Beach Re-nourishment and Property Value Growth: The Case of Folly Beach, South Carolina

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Abstract

Numerous studies using a variety of methods suggest that beach re-nourishment generates benefits to both recreational users and property owners. However, the only study to use a repeat sales index (Cordes, Gatlaff and Yezer, 2001) found no effect of re-nourishment on property values. We use a repeat sales index to investigate the effects of the Army Corps of Engineers' re-nourishment of Folly Beach, South Carolina. We find that this re-nourishment has maintained property values' rates of appreciation when compared with real estate values in a similar real estate market, the Isle of Palms, South Carolina.

1. Introduction

Beach re-nourishment can be both costly and controversial. As a result, policy makers need to know the specific costs and benefits of re-nourishing a beach. Although economists' attempts to measure the benefits of re-nourishment have produced varying estimates, only one published paper has failed to find positive benefits associated with beach improvements: Cordes, Gatzlaff and Yezer (2001) (hereafter, CGY). Using a similar methodology to CGY and a new data set, we find that re-nourishment helps property owners maintain property value when we compare property on a beach that has eroded and been re-nourished to property on a beach that did not require re-nourishment.

In particular, we look at two beachfront communities in South Carolina: Folly Beach (FB) and the Isle of Palms (IOP). Both communities share some common features, including similar geographic properties (e.g., both are barrier islands) and occupying the same niche in the Charleston, South Carolina real estate market. However, FB, due to its unique geographical location down current of the Charleston harbor, is subject to tremendous erosion from jetties constructed to maintain shipping access to the harbor. As a result, the Army Corps of Engineers has regularly re-nourished FB. The fact that the two communities are similar except for their experience with erosion and re-nourishment allows us to look at the impact of re-nourishment as a treatment effect in a natural experiment. To examine the effect of re-nourishment, we use a repeat sales index of property values on the two islands, and find that the rate of growth in property values is not statistically different. This result suggests that re-nourishment is effective at maintaining property values, and thus has some positive benefit to society.

2. Literature Review

This paper fits into the literature on valuing beach re-nourishment by serving as a sort of replication of CGY. We use a similar dataset and methodology to examine the effects of re-nourishment. In an attempt to better understand why CGY found results that were counter to most of the literature, we present the following brief review of that literature. We begin by discussing two methodological issues, then proceed to discuss particular papers that have reported positive benefits, and finally complete the review with a detailed discussion of CGY's results.

2.1. Methodological Issues

The first methodological issue when attempting to measure the effects of re-nourishment is addressing the form of re-nourishment. There are at least three ways the beach can be re-nourished, and their potential benefits are not the same. The beach can be lengthened, deepened, or the features that protect the beach from erosion (e.g., dunes) can be improved. On FB, one of the two barrier islands examined in this paper, one can imagine all three types of re-nourishment taking place. Lengthening could occur at either the north or south ends of the island. (Erosion has occurred at both ends of the island, shrinking the length of the beach and the island.) Deepening of the beach could occur all along the extant beach by adding sand to the beach so that the average distance from the mean high tide mark and the first line of dunes increases. Finally, work to repair and strengthen the beach's dunes would be an example of improving the protective features of the beach.

The second methodological issue has to do with the group being surveyed and/or impacted by beach re-nourishment. Primarily two groups have been examined when determining the benefits of re-nourishment: recreational users and nearby property owners. While recreational users are assumed to gain benefits from larger, less crowded beaches, property owners not only receive these benefits, but also gain from erosion control. Recreational users gain benefits from bigger, less visited beaches, but these effects are likely subject to diminishing marginal returns. Property owners may have more ambiguous feelings about certain types of re-nourishment projects, because although they value the property protection provided by re-nourishment, some types of protection/re-nourishment may result in increased distances from the property owner's structures to the waterline. Generally, property owners prefer to be closer to the waterline, so a project that increases protection but that simultaneously increases the distance to the waterline, might be viewed negatively overall by property owners. (In fact, such a situation has been observed recently in Florida, where a group of homeowners sued the Florida Department of Environmental Protection in an attempt to stop a beach re-nourishment project in the Florida panhandle, (*Stop the Beach Renourishment, Inc. v. Florida Dep't of Env'l Protection,* 130 S. Ct. 2592 (2010)).)

