



June 2001

Executive Summary

GEC Project No. 22805104A

AN ECONOMIC ANALYSIS OF THE DISTRICT'S WATERWAYS IN INDIAN RIVER COUNTY

Submitted to

Florida Inland Navigation District
Jupiter, Florida

Submitted by

G.E.C., Inc.
Baton Rouge, Louisiana

Engineering . Economics . Transportation Technology . Social Analysis . Environmental Planning

P.O. Box 84010 . Baton Rouge, Louisiana 70884-4010 . (225) 612-3000 . Fax (225) 612-3016
9357 Interline Avenue . Baton Rouge, Louisiana 70809-1910

TABLE OF CONTENTS

Section	Page
Introduction and Summary of Findings.....	1
Background	2
The Intracoastal Waterway in Indian River County	3
The Economic Impact of Marine Related Business in Indian River County.....	3
Identifying and Quantifying Current Marine Related Business Volume.....	4
Characteristics of Marine Related Business	4
Current Purchases of Non-Marine Related Items	5
Characteristics of Recreational Boaters	7
Current Economic Impact of Marine Related Business.....	8
Economic Impact of a Cessation of Waterways Maintenance.....	9
Economic Impact of an Increase in Waterways Maintenance	10
The Impact of the Waterways on Property Value in Indian River County.....	11
Current Impact of the Waterways on Property Values	11
Residential Property	11
Condominiums	12
Commercial Property	13
Boat Slips	14
Total Current Impacts to Property Values.....	14
Changes in Property Values Due to a Cessation of Waterways Maintenance.....	14
Residential Property	14
Condominiums	15
Commercial Property	16
Boat Slips	16
Total Impact to Property Values of a Cessation of Waterways Maintenance.....	16
Changes in Property Values Due to Increased Waterways Maintenance	17
Residential Property	17
Condominiums	17
Commercial Property	17
Boat Slips	18
Total Impact to Property Values of Increased Waterways Maintenance	18

TABLE OF CONTENTS (cont'd)

Section	Page
Summary	18
Current Impacts	18
Impacts of a Cessation of Waterways Maintenance.....	18
Impacts of Increased Waterways Maintenance	19

LIST OF TABLES

Table Number	Page
1 Summary of Total Economic Impacts Attributable to the Waterways	9
2 Summary of Total Economic Impacts Attributable to the Waterways Assuming Vessel Draft Restrictions of Three Feet	9
3 Summary of Total Economic Impacts Attributable to the Waterways Assuming Vessel Draft Restrictions of 10 Feet	10
4 Characteristics of Residential Properties in Indian River County in Subdivisions Containing Properties Adjacent to the Intracoastal Waterway	12
5 Adjustment of Market Value Per Square Foot of Building Area.....	15

LIST OF FIGURE

Figure Number	Page
1 Location of Marine Related Businesses in Indian River County, by Business Type	6

EXECUTIVE SUMMARY

INTRODUCTION AND SUMMARY OF FINDINGS

The purpose of this report is twofold: (1) to identify and quantify the total economic impact of the waterways operated, maintained, or within the boundaries of the Florida Inland Navigation District (the District) in Indian River County; and (2) to estimate the influence of the waterways on property values in the county. For the purpose of this report, the District's waterways include the Intracoastal Waterway and all waterways that are physically connected to it. The expected impacts to the Indian River County economy and to property values for three waterway conditions were evaluated: (1) existing conditions; (2) cessation of maintenance of the waterways (resulting in vessel draft restrictions of three feet MLW on the waterways); and (3) increased maintenance of the waterways (resulting in vessel draft restrictions of ten feet MLW). This analysis also addresses the influence that the waterways have had on the construction of larger, more expensive homes on the waterways.

The results of the analysis are summarized below:

- Impacts of the waterways under existing conditions:
 - \$80.1 million in business volume
 - \$29.2 million in personal income
 - 1,185 jobs
 - \$614 to \$724 million in property values
- Expected impacts of the waterways assuming a cessation of waterways maintenance:
 - Decrease of \$27.4 million in business volume
 - Decrease of \$9.9 million in personal income
 - Decrease of 396 jobs
 - Decrease of \$290 million in property values
- Expected impacts of the waterways assuming an increase in waterways maintenance:
 - Increase of \$30 million in business volume
 - Increase of \$1.0 million in personal income
 - Increase of 46 jobs
 - Increase of \$355,000 in property values

Background

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. For example, studies have shown that maintenance of the Atlantic Intracoastal Waterway Project in Florida requires expenditures of \$7.8 million each year while federal funding remains at \$3.2 million per year. The District has made a decision not to allow the waterways to deteriorate by deferring maintenance projects and has

elected to fund this budgetary shortfall. This investment by the District may total up to \$230 million over the 50-year planning period of the waterway. With such a large potential investment, the District needs to educate the general public as well as federal, state, and local public officials of the economic importance of expending these monies to meet the needs of the waterways.

