Economic Impact of Beach Restoration: Does Beach Nourishment Protect Property Values from Hurricanes? The Case of the 2004 Florida Hurricanes.

By

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INTRODUCTION

Florida is the nation's premier ocean state, dependent on its 825 miles of sandy beaches for the enjoyment of Florida residents and tourists. Equally as important, beaches provide natural resources for plant and animal habitat and act as storm protection for public infrastructure and private investments along the state's coastlines. For more than thirty years, the State of Florida has encouraged the use of beach nourishment—the placement of sand on eroded beaches—in order to reduce storm damage to upland properties. For much of the period, however, the annual frequency of hurricanes was below levels that had been seen earlier in the twentieth century. In 2004, four storms of hurricane strength hit the state's coastline, an unprecedented number, and four more storms hit the state's coastline in 2005.

This report focuses on the economic impact of restored beaches on residential properties in the hurricane study areas of 2004 and 2005. The average changes in property values before and after the 2004 and 2005 hurricanes for a large number of properties upland of nourished beaches were compared to changes in property values on similar areas upland of beaches that had not been restored. This report focuses on the first phase of the case study completed for the 2004 hurricanes. The study is based on more than 6,700 coastline properties in Escambia, Indian River, Lee and Sarasota counties.

(Left) Pensacola Beach before Hurricane Ivan, (Right) after Hurricane Ivan.


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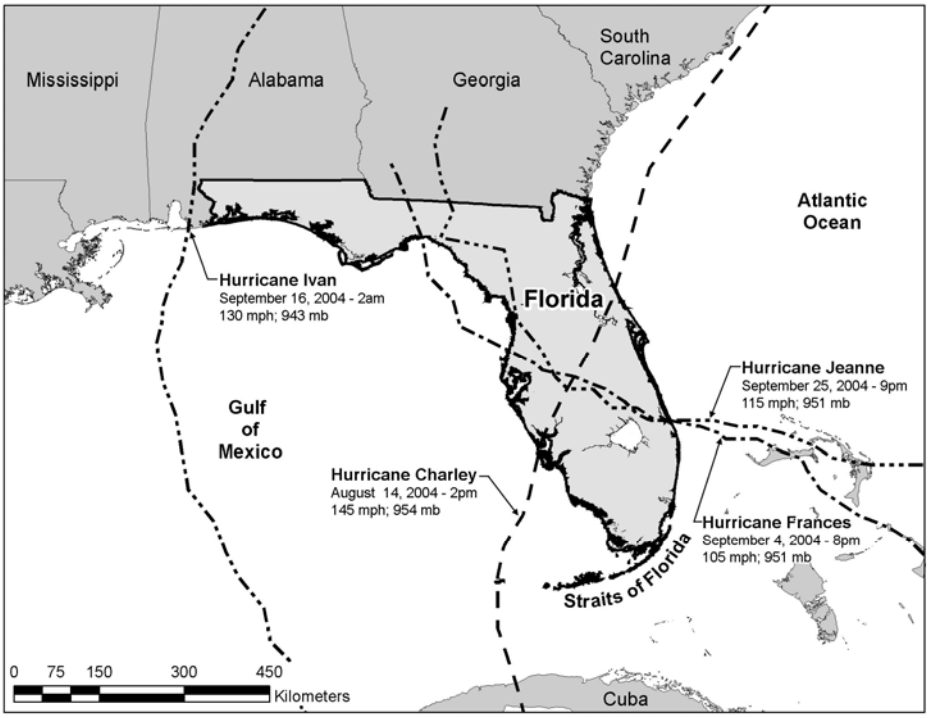
BACKGROUND METHODOLOGY AND OVERALL RESULTS

Damage to properties will normally show up in reduced market values and an examination of the change in property values from the period before a hurricane provides an important indication of the impact of the storm. A comprehensive database on individual property values is maintained in Florida in connection with property taxes. Because the state requires property taxes to be levied in connection with school funding, each county has an elected property appraiser who has the responsibility of valuing properties under a common set of rules and procedures adopted by the state. Properties are valued as of July 1 each year based on the condition of the property at the end of the preceding year. [1]

Property owners normally have a period of at least six weeks during which they may protest the value assigned to their property before a preliminary tax roll is adopted. Further adjustments may be made as a result of state analyses of the submitted roll and associated data before the roll is finally certified around the beginning of the next calendar year.[2]