2.2. Previous Work

Early work valuing beach re-nourishment focused primarily on estimating benefits for recreational users. For example, McConnell (1977), used a contingent valuation survey, to find that beach users had a higher willingness to pay for less crowded beaches. Unlike later researchers, McConnell did not ask participants explicitly about re-nourishment. Bell (1986) used a contingent valuation survey to find a positive value for re-nourishing the beach. In his survey, Bell asked participants how much more they would be willing to pay to preserve their beach. In addition to finding that participants were willing to pay a positive sum to preserve the beach, Bell found that beachgoers' willingness to pay to increases as the square footage of the beach per person falls. Silberman and Klock (1988) also used a contingent valuation survey and estimated significant positive benefits to beach re-nourishment. Silberman and Klock did not attempt to measure the relationship between the amount of re-nourishment and the level of benefits, merely showing survey participants pictures of beaches that had been re-nourished and beaches that had not. More recently, Lew and Larson (2007) used the travel cost method to estimate the benefits of re-nourishment for beachgoers near San Diego, CA. They estimated a greater willingness to pay to use the beach for beaches that had a greater length, and found that this benefit was subject to diminishing returns. Lew and Larson also found that beaches that had suffered more erosion were less valued.

Landry, Keeler and Kriesel (2003) measured the benefits of re-nourishment to both recreational users and property owners by using two methodologies: stated-preference and hedonic valuation. Employing a contingent valuation survey, they found that beachgoers prefer wider beaches, and that beachgoers seem to have a preference as to how that widening occurs, preferring to re-nourish beaches instead of simply widening them. When they estimated a hedonic model of property values, Landry, Keeler and Kriesel found that property values did not always increase with beach re-nourishment, but instead found that although increasing the width of the beach increases property values, increasing the distance to the waterline reduces property values.

Pompe and Rinehart (1995) also used a hedonic model to estimate the benefits of beach re-nourishment on properties near Myrtle Beach, South Carolina. Like Landry, Keeler and Kriesel, Pompe and Rinehart differentiated between re-nourishment that increases the size of the beach and that increases the distance between the property and the beach. Also like Landry, Keeler and Kriesel, Pompe and Rinehart found that wider beaches create more valuable property, while increased distance to the beach reduces property value. In a later paper, Pompe and Rinehart (1999) essentially replicate their findings using data from Seabrook Island, South Carolina.

Using data from the state of Delaware, Parsons and Powell (2001) estimated the lost property value associated with beach erosion. Similarly, Raybould and Mules (1995) found that increased beach erosion led to lost tourism revenue, and conclude that re-nourishment has positive value.

2.3. Cordes, Gatzlaff and Yezer (2001)

CGY appear to be the only researchers (until this paper) to have used a repeat sales index to value beachfront protection. The hedonic pricing method, in which property values and property characteristics are used to measure the value of different attributes of the beach, has been used many times (see the above discussion, e.g., Landry, Keeler and Kriesel, 2003; Pompe and Rinehart, 1995; and Parsons and Powell, 2001), and typically estimates a positive value to beach protection and/or enlargement. The repeat sales method, like the hedonic pricing method, uses actual market transactions. In this method, properties that sell more than once over some sample period are aggregated into an index, and then the evolution of that index is taken as an index of overall property values. A major advantage of the repeat sales method over hedonic pricing is the potential elimination of omitted variable bias. Because the repeat sales method uses the exact same properties and looks at their values over time, no characteristic that could influence the price are left out of the regression model.

In their paper, CGY create a repeat sales index for property in three Florida counties. CGY find that the repeat sales index does not show a statistically significant increase in response to increases in the amount of money spent by the Army Corps of Engineers (ACE) or to the existence of ACE projects. CGY propose several possible reasons for this finding. First, they point out that the amount of money spent over their study's time period is small, and so may have had little effect. Second, they suggest that perhaps the regulations that often accompany ACE projects may offset the benefits of those same projects. And third, they observe that the time period studied did not include any major storm-produced erosion.

