MARKET STUDY

EAST EVERGLADES REPORT

FIRST REVISION

JOB# 5893DOJ

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SUMMARY OF CONCLUSIONS

VARIABLE	FINDINGS	RECOMMENDED ACTION
Project Influence	There is no evidence to suggest that either the NPS announcement of the expansion of Everglades National Park or The Corps of Engineers announcement of its changes to the L31-N canal had any measurable impact on the value of the freshwater wetlands.	An appraiser or analyst should not make any adjustment for Project Influence.

Financing	There is evidence that seller financing has an upward impact on price, even after making mathematical cost equivalency adjustments.	Owner financed transactions should be avoided, if possible, for other than agricultural use tracts. Appraisers should rely on cash or third-party financed sales for other than agricultural use sales. There is no evidence that price is affected by owner financing for agricultural use properties.
Market Conditions (Time)	Our study of many land sales in the freshwater wetlands uncovered no persuasive evidence of any change in the price per acre directly associated with the date of sale. Neither Recreational use land sales nor Agricultural land use sales changed due to changes in the date of sale, 1974-1997.	No adjustment necessary for date of sale (Market Conditions).
Property Size	There is strong evidence that "size" is a significant factor for properties generally based on size categories, especially 6-15 acres, 15-55 acres and >100 acres. There is a modest ½%/acre decrease in $/acre as a continuous variable, but this adjustment is not meaningful unless there are very large differences between the size of the comparable sales and the subject. Size is often an interaction variable. For example, a 6-15 acre tract on a paved road or a 6-15 acre tract near a bridge sold for significantly different prices than can be explained by either size or proximity.	Limit comparable sales to similar sized properties generally within the size categories identified within the study. Pay particular attention to 6-15 acre sales on paved roads, 6-15 acre tracts near a bridge and 15-55 acre tracts on dirt/grass roads as statistically significant, distinct markets.
Location	Sales within the Dade county Overlay Ordinance (within Management Areas) sold for a significantly different (lower) price than sales not governed by the Overlay Ordinance. Sales near one of the four bridges across the L31-N canal sell for substantially more than other sales. If there is no all weather road providing direct access	Select comparable sales located within the Overlay Ordinance if the subject is within the area governed by the Overlay ordinance. Pay attention to the proximity of the subject or comparables to one of the bridges crossing the L-31N

	to a parcel, being within a mile of a paved road probably affects the value.	canal. Check for proximity to a paved road if the subject or comparables do not have either a paved or gravel/limestone road providing direct access.
Land Use Regulations	There is good evidence that this variable is a significant factor influencing land prices, specifically regarding restrictions on use imposed by the Management Area overlay zone. Properties in MA-1 and MA-3B sell for substantially more than parcels in other management areas, and parcels in MA 2 sell for less than parcels in other management areas.	There are too many other variables that affect value to directly measure the dollar impact of the numerous regulations, all other variables held constant. Select comparable sales to be relied upon from those within the overlay zone. Refer to the study to understand the relative values within each Management Area.
Road Frontage/Access	This variable has a significant influence on land prices, especially with regard to frontage on a paved road, a gravel/limestone road or a dirt/grass road. The data indicates no distinction in price between access by airboat, swamp buggy or foot paths (no vehicular access).	Try to select comparables with the same access/type of frontage as the property under appraisal. We found that properties with dirt road or grass road access sold for about 30% less per acre than p4roperties with all weather access; properties with airboat, swamp buggy or no road access sold for about 40% less per acre than properties with all-weather road access.
Mineral Rights	There is no evidence of any change in the price per acre, for sales in the freshwater wetlands, directly associated with the issue of Mineral Rights.	No adjustment necessary
Severable Use Rights	There is no evidence of any change in the price per acre, for sales in the freshwater wetlands, directly associated with the issue of Severable Use Rights.	No adjustment necessary

Compiled by Pritchett, Ball & Wise, Inc.

MARKET STUDY
EAST EVERGLADES REPORT

FIRST REVISION
03/99

DESCRIPTION OF THE FIRST REVISION

This study revision replaces the original study published 10/21/97.

Following our publication of the original East Everglades study, dated 10/21/97, the U.S. Department of Justice discovered that some of the governmental agencies involved had not sent us sales that may have reflected the impact of "project influence" on the value of land in the freshwater wetlands of south Florida. The exclusion of these sales was an understandable oversight. Agencies had been asked to provide us sales used in appraisal reports for agency land acquisition over a 20-year period. Appraisers, conscious of the Federal Land Acquisition rules, excluded sales as possible comparables if they suspected that the sales reflected "project influence". As a consequence of the exclusion of these sales from our original study, we concluded that the announcement of the East Everglades expansion in December 1989 and the announcement of the Corps of Engineers project in May 1992 had no impact on the value of the subject lands.