Map of 2004 Florida Hurricane Season

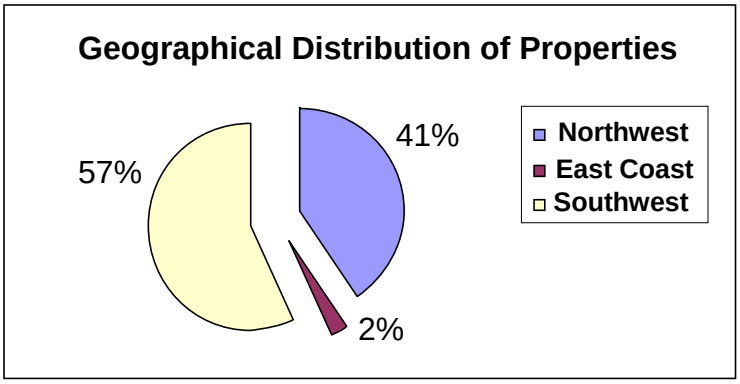


The Fiscal Year 2004 tax roll contains property values initially set on July 1, 2004, based on the condition of the properties as of the end of calendar year 2003. These values were set on the condition of the properties <u>before</u> the hurricanes of 2004. The Fiscal Year 2005 tax roll contains property values initially set on July 1, 2005, based on the condition of the properties as of the end of calendar year 2004. These values were set based on the condition of the properties <u>after</u> the hurricanes of 2004. The impact of the

2004 hurricanes can be expected to show up in the change of property values between Fiscal Year 2004 and Fiscal Year 2005.

In 2006, about half of Florida's sandy beaches (386 miles) are experiencing erosion, and the erosion is critical along 385 miles. Of the 385 critical erosion miles, approximately 180 miles are being actively managed and nourished with additional sand.[3] It is therefore possible to select matched beach segments along the Florida coasts that were impacted by the 2004 hurricanes, where one segment contained a beach that had been nourished and the other segment contained an eroding beach that had not been nourished. A comparison of the change in property values along these segments will give some indication of the extent to which beach nourishment protects the value of upland properties.

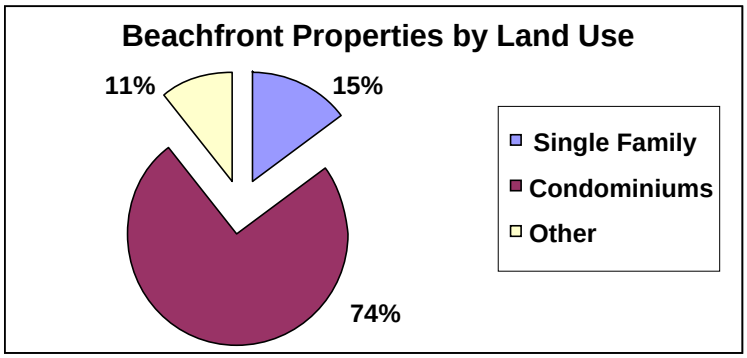
Property values are set in markets, and changes in the sentiments of buyers and sellers cause values to change not only on an annual basis but, in fact, on an ongoing minute-by-minute basis. Determining the impact of beach nourishment on the change in property values due to the hurricanes of 2004 is difficult because other factors were also changing market sentiments. In much of the state, coastal property values increased rapidly between 2004 and 2005 because of increased demand pressures due, in part, to low mortgage interest rates.



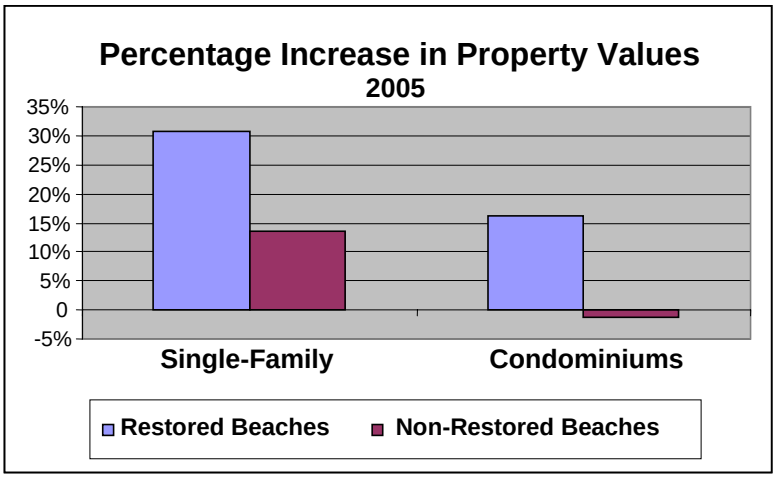
The best approach for understanding the value of property is to examine a relatively large number of properties and to control for as many other variables as possible. This study is based on more than 6,700 properties. Of these, about one-third of properties, were adjacent to nourished beaches and two-thirds were adjacent to nearby beaches that had not been nourished.[4] The properties were from three different study areas in the state: the northwest, east coast, and southwest. Most of the properties studied were in northwest and southwest Florida, the parts of the state's coastline where the 2004 hurricanes made landfall.

Beachfront properties in the urbanized areas of the state are predominantly residential. This category accounts for over 90 percent of the properties in this study. The residual "other" category of properties includes vacant residential properties, mobiles homes and apartments, and commercial properties (including hotels), and public parks.