The Atlantic Intracoastal Waterway is a 1,391-mile federally and locally maintained channel between Trenton, New Jersey, and Miami, Florida. The Florida segment, which was completed in



Pleasure craft, many of which are home ported in other states, dominate the waterways throughout Florida



In order to maintain navigation on the waterways, investment by the District in its 11 counties may total up to \$230 million over the 50-year planning period

1965, is 370 miles long and follows coastal rivers and lagoons past numerous tourism-oriented communities.

The waterway from the Florida/Georgia border to Miami was constructed and is maintained by the Jacksonville District Corps of Engineers in cooperation with the Florida Inland Navigation District, the local sponsor for the waterway. Continued maintenance dredging is required because the channel is subject to sedimentation from upland erosion and coastal sediment migration through ocean inlets. A Long Range Dredged Material Management

Plan for meeting dredged material management requirements over the next 50 years has been developed and is presently being implemented.

The Intracoastal Waterway in Indian River County

The Intracoastal Waterway extends for 23 miles through Indian River County. The waterway enters the county at the Sebastian Inlet, the only waterway access to the Atlantic Ocean in the county. The entire length of the waterway in the county proceeds through the Indian River. The dredged channel is fairly straight from the northern county line, past the town of Sebastian to the vicinity of Wabasso. The channel then winds along the eastern shoreline of the Indian River, passing under a fixed bridge in Wabasso, to Vero Beach. The waterway is spanned by two additional fixed span bridges in Vero Beach. South of Vero Beach the river widens and the dredge channel begins to straighten out for the 13 miles south to Fort Pierce in St. Lucie County.

THE ECONOMIC IMPACT OF MARINE RELATED BUSINESS IN INDIAN RIVER COUNTY

In general terms, there are two types of economic impacts or benefits associated with an inland navigation system, National Economic Development (NED) benefits and Regional Economic Development (RED) benefits. Inland waterway systems have historically been evaluated to determine economic feasibility based on NED benefits, which are economic benefits to the nation



The Sebastian Inlet, pictured here with the Indian River in the background, is located at the Indian River\Brevard County line and is the waterway's only outlet to the Atlantic Ocean in Indian River County

and not a particular region. The purpose of this analysis is to estimate the regional benefits generated by the waterways in Indian River County.

Regional benefits can be classified as direct, indirect, induced, and total. The direct impacts of the waterways are the goods and services purchased from marine related businesses in Indian River County. Direct impacts include the initial round of spending and employment generated by business activity that is directly dependent on the waterways. Indirect impacts consist of the goods and services purchased by marine related businesses in Indian River County. These impacts are the additional “rounds” of spending that result from the initial sales by waterway-impacted businesses. Induced impacts consist of increased household purchases of goods and services (such as food, clothing, and housing) by employees of businesses directly and indirectly impacted by the waterways. In short, navigation on the waterways results in dollars being pumped into the region which generate primary and secondary economic benefits to the area, benefits which include increased business activity (sales), personal income (wages), and employment (jobs).

Many techniques have been developed to estimate the types and levels of regional economic impacts. These models are based on the understanding of a regional economy as an interdependent entity. IMPLAN is a regional impact model that enables the evaluation of the economic impact of specific activities such as construction or operation of public works projects, retail, wholesale, manufacturing, and service sales within an economy. IMPLAN was used in this analysis to estimate the regional economic impacts of the waterway.

Identifying and Quantifying Current Marine Related Business Volume

A database of 152 marine related businesses in Indian River County was developed from various sources. These businesses were surveyed by mail and telephone to obtain information on their marine related business patterns and practices. A total of 62 completed surveys were obtained, resulting in a response rate of 41 percent.

Characteristics of Marine Related Business

Selected findings of the marine related business survey are presented below:

- About 46 percent of the businesses are located on or adjacent to the waterway.
- 32.8 percent are dependent on being on or adjacent to the waterway.
- The three most prominent lines of business are services, retail trade, and manufacturing.
- 85 percent of the respondent’s business volume is marine or water related.

- Most marine industry firms employ less than four people and have annual revenues of less than \$500,000.
- 75 percent of the firms believe their revenue would decrease if vessel drafts were restricted to three feet.
- 21 percent of the firms believe their revenue would increase if vessel drafts were 10 feet.