The Department of Justice attorneys provided us with 173 additional sales to be considered in a re-examination of our market study conclusions. Some of the additional sales were provided in an attempt to include additional agricultural use sales and sales from management areas (as described by the Dade County Overlay Ordinance discussed below) where the number of sales in the original study database was smaller than desirable. However, most of these sales were included because they may have indicated that "project influence" was a significant variable.

Inclusion of these new sales required a complete re-analysis of the data. We were obligated to geographically locate (geocode) these new sales, inspect the sales and verify the transactional information. Through this process we added a total of 130 sales to the analytical (statistical) study and 147 new sales to the descriptive database. We included sales in the descriptive database even if we learned that they did not represent arms-length transactions, because we want any analyst using the database to benefit from our research. We clearly labeled these "non-market" transactions in the descriptive database. In many circumstances we were required to undertake a lengthy verification process in order to learn that a sale actually did not represent a "market" transaction. Given the imperfect state of real estate transactional information, it is easy for an appraiser to be misled about the third-party nature of a sale. We included only what we believed to be third party, market-based transactions in the analytical study.

In the process of redoing the study, we tested for coding errors and determined that although some errors existed, they did not have a statistically significant influence on our conclusions. We corrected any coding errors that were discovered, thereby increasing the reliability of the revised study. In this second revision we more closely analyzed the potential impact of changes in the market, as reflected by date-of-sale. Our preliminary analysis indicated that although there was no evidence of change in the market 1972-1989, regardless of property type or location, but that there was an indication that sales in four of the Dade County Land Use Overlay Ordinance Management Areas (MA1, MA3A, MA3B and MA3C) increased over time, 1989-1997. Our more detailed research indicates that there is no reliable evidence that there has been a change in value over time.

We have chosen to completely replace the original study with this first revision. Our intention is to permit users to dispose of the original study and replace it with this revision without losing any of the data or information contained in the original report.

I. INTRODUCTION, PURPOSE AND FUNCTION OF THE STUDY

As a part of its program of curative measures for water flowage problems in the project areas, the United States Government is proposing to expand both the Big Cypress National Preserve and the Everglades National Park. Also, the Corps of Engineer's is engaged in a project to construct a levy to protect properties outside of the East Everglades Expansion Area from additional flooding when the water flow into the Everglades National Park is increased. The acquisitions associated with these projects will, in turn, require the services of many appraisers.

In response to a request for proposal dated April 3, 1997, Pritchett, Ball & Wise, Inc. was engaged to perform a market. This market study was performed for the Department of Justice, in cooperation with the National Park Service and the

Army Corps of Engineers.

The purpose of this market study is to identify the variables that affect the value of the freshwater wetlands in south Florida. We focused on the quantitative and qualitative legal, locational and physical impacts of the likely causative (independent) variables on the market value of properties in the project area. No value conclusions were estimated for the properties and this study should not be construed as an appraisal of any single parcel. This study includes only vacant or essentially vacant land transactions and does not consider improved properties. This report is specific to the Everglades National Park only. We determined that sales associated with the Big Cypress National Preserve represented a different market area, and we prepared a separate report that is a study of variables affecting the value of the freshwater wetlands on the western side of south Florida.

This study provides (where possible and appropriate) an indication of the direction and the extent to which the independent variables appear to affect the price paid for land in this unusual and ecologically sensitive area. This study is of a scope that is much larger than is usually available to appraisers, and we were able to utilize analytical models that are more sensitive and reliable than generally available to appraisers. However, our best service to appraisers and others who utilize this report is to identify the variables that an appraiser should consider when identifying and adjusting comparable sales. The individual appraiser who is concentrating on a specific subject property is better able to judge the actual impact on price associated with the variables he or she is considering when selecting comparables and making appropriate adjustments.

Once we had accounted for interaction variables (such as size of parcel and proximity to a bridge), we developed a list of 177 potential independent variables that represented the observable factors about the sales and the market area. Only a few of the potential independent variables turned out to have any impact on the value of land in the freshwater wetlands.

The following factors were specifically identified for study in the RFP. Each is described and analyzed separately within the body of this report.