Residences constructed during 2005 are also in the "other" category, but they were excluded from the study because the changes in their values reflected the change in the land use as well as any hurricane impacts. The comparisons presented below include only single family and condominium properties.

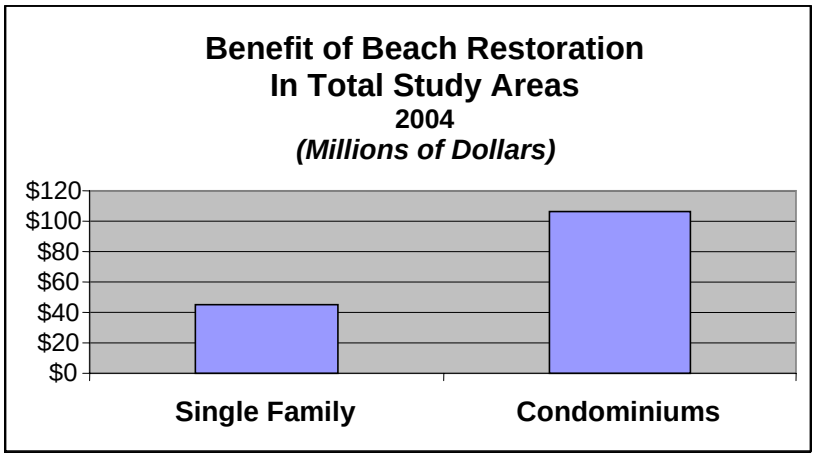


In the sample as a whole, single family properties increased by 22 percent in value during 2005, and condominium properties increased by one percent. Single family properties adjacent to nourished beaches increased by more than 30 percent –more than twice the increase in properties adjacent to beaches that had not been nourished. Condominium properties adjacent to nourished beaches increased by more than 15 percent, compared to a one percent decline for condominiums adjacent to beaches that had not been nourished. These results support the hypothesis that beach nourishment protects the value of upland properties from storm damage.



The value of the storm protection benefit to property values is estimated at $45 million, when comparing the difference in the property value increases between the nourished and non-nourished study areas. This is sixteen percent of the 2004 value of single family properties in the nourished beach study areas. The benefit to condominiums was even larger, at more than $105 million. The larger benefit to condominium properties resulted from a greater percentage differential (21 percent) applied to a larger 2004 property value base. The benefits in this one year, albeit an

extraordinary year, from the nourishment programs in three relatively small areas of the state amounted to $150 million.

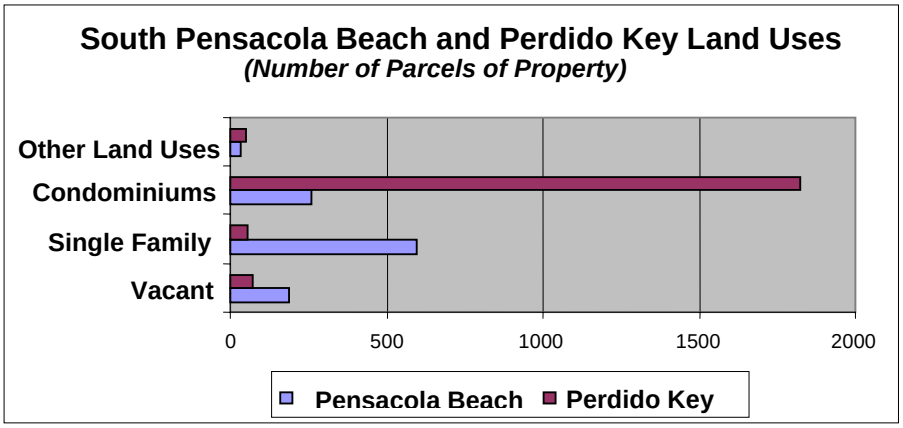


STUDY AREA COMPARISONS

The overall results presented above summarize the data for study areas in three different parts of the state—the northwest, the east coast and the southwest coast. The northwest study areas were in Escambia County, the east coast areas were in Indian River County, and the southwest study areas were in Lee and Sarasota counties.

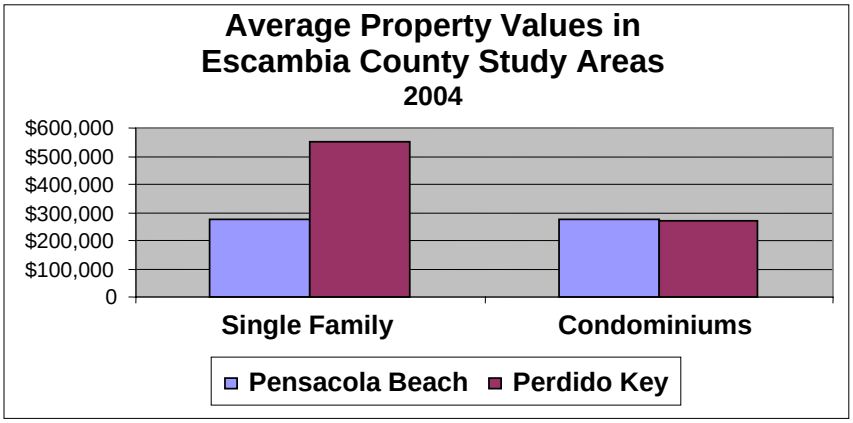
Pensacola Beach and Perdido Key in Escambia County

