted, the firms classified as Kind Code 28 reported $6.194 billion in gross retail sales. In 2009, the latest year that data is available, Kind Code 28 firms reported total gross sales of $3.665 billion. This constitutes a decrease of 40 percent in gross sales over the three-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 N-3 presents the 2006 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 $1.358 billion in 2006 to $731.0 million in 2009.

The original analysis included the distribution of business volume for each marine-related business type and is reproduced here as Table N-4. For this analysis, the business activity distribution (Table N-4) for each business type was applied to the 2009 updated marine-related business volume (Table N-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 N-4, on average 79.6 percent of the business volume generated by a boat dealer would actually be retail trade, 1.4 percent would be used boat sales, 18.4 percent would be services, and 0.6 percent would be construction and transportation activities. Applying the percent distribution by business type and activity in Table N-4 to the 2009 updated marine-related business volume of $731.0 million in

**Table N-3. Total Direct Marine-Related Business Volume in Miami-Dade County, Aggregated by Business Type, 2006 and 2009**

| Business Type | 2006 Total Marine Business Volume | 2009 Total Marine Business Volume |
|---|---|---|
| Boat Dealers | $119,652,572 | $64,430,728 |
| Yacht Brokers | $120,985,456 | $65,148,462 |
| Marinas | $88,006,223 | $47,389,747 |
| Boat Yards | $14,907,170 | $8,027,239 |
| Canvas Products/Upholstery | $27,176,488 | $14,634,043 |
| Boat Repairs | $32,314,769 | $17,400,914 |
| Outboard Repairs | $34,407,804 | $18,527,975 |
| Marine Equipment/Electronics | $182,042,503 | $98,026,569 |
| Marine Construction | $62,323,981 | $33,560,327 |
| Tackle/Dive Equipment | $72,665,332 | $39,128,956 |
| Marine/Sporting Goods Retail | $681,700 | $367,083 |
| Wholesaler | $20,219,142 | $10,887,639 |
| Boat Manufacturer | $214,905,494 | $115,722,690 |
| Equipment Manufacturer | $142,641,052 | $76,809,606 |
| Ski/Boating Instruction | $3,362,000 | $1,810,376 |
| Boat Trailers | $15,785,000 | $8,499,935 |
| A/C Heating | $16,615,000 | $8,946,875 |
| Clubs/Associations | $14,626,669 | $7,876,195 |
| Engineering/Surveyors | $11,656,440 | $6,276,780 |
| Boating Services | $68,597,291 | $36,938,391 |
| Auto/Cycle Dealers | $15,940,789 | $8,583,824 |
| Restaurant/Seafood Market | $27,508,000 | $14,812,556 |
| Charter Boats/Rentals | $50,545,985 | $27,218,091 |
| **Total** | **$1,357,566,860** | **$731,025,003** |

## Table N-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 Dealers | 0.48% | 0.10% | 79.56% | 1.44% | 0.00% | 0.00% | 0.00% | 18.43% |
| Yacht Brokers | 0.00% | 0.00% | 30.48% | 41.13% | 0.00% | 2.48% | 0.00% | 25.91% |
| Marinas | 0.00% | 0.36% | 5.66% | 0.77% | 0.29% | 0.07% | 0.07% | 92.77% |
| Boat Yards | 0.00% | 0.00% | 7.00% | 0.00% | 0.00% | 0.00% | 0.00% | 93.00% |
| Canvas Products/Upholstery | 0.00% | 0.00% | 13.62% | 0.00% | 80.30% | 3.73% | 0.00% | 2.35% |
| Boat Repairs | 0.00% | 0.00% | 23.27% | 0.00% | 0.00% | 7.64% | 0.00% | 69.09% |
| Outboard Repairs | 0.00% | 0.00% | 21.60% | 0.00% | 0.00% | 0.00% | 0.00% | 78.40% |
| Marine Equipment/Electronics | 0.00% | 0.00% | 65.13% | 0.00% | 0.00% | 12.02% | 0.47% | 22.38% |
| Marine Construction | 90.47% | 0.00% | 0.00% | 0.00% | 0.84% | 0.00% | 0.00% | 8.69% |
| Tackle/Dive Equipment | 0.00% | 1.48% | 51.80% | 0.00% | 0.00% | 0.00% | 0.00% | 46.72% |
| Marine/Sporting Goods Retail | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Wholesaler | 0.00% | 0.00% | 37.42% | 0.00% | 0.00% | 62.58% | 0.00% | 0.00% |
| Boat Manufacturer | 0.00% | 0.00% | 0.00% | 3.78% | 96.22% | 0.00% | 0.00% | 0.00% |
| Equipment Manufacturer | 0.00% | 0.00% | 0.04% | 0.00% | 95.84% | 4.12% | 0.00% | 0.00% |
| Ski/Boating Instruction | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| Boat Trailers | 0.00% | 5.00% | 80.00% | 0.00% | 0.00% | 10.00% | 0.00% | 5.00% |
| A/C Heating | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| Clubs/Associations | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| Engineering/Surveyors | 0.00% | 27.40% | 2.85% | 0.00% | 0.00% | 0.00% | 0.00% | 69.75% |
| Boating Services | 0.00% | 74.86% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 25.14% |
| Auto/Cycle Dealers | 0.00% | 0.00% | 50.00% | 0.00% | 0.00% | 0.00% | 0.00% | 50.00% |
| Restaurant/Seafood Market | 0.00% | 0.00% | 51.07% | 0.00% | 0.00% | 48.93% | 0.00% | 0.00% |
| Charter Boats/Rentals | 0.00% | 0.00% | 34.47% | 0.00% | 0.00% | 0.00% | 0.00% | 65.53% |
| **Total** | **4.20%** | **4.19%** | **27.52%** | **4.44%** | **26.97%** | **4.57%** | **0.07%** | **28.05%** |

Table N-3 results in the summary of updated business volume distributed by business activity, as presented in Table N-5.

The values presented in Table N-5 are the total business volume of marine-related businesses. For instance, the $201.2 million in retail sales, the $32.5 million in used boat sales, and the $33.4 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 N-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.

To illustrate, when a boat dealer in Miami-Dade 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.

## Table N-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 Dealers | $64,430,728 | $308,413 | $61,683 | $51,261,458 | $925,242 | $0 | $0 | $0 | $11,873,932 |
| Yacht Brokers | $65,148,462 | $0 | $0 | $19,859,289 | $26,798,239 | $0 | $1,612,616 | $0 | $16,878,317 |
| Marinas | $47,389,747 | $0 | $172,634 | $2,682,792 | $365,992 | $138,115 | $34,521 | $34,521 | $43,961,161 |
| Boat Yards | $8,027,239 | $0 | $0 | $561,907 | $0 | $0 | $0 | $0 | $7,465,332 |
| Canvas Products/Upholstery | $14,634,043 | $0 | $0 | $1,992,648 | $0 | $11,751,500 | $546,088 | $0 | $343,813 |
| Boat Repairs | $17,400,914 | $0 | $0 | $4,049,667 | $0 | $0 | $1,328,810 | $0 | $12,022,437 |
| Outboard Repairs | $18,527,975 | $0 | $0 | $4,001,530 | $0 | $0 | $0 | $0 | $14,526,445 |
| Marine Equipment/Electronics | $98,026,569 | $0 | $0 | $63,845,673 | $0 | $0 | $11,782,027 | $457,749 | $21,941,123 |
| Marine Construction | $33,560,327 | $30,361,372 | $0 | $0 | $0 | $281,847 | $0 | $0 | $2,917,110 |
| Tackle/Dive Equipment | $39,128,956 | $0 | $580,336 | $20,268,134 | $0 | $0 | $0 | $0 | $18,280,485 |
| Marine/Sporting Goods Retail | $367,083 | $0 | $0 | $367,083 | $0 | $0 | $0 | $0 | $0 |
| Wholesaler | $10,887,639 | $0 | $0 | $4,074,669 | $0 | $0 | $6,812,970 | $0 | $0 |
| Boat Manufacturer | $115,722,690 | $0 | $0 | $0 | $4,378,044 | $111,344,646 | $0 | $0 | $0 |
| Equipment Manufacturer | $76,809,606 | $0 | $0 | $30,724 | $0 | $73,614,310 | $3,164,571 | $0 | $0 |
| Ski/Boating Instruction | $1,810,376 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $1,810,376 |
| Boat Trailers | $8,499,935 | $0 | $424,997 | $6,799,948 | $0 | $0 | $849,993 | $0 | $424,997 |
| A/C Heating | $8,946,875 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $8,946,875 |
| Clubs/Associations | $7,876,195 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $7,876,195 |
| Engineering/Surveyors | $6,276,780 | $0 | $1,720,130 | $178,623 | $0 | $0 | $0 | $0 | $4,378,028 |
| Boating Services | $36,938,391 | $0 | $27,652,934 | $0 | $0 | $0 | $0 | $0 | $9,285,457 |
| Auto/Cycle Dealers | $8,583,824 | $0 | $0 | $4,291,912 | $0 | $0 | $0 | $0 | $4,291,912 |
| Restaurant/Seafood Market | $14,812,556 | $0 | $0 | $7,565,260 | $0 | $0 | $7,247,297 | $0 | $0 |
| Charter Boats/Rentals | $27,218,091 | $0 | $0 | $9,381,315 | $0 | $0 | $0 | $0 | $17,836,778 |
| **Total** | **$731,025,003** | **$30,669,785** | **$30,612,713** | **$201,212,633** | **$32,467,516** | **$197,130,419** | **$33,378,893** | **$492,270** | **$205,060,772** |