- Project Influence
- Financing
- Market Conditions (Time)
- Property Size
- Location
- Land Use Regulations
- Road Frontage/Access
- Mineral Rights
- Severable Use Rights and Transferable Development Rights

Our investigation and analysis during the performance of this market study uncovered no additional variables that appear to have a significant impact on land values within the East Everglades Expansion Area.

The report is organized to directly address the variables the Department of Justice requested be included in the study. The study took place between June 1, 1997, and December 31, 1998, as revised, and involved four phases: (1) database creation, (2) property inspections, (3) research and analysis, and (4) report preparation. The first phase involved establishing the descriptive database. The sales data was mapped and geocoded on geological survey quadrant maps using longitudes and latitudes up to four significant digits. The properties were inspected either on foot, by swamp buggy, by road vehicle, or by helicopter. Where possible and appropriate, the sales were verified in person or by telephone.

A data book containing a significant sampling of the sales pertinent to this market is included under separate cover and is considered an integral part of this study. Each of the sales was input into the descriptive database utilizing the input form as illustrated in the Addenda as Exhibit A. A sales data sheet that compiles this information for many of these transactions is included in the data book and a sample output form is identified as Exhibit B in the Addenda. Also included with this study is a copy on CD of the database in three forms: 1) the main descriptive database in Microsoft Access software; 2) the statistical analysis data set in Microsoft Excel software; and 3) the paired data analysis data set on Microsoft Excel software. All of the sales directly referenced in this report by Pritchett, Ball & Wise (PBW) Number are reproduced in the data book.

Each variable was analyzed. The findings and conclusions that relate to the East Everglades are presented in this narrative report unless otherwise stated. [The findings and conclusions that relate to the Big Cypress National Preserve are contained in a separate report.] The above processes involved a total of 12 professionals: four MAI designated appraisers, one database management consultant, two statistical market analysis consultants, three senior consultants/appraisers, and two staff administrators.

II. OVERVIEW
DESCRIPTION OF SALES ANALYZED FOR BOTH EAST EVERGLADES AND BIG CYPRESS

The database was developed utilizing sales from appraisals of Florida's freshwater wetlands provided by the Department of Justice, the National Park Service, the Corps of Engineers, and the South Florida Water Management District. The appraisals were prepared by the agency's staff appraisers and/or independent fee appraisers. There were a total of 1,129 sales originally considered. After deletions and adjustments to the database (as described in more detail later in this report; see - "Description of Sales Analyzed"), the descriptive database contains a universe of 785 sales, dating from 1972 to 1997. Many of the sale write-ups were of the same transaction as investigated and reported by different appraisers. The publicly recorded factual information was generally the same for these "duplicated" sales, but the comments resulting from the various appraiser's interviews with grantors, grantees, brokers, and other knowledgeable market participants may have differed. We consolidated the various observations and opinions in order to report as full a picture as possible about the conditions of the sale and the motivations of the buyer and seller.

We eliminated duplicates, any sales that included significant structures or improvements, and sales that involved any government agency or entity with the power of eminent domain. This reduced the total database to 785 comparable sales. The technical framework of the database is described in the following section of this report.

To accommodate separate studies and reports for Big Cypress and East Everglades, we divided this data into two databases. The following table provides an overview of the data after this division, focusing on the number of sales transactions in each Expansion Area in their various size ranges. As shown, there are 393 comparable sales within the East Everglades descriptive database and 392 in the Big Cypress descriptive database.

TABLE 1, SALES BY SIZE

Size (Acres)	Big Cypress Sales	East Everglades Sales	Total Sales
0 - 2.5	89	97	186
2.51 - 5.0	140	81	221
5.01 - 10.0	67	62	129
10.01 - 20.0	20	41	61
20.01 - 30.0	3	17	20
30.01 - 40.0	17	28	45
40.01 - 100.0	10	37	47
100.01 - 200.0	21	14	35
200.01 - 300.0	4	3	7
300.01 - 400.0	6	5	11
400.01 - 1,000.0	5	5	10

1,000+	10	3	13
Total	392	393	785
Compiled by Pritchett, Ball & Wise, Inc.			

Of the 393 sales in the East Everglades database, 178 are sales of properties consisting of five acres or less. This represents 45% of this database. For Big Cypress, 229 (58%) of the 392 sales were of properties of five acres or less. Graphs which illustrate the data within each database are presented below.