Properties were selected south of the main east-west road on these two keys or islands. In the case of Pensacola Beach, this is Highway 399 and Ft. Pickens Road to the west. The analysis was conducted on parcels that existed on both the 2004 and 2005 Property Appraiser's NAL files and had the same land use in both years.[5]



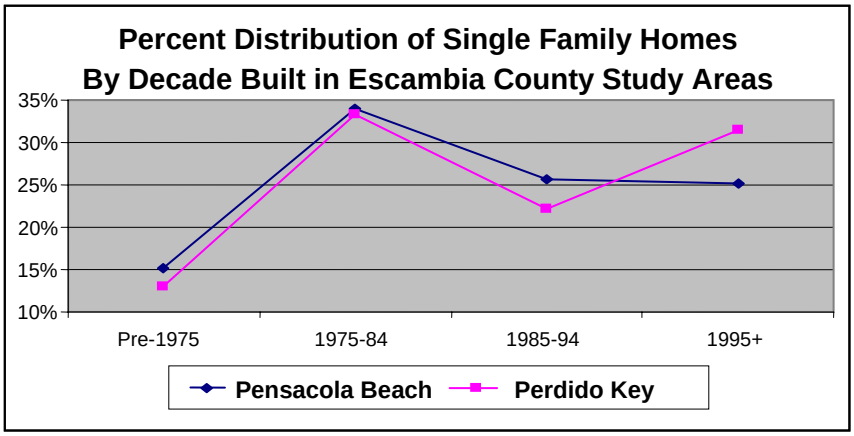
In Pensacola Beach, the largest land use category consisted of single family homes (599 parcels), and there were also a significant number of condominium units (262). On Perdido Key, the bulk of the parcels were condominium units (1,825 parcels), and although the number of single family units was small (55), it was sufficient to undertake an analysis.

The single family units in Pensacola Beach were predominantly in the middle part of the study area, and the condominium units were in the west. In the case of Perdido Key, the condominium units were in the western part of the study area, and the single family parcels were interspersed among the condominium units in the far west.



Average condominium values were similar in Pensacola Beach and Perdido Key in the summer of 2004 before Hurricane Ivan struck. Average values of single family

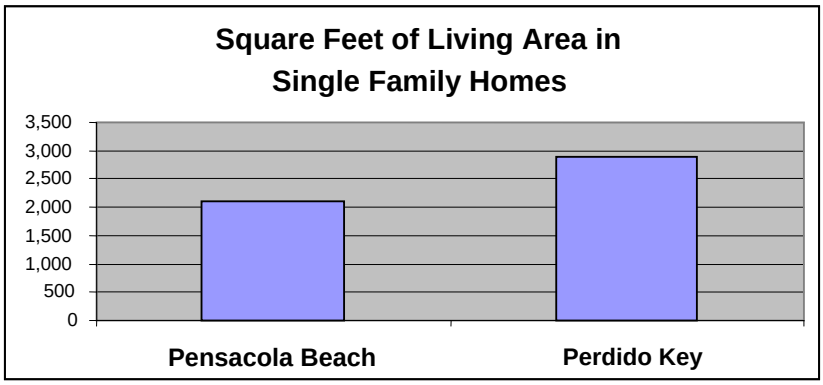
properties were not equal in the two study areas; the average single family property on Perdido Key was twice as valuable as in Pensacola Beach before the hurricane struck.



One factor that accounts for the higher value of single family homes on Perdido Key is that they have been built more recently than those on Pensacola Beach. More than 30 percent of the single family homes on Perdido Key were built in the most recent ten years, compared to twenty-five percent of the homes in Pensacola Beach. The more recently built homes may be less vulnerable to storm damage.

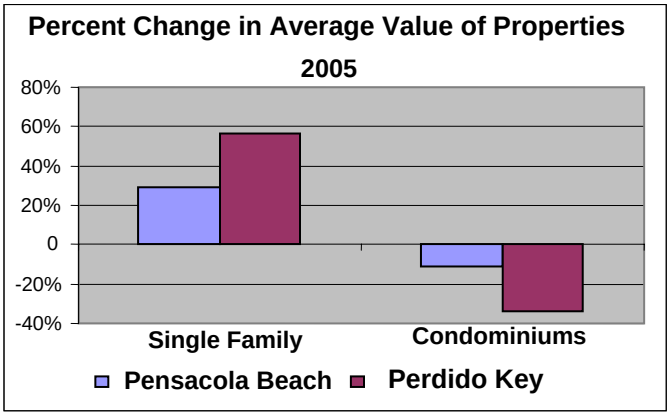
Another factor that accounts for the higher average single family value in Perdido Key is a larger average living area. Single family homes on Perdido Key are almost 40 percent larger than those in Pensacola Beach.