The 152 businesses in the database were aggregated to 18 similar business types, which were classified as generating a commercial benefit or a recreational benefit. Commercial business types were assumed to consist of boat charters/rentals. The remaining business types were classified as recreational.



Marinas on the waterways are some of the 152 firms in the county that generate \$76 million in marine related retail sales

The total marine-related business activity in Indian River County, as calculated from the survey responses, is estimated at \$76.8 million, including \$71.9 million that are expected to generate commercial benefits and \$4.9 million that are expected to generate recreational benefits.

The \$76.8 million in business activity was distributed by type of activity as follows:

- \$7.2 million in construction activity
- \$31.3 million in retail trade
- \$550,000 in used boat sales
- \$6.8 million in manufacturing activities
- \$8.3 million in wholesale trade
- \$1.1 million in finance activities
- \$21.3 million in service activities

The location of the 152 businesses in the county are presented in Figure 1, color coded by business activity. Businesses conducting more than one type of activity were classified according to their predominate activity.

Current Purchases of Non-Marine Related Items

To estimate the economic impacts of non-marine related items purchased from businesses not located on the waterways, 318 recreational boaters and fishermen were interviewed on the waterway

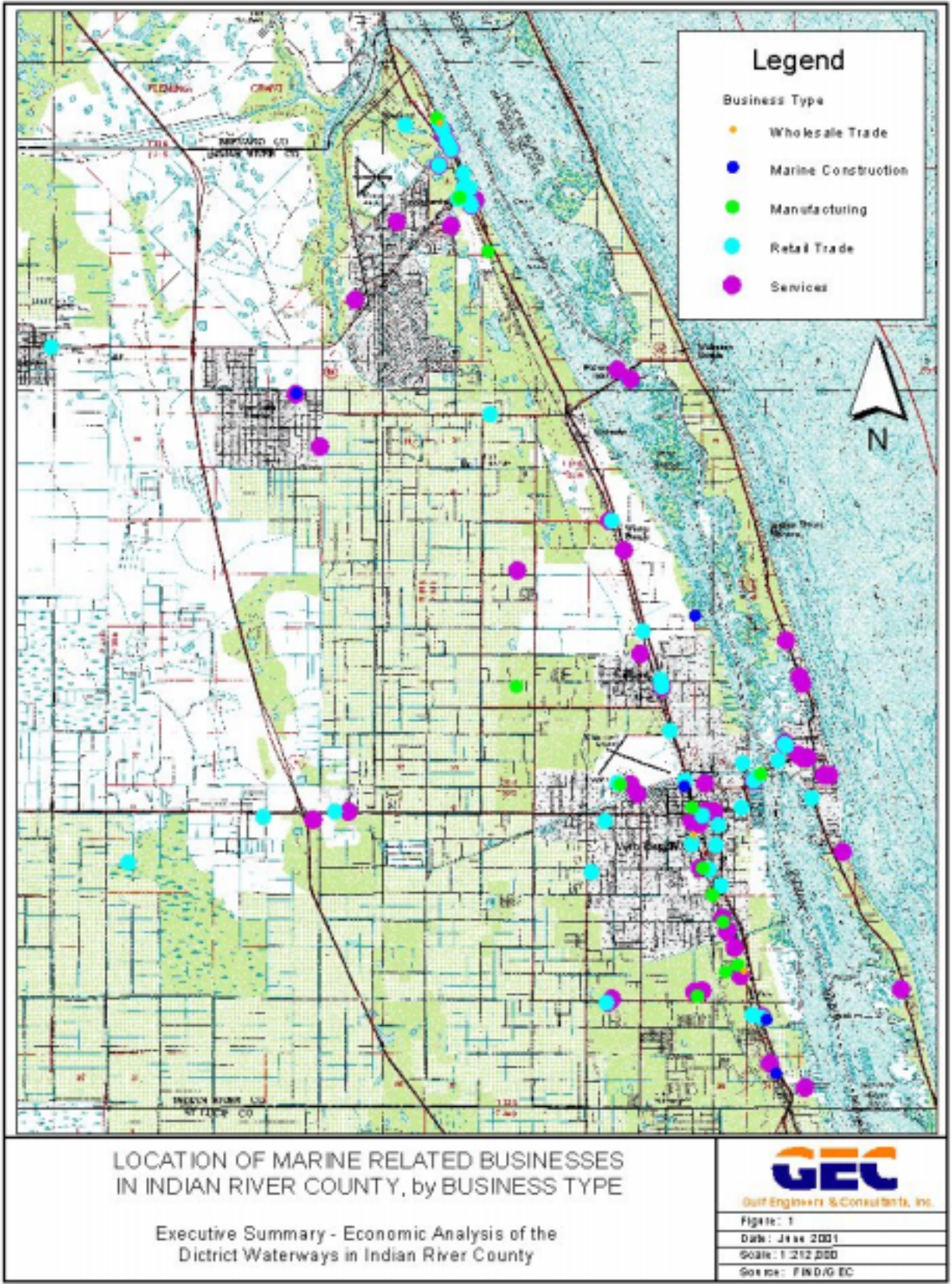


Figure 1

throughout Indian River County. A summary of purchasing patterns of recreational boaters that were interviewed are presented below:

- Survey respondents purchased an average of \$56.85 per outing at establishments not located on the waterway.
- Larger boats that are not trailered tend to spend less money at establishments not located on the waterways.
- Smaller vessels spend almost all their expenditures at establishments not located on the waterways.
- Total expenditures on non-marine items at establishments not located on the waterways include \$9.2 million for gasoline and \$5.4 million for food, drinks, and ice.

Characteristics of Recreational Boaters

Highlights of the results of the interviews of the 318 recreational boaters are presented below:

- The primary local residence of boaters:
 - Indian River County - 80 percent
 - Brevard County - 13 percent
 - St. Lucie County - 3 percent
 - Other - 4 percent
- The primary permanent residence of the boaters:
 - Florida - 96 percent
 - New Jersey – 1 percent
 - Virginia – 1 percent
 - Other - 2 percent
- There was an average of 2.9 persons per boat; the most common occurrence was two persons per boat.
- 24.7 percent owned a second boat, and 2.5 percent owned two other boats.
- 73 percent of boaters used an outboard boat, 13 percent used an inboard, and 9 percent used “other boat” types.