We believe there are some other potential reasons for CGY's findings. Some obvious potential reasons include data variability and the fact the CGY were the only researchers to use data from these three Florida counties, as well as the use of the repeat sales index itself. Perhaps something about the technique and/or the data CGY used just happened to result in their null result. More substantively, perhaps the measure used by CGY was not precise enough. In papers by Pompe and Rinehart and Landry, Keeler and Kriesel, re-nourishment was measured in terms of both widening the beach and increasing the distance between property and the beach. CGY's measure lumped all of that information together into an imprecise variable: the amount spent on re-nourishment projects. These projects take various forms, some leading to wider beaches and other leading to greater distance to the beach. It is possible that these offsetting valuations could have caused CGY to fail to find a measurable impact.

Another issue that may help explain CGY's anomalous results is the nature of the measurement regarding the beach. Some researchers look at the value of widening the beach, while other researchers look at the value of re-nourishing the beach. In the first case a value of a gain is being measured while in the second place the value of mitigating a loss is being measured. As mentioned earlier, Landry, Keeler and Kriesel found different valuations for the same re-nourishment project, depending upon whether it was presented to survey participants as simply widening the beach or re-nourishing the beach to a previous width. This type of distinction between gains and losses may be important, and may help to explain CGY's results. We suspect that markets may value preservation differently from expansion. That is, CGY were looking for increased property values due to increased beach size and could not measure a benefit. It may be that if they had looked at beach protection measures, they would have found a benefit. This result is consistent with broader psychological and economic research showing that people value gains differently from losses (see for example the classic work of Kahneman and Tversky (1979). So for example, if the beach on FB has always been 40 feet deep, then property owners are willing to pay a positive sum to preserve the size of the beach at 40 feet. However, property owners may be used to the size of the beach, and so are unwilling to pay much, if anything, to have the depth of the beach increased.

3. Background

Folly Beach and the Isle of Palms have similar geographic properties, as shown in figure 1, a map of the Charleston area. Both communities are on barrier islands, with similar erosion and accretion patterns. Both islands share South Carolina's typical tidal range of approximately 1.5 to 3.5 meters (Hayes, 1975). There are numerous inlets to accommodate the high volume of water from tides. The barrier island coast is ebb tidal dominant, so tidal deltas form on the seaward side of the islands, and there is an abundance of salt marshes behind the islands (Fitzgerald, 1988).

[Insert Figure 1 about here]

The two islands share similar histories, and play similar roles in the greater Charleston community. Both islands serve as beach destinations for locals and tourists. IOP has a slightly longer history as a tourist destination, and is perceived as somewhat more upscale than FB. The development of IOP began at the turn of the 20th century with the opening of an amusement park on the island. FB's development was slower, but there were a substantial number of homes and a major hotel on FB by the 1930's, when George Gershwin composed the opera *Porgy and Bess* while staying on the island. In the 1970's, Wild Dunes[1], a world class resort, opened on IOP. Although nothing as fancy as Wild Dunes exists on FB, both islands are today seen as attractive beach destination (City of Isle of Palms, 2011, City of Folly Beach, 2011).

As shown in Figure 1, both islands are of similar distance from Charleston, the nearest large urban area. As such the primary economic forces faced by both communities are largely the same – both communities provide labor and recreational opportunities to the Charleston area, and both areas are influenced by the Charleston real estate market. Table 1 presents U.S. Census Bureau data on FB, IOP, and the greater Charleston area for the years 1990 and 2000. This data includes total population,

[1] Wild Dunes was the location for *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992), the case in which David Lucas claimed that South Carolina's Beachfront Management Act (1988) constituted a taking of his beachfront property.

demographic, economic and real estate market information in each community. The two island communities are of comparable size, racial distribution and household composition. The one real difference between the two communities is median income. Households on IOP report having a significantly higher income than households on FB. We will see that these higher incomes result in higher property values, but these incomes seem to grow at approximately the same rate (FB: 6.5% growth/year, Isle of Palms: 4.1% growth/year) with FB catching up slightly over the time period from 1990 to 2000. Although IOP is more affluent than FB, both communities are more affluent than Charleston, with both communities having higher median incomes, higher rents, and higher rates of educational attainment. Table 2, taken from Pompe (2008), provides real estate data on FB, IOP, and four other barrier island communities near to Charleston. This data shows that of the six communities, FB is most similar to IOP, in terms of property value, size and age. The point of all of this comparison is that FB and IOP are very similar communities, and they occupy similar if not identical niches in the Charleston area real estate market. Given their similar roles, we expect that property values on the two barrier islands should grow at comparable rates.[2]

[Insert Table 1 about here]

[Insert Table 2 about here]

[2] A crude measure of cross price elasticity from our data set for the years 2004-2005 indicates that a 1% increase in the sales price on FB causes a 0.37% drop in the number of properties sold on IOP, and a 1% increase in the sales price on IOP causes a 0.95% drop in the number of properties sold on FB. These numbers indicate that properties on the two islands are substitutes.