Between 2004 and 2005, average condominium market values declined both in Pensacola Beach and on Perdido Key. The decline on Perdido Key, which did not have a nourished beach, was greater than in Pensacola Beach, where the beach had been nourished. The greater decline on Perdido Key may also reflect its closer location to the point where Hurricane Ivan made landfall.



Average single family homes rose in value between 2004 and 2005 in Pensacola Beach and on Perdido Key. The rise was larger on Perdido Key. For the reasons given

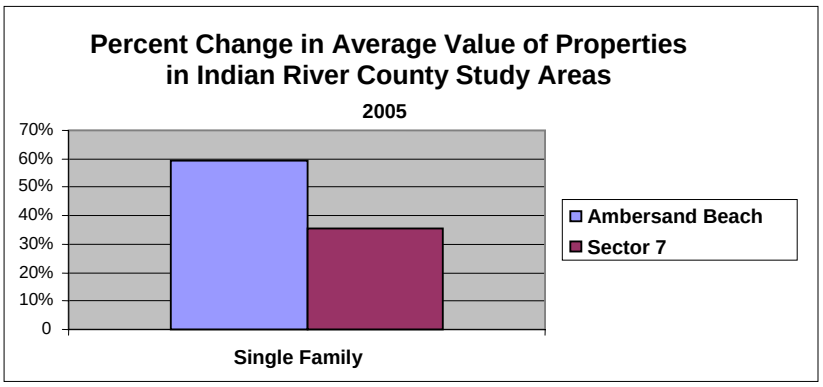
above, namely, the relatively small sample size on Perdido Key, the fact that the units on Perdido were more recently constructed and were larger in area may explain why the nourished beach afforded less of an advantage to the single family homes in Pensacola Beach.



Ambersand Beach and Sector 7 in Indian River County

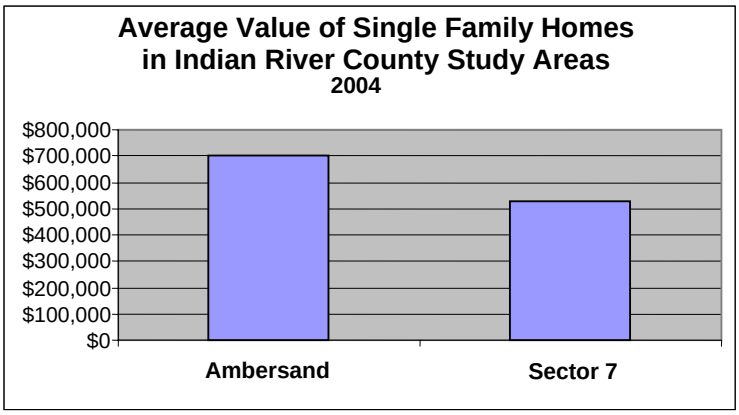
Ambersand Beach and Sector 7 in Indian River County provided another basis for comparison of the change in property values before and after the 2004 hurricanes. These east coast areas were impacted by two less intense storms (Category 2 and 3) than the category 4 storms that hit the coasts of northwest and southwest Florida. Ambersand Beach had been nourished prior to the storms and Sector 7 had not had a project.

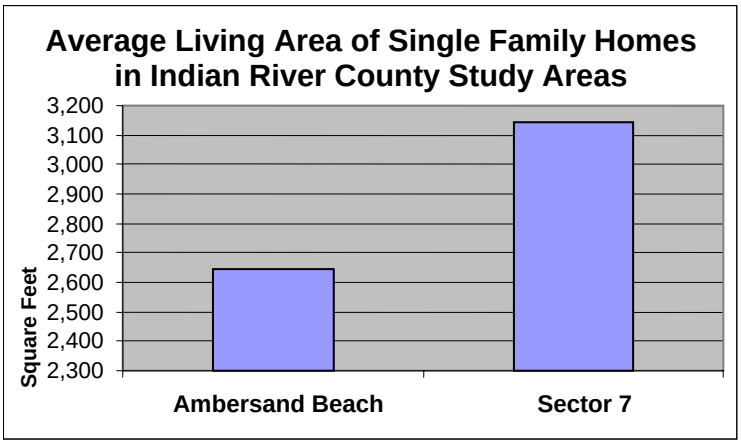
The properties in the Ambersand Beach Study Area were seaward of Highway A1A. The dominant land use (almost two-thirds of the parcels) was single family. There was a small number of mixed residential parcels, and the remainder were vacant residential. About 90 percent of the parcels in Sector 7 were single family, and the small number of vacant residential parcels was insufficient to permit a valid comparison for this land use. As a result, only the change in the value of single family homes was compared for the Indian River County study areas.