- Of the boaters that owned more than one boat, the boats that were not being used on the day of the interview were typically outboards, followed by personal watercraft.
- The length of boats owned by the boaters ranged between 6 feet and 42 feet, with most being between 16 and 26 feet.

- 60 percent of the boaters were on half-day trips, 35 percent were on full-day trips, and 4 percent were on multiple day trips.
- The three primary purposes of the boating trips were fishing, pleasure boating, and skiing.
- 70 percent of the boaters intended to stay in inland waters.
- 30 percent of boaters intended to access offshore waters.
- 91 percent of all boats are stored at home on a trailer, and 8 percent are stored at some type of commercial storage facility.
- Boaters that store their boat at a commercial storage facility pay an average of \$1,399 per year.
- Boaters annually spend an average of \$857 on maintenance and \$449 on boat insurance premiums.
- 8 percent of the people interviewed had incurred damage to their boat while using the waterway in the past year.
- The most frequent type of damage was to the propeller, followed by unspecified damage, and damage to hull.
- The most frequent cause of damage was an unknown source or object in the water, followed by grounding the vessel and hitting a submerged or floating object.

Current Economic Impact of Marine Related Activities

The retail sales of the 152 marine related businesses in Indian River County generate a total of \$73.1 million in local business volume, \$26.2 million in personal income (wages), and 1,079 jobs. The greatest impacts are generated by service type activities.

The \$14.7 million in retail purchases (\$9.2 million for gasoline sales and \$5.4 million for food, drinks, and ice) by recreational boaters from establishments not located on the



Recreational boating, including purchases made at non-water related businesses, contributes a total of \$80 million in sales, \$29 million in income and 1,185 jobs to the local economy

waterways were estimated to generate economic impacts of \$7.0 million in business volume, \$3.0 million in personal income, and 106 jobs.

The current total economic impact of the waterways (marine related businesses and the purchase of non-marine related items) consist of \$80.1 million in business volume, \$29.2 million in personal income, and 1,185 jobs (Table 1).

Table 1. Summary of Total Economic Impacts Attributable to the Waterways

Activity	Recreational Economic Impacts				Commercial Economic Impacts				Total Economic Impacts			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Business Volume (Millions)	\$48.20	\$12.16	\$13.26	\$73.62	\$4.19	\$1.97	\$1.22	6.48	\$52.39	\$13.23	\$14.48	\$80.10
Personal Income (Millions)	\$17.31	\$4.54	\$4.93	\$26.78	\$1.6	\$0.44	\$0.46	2.50	\$18.91	\$4.98	\$5.39	\$29.28
Employment	697	148	190	1,035	117	15	18	150	814	163	208	1,185

Economic Impact of a Cessation of Waterways Maintenance

If maintenance of the waterways in Indian River 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.