**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 Miami-Dade County. The benefits were measured as changes in business volume, personal income, employment, and tax revenues. As illustrated in Table N-6, sales to consumers (by marine-related businesses in Miami-Dade County) generate a total of $1.115 billion in business volume (sales), $269.6 million in personal income (wages), and 6,491 jobs. State and local tax revenues were estimated at $45.3 million. Tax revenues were not presented in Table N-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.

The $1.115 billion in total business volume generated by marine-related businesses is distributed as a direct benefit of $759.0 million, an indirect benefit of $187.6 million, and an induced benefit of $168.2 million. The $269.6 million in personal income includes a direct benefit of $149.3 million and indirect and induced benefits of $120.3 million. The 6,491 man-years of employment generated by marine-related businesses include 3,879 direct jobs, 1,320 indirect jobs, and 1,292 induced jobs. The $45.3 million in state and local tax revenues includes $24.8 million generated by direct benefits, $9.7 million generated by indirect benefits, and $10.9 million generated by induced benefits.

About 30 to 40 percent of the total economic benefits are generated by the service industry, including $342.8 million in business sales, $100.1 million in personal income, and 2,597 jobs. The second largest benefits are generated by the manufacturing industry, with $327.6 million in sales, $82.3 million in personal income, and 1,741 jobs.

**Table N-6. Summary of Economic Benefits of Marine-Related Businesses in Miami-Dade 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 | 31.80 | 11.50 | 12.35 | 55.65 | 11.22 | 4.33 | 4.00 | 19.54 | 236 | 84 | 95 | 415 |
| Manufacturing | 202.62 | 73.42 | 51.60 | 327.64 | 40.48 | 25.12 | 16.70 | 82.31 | 879 | 465 | 397 | 1,741 |
| Transportation | 31.65 | 11.51 | 7.65 | 50.80 | 4.86 | 5.01 | 2.48 | 12.35 | 66 | 99 | 59 | 223 |
| Wholesale Trade | 35.08 | 2.94 | 3.96 | 41.98 | 4.08 | 1.03 | 1.28 | 6.40 | 126 | 21 | 30 | 177 |
| Retail Trade | 245.60 | 19.30 | 30.06 | 294.97 | 32.26 | 6.64 | 9.74 | 48.64 | 965 | 137 | 231 | 1,333 |
| Finance | 0.51 | 0.16 | 0.21 | 0.88 | 0.21 | 0.06 | 0.07 | 0.34 | 3 | 1 | 2 | 5 |
| Services | 211.76 | 68.72 | 62.33 | 342.81 | 56.19 | 23.70 | 20.18 | 100.06 | 1605 | 513 | 479 | 2,597 |
| **Total** | **759.01** | **187.55** | **168.16** | **1,114.72** | **149.30** | **65.89** | **54.44** | **269.63** | **3,879** | **1,320** | **1,292** | **6,491** |

### 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 Miami-Dade 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. Miami-Dade County boat owners returned a total of 37 completed questionnaires, of which one indicated that they no longer own a boat and eight 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, resulting in a total of 28 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 Miami-Dade 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 Palm Beach, Broward, and Miami-Dade 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 Miami-Dade 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 $32.9 million for gasoline and $22.1 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 Miami-Dade 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 $55.0 million in retail purchases ($32.9 million for gasoline sales and $22.1 million for food, drinks, and ice) by recreational boaters from establishments not located on the Waterways were estimated to generate total economic benefits of $77.0 million in business volume, $18.3 million in personal income, 405 jobs, and $7.7 million in tax revenues. As illustrated in Table N-7, the sales generated by these purchases include $54.7 million in direct benefits and $22.3 million in indirect and induced benefits. The total personal income includes $10.9 million in direct benefits and $7.5 million in indirect and induced benefits. The 405 jobs include 243 direct jobs and 162 indirect and induced jobs. State and local tax revenues include

$6.5 million generated by direct activities and $1.25 million generated by indirect and induced activities. The $6.5 million in tax revenues generated by direct activities includes $4.0 million in fuel taxes generated by the sale of $32.9 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 Miami-Dade County fuel tax in 2010 was $0.326 per gallon, including $0.16 per gallon in state levied taxes and $0.166 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 N-7. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in Miami-Dade County, Under Current Existing Conditions**

| | Economic Impacts | | | |
|---|---|---|---|---|
| **Activity** | **Direct** | **Indirect** | **Induced** | **Total** |
| Business Volume (Millions) | $54.70 | $10.89 | $11.40 | **$76.99** |
| Personal Income (Millions) | $10.85 | $3.79 | $3.69 | **$18.33** |
| Employment | 243 | 74 | 88 | **405** |
| Tax Revenues (Millions) | $6.48 | $0.51 | $0.74 | **$7.72** |

**Combined Economic Benefits of the Waterways**

The total economic benefits of the Waterways include the benefits generated by marine-related businesses in Miami-Dade County (presented in Table N-6) and the purchase of non-marine-related items for consumption on the Waterways (presented in Table N-7). A summary of these benefits is presented in Table N-8. Total benefits consist of $1.192 billion in business volume, $288.0 million in personal income, 6,896 jobs, and $53.0 million in tax revenue. Total business volume benefits consist of $813.7 million in direct sales and $378.0 million in indirect and induced sales. Total personal income benefits consist of $160.1 million in direct wages and $127.8 million in indirect and induced wages. Total employment benefits consist of 4,122 direct jobs and 2,774 indirect and induced jobs. State and local tax revenues include $31.3 million generated by direct activities, $10.2 million generated by indirect activities, and $11.6 million

generated by induced activities. The $31.3 million generated by direct activity includes $4.0 million in fuel taxes generated by gasoline sales.