Between 2004 and 2005, the value of single family homes increased in both Ambersand and Sector 7. The increase was substantially larger in Ambersand (59.5 percent), where the beach had been nourished, than in Sector 7, which had received no beach nourishment (35.3 percent).

As was true of the Escambia County single family homes, part of the explanation for the difference in value increases between the two areas lies in differences in the characteristics of the single family homes. The single-family homes in Ambersand Beach had higher values, on average, than those in Sector 7.

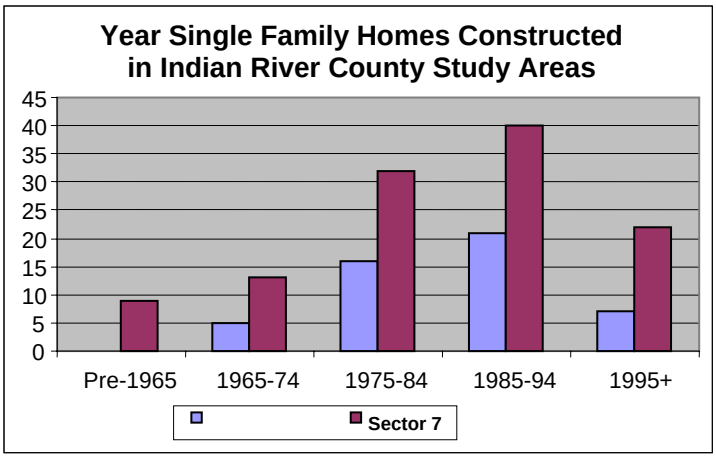




Although the Ambersand homes had a higher average value, they had a slightly smaller average living area than those in Sector 7. Although Sector 7 has a higher percentage of older homes than does Ambersand, it also has a higher proportion of homes built in the last decade. Therefore, the higher values in Ambersand are not due to more recently constructed housing.

The conclusion from the Indian River comparisons is that single family homes in the two study areas increased between 2004 and 2005, but that the increase was considerably larger in the Ambersand study area, where the beach had been nourished. Part of the explanation for higher increase in Ambersand values may lie in the fact that the homes in that area were relatively expensive and, therefore, may have been

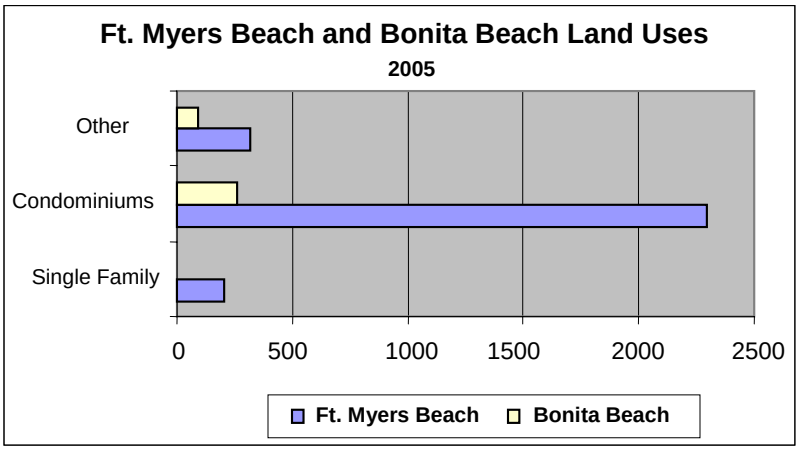
constructed to withstand stronger winds than those in Sector 7. The higher values in Ambersand did not reflect larger living areas or more recent construction, however.



Bonita Beach and Fort Myers Beach

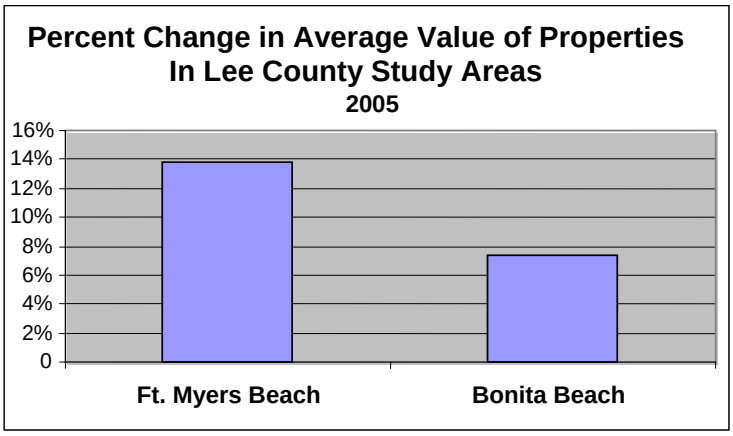
Bonita Beach and Fort Myers Beach in Lee County provided a basis for comparison of the change in property values before and after the 2004 hurricanes that hit southwest Florida. The primary agent of destruction in the southwest was Hurricane Charley, a category 4 storm. Bonita Beach had been nourished prior to the hurricane and Ft. Myers Beach had not received the benefit of a nourishment project.