Based on the responses of businesses surveyed for this analysis, an average of 40.4 percent of marine related business activity would be lost if vessel drafts were limited to three feet MLW. The largest impacts are expected in the retail trade sector, followed by the service sector, manufacturing, the wholesale trade sector, and construction.

The total economic impact expected to be generated with three-foot vessel draft restrictions on the waterways (marine related businesses and the purchases of non-marine related items) is presented in Table 2. The total impact includes \$52.6 million in business volume, \$19.3 million in personal income, and 789 jobs. *This is a reduction of \$27.4 million in business volume, \$9.9 million in personal income, and 396 jobs compared to existing conditions on the waterways.*

Table 2. Summary of Total Economic Impacts Attributable to the Waterways Assuming Vessel Draft Restrictions of Three Feet

Activity	Recreational Economic Impacts				Commercial Economic Impacts				Total Economic Impacts			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Business Volume (Millions)	\$31.65	\$8.14	\$8.73	\$48.52	\$2.66	\$0.68	\$0.78	\$4.12	\$34.31	\$8.82	\$9.51	\$52.64
Personal Income (Millions)	\$11.38	\$3.05	\$3.30	\$17.73	\$1.02	\$0.28	\$0.30	\$1.60	\$12.40	\$3.33	\$3.60	\$19.33
Employment	469	99	126	694	74	10	11	95	543	109	137	789

Economic Impact of an Increase in Waterways 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 to 10 feet MLW. This increase in draft allowance would permit deeper draft vessels to fully utilize the waterways in Indian River County.

According to marine related businesses surveyed for this analysis, increasing vessel drafts on the waterways to 10 feet MLW would result in an overall average increase in business volume of 3.5 percent, from the current level of \$76.8 million to \$79.5 million (a \$2.6 million increase). The increase is expected to be distributed as:

- \$470,000 in construction activity
- \$1.0 million in retail trade
- \$11,000 in used boat sales
- \$120,000 in manufacturing
- \$35,000 in wholesale trade
- \$10,000 in finance services
- \$960,000 in services activities.

This higher maintenance scenario should not significantly impact the sale of non-marine related items by businesses that are not located on the waterways. These impacts should be equivalent to those under current waterways conditions.

The combined total impacts (marine related businesses and purchases of non-marine related items) under this scenario are presented in Table 3. Total impacts include \$83.1 million in business volume, \$30.3 million in personal income, and 1,231 jobs. *This is an increase of \$3.0 million in business volume, \$1.0 million in personal income, and 46 jobs compared to existing conditions on the waterways.*

Table 3. Summary of Total Economic Impacts Attributable to the Waterways Assuming Vessel Draft Restrictions of 10 Feet

Activity	Recreational Economic Impacts				Commercial Economic Impacts				Total Economic Impacts			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Business Volume (Millions)	\$48.20	\$12.16	\$13.26	\$73.62	\$6.17	\$1.60	\$1.75	\$9.52	\$54.37	\$13.76	\$15.01	\$83.14
Personal Income (Millions)	\$17.31	\$4.54	\$4.93	\$26.78	\$2.26	\$0.64	\$0.66	\$3.56	\$19.57	\$5.18	\$5.59	\$30.34
Employment	697	148	190	1,035	147	23	26	196	844	171	216	1,231

THE IMPACT OF THE WATERWAYS ON PROPERTY VALUE IN INDIAN RIVER COUNTY

Current Impact of the Waterways on Property Values

This analysis evaluates the waterways' impact on the value of residential and commercial property and boat slips.

Residential Property

The impact of the waterways in Indian River County on property values was estimated by comparing values of properties located directly on the Intracoastal Waterway to values of properties located on waterways connected to the Intracoastal Waterway that have varying vessel draft restrictions and to properties that have no access to the waterways.



Residential home sites along the Intracoastal Waterway are some of the most prized locations in the county, which is reflected by their average appraised value of \$616,500

Table 4 illustrates the type of residential property, the average appraised value, and the average building size for the residential parcels used in this analysis. The data indicates that the Intracoastal Waterway has a positive influence on residential property values in Indian River County throughout the length of the waterways and that an estimate of the influence of the waterways on property values, based upon comparison with neighboring parcels, is not biased by other factors, such as socioeconomic conditions or concentration of parcels in an affluent area of the county. Therefore,

we can safely assume that if the waterways did not exist, existing properties on the waterways would exhibit the same characteristics (in terms of size and value) of neighboring properties that were developed without waterway access.