**Table N-8. Summary of Total Economic Benefits of the Waterways in Miami-Dade County, Under Current Existing Conditions**

| Activity | Total Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $813.72 | $198.44 | $179.55 | **$1,191.71** |
| Personal Income (Millions) | $160.14 | $69.67 | $58.13 | **$287.95** |
| Employment | 4,122 | 1,395 | 1,379 | **6,896** |
| Tax Revenues (Millions) | $31.27 | $10.17 | $11.60 | **$53.04** |

These benefits represent about a 53 percent decrease from the values presented in the original analysis in business volume, a 63 percent decrease in personal income, and a 66 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 46 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 2006 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 2006 to 2010 was 8.2 percent. In other words, all other factors being held constant, the reported business output would have had to increase by approximately 8.2 percent, from 2006 to 2010, in order to maintain the same personal income and employment levels as reported in 2006. In addition, the total compensation costs for all civilian employees increased 9.6 percent over the same time period. In other words, employee compensation increased at a faster rate than inflation to the point that, in 2010, employees were paid approximately 9.6 percent more than they were paid in 2006. Therefore, business output and personal income would have to increase by 9.6 percent just to maintain the 2006

employment level. Another reason for the disparity between changes in business volume and employment is the change in output per person. For instance, from 2006 to 2010, output per person in the manufacturing industry experienced a 12.7 percent increase. This increase includes the 9.6 percent increase in employee compensation, indicating that adjusted for increasing employee compensation, output per employee increased by about 3.1 percent from 2006 to 2010. In other words, in the amount of time it took an employee to produce $1.00 of output in 2006, approximately $1.127 of output could be produced in 2010, with increased employee compensation accounting for about $0.096 of that increased output.

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.

### Commercial Fishing Activity

The economic benefits of commercial fishing in Biscayne Bay, for species dependent on the Bay but caught elsewhere in Miami-Dade County were addressed in the April 2005 *Biscayne Bay Economic Study* by Hazen and Sawyer for the South Florida Water Management District.

For commercial fishing and species dependent on the bay, IMPLAN was used to estimate direct, indirect, and induced business volume, personal income, and employment generated by the ex-vessel values of commercial fish harvests. In addition, IMPLAN was used to estimate the benefits of expenditures for vessel purchases and refurbishments and the benefits of the marketing and retailing of marine landings.

The economic benefits for commercial fishing were taken directly from the *Biscayne Bay Economic Study* and incorporated into the original analysis. For this update, the direct benefits presented in the 2005 *Biscayne Bay Economic Study* were updated to current values using the same methodology used to update the direct marine-related activities and the purchase of non-marine-related items. These updated direct benefits were then input into the IMPLAN model to estimate the current benefit of commercial fishing in the county.

The *Biscayne Bay Economic Study* and the original analysis included economic benefits generated by commercial fisheries landings, capital investments by commercial fishers for vessel costs and vessel refurbishments (maintenance and repair), and the wholesale and retail activity associated with marketing the Bay and Bay-dependent catches. For this update, vessel costs and vessel refurbishments were not included in this analysis because these benefits are captured in the marine-related business benefits discussed above.

In 2004, the direct benefits of commercial fishing presented in the original analysis, excluding capital investments by commercial fishers, were estimated at $9.3 million (see Table N-9). These values were updated to current values using the estimated increase in gross sales of all FDOR Kind Codes for the State of Florida. From 2004 to 2009, reported gross sales for the State of Florida increased by 12.6 percent, from $707.9 billion in 2004 to $796.8 billion in 2009. Total direct commercial fishing activity in the county is estimated to have increased from $9.3 million in 2004 to $10.5 million in 2009.

**Table N-9. Total Direct Biscayne Bay-Related Commercial Fishing Business Volume in Miami-Dade County, by Business Activity 2004 and 2009**

| Business Activity | 2004 Business Volume | 2009 Business Volume |
|---|---|---|
| Commercial Fishing | $3,914,950 | $4,406,527 |
| Wholesale Trade | $2,425,558 | $2,730,121 |
| Eating and Drinking Establishments | $2,834,944 | $3,190,911 |
| Government - State, Local, Federal | $116,904 | $131,583 |
| **Total** | **$9,292,356** | **$10,459,142** |

**Economic Benefits Generated by Commercial Fishing**

The $10.5 million in updated direct commercial fishing activities were input into the appropriate industrial sector of the IMPLAN model to estimate total current economic benefits. As can be seen in Table N-10, the direct commercial fishing activity are estimated to generate total economic benefits of $17.2 million in business volume, $6.4 million in personal income, 198 jobs, and $1.0 million in tax revenues. The total business volume benefits include $10.7 million in direct benefits and $6.5 million in indirect and induced benefits. The total personal income includes $4.1 million in direct benefits and $2.2 million in indirect and induced benefits. The 198 jobs include 149 direct jobs and 49 indirect and induced jobs. State and local tax revenues include $0.6 million generated by direct activities and $0.38 million generated by indirect and induced activities.

**Table N-10. Summary of Economic Benefits of Commercial Fishing in Miami-Dade County**

| | Economic Impacts | | | |
|---|---|---|---|---|
| **Activity** | **Direct** | **Indirect** | **Induced** | **Total** |
| Business Volume (Millions) | $10.69 | $2.61 | $3.93 | **$17.23** |
| Personal Income (Millions) | $4.11 | $0.97 | $1.27 | **$6.35** |
| Employment | 149 | 19 | 30 | **198** |
| Tax Revenues (Millions) | $0.61 | $0.13 | $0.25 | **$0.99** |

**Summary of Total Economic Benefits Under Current Existing Conditions**

**Economic Benefits Generated by Marine-Related Businesses**

Sales to consumers by marine-related businesses in Miami-Dade County generate a total of $1.115 billion in business volume, $269.6 million in personal income, 6,491 jobs, and $45.3 million in tax revenues.

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

The $55.0 million in retail purchases by recreational boaters from establishments not located on the Waterways were estimated to generate economic benefits of $77.0 million in business volume, $18.3 million in personal income, 405 jobs, and $7.7 million in tax revenues.

### Economic Benefits Generated by Commercial Fishing and Related Activities

Total business volume benefits resulting from commercial fishing activities are estimated at $17.2 million in business volume, $6.4 million in personal income, 198 jobs, and $1.0 million in tax revenues.

### Total Economic Benefits

As presented in Table N-11, current total economic benefits to Miami-Dade County resulting from waterway activities, including sales by marine-related businesses, boater purchases of non-marine-related items, and commercial fishing and related activities, are estimated at $1.209 billion in business volume, $294.3 million in personal income, 7,094 jobs, and $54.0 million in tax revenues.

**Table N-11. Summary of Total Economic Benefits Resulting from Waterway Activities, Under Current Existing Conditions**

| Activity | Business Sales (Millions of Dollars) | Personal Income (Millions of Dollars) | Employment (Jobs) | Tax Revenues (Millions of Dollars) |
|---|---|---|---|---|
| Marine Business Activity | $1,114.72 | $269.63 | 6,491 | $45.32 |
| Purchase of Non-Marine Items | $76.99 | $18.33 | 405 | $7.72 |
| Commercial Fishing | $17.23 | $6.35 | 198 | $0.99 |
| **Total** | **$1,208.94** | **$294.31** | **7,094** | **$54.03** |

## Economic Benefits Assuming a Cessation of Maintenance

If maintenance of the Waterways in Miami-Dade 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 $596.2 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 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 N-12 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 N-12, 44 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 $321.0 million if vessel drafts were reduced to three feet MLW, a reduction of $410.0 million from the $731.0 million in current business activity.

**Economic Benefits Generated by Marine-Related Businesses**

Assuming vessel draft restrictions of three feet MLW on the Waterways, the $321.0 million of marine-related business revenue in Miami-Dade County would be expected to generate total benefits of $485.0 million in business volume, $119.3 million in personal income, and 2,838 jobs (Table N-13). State and local tax revenues are estimated at $20.2 million. The $485.0 million in business volume expected to be generated by marine-related business includes a total direct benefit of $333.4 million and combined indirect and induced benefits of $151.6 million. The $119.3 million in personal income includes a direct benefit of $68.4 million and combined indirect and induced benefits of $51.0 million. The 2,838 jobs generated by marine-related businesses include 1,735 direct jobs, 531 indirect jobs, and 573 induced jobs. State and local tax revenues are estimated to be distributed as $11.5 million generated by direct activities, $3.9 million generated by indirect activities, and $4.8 million generated by induced activities.