3.1. Erosion and Re-nourishment on Folly Beach

Although the two communities are similar in many ways, they differ in at least one significant way: human-induced erosion. For historical, political and economic reasons, FB is subject to tremendous erosive forces. In 1898, the Army Corps of Engineers completed building two jetties to the entrance of the Charleston, South Carolina harbor. These jetties were built to maintain shipping access to Charleston harbor by preventing sand from collecting at the harbor's entrance. Although initially these jetties caused FB to accrete, the long term effect of the jetties has been extreme erosion of the beach. This erosion is mainly due to the fact that the primary movement of sediment along this part of the South Carolina coast is from northeast to southwest. This longshore drift causes the many barrier islands (like FB and IOP) to accrete on their northeastern side and erode on their southwestern side. To help illustrate these forces, figure 1 shows the jetties and the direction of longshore drift. When the Charleston Harbor jetties were built, they disrupted the longshore drift for FB, preventing sediment from accreting on its northeastern side. With the natural re-nourishment process disrupted, FB began to erode. Figure 1 shows the basic geographic layout of the area under study. Notice that FB is south of IOP and the Charleston Harbor jetties (Owens and Rogers, 2007).

In order to counteract the effects of the Charleston Harbor jetties, the Army Corps of Engineers (ACE) in 1986 began a program of beach re-nourishment. This program has been quite effective. Levine, Kaufman, Katuna, Harris and Colgan (2009) estimate that current rates of erosion on FB range from 0.3 to 1.8 meters per year, down from 2.7 to

4.5 meters per year during the time period from 1854 to 1977, prior to the re-nourishment program. The ACE has re-nourished the beach in 1993, 1998, 1999, 2003, 2005 and 2007 (Owens and Rogers, 2007) Since 1986 IOP has had no re-nourishment projects.

4. Hypothesis

We are attempting to ascertain the effect of re-nourishment upon the property values of FB. In order to uncover this impact, we examine data from a similar real estate market, IOP, and observe how real estate values differ between the two markets. We assume that because of their similarities, all relevant factors impacting real estate values on the two islands are the same with one exception: re-nourishment. Any differences in real estate values in the two markets can then be attributed to the effect of re-nourishment. If that program is effective, then there ought to be no difference in property values between the two real estate markets. In particular, we will look at rates of appreciation over a 20 year time period, and the null hypothesis will be that the rate of appreciation on FB is equal to the rate of appreciation on IOP.

5. Data and Methodology

We examine property values on FB and IOP. In particular, we are focusing on property whose value is most likely to be impacted by beach re-nourishment: beachfront property and the properties immediately behind beachfront property. FB and IOP share the same basic real estate development pattern. Homes are located on lots immediately adjacent to the beach and these lots run parallel to the beach. Opposite the beachside of the home is a street, and across the street is another line of homes. Our data consists of all the properties on the beachfront and the first row that were bought and sold at least two times between 1986 and 2005.

Our basic approach is to look at the ACE re-nourishment as a natural experiment. Two similar entities, the real estate markets on FB and IOP, can be thought of as receiving two different treatments. FB has received the policy treatment – human-induced erosion and ACE re-nourishment, while IOP did not receive the treatment and can be thought of as the experimental control. Because of the initial similarities between the two markets, we argue that any difference in the two real estate markets post-treatment is the result of the policy treatment.

We use the repeat sales method to examine the difference in property values on FB and IOP over the time period from 1986 to 2005. This method creates an index of price changes for properties that sell more than once during a particular time interval. The method, originally proposed by Bailey, Muth and Nourse (1963), assumes that housing quality stays the same between sales dates, and that the change in the sales price between the sales dates is purely a function of time.