Table 4. Characteristics of Residential Properties in Indian River County in Subdivisions Containing Properties Adjacent to the Intracoastal Waterway

Type of Property	Number of Parcels	Average Total Appraised Value (\$)	Average Building Size (Square Feet)
Non-canal (dry parcel)	863	136,483	2,160
Connecting Canal	719	389,740	3,320
Riverfront	724	616,500	3,778
Oceanfront *	39	368,436	2,800
Golf Course *	180	473,433	3,755

*Not used to determine the influence of waterways on property values

Two methods were used to estimate the impact of the waterways on residential property values. The first method assumed that if the waterways did not exist, the land adjacent to the waterways would have on average been developed as homesites of similar size and value as existing homes that do not have waterway access. Under this methodology, lot sizes and homes would have on average been smaller than they currently are, which would have led to more lots and homes being developed in the same amount of space. If the waterways did not exist the 1,443 homesites on the waterway would have been developed as 1,770 smaller homesites. As a result, the total aggregate market value of residential property would be \$716 million less than its current level.

The second methodology assumes that the number and size of houses would be the same as they currently are, but the value of these houses, on a per-square-foot basis, would decrease to reflect current values of non-waterway property. The current average per-square-foot market value increases from \$85.06 for existing dry parcels, to \$154.00 for properties on connecting canals, to \$246.70 for properties on the Intracoastal Waterway.

Adjusting property values to reflect the impact of the waterways, indicates the waterways result in an increase of \$606 million in residential property values.

Condominiums

Similar to single family residential property, it is believed that condominiums on the waterways have higher appraised values than those removed from the waterways. The 57 riverfront condominiums in the county are currently appraised at \$142.12 per square foot, and the 485

riverview condominiums are appraised at \$111.11 per square foot. To estimate the current impact of the waterways, it was assumed that if the waterways did not exist, riverfront condominium values would approach the value of riverview condominiums. Based on these figures, the impact of the waterway on condominium values can be estimated as \$31.01 per square foot (\$142.12 - \$111.11), for a total value of \$4.9 million. This is a rough estimate. Single family residences with waterfront access almost always have boat docks that provide the homeowner with easy boat access to the waterways. This boat access is a primary reason waterfront parcels have higher values. However, condominium owners are not provided waterway access unless they own or rent a boat slip, at a significant additional expense over the cost of the condominium. Although riverfront condominiums are apparently more valued than riverview condominiums, there is no way to determine if this additional value results from potential boat access. Secondly, if the waterway did not exist, the property on which the condominiums were constructed may have been developed differently; however, the data needed to determine the impact if the property were developed differently is currently unavailable.

Commercial Property

The current impact of the waterways on commercial property values was assumed to be the difference between the value of the property under its current use and the value of the same property if the waterways did not exist. Without the waterways, the land used by the marinas in the county would have been developed for other uses, most probably residential. Therefore, if the waterway did not exist, it is assumed that the land currently occupied by marinas would have been developed as residential property, with per acre values that reflect existing residential developments near the waterway. Under this assumption, the 7.27 acres of current marina land would have an appraised value of \$1.73 million if developed as residential property, a decrease in value of \$1.12 million from its current value of \$2.85 million.

Other commercial businesses benefiting from the waterway are restaurants, nightclubs, and hotels. These businesses derive a portion of their revenue from waterborne traffic or their proximity to the waterway. Since these businesses are not heavily dependent on the waterway, the waterways should not have a significant impact on their operations; therefore, if the waterways did not exist, the value of the property should not be significantly impacted.

Boat Slips

The total value of boat slips in the county was based on values and counts from the Property Appraiser's Office. The average boat slip value of \$20,000 was multiplied by the total number of boat slips (98), yielding a total value of \$2.0 million. It is assumed that boat slips were built as a result of the waterway, and without the waterway the boat slips would not exist. Therefore, the entire \$2.0 million value of boat slips is considered to be a current impact of the waterway on property values.

Total Current Impacts to Property Values

It is estimated that the waterways in Indian River County have resulted in a total increase in property values of between \$614 million to \$724 million. This total includes an increase of between \$606 million to \$716 million in residential property values, \$4.9 million in condominium values, \$1.1 million in commercial property values, and \$2.0 million in boat slip values.

Changes in Property Values Due to a Cessation of Waterways Maintenance

If vessel drafts were restricted to three feet MLW, the value of property on the waterways would decrease. In order to estimate the impacts of reduced waterway depths, property values of parcels with access to waterways with varying vessel drafts must be compared to each other. For the purpose of this analysis, it is assumed that properties on the Intracoastal Waterway have access to a channel at least six feet deep. However, the vessel draft restrictions of canals connecting to the Intracoastal Waterway were assumed to vary. A comparison of the difference in property values on restricted draft waterways to property values on the Intracoastal Waterway illustrates part of the expected change in property value if vessel drafts were restricted to three feet MLW on the Intracoastal Waterway.