## Table N-12. 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 Dealers | $64,430,728 | 35.64% | $22,962,950 | $106,882 | $21,376 | $18,199,892 | $320,645 | $0 | $0 | $0 | $4,314,155 |
| Yacht Brokers | $65,148,462 | 11.77% | $7,666,158 | $0 | $0 | $2,360,476 | $3,341,673 | $0 | $231,165 | $0 | $1,732,856 |
| Marinas | $47,389,747 | 32.26% | $15,287,416 | $0 | $47,442 | $1,142,149 | $115,924 | $37,948 | $9,486 | $9,486 | $13,924,983 |
| Boat Yards | $8,027,239 | 32.00% | $2,568,717 | $0 | $0 | $179,810 | $0 | $0 | $0 | $0 | $2,388,906 |
| Canvas Products/Upholstery | $14,634,043 | 75.53% | $11,053,111 | $0 | $0 | $1,486,219 | $0 | $8,906,480 | $417,234 | $0 | $243,193 |
| Boat Repairs | $17,400,914 | 62.40% | $10,858,170 | $0 | $0 | $2,587,641 | $0 | $0 | $849,069 | $0 | $7,421,456 |
| Outboard Repairs | $18,527,975 | 66.11% | $12,249,050 | $0 | $0 | $2,632,852 | $0 | $0 | $0 | $0 | $9,616,197 |
| Marine Equipment/Electronics | $98,026,569 | 56.96% | $55,831,820 | $0 | $0 | $36,628,595 | $0 | $0 | $6,870,897 | $266,117 | $12,066,200 |
| Marine Construction | $33,560,327 | 41.32% | $13,866,833 | $12,490,979 | $0 | $0 | $0 | $147,102 | $0 | $0 | $1,228,748 |
| Tackle/Dive Equipment | $39,128,956 | 71.36% | $27,921,274 | $0 | $405,321 | $14,491,167 | $0 | $0 | $0 | $0 | $13,024,777 |
| Marine/Sporting Goods Retail | $367,083 | 100.00% | $367,083 | $0 | $0 | $367,083 | $0 | $0 | $0 | $0 | $0 |
| Wholesaler | $10,887,639 | 78.65% | $8,563,297 | $0 | $0 | $3,125,783 | $0 | $0 | $5,437,514 | $0 | $0 |
| Boat Manufacturer | $115,722,690 | 35.15% | $40,679,361 | $0 | $0 | $0 | $931,130 | $39,748,230 | $0 | $0 | $0 |
| Equipment Manufacturer | $76,809,606 | 69.00% | $52,998,514 | $0 | $0 | $9,353 | $0 | $52,160,427 | $828,733 | $0 | $0 |
| Ski/Boating Instruction | $1,810,376 | 0.00% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Boat Trailers | $8,499,935 | 50.00% | $4,249,967 | $0 | $212,498 | $3,399,974 | $0 | $0 | $424,997 | $0 | $212,498 |
| A/C Heating | $8,946,875 | 0.00% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Clubs/Associations | $7,876,195 | 15.00% | $1,181,429 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $1,181,429 |
| Engineering/Surveyors | $6,276,780 | 70.24% | $4,408,751 | $0 | $1,271,799 | $133,472 | $0 | $0 | $0 | $0 | $3,003,478 |
| Boating Services | $36,938,391 | 7.66% | $2,827,778 | $0 | $1,815,215 | $0 | $0 | $0 | $0 | $0 | $1,012,563 |
| Auto/Cycle Dealers | $8,583,824 | 100.00% | $8,583,824 | $0 | $0 | $4,291,912 | $0 | $0 | $0 | $0 | $4,291,912 |
| Restaurant/Seafood Market | $14,812,556 | 100.00% | $14,812,556 | $0 | $0 | $7,850,655 | $0 | $0 | $6,961,902 | $0 | $0 |
| Charter Boats/Rentals | $27,218,091 | 7.72% | $2,102,467 | $0 | $0 | $680,163 | $0 | $0 | $0 | $0 | $1,422,330 |
| **Total** | **$731,025,003** | **43.92%** | **$321,040,527** | **$12,597,861** | **$3,773,650** | **$99,567,197** | **$4,709,372** | **$101,000,187** | **$22,030,997** | **$275,603** | **$77,085,682** |

**Table N-13. Summary of Economic Benefits of Marine-Related Businesses in Miami-Dade 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 | 13.06 | 4.72 | 5.07 | 22.86 | 4.61 | 1.78 | 1.64 | 8.03 | 97 | 35 | 39 | 170 |
| Manufacturing | 103.76 | 35.21 | 27.95 | 166.92 | 23.38 | 12.04 | 9.05 | 44.46 | 452 | 221 | 215 | 887 |
| Transportation | 3.90 | 1.42 | 0.98 | 6.30 | 0.66 | 0.61 | 0.32 | 1.58 | 11 | 12 | 8 | 30 |
| Wholesale Trade | 23.15 | 1.97 | 2.62 | 27.74 | 2.69 | 0.69 | 0.85 | 4.23 | 85 | 14 | 20 | 119 |
| Retail Trade | 109.59 | 9.87 | 14.20 | 133.66 | 14.97 | 3.39 | 4.60 | 22.96 | 486 | 70 | 109 | 665 |
| Finance | 0.28 | 0.09 | 0.12 | 0.49 | 0.12 | 0.03 | 0.04 | 0.19 | 1 | 1 | 1 | 3 |
| Services | 79.65 | 23.83 | 23.59 | 127.07 | 21.96 | 8.28 | 7.64 | 37.87 | 603 | 179 | 181 | 963 |
| **Total** | **333.40** | **77.11** | **74.53** | **485.04** | **68.38** | **26.82** | **24.13** | **119.33** | **1,735** | **531** | **573** | **2,838** |

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 $629.7 million, a decrease in personal income of $150.3 million, a decrease of 3,653 jobs, and a decrease of $25.1 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 Miami-Dade County and the distribution of registered vessels by size. The current sales of non-marine-related items to recreational boaters were estimated at $55.0 million ($32.9 million for gasoline sales and $22.1 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 $32.4 million (including $20.3 million for gasoline sales and $12.1 million in food, drink, and ice sales), a reduction of $22.6 million from existing conditions.

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

As illustrated in Table N-14, the expected $32.4 million in retail sales of gas, food, drinks, and ice to recreational boaters from businesses not located on the Waterways would generate benefits of $45.5 million in business volume, $10.9 million in personal income, 239 jobs, and $4.7 million in tax revenues. Compared to existing conditions, this is a reduction of about $31.5 million in business volume, $7.4 million in personal income, 166 jobs, and $3.1

million in tax revenues. Tax revenues generated under this scenario include $2.4 million in fuel taxes distributed as $1.2 million in state levied and locally levied taxes, each.

**Table N-14. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in Miami-Dade County, Assuming Vessel Draft Restrictions of Three Feet**

| Activity | Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $32.20 | $6.48 | $6.78 | **$45.45** |
| Personal Income (Millions) | $6.45 | $2.25 | $2.20 | **$10.90** |
| Employment | 143 | 44 | 52 | **239** |
| Tax Revenues (Millions) | $3.92 | $0.30 | $0.44 | **$4.66** |

**Combined Economic Benefits of the Waterways**

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 N-15. The combined benefits include $530.5 million in business volume, $130.2 million in personal income, 3,077 jobs, and $24.8 million in tax revenues. The $24.8 million in state and local tax revenues includes $2.4 million in fuel taxes generated by gasoline sales to boaters. These benefits are a reduction of $661.2 million in business volume, $157.7 million in personal income, 3,819 jobs, and $28.2 million in tax revenues compared to existing conditions on the Waterways and account for 53 to 55 percent of the existing benefits of the Waterways.