The Bonita Beach study area consisted of properties seaward of Hickory Boulevard, and the Ft. Myers Beach study area consisted of all properties south or west of Estero Boulevard. The Bonita Beach project was relatively small—less than a mile in length. Ft. Myers Beach was in the process of planning for a nourishment project, however.



The land use in the Bonita Beach study area was dominated by condominiums, which accounted for almost three quarters of the properties adjacent to the nourished

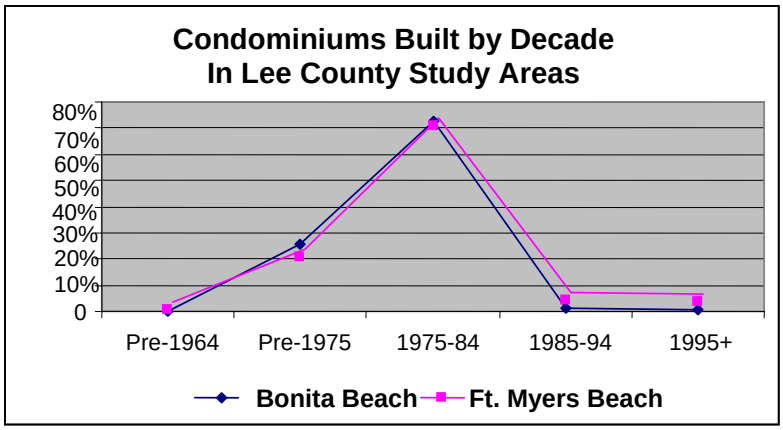
beach. Condominiums were also the biggest land use in the Ft. Myers Beach study area, where they accounted for over 80 percent of the total. There were sufficient numbers of properties to enable a comparison between the two study areas only for the condominium land use.



Condominium properties increased in value, on average, both on Bonita Beach and in Fort Myers Beach between 2004 and 2005. The increase in the average value in Fort Myers Beach, the beach that had not been nourished, was almost twice as great as in the properties adjacent to the nourished Bonita Beach.

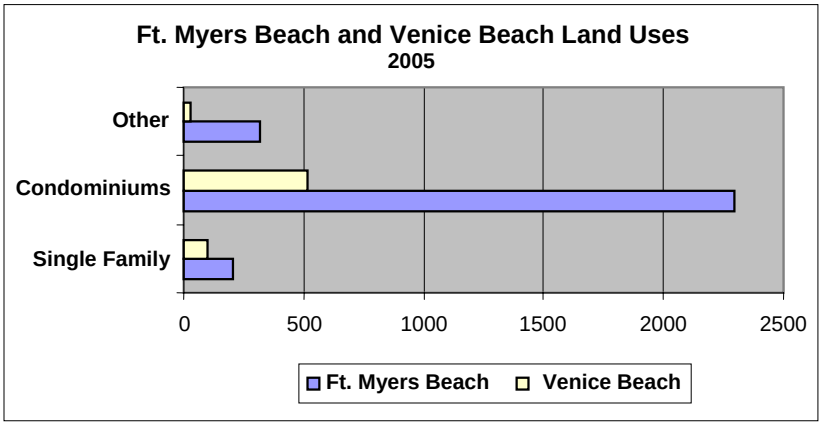
Pre-storm condominium values, on average, were higher adjacent to the nourished Bonita Beach than they were in Fort Myers Beach. The differences in average values did not reflect a different age structure for the properties. The age structure of the condominiums was remarkably similar in both locations. The difference in condominium values reflected the fact that the Bonita Beach properties, on average, had a larger living area than those in Fort Myers Beach. It is unlikely that this factor can account for the greater value loss among the Bonita Beach condominiums. The results for the Lee County comparison do not support the hypothesis that a nourished beach reduces average losses from hurricanes.

It was mentioned above that the Bonita Beach nourishment project was relatively small. There is a larger beach project in Lee County on Captiva Island, but it was not a suitable point of comparison since the resort that occupies the northern half of the island and which accounts for most of its properties shut down after Hurricane Charley, was taking the opportunity to undertake a major upgrade.