Residential Property

A comparison of property types in the county indicates that canalfront parcels have higher values than non-canalfront parcels and that the degree of vessel draft accessibility of the Intracoastal Waterway further enhances property values. Canals with restricted access to the Intracoastal Waterway supply residents of canalfront parcels with additional privacy and quiet, and perhaps some aesthetic value, which have a positive influence on property values.

On a county-wide basis, properties on canals connected to the waterways are valued 89 percent higher than properties without waterway access, and properties on the Indian River are valued 189 percent higher than properties without waterway access. On average, the difference in

per-square-foot value between dry parcels versus property on the Intracoastal Waterway and property on shallow draft waterways, in the neighborhoods reviewed in detail for this analysis, is 63 percent and 32 percent, respectively. In other words, a 32 percent premium is paid over dry parcel property prices for properties with vessel draft restrictions, and this premium is doubled for properties without vessel draft restrictions (properties on the Intracoastal Waterway). Therefore, if maintenance of the waterway were to cease, it is assumed that the value of properties on the Intracoastal Waterway (properties that currently do not have vessel draft restrictions) would lose half of the premium that they currently have over dry parcels; and their values would be in line with those of properties that are currently draft restricted. Due to the lack of data, the reduction in the premium paid for property on shallow draft restrictions under this maintenance scenario cannot be estimated. However, it can be assumed that the same impact will occur to this property type as was estimated to occur to property values on the Intracoastal Waterways, namely, that they will lose half of the premium that they enjoy over dry parcel property values.

The reduction in property values resulting from decreased waterway maintenance was estimated at \$294 million by applying the expected decrease in market value, as presented in Table 5, to the current total square feet of building area.

Table 5. Adjustment of Market Value Per Square Foot of Building Area

Property Type	Market Value Per Square Foot	Adjusted Premium Over Dry Parcels	Adjusted Market Values Per Square Foot	Difference Per Square Foot
Non-Canal (dry parcel)	\$85.06	--	\$85.06	--
Connecting Canal	\$154.00	0.45	\$123.34	\$30.66
Riverfront	\$246.70	0.95	\$165.87	\$80.83
Total	\$171.87			

Condominiums

The impact of a cessation of waterway maintenance on condominium values is expected to be relatively smaller than the impact on single family residences. Condominiums are located along the waterway primarily for the scenic value rather than to allow direct boating access to the waterways. If cessation of waterway maintenance results in three-foot vessel draft restrictions, condominium values would be expected to decline somewhat because of a reduction in the scenic

value due to a reduction in the size of vessels on the waterway. However, the scarcity of condominium developments on connecting canals precludes estimating this decline through direct comparison of condominiums on the waterway with condominiums on connecting canals.

Commercial Property

The appraised value of commercial property is determined in part by the income the property generates. As part of this analysis, the change in marine business revenue for various business types was estimated assuming a cessation of maintenance of the waterway. The estimate is based upon a survey of marine related businesses. If maintenance of the waterways ceased and, as a result, vessel drafts were restricted to three feet, marine related businesses indicated that only 38 percent of existing business volume at marinas would be retained. The majority of their business would be lost because deeper draft vessels would not be able to access their facilities. The existing property value of marinas is appraised at \$2.85 million. Under the assumption that appraised commercial property values are directly impacted by business revenue, a reduction of 62 percent (100 percent minus 38 percent of the business remaining) of business revenue at marinas should result in a reduction of 62 percent of the current appraised value, or a reduction to \$1.08 million. Such a reduction in property value assumes that the property remains in its current use. However, since marinas are not likely to remain in business after such a drastic reduction in income, the 7.27 acres of property will probably convert to other commercial uses, namely residential. Assuming the property would reflect the appraised value of existing residential property on connecting canals (\$874,000 per acre) will result in an increase in property value of \$3.5 million.

Boat Slips

Many boat slips at private residences are used to dock vessels drafting in excess of three feet. Since these boats will no longer be able to access the boat slips, the value of larger boat slips is expected to decline. However, data are not available to indicate the number of slips that are used to accommodate vessels drafting in excess of 3 feet. Therefore, an accurate estimate of the impact to boat slip values, of decreased maintenance of the waterways cannot be made. However, it should be noted, that the total appraised value of boat slips is \$2.0 million. Therefore, any decrease in values should be less than \$2.0 million and will be minimal in comparison to the decrease expected in residential property values.