**Table N-15. Summary of Total Economic Benefits of the Waterways in Miami-Dade County, Assuming Vessel Draft Restrictions of Three Feet**

| Activity | Total Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $365.59 | $83.59 | $81.31 | **$530.49** |
| Personal Income (Millions) | $74.83 | $29.07 | $26.32 | **$130.23** |
| Employment | 1,878 | 575 | 625 | **3,077** |
| Tax Revenues (Millions) | $15.37 | $4.21 | $5.25 | **$24.84** |

### Economic Benefits Generated by Commercial Fishing

The Biscayne Bay Economic Study did not estimate the impacts for varying Intracoastal Waterway depths. However, the depth of the District's waterways should have a minimal effect on the overall production of fisheries in the region. Therefore, the benefits to commercial fishing were assumed to equal those estimated under current conditions, including $17.2 million in total business volume, $6.4 million in total personal income, 198 jobs, and $1.0 million in tax revenues.

### Total Economic Benefits

Total economic benefits to Miami-Dade County under the reduced maintenance scenario, including sales by marine-related businesses, boater purchases of non-marine-related items, and commercial fishing and related activities, are estimated at $547.7 million in business volume, $136.6 million in personal income, 3,275 jobs, and $25.8 million in tax revenues (Table N-16). This is a decrease of $661.2 million in business volume, $157.7 million in personal income, 3,818 jobs, and $28.2 million in tax revenues compared to current existing conditions.

**Table N-16. Summary of Total Economic Benefits Resulting from Waterway Activities, Assuming Vessel Draft Restrictions of Three Feet**

| Activity | Business Sales (Millions of Dollars) | Personal Income (Millions of Dollars) | Employment (Jobs) | Tax Revenues (Millions of Dollars) |
|---|---|---|---|---|
| Marine Business Activity | $485.04 | $119.33 | 2,838 | $20.17 |
| Purchase of Non-Marine Items | $45.45 | $10.90 | 239 | $4.66 |
| Commercial Fishing | $17.23 | $6.35 | 198 | $0.99 |
| **Total** | **$547.72** | **$136.58** | **3,275** | **$25.83** |

### 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 Miami-Dade County to 10 feet MLW. This increase in draft allowance would permit deeper draft vessels to fully utilize the Waterways in Miami-Dade 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 $1.537 billion. 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 N-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 N-17 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 13.2 percent if vessel drafts were increased to 10 feet MLW. Total marine-related business revenue is expected to be $1.537 billion, an increase of $179.6 million from the $1.358 billion in existing business activity.

## Table N-17. 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 Dealers | $64,430,728 | 6.46% | $68,594,315 | $330,248 | $66,050 | $54,471,146 | $990,747 | $0 | $0 | $0 | $12,736,123 |
| Yacht Brokers | $65,148,462 | 32.47% | $86,302,561 | $0 | $0 | $25,856,727 | $34,369,363 | $0 | $2,034,653 | $0 | $24,041,812 |
| Marinas | $47,389,747 | 17.76% | $55,806,181 | $0 | $191,344 | $3,212,301 | $430,152 | $153,080 | $38,258 | $38,258 | $51,742,775 |
| Boat Yards | $8,027,239 | 18.00% | $9,472,142 | $0 | $0 | $663,050 | $0 | $0 | $0 | $0 | $8,809,093 |
| Canvas Products/Upholstery | $14,634,043 | 12.65% | $16,485,615 | $0 | $0 | $2,229,423 | $0 | $13,261,447 | $607,771 | $0 | $386,980 |
| Boat Repairs | $17,400,914 | 8.18% | $18,824,625 | $0 | $0 | $4,368,959 | $0 | $0 | $1,428,267 | $0 | $13,027,382 |
| Outboard Repairs | $18,527,975 | 1.53% | $18,811,041 | $0 | $0 | $4,061,292 | $0 | $0 | $0 | $0 | $14,749,750 |
| Marine Equipment/Electronics | $98,026,569 | 14.33% | $112,070,123 | $0 | $0 | $73,048,322 | $0 | $0 | $13,489,507 | $526,388 | $25,005,909 |
| Marine Construction | $33,560,327 | 29.46% | $43,447,390 | $39,324,354 | $0 | $0 | $0 | $349,494 | $0 | $0 | $3,773,545 |
| Tackle/Dive Equipment | $39,128,956 | 8.43% | $42,428,150 | $0 | $634,021 | $21,925,243 | $0 | $0 | $0 | $0 | $19,868,888 |
| Marine/Sporting Goods Retail | $367,083 | 0.00% | $367,083 | $0 | $0 | $367,083 | $0 | $0 | $0 | $0 | $0 |
| Wholesaler | $10,887,639 | 0.00% | $10,887,639 | $0 | $0 | $4,074,669 | $0 | $0 | $6,812,970 | $0 | $0 |
| Boat Manufacturer | $115,722,690 | 7.86% | $124,817,529 | $0 | $0 | $0 | $4,532,188 | $120,285,336 | $0 | $0 | $0 |
| Equipment Manufacturer | $76,809,606 | 2.00% | $78,345,805 | $0 | $0 | $30,800 | $0 | $75,142,606 | $3,172,398 | $0 | $0 |
| Ski/Boating Instruction | $1,810,376 | 0.00% | $1,810,376 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $1,810,376 |
| Boat Trailers | $8,499,935 | 25.00% | $10,624,918 | $0 | $531,246 | $8,499,935 | $0 | $0 | $1,062,491 | $0 | $531,246 |
| A/C Heating | $8,946,875 | 30.00% | $11,630,937 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $11,630,937 |
| Clubs/Associations | $7,876,195 | 10.00% | $8,663,814 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $8,663,815 |
| Engineering/Surveyors | $6,276,780 | 45.18% | $9,112,585 | $0 | $2,381,825 | $247,162 | $0 | $0 | $0 | $0 | $6,483,600 |
| Boating Services | $36,938,391 | 31.80% | $48,685,438 | $0 | $36,507,810 | $0 | $0 | $0 | $0 | $0 | $12,177,623 |
| Auto/Cycle Dealers | $8,583,824 | 0.00% | $8,583,824 | $0 | $0 | $4,291,912 | $0 | $0 | $0 | $0 | $4,291,912 |
| Restaurant/Seafood Market | $14,812,556 | 0.00% | $14,812,556 | $0 | $0 | $7,565,260 | $0 | $0 | $7,247,297 | $0 | $0 |
| Charter Boats/Rentals | $27,218,091 | 0.00% | $27,218,091 | $0 | $0 | $9,381,315 | $0 | $0 | $0 | $0 | $17,836,778 |
| **Total** | **$731,025,003** | **13.24%** | **$827,802,740** | **$39,654,602** | **$40,312,295** | **$224,294,597** | **$40,322,451** | **$209,191,962** | **$35,893,611** | **$564,646** | **$237,568,542** |

### 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 $1.267 billion in business volume, $310.5 million in personal income, and 7,497 jobs (Table N-18). State and local tax revenues were estimated at $52.4 million. The sales expected to be generated by marine-related businesses under this scenario include a direct benefit of $859.6 million and combined indirect and induced benefits of $407.9 million. The total personal income generated under this maintenance scenario includes a direct benefit of $172.3 million and combined indirect and induced benefits of $138.2 million. Total employment benefits include 4,492 direct jobs, 1,518 indirect jobs, and 1,487 induced jobs. The $52.4 million in state and local tax revenues includes $28.9 million generated by direct benefits, $11.0 million generated by indirect benefits, and $12.5 million generated by induced benefits.