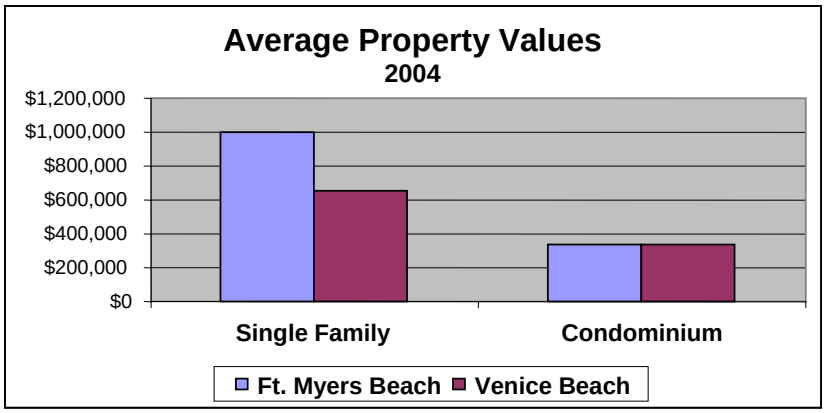
Venice Beach and Fort Myers Beach

A relatively long nourishment project (more than three miles) had been undertaken at Venice Beach in Sarasota County, close to the northern border of Lee County, and this provided a final basis for comparison.

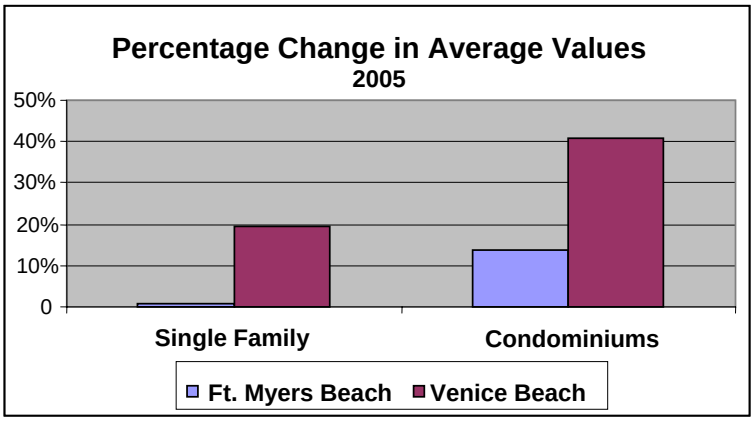


As is true of Fort Myers Beach, the condominium is the dominant land use adjacent to the Venice Beach project. With more than 100 single family properties in Venice Beach and more than 200 in Fort Myers Beach, it is possible to make a comparison of the change in the average value of single family properties, as well as to compare condominium values.

Average property values rose in both Venice Beach and Fort Myers Beach in 2005 after the 2004 hurricanes, although the rise in Fort Myers Beach single family properties was only one percent. Average property values rose more strongly adjacent to the nourished Venice Beach than in Fort Myers Beach, where no nourishment project had been undertaken.



Average condominium values before the 2004 hurricanes were virtually the same in Venice Beach and Fort Myers Beach, but Fort Myers Beach had a significantly higher average single family value.



The higher average value in Fort Myers Beach does not reflect more recent construction. In fact, the Fort Myers Beach single family beach properties are considerably older than those in Venice Beach. The median single family property in the Fort Myers Beach study area was constructed before 1955, and the median property in the Venice Beach study area was constructed ten years later.

The higher values in Fort Myers Beach reflect larger living areas. The average living area in Fort Myers Beach was about 4,000 square feet, compared to 2,500 square feet in Venice Beach.

The Venice Beach-Fort Myers Beach comparison supports the hypothesis that proximity to a nourished beach reduces the impact of hurricanes on property values. The finding is qualified by the more recent construction of the Venice Beach single family properties, although the median property in Venice Beach was forty years old at the time of the hurricanes. On the other hand, the properties on Venice Beach had a lower average value, reflecting their smaller living areas.

CONCLUSION

This exploratory study provides evidence that restored beaches protect the value of Florida coastal properties from hurricanes. The findings demonstrate that the value of coastal residential properties upland of restored beaches was less negatively impacted by the hurricanes of 2004 than were nearby properties on beaches that had not been restored.

[1] This description of the appraisal process is intended for the lay person. The actual process is much more finely detailed than provided in this paragraph.

[2] The hurricanes impacted the hurricanes appeals process and some of the values used in this study may have been lowered after the data were obtained. This would have increased the adverse impact of the hurricanes on property values reported in this study, especially in the non-nourished areas where damages were greatest.

[3] Paden Woodruff, Environmental Administrator, Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection (Personal communication, April 3, 2007).

[4] The length of nourished beach segments is known, but the length of beach segments is arbitrary. It was decided to include the full length on non-nourished beach segments rather than to arbitrarily select a segment equal in length to the corresponding nourished segment. The result was a larger number of properties upland of non-nourished than nourished beaches.

[5] Some properties may have been lost, or been so damaged as a result of the hurricanes that their land uses may have changed between 2004 and 2005. The omission of these properties will lead to an underestimation of the negative impact of the hurricanes on property values.