Total Impact to Property Values of a Cessation of Waterways Maintenance

In summary, if maintenance of the waterways were to cease and vessel drafts were restricted to three feet MLW, it is estimated that property values along the waterways would

decrease by up to \$290 million. Residential property values are expected to decline by \$294 million, while commercial property values are expected to increase by \$3.5 million. Due to the lack of sufficient data, the impact to condominiums and boat slips cannot be accurately estimated, although any impact to these assets should be minimal in light of their total appraised value compared to residential property values.

Change in Property Values Due to Increased Waterways Maintenance

Residential Property

This analysis requires the identification of subdivisions that have homogenous housing with different levels of waterway access. A review of waterways in Indian River County did not locate any subdivisions on waterways with 10-foot channel depths with deep draft access to the ocean inlets. It is not possible to estimate the impact of a higher state of maintenance on property values based upon comparison of residential parcels within Indian River County. This does not mean that property values would not increase if vessel draft restrictions were increased, but there is no method of estimating what that increase would be using data from Indian River County. However, it should be noted that although the impact cannot be estimated, it is assumed that the impact, if any, would not significantly increase the total value of property in the county. This assumption is based on the limited number of properties that would be impacted by deeper channels. A deeper channel would only benefit owners of mega yachts and commercial vessels. Because of the cost of these vessels, there are only a limited number of people who can afford them. People who can afford them would also tend to reside in existing prestigious, exclusive, and expensive neighborhoods in the region.

Condominiums

As with residential property, due to the lack of 10-foot deep waterways in the county with access to offshore waters, there is no basis for estimating an increase in condominium values if vessel draft restrictions were increased to 10 feet. Some condominium developments with boat slips may experience an increase in value; however, there is no data available indicating this increase would be significant on a county-wide basis.

Commercial Property

Increasing the vessel draft restriction to 10 feet MLW on the waterway would allow larger vessels to access commercial facilities and should result in an increase in income generated by marinas. The income method of assessing property tax, used by the Property Appraiser's Office as

an alternative assessment method, results in property values increasing in conjunction with business volume. The survey of marina owners conducted as part of this analysis indicated that these businesses expected an increase in revenue of 9.5 percent if vessels drafting up to 10 feet could access their facility. It was assumed that a proportional increase in property value would also occur. Marinas are currently valued at \$2.85 million. An increase of 9.5 percent in property value, resulting from an increase in business volumes, would produce a \$265,000 increase in property values.

Boat Slips

An increase in vessel draft restrictions to 10 feet MLW may result in an increase in the overall value of boat slips in the county. If larger vessels can access the county's waterways, an increase in demand for boat slips that can accommodate larger vessels may occur. The expected increase in business volume generated at marinas was estimated by marina owners as 9.5 percent. This increase was used as a proxy for the expected increase in boat slip rental revenue and therefore boat slip values. The increase in boat slip values is estimated to be 9.5 percent, based on the projected increase in income of marinas. Boat slips are currently estimated to be valued at \$2.0 million. A 9.5 percent increase in value would result in an additional \$190,000 in the value of boat slips in the county.

Total Impact to Property Values of Increased Waterways Maintenance

If maintenance of the waterways were to increase and vessel draft restrictions were increased to 10 feet MLW, property values in the county would be expected to increase by \$355,000. There is no evidence that residential property or condominium values would significantly increase, while commercial property values are expected to increase slightly by \$265,000, and boat slip values could increase by \$190,000.

Summary

Current Impacts

The current impacts of the waterways in Indian River County include \$80.1 million in business volume, \$29.2 million in personal income, 1,185 jobs, and between \$614 million to \$724 million in property values. Furthermore, the waterways result in the construction of larger, more luxurious homes in the county.

Impacts of a Cessation of Waterways Maintenance

If maintenance of the waterway ceases and vessel drafts are restricted to three feet MLW, there is expected to be a reduction of \$27.4 million in businesses volume, \$9.9 million in personal income, 396 jobs, and up to \$290 million in property values.

Impacts of Increased Waterways Maintenance

If maintenance of the waterway increased and vessel drafts were increased to 10 feet MLW, there is expected to be an increase of \$3.0 million in business volume, \$1.0 million in personal income, 46 jobs, and \$355,000 in property values from current conditions.

ACKNOWLEDGEMENTS

Financial support for this project was provided by the following agencies.

- The Florida Inland Navigation District
- The Marine Industries Association of the Treasure Coast
- The Indian River County Board of Commissioners