A major advantage of using this technique is that it avoids the omitted variable bias that can occur when using hedonic real estate pricing models. However, the repeat sales method itself has at least two potential weaknesses. First, if the quality of the property changes (through renovation, addition or neglect), then this change will bias the model's results. Second, houses that are picked up by this method may not be representative of the underlying population of property values.

Following the model presented in CGY, let P_{it} be the market price of property *i* at time *t*. If a property is initially purchased at time *T1* and then resold at time *T2*, then:

$$P_{iT2} = P_{iT1}(1+r_1)^{Di1}(1+r_2)^{Di2}(1+r_3)^{Di3}...(1+r_n)^{Din} \quad (1)$$

where

r_t = an index of cumulative appreciation through period *t* and

D_t = -1 if $t = T1$, 1 if $t = T2$, and 0 otherwise.

Dividing equation 1 by P_{iT1} and taking the natural log results in equation 2:

$$LN(P_{iT2}/P_{iT1}) = D_{i2}LN(1+r_1)+D_{i2}LN(1+r_2)+...+D_{in}LN(1+r_n) \quad (2)$$

If we add ε_i as an i.i.d. random error term to equation 2 we find the econometric model:

$$LN(P_{iT2}/P_{iT1}) = \beta_i D_{i1} + \beta_2 D_{i2} + \beta_3 D_{i3} + ... \beta_n D_{in} + \varepsilon_i \quad (3)$$

To investigate the potential impact of re-nourishment on FB, we create a series of dummy variables and incorporate them into equation 3:

$$LN(P_{iT2}/P_{iT1}) = \beta_i D_{i1} + \beta_2 D_{i2} + \beta_3 D_{i3} + ... + \beta_n D_{in} + (\varphi_i D_{i1} + \varphi_2 D_{i2} + \varphi_3 D_{i3} + ... \varphi_n D_{in}) F_i + \varepsilon_i \quad (4)$$

where F_i is a dummy variable that takes on the value 1 if the property is located on FB and 0 otherwise.

6. Results

Figure 2 shows average property prices from 1986 to 2005. We see that property values are generally higher on IOP, but property values in both municipalities grow steadily over this time period. Only one major difference in growth rates is evident in this graph – the dramatic downturn in property prices on IOP in 2004. This drop is likely due to 2004's busy hurricane season and the fact that Hurricane Gaston hit IOP in 2004.[3] Note however that property values return to their long run pattern in the next year. This pattern of a temporary dip in prices is consistent with previous work by Ewing, Kruse and Wang (2007), who found the same pattern (a temporary dip followed by no long term effects) between wind damage and real estate prices in six metropolitan areas. Figure 2, although informative, is hardly conclusive, and so we turn to regression analysis.

[Insert Figure 2 about here]

Table 3 gives the definitions for the variables used to estimate equation 4. Table 4 presents the results of estimating equation 4 with and without the FB dummy variables included. The estimated parameters for years close in time to 1986 are not statistically significant, but later years are. This result shows that property values were generally rising over time, but that we do not have enough statistical power to capture the initial differences in property values. As these values grow larger over time, they become statistically significant. If the null hypothesis is true, that is, that re-nourishment has been effective in maintaining property values on FB, then the estimated values of φ from equation 4 should be zero. Note that none of the individual estimated coefficients for any particular φ_i are significantly different from zero, and a further F-test of the joint hypothesis: $\varphi_i = 0$ is also not rejected (F = 0.918, p-value = 0.561). We conclude that the

[3] Although Hurricane Gaston impacted the greater Charleston area, it had a more powerful impact on IOP than FB. Windspeeds on IOP were higher than FB, and IOP reported more and more extensive power outages after Gaston than did FB (National Oceanographic and Atmospheric Administration, 2004).

rates of growth of property values on FB and IOP do not differ over the time period 1986 to 2005.