**Table N-18. Summary of Economic Benefits of Marine-Related Businesses in Miami-Dade 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 | 41.12 | 14.87 | 15.97 | 71.95 | 14.50 | 5.60 | 5.17 | 25.27 | 305 | 109 | 123 | 536 |
| Manufacturing | 215.03 | 78.17 | 54.53 | 347.73 | 42.61 | 26.75 | 17.65 | 87.01 | 938 | 496 | 419 | 1,853 |
| Transportation | 41.67 | 15.16 | 10.05 | 66.88 | 6.37 | 6.60 | 3.26 | 16.23 | 85 | 130 | 77 | 293 |
| Wholesale Trade | 37.72 | 3.19 | 4.31 | 45.22 | 4.46 | 1.12 | 1.40 | 6.97 | 138 | 23 | 33 | 194 |
| Retail Trade | 278.11 | 23.33 | 36.09 | 337.53 | 38.67 | 8.02 | 11.69 | 58.39 | 1,167 | 166 | 277 | 1,610 |
| Finance | 0.58 | 0.19 | 0.24 | 1.01 | 0.24 | 0.07 | 0.08 | 0.39 | 3 | 1 | 2 | 6 |
| Services | 245.35 | 79.35 | 72.41 | 397.12 | 65.42 | 27.38 | 23.45 | 116.25 | 1,857 | 592 | 556 | 3,005 |
| **Total** | **859.60** | **214.25** | **193.60** | **1,267.44** | **172.27** | **75.54** | **62.68** | **310.49** | **4,492** | **1,518** | **1,487** | **7,497** |

### 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 $77.0 million in business volume, $18.3 million in personal income, and 405 jobs (Table N-19). The $7.7 million in tax revenues generated under this scenario includes $4.0 million in fuel taxes distributed as $2.0 million in state levied taxes and $2.0 million in locally levied taxes.

**Table N-19. Summary of Economic Benefits of Non-Marine-Related Items Purchased by Boaters in Miami-Dade County, Assuming Vessel Draft Restrictions of 10 Feet**

| Activity | Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $54.70 | $10.89 | $11.40 | **$76.99** |
| Personal Income (Millions) | $10.85 | $3.79 | $3.69 | **$18.33** |
| Employment | 243 | 74 | 88 | **405** |
| Tax Revenues (Millions) | $6.48 | $0.51 | $0.74 | **$7.72** |

**Combined Economic Benefits of the Waterways**

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 N-20. Combined benefits include $1.344 billion in business volume, $328.8 million in personal income, 7,902 jobs, and $60.1 million in tax revenues. State and local tax revenues include $4.0 million in fuel taxes generated by gasoline sales to boaters.

**Table N-20. Summary of Total Economic Benefits of the Waterways in Miami-Dade County, Assuming Vessel Draft Restrictions of 10 Feet**

| Activity | Total Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $914.30 | $225.14 | $205.00 | **$1,344.44** |
| Personal Income (Millions) | $183.11 | $79.33 | $66.37 | **$328.81** |
| Employment | 4,735 | 1,592 | 1,575 | **7,902** |
| Tax Revenues (Millions) | $35.37 | $11.51 | $13.24 | **$60.12** |

The combined business volume generated from the Waterways assuming 10-foot vessel draft restrictions includes a direct benefit of $914.3 million, an indirect benefit of $225.1 million, and an induced benefit of $205.0 million. Combined personal income generated under this scenario consists of $183.1 million in direct benefits, $79.3 million in indirect benefits, and $66.4 million in induced benefits. Combined employment includes 4,735 direct jobs, 1,592 indirect jobs, and 1,575 induced jobs. State and local tax revenues include $35.4 million generated by direct activities, $11.5 million generated by indirect activities, and $13.2 million

generated by induced activities. The $35.4 million in tax revenues generated by direct activity includes $4.0 million in fuel taxes.

**Economic Benefits Generated by Commercial Fishing**

The depth of the Intracoastal Waterway should have a minimal effect on the overall production of fisheries in the region. Therefore, the benefits to commercial fishing were assumed to equal those estimated under current conditions, including $17.2 million in total business volume, $6.4 million in total personal income, 198 jobs, and $1.0 million in tax revenues.

**Total Economic Benefits**

Total economic benefits to Miami-Dade County under the higher state of maintenance scenario generated by marine-related businesses sales, boater purchases of non-marine-related items, and commercial fishing and related activities, are estimated at $1.362 billion in business volume, $335.2 million in personal income, 8,100 jobs, and $61.1 million in tax revenues (Table N-21). This is an increase of $152.7 million in business volume, $40.9 million in personal income, 1,006 jobs, and $7.1 million in tax revenues compared to existing conditions.

**Table N-21. Summary of Total Economic Benefits Resulting from Waterway Activities, Assuming Vessel Draft Restrictions of 10 Feet**

| Activity | Business Sales (Millions of Dollars) | Personal Income (Millions of Dollars) | Employment (Jobs) | Tax Revenues (Millions of Dollars) |
|---|---|---|---|---|
| Marine Business Activity | $1,267.44 | $310.49 | 7,497 | $52.40 |
| Purchase of Non-Marine Items | $76.99 | $18.33 | 405 | $7.72 |
| Commercial Fishing | $17.23 | $6.35 | 198 | $0.99 |
| **Total** | **$1,361.67** | **$335.17** | **8,100** | **$61.11** |

**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. To estimate the impact of the recession, the trend in gross sales of Kind Code 28 established over the 20-year period prior to the onset of the recession was used to estimate the theoretical gross sales in Miami-Dade 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. 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 N-1 graphically illustrates the gross sales for Kind Code 28 for Miami-Dade County from 1986 through 2009. Gross sales peaked in 2006 at $517.8 million and declined to $278.9 million in 2009.

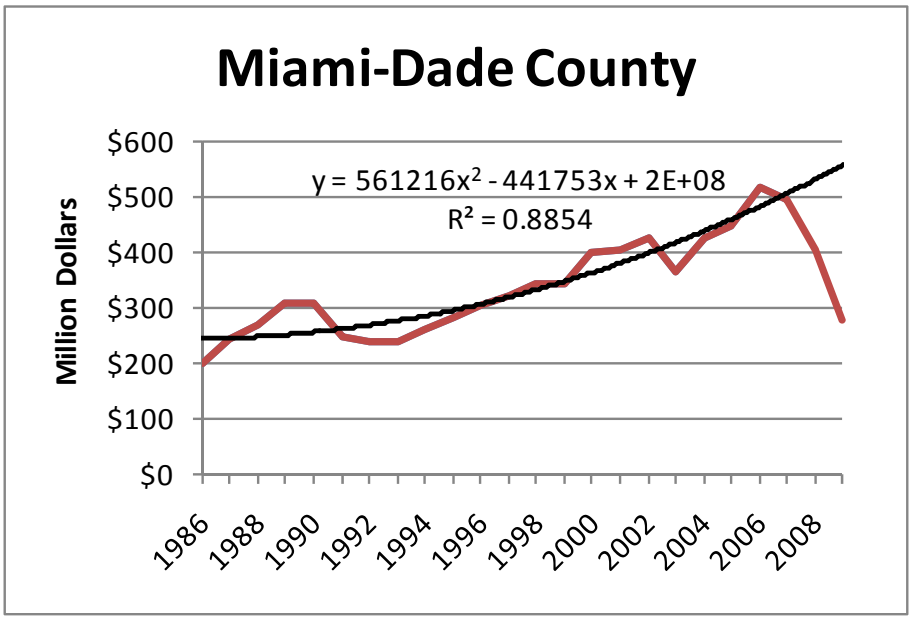


**Figure N-1. Miami-Dade County, FDOR Reported Gross Sales of Kind Code 28, 1986 Through 2009**

The black line on the graph is the trend line exhibited by the gross sales for Kind Code 28 from 1986 to 2007. The trend line is based on the following polynomial equation:

$Y = 561{,}216x^2 - 441{,}753x + 2E+08$

Where:

Y = expected value

x = known value (year, expressed as year for which expected value is being estimated minus the base year of 1986)

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

With an $R^2$ value of 0.8854.

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 $512.7 million, 84 percent greater than actual reported sales. In other words, the recession reduced marine-related gross sales, as reported to FDOR, by $233.8 million in 2009.