[Insert Table 3 about here]

[Insert Table 4 about here]

7. Conclusion

Our study, like all empirical work, suffers from a number of limitations. Perhaps the most critical of these limitations is the assumption, necessary to apply the natural experiment methodology, that observations come from entities that are identical in all dimensions except for the treatment effect. In practice, this assumption is never matched by reality, and we freely admit that there are significant differences between IOP and FB. The primary difference is one of relative affluence – although both communities are wealthier than the rest of the Charleston area, IOP is more affluent than FB. However, this affluence seems most likely to bias our results against our main finding, that the two communities' properties grow at equal rates. Over the time period studied, the highest rates of growth in property values in the Charleston area have been at the upper end of the price spectrum, so we might expect that even if re-nourishment were effective, IOP would grow faster than FB.

Despite limitations like the aforementioned, we find that re-nourishment can help maintain property values. We have shown that the repeat sales methodology can measure positive benefits for re-nourishment. The inability of CGY to measure positive benefits from re-nourishment seems to be an anomaly. Future research should focus on refining the repeat sales methodology so that it can be used to precisely measure the size of the benefit. This precise measure would be valuable for policy makers to use in cost-benefit analyses of current and future re-nourishment projects.

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Figure 1. Satellite Image of Folly Beach and the Isle of Palms, South Carolina, with the Charleston Harbor Jetties and the Pattern of Longshore Drift Overlaid.

Image from Google Earth. Accessed April 11, 2007.

Figure 2. Average Property Prices by Year for Folly Beach and the Isle of Palms, 1986 – 2005.

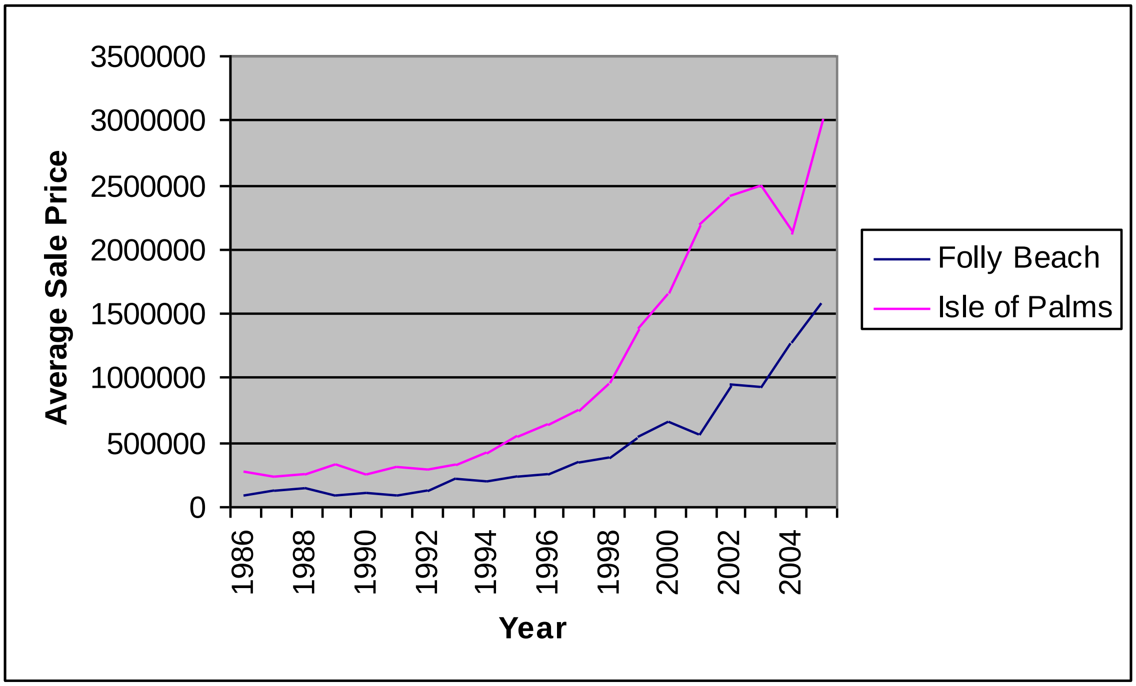

Table 1. U.S. Census Data for Folly Beach and the Isle of Palms, 1990 and 2000.

	1990 Census Data			2000 Census Data		
Variable	Folly Beach	Isle of Palms	Charleston	Folly Beach	Isle of Palms	Charleston
Population	1,398	3,682	80,414	2,116	4,583	96,650
% White	99.3	99.6	57.2	96.6	98.2	63.1
% Black	0.1	0	41.6	0.8	0.3	34.0
% Male	51.6	50.8	47.2	51.0	49.6	47.3
Median Age	40-44	40-44	30-34	41.1	44.9	33.2
Unemployment Rate	6.9	4.6	5.4	2.3	0.8	4.1
% Bachelor's Degree or Higher	33.2	42.7	29.5	50.7	59.7	37.5
% Married	65.6	63.7	46.3	47.6	67.2	43.2
Total Housing Units	1,391	3,063	34,322	1,747	3,881	44,563
% Occupied Units	47.9	48.4	89.6	60.7	50.0	91.5
% Owner Occcupied	28.5	38.3	43.1	35.4	40.4	46.8
% Renter Occupied	19.3	10.1	46.5	25.3	9.6	44.8
Mean Contract Rent ($)	411	558	341	821	1,169	614
Median Household Income ($)	28,413	47,702	25,153	46,935	76,170	35,295

Table 2. Real Estate Market Data, 2002-2005, from Pompe (2008).

Variable	Folly Beach	Isle of Palms	Dewees Island	Sullivan's Island	Kiawah Island	Seabrook Island
Average Price	$598,478	$861,769	$1,247,900	$1,100,404	$1,192,559	$606,227
Average Square Footage	1,630	2,132	2,570	2,492	2,825	2,306
Average Age	30.2	29.7	9.1	52.5	15.6	17.3
Number of Sales	340	450	10	170	589	348

Table 3. Variable Definitions.

Variable Name	Definition
LOGPRATIO	the natural logarithm of the ratio of the price the property sold for the second time to the price the property sold for initially
YRXX	= -1 if the property was first sold in year *XX*
	= 0 if the property was not sold in year *XX*
	= 1 if the property was sold for a second time in year *XX*
FYRXX	= -1 if the property is on Folly Beach and was first sold in year *XX*
	= 0 if the property was not sold in year *XX* or is located on IOP
	= 1 if the property is on Folly Beach and was sold for a second time in year *XX*

Table 4. Regression Results (Dependent Variable = *LOGPRATIO*).

Variable	Model (*i*) Estimated Coefficient	Standard Error	Model (*ii*) Estimated Coefficient	Standard Error
Intercept	0.170	0.051	0.154***	0.051
YR87	0.108	0.156	-0.355	0.471
YR88	0.233	0.188	-0.291	0.495
YR89	0.189	0.176	-0.049	0.482
YR90	0.078	0.143	-0.335	0.476
YR91	0.181	0.154	-0.198	0.473
YR92	0.303*	0.138	-0.072	0.467
YR93	0.632***	0.164	0.209	0.478
YR94	0.856***	0.149	0.406	0.481
YR95	0.766***	0.148	0.370	0.472
YR96	0.928***	0.153	0.445	0.468
YR97	1.161***	0.165	0.798	0.468
YR98	1.303***	0.166	1.054*	0.490
YR99	1.540***	0.160	1.238**	0.443
YR00	1.785***	0.173	1.562***	0.475
YR01	1.675***	0.190	1.793***	0.499
YR02	1.972***	0.186	1.957***	0.492
YR03	2.054***	0.181	1.714***	0.487
YR04	2.180***	0.188	1.478**	0.485
YR05	2.411***	0.201	1.857***	0.491
FYR87			0.591	0.516
FYR88			0.703	0.550
FYR89			0.083	0.534
FYR90			0.455	0.500
FYR91			0.381	0.512
FYR92			0.382	0.491
FYR93			0.546	0.512
FYR94			0.533	0.505
FYR95			0.510	0.496
FYR96			0.570	0.495
FYR97			0.465	0.506
FYR98			0.261	0.515
FYR99			0.311	0.467
FYR00			0.184	0.504
FYR01			-0.203	0.530
FYR02			-0.104	0.519
FYR03			0.344	0.520
FYR04			0.964	0.514
FYR05			0.815	0.527
R^2	0.620		0.673	
Adjusted R^2	0.588		0.613	
F-Statistic	19.182		11.071	

Degrees of Freedom	223	204

* indicates significance at the 5% level
** indicates significance at the 1% level
*** indicates significance at the 0.1% level