The gross sales reported in Kind Code 28 in the year that the original analysis was conducted (2006) 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 N-22, if the recession had not occurred, total direct marine-related business sales would have decreased from $1.358 billion in 2006 to $1.344 billion in 2009. The updated Table N-22 data were combined with the distribution of marine revenues by type (as obtained from the original analysis and presented in Table N-4 in this report) to develop updated estimates of total non-recession marine-related business revenues (see Table N-23). 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 Miami-Dade County measured as increases in business volume, personal income, employment, and tax revenues.

**Table N-22. Total Marine-Related Business Volume in Miami-Dade County, Aggregated by Business Type, 2006 and 2009, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur**

| Business Type | 2006 Total Marine Business Volume | 2009 Total Marine Business Volume |
|---|---|---|
| Boat Dealers | $119,652,572 | $118,454,159 |
| Yacht Brokers | $120,985,456 | $119,773,693 |
| Marinas | $88,006,223 | $87,124,773 |
| Boat Yards | $14,907,170 | $14,757,863 |
| Canvas Products/Upholstery | $27,176,488 | $26,904,294 |
| Boat Repairs | $32,314,769 | $31,991,112 |
| Outboard Repairs | $34,407,804 | $34,063,183 |
| Marine Equipment/Electronics | $182,042,503 | $180,219,207 |
| Marine Construction | $62,323,981 | $61,699,758 |
| Tackle/Dive Equipment | $72,665,332 | $71,937,533 |
| Marine/Sporting Goods Retail | $681,700 | $674,872 |
| Wholesaler | $20,219,142 | $20,016,632 |
| Boat Manufacturer | $214,905,494 | $212,753,050 |
| Equipment Manufacturer | $142,641,052 | $141,212,392 |
| Ski/Boating Instruction | $3,362,000 | $3,328,327 |
| Boat Trailers | $15,785,000 | $15,626,901 |
| A/C Heating | $16,615,000 | $16,448,588 |
| Clubs/Associations | $14,626,669 | $14,480,172 |
| Engineering/Surveyors | $11,656,440 | $11,539,692 |
| Boating Services | $68,597,291 | $67,910,236 |
| Auto/Cycle Dealers | $15,940,789 | $15,781,130 |
| Restaurant/Seafood Market | $27,508,000 | $27,232,486 |
| Charter Boats/Rentals | $50,545,985 | $50,039,728 |
| **Total** | **$1,357,566,860** | **$1,343,969,780** |

## Table N-23. 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 Dealers | $118,454,159 | $567,010 | $113,403 | $94,242,811 | $1,701,032 | $0 | $0 | $0 | $21,829,905 |
| Yacht Brokers | $119,773,693 | $0 | $0 | $36,510,769 | $49,267,840 | $0 | $2,964,751 | $0 | $31,030,331 |
| Marinas | $87,124,773 | $0 | $317,383 | $4,932,240 | $672,866 | $253,921 | $63,466 | $63,466 | $80,821,411 |
| Boat Yards | $14,757,863 | $0 | $0 | $1,033,051 | $0 | $0 | $0 | $0 | $13,724,813 |
| Canvas Products/Upholstery | $26,904,294 | $0 | $0 | $3,663,430 | $0 | $21,604,817 | $1,003,969 | $0 | $632,090 |
| Boat Repairs | $31,991,112 | $0 | $0 | $7,445,204 | $0 | $0 | $2,442,981 | $0 | $22,102,927 |
| Outboard Repairs | $34,063,183 | $0 | $0 | $7,356,704 | $0 | $0 | $0 | $0 | $26,706,479 |
| Marine Equipment/Electronics | $180,219,207 | $0 | $0 | $117,378,551 | $0 | $0 | $21,660,939 | $841,559 | $40,338,164 |
| Marine Construction | $61,699,758 | $55,818,564 | $0 | $0 | $0 | $518,169 | $0 | $0 | $5,363,029 |
| Tackle/Dive Equipment | $71,937,533 | $0 | $1,066,932 | $37,262,419 | $0 | $0 | $0 | $0 | $33,608,179 |
| Marine/Sporting Goods Retail | $674,872 | $0 | $0 | $674,872 | $0 | $0 | $0 | $0 | $0 |
| Wholesaler | $20,016,632 | $0 | $0 | $7,491,170 | $0 | $0 | $12,525,462 | $0 | $0 |
| Boat Manufacturer | $212,753,050 | $0 | $0 | $0 | $8,048,916 | $204,704,133 | $0 | $0 | $0 |
| Equipment Manufacturer | $141,212,392 | $0 | $0 | $56,486 | $0 | $135,337,926 | $5,817,978 | $0 | $0 |
| Ski/Boating Instruction | $3,328,327 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $3,328,327 |
| Boat Trailers | $15,626,901 | $0 | $781,345 | $12,501,521 | $0 | $0 | $1,562,690 | $0 | $781,345 |
| A/C Heating | $16,448,588 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $16,448,588 |
| Clubs/Associations | $14,480,172 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $14,480,172 |
| Engineering/Surveyors | $11,539,692 | $0 | $3,162,413 | $328,394 | $0 | $0 | $0 | $0 | $8,048,887 |
| Boating Services | $67,910,236 | $0 | $50,839,174 | $0 | $0 | $0 | $0 | $0 | $17,071,062 |
| Auto/Cycle Dealers | $15,781,130 | $0 | $0 | $7,890,565 | $0 | $0 | $0 | $0 | $7,890,565 |
| Restaurant/Seafood Market | $27,232,486 | $0 | $0 | $13,908,526 | $0 | $0 | $13,323,960 | $0 | $0 |
| Charter Boats/Rentals | $50,039,728 | $0 | $0 | $17,247,294 | $0 | $0 | $0 | $0 | $32,792,436 |
| **Total** | **$1,343,969,780** | **$56,385,573** | **$56,280,649** | **$369,924,007** | **$59,690,655** | **$362,418,966** | **$61,366,196** | **$905,025** | **$376,998,707** |

If the recession had not occurred, business activity would have been 84 percent greater than estimated for 2009. Total marine-related business revenue, assuming no recession, would have been approximately $1.344 billion in 2009, an increase of $613 million from the $731.0 million in current business activity.

**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 $2.049 billion in business volume, $495.7 million in personal income, and 11,934 jobs (Table N-24). State and local tax revenues would have been $83.3 million. This is an increase of $934.7 million in business volume, $226.1 million in personal income, 5,443 jobs, and $38.0 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 $1.395 billion and combined indirect and induced benefits of $654.0 million. The total personal income generated under this maintenance scenario includes a direct benefit of $274.5 million and combined indirect and induced benefits of $221.2 million. Total employment benefits include 7,131 direct jobs, 2,428 indirect jobs, and 2,375 induced jobs. The $83.3 million in state and local tax revenues includes $45.6 million generated by direct benefits, $17.8 million generated by indirect benefits, and $20.0 million generated by induced benefits.

**Table N-24. Summary of Economic Benefits of Marine-Related Businesses in Miami-Dade 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 | 58.47 | 21.14 | 22.71 | 102.31 | 20.62 | 7.96 | 7.35 | 35.93 | 433 | 155 | 175 | 763 |
| Manufacturing | 372.50 | 134.99 | 94.87 | 602.36 | 74.43 | 46.19 | 30.71 | 151.32 | 1,616 | 855 | 729 | 3,201 |
| Transportation | 58.18 | 21.15 | 14.06 | 93.40 | 8.94 | 9.21 | 4.55 | 22.70 | 121 | 182 | 108 | 411 |
| Wholesale Trade | 64.50 | 5.40 | 7.28 | 77.17 | 7.51 | 1.89 | 2.36 | 11.76 | 231 | 39 | 56 | 326 |
| Retail Trade | 451.53 | 35.49 | 55.27 | 542.29 | 59.31 | 12.21 | 17.90 | 89.42 | 1,775 | 252 | 424 | 2,451 |
| Finance | 0.93 | 0.30 | 0.38 | 1.61 | 0.38 | 0.11 | 0.12 | 0.62 | 5 | 2 | 3 | 9 |
| Services | 389.32 | 126.34 | 114.59 | 630.24 | 103.30 | 43.56 | 37.10 | 183.96 | 2,951 | 943 | 880 | 4,774 |
| **Total** | **1,395.42** | **344.80** | **309.15** | **2,049.38** | **274.48** | **121.13** | **100.09** | **495.70** | **7,131** | **2,428** | **2,375** | **11,934** |

**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 Palm Beach, Broward, and Miami-Dade 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 Miami-Dade County that used the Waterways over the past twelve 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 $43.6 million for gasoline and $29.2 million for food, drinks, and ice.

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

As illustrated in Table N-25, the expected $72.8 million in retail sales of gas, food, drinks, and ice to recreational boaters from businesses not located on the Waterways would generate benefits of $115.9 million in business volume, $33.3 million in personal income, and 767 jobs. State and local tax revenues would have been $12.4 million, including $9.9 million generated by direct activities that includes $5.3 million in fuel taxes. Compared to existing conditions, these benefits would have been an increase of about $38.9 million in business volume, $15.0 million in personal income, 362 jobs, and $4.6 million in tax revenues.

**Table N-25. Summary of Economic Benefits of Non-Marine-Related Items Purchased By Boaters in Miami-Dade County, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur**

| | Economic Impacts | | | |
|---|---|---|---|---|
| **Activity** | **Direct** | **Indirect** | **Induced** | **Total** |
| Business Volume (Millions) | $72.47 | $19.00 | $24.41 | **$115.89** |
| Personal Income (Millions) | $18.82 | $6.58 | $7.91 | **$33.30** |
| Employment | 450 | 130 | 187 | **767** |
| Tax Revenues (Millions) | $9.89 | $0.89 | $1.58 | **$12.35** |

**Combined Economic Benefits of the Waterways**

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 N-26. Combined benefits would have included $2.165 billion in business volume, $529.0 million in personal income, 12,701 jobs, and $95.7 million in state and local tax revenues. State and local tax revenues would have included $5.3 million in fuel taxes generated by the sale of gasoline. In other words, the recession has resulted in a decrease of $973.6 million in business volume, $241.1 million in personal income, 5,805 jobs, and $42.6 million in tax revenues compared to current conditions.

**Table N-26. Summary of Total Economic Benefits of the Waterways in Miami-Dade County, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur**

| Activity | Total Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $1,467.90 | $363.80 | $333.57 | **$2,165.26** |
| Personal Income (Millions) | $293.30 | $127.71 | $108.00 | **$529.01** |
| Employment | 7,581 | 2,558 | 2,562 | **12,701** |
| Tax Revenues (Millions) | $55.47 | $18.65 | $21.55 | **$95.67** |

**Commercial Fishing Activity**

The direct economic benefits of commercial fishing in Biscayne Bay, as presented in the original analysis, were updated to current values based on the reported change in gross sales in Florida. The gross sales reported for all Kind Codes in the State of Florida in the year that the original analysis was conducted (2004) 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 commercial activity (as presented in the original analysis) to estimate the direct current benefit of these industries if the recession had not occurred. These updated direct benefits were then input into the IMPLAN model to estimate the current benefit of commercial fishing in the county.

In 2004, the direct benefits of commercial fishing presented in the original analysis, excluding ship building and repair costs, were estimated at $9.3 million (see Table N-27). These values were updated to current values using FDOR gross sales data for all Kind Codes for the State of Florida. The reported gross sales for the State of Florida for all Kind Codes increase by 12.5 percent, from $707.9 billion in 2006 to the theoretical gross sales in the county if the recession had not occurred of $920.0 billion in 2009. Total direct commercial fishing activity in the county, assuming that the recession had not occurred, is estimated to have increased from $9.3 million in 2004 to $12.1 million in 2009.

**Table N-27. Total Direct Biscayne Bay-Related Commercial Fishing Business Volume in Miami-Dade County, by Business Activity 2004 and 2009, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur**

| Business Activity | 2004 Business Volume | 2009 Business Volume |
|---|---|---|
| Commercial Fishing | $3,914,950 | $5,087,927 |
| Wholesale Trade | $2,425,558 | $3,152,291 |
| Eating and Drinking Establishments | $2,834,944 | $3,684,335 |
| Government - State, Local, Federal | $116,904 | $151,930 |
| **Total** | **$9,292,356** | **$12,076,482** |

**Economic Benefits Generated by Commercial Fishing**

The $12.1 million in updated direct commercial fishing activities, if the recession had not occurred, were input into the appropriate industry sector of the IMPLAN model to estimate total current economic benefits. As can be seen in Table N-28, the direct commercial fishing activity is estimated to generate total economic benefits of $19.9 million in business volume, $7.3 million in personal income, 229 jobs, and $1.2 million in tax revenues. The total business volume benefits include $12.3 million in direct benefits and $7.6 million in indirect and induced benefits. The total personal income includes $4.8 million in direct benefits and $2.6 million in indirect and induced benefits. The 229 jobs include 172 direct jobs and 57 indirect and induced jobs. State and local tax revenues include $0.7 million generated by direct activities and $0.4 million generated by indirect and induced activities.

**Table N-28. Summary of Economic Benefits of Commercial Fishing in Miami-Dade County Assuming the 2007-2009 U.S. Economic Recession Did Not Occur**

| Activity | Economic Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Business Volume (Millions) | $12.34 | $3.01 | $4.54 | **$19.90** |
| Personal Income (Millions) | $4.75 | $1.12 | $1.47 | **$7.34** |
| Employment | 172 | 22 | 35 | **229** |
| Tax Revenues (Millions) | $0.71 | $0.15 | $0.29 | **$1.15** |

## Summary of Total Economic Benefits Assuming the Recession Did Not Occur

### Economic Benefits Generated by Marine-Related Businesses

Sales by marine-related businesses in Miami-Dade County generate a total of $2.049 billion in business volume, $495.7 million in personal income (wages), 11,934 jobs, and $83.3 million in tax revenues.

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

The $72.8 million in retail purchases by recreational boaters from establishments not located on the Waterways were estimated to generate economic benefits of $115.9 million in business volume, $33.3 million in personal income, 767 jobs, and $12.4 million in tax revenues.

### Economic Benefits Generated by Commercial Fishing and Related Activities

Total business volume benefits resulting from commercial fishing activities are estimated at $19.9 million in business volume, $7.3 million in personal income, 229 jobs, and $1.2 million in tax revenues.

### Total Economic Benefits

As presented in Table N-29, current total economic benefits to Miami-Dade County resulting from waterway activities, including sales by marine-related businesses, boater purchases of non-marine-related items, and commercial fishing and related activities, are estimated at $2.185 billion in business volume, $536.3 million in personal income, 12,929 jobs, and $96.8 million in tax revenues. This is a difference of $976.2 million in business volume, $242.0 million in personal income, 5,835 jobs, and $42.8 million in tax revenues compared to existing conditions.

**Table N-29. Summary of Total Economic Benefits Resulting from Waterway Activities, Assuming the 2007-2009 U.S. Economic Recession Did Not Occur**

| Activity | Business Sales (Millions of Dollars) | Personal Income (Millions of Dollars) | Employment (Jobs) | Tax Revenues (Millions of Dollars) |
|---|---|---|---|---|
| Marine Business Activity | $2,049.38 | $495.70 | 11,934 | $83.32 |
| Purchase of Non-Marine Items | $115.89 | $33.30 | 767 | $12.35 |
| Commercial Fishing | $19.90 | $7.34 | 229 | $1.15 |
| **Total** | **$2,185.16** | **$536.34** | **12,929** | **$96.81** |