The descriptive database includes a number of transactions to and from Michael Jones for the transfer of severable use rights (SURs), a group of sales that were purchased by an investor (7^{th} Cavalry Corporation) specializing in real estate tax auction sales, and other non market value transactions, such as sales between related parties. The East Everglades database sales that were eliminated from our analyses, and the reason for elimination, are identified in the following table. The sales remain in the descriptive database for the reference of reviewers and appraisers, but should not be relied upon for comparable sales analysis purposes.

TABLE 2, SALES ELIMINATED FROM STATISTICAL AND PAIRED DATA ANALYSIS DATABASES

PBW No.	Reason for Elimination
1052	Auction of bankrupt corporation
2004	Tax sale
2007	Consolidation among partners
2008	Tax sale
2009	Purchased for SURs
2015	Liquidation
2017	Quit Claim Deed
2075	Related parties
7023	Not an arms length transaction
12007	West Palm County
12152	Broward County
12188	Broward County - commercial gas station

12256	No cash; swap for land in Mexico
12271	Trade for boat parts, not cash
12287	Donation to Miccosukee Indian tribe
12306	Donation to Miccosukee Indian tribe-Commercial Land Use
12312	Only commercial property in data / not representative of study
12320	Contract 20 years ago
12325	Contract date unknown
12340	Appraiser's comments said not arm's length
12342	Contract in 1976
12347	Property bartered for groceries
12401	Payment of debt, only asset, debtor left U.S.
12402	Payment of debt, only asset
12404	Distressed sale to son-in-law
12410	Contract for deed
12433	Sale for/of SURs
12436	Purchased for SURs
12438	Sale for/of SURs
12446	Quit claim Deed
12452	Sale for/of SURs
12462	Sale for/of SURs
12466	Tax sale
12467	Sale for/of SURs

12468	Sale for/of SURs
12470	Sale for/of SURs
12472	Sale for/or SURs
12473	Sale for/or SURs
12484	Purchased for house, illegal fill at time of sale
12568	Monroe County
20012	Distressed Sale
20019	Not arms length transaction
20061	Sale for/of SURs
20063	Not arms length transaction
20082	Sale for/of SURs
20083	Sale for/of SURs
20085	Not arms length transaction
20090	Sale for/of SURs
20106	Quit claim deed
20110	Sale for/of SURs
20111	Sale for/of SURs
Compiled by Pritchett, Ball and Wise, Inc.	

TABLE 2, CONTINUED. SALES ELIMINATED FROM THE ANALYTICAL DATABASE

PBW No.	Reason for Elimination

20112	Distressed Sale
20114	Not arms length transaction
20116	Incomplete sales information (sale date unknown)
20138	Not arms length transaction
20139	Not arms length transactions
20140	Sale for/of SURs
Total	57
Compiled by Pritchett, Ball & Wise, Inc.	

III. DEVELOPMENT OF THE DATABASES

Descriptive Database

The sales were input into a Microsoft Access database format which consisted of one main sales table, seven subordinate sales information tables, and 11 reference tables. Data on each of the sales was coded within five major headings: location, physical data, sales data, verification, and comments. An attempt was made to reverify the transactions, but given the age of the comparables, some sales could not be reverified with any party to the transaction. All sales provided to us by other sources and relied upon in this study were previously verified by qualified appraisers.

Design

The database was modeled using standard Entity Relationship Diagramming (ERD) techniques to logically model the real estate data entities, attributes, and relationships. The logical data model was then translated into a physical database design by defining table and columns for the logical entities and attributes. Each entity natural key attribute was translated to a table primary key column for unique identification of each table row (record). Relationships were defined between the subordinate sales tables and the main sales table. The corresponding foreign keys were defined between the tables. Various index tables were defined to improve the performance of certain database queries.

The sales table has a "one-to-many" (1-M) relationship with each of the seven subordinate sales tables. In other words, for each main sales record there may be one or more records in each of the subordinate tables. For example, a sale may have one or more legal descriptions depending on how many parcels of land make up the sale.

The purpose of the reference tables is to store the allowable set of values for a field (column) in one of the sales tables. The sales and reference tables are identified in the following chart.

TABLE 3, DESCRIPTION OF TABLES	
Table Name	**Description**
Areas	Options (values): Big Cypress and East Everglades
Buyer_Motivation	Buyer Motivation Land Use

Counties	All Counties In and Near the Project
Deed_Type	Options (values): Quit Claim, Special Warranty, and Warranty
In _Big_Cypress_Exp	Township, Range, and Section in Big Cypress Expansion Area
In_Corps_Project	Township, Range, and Section in Corps Project
In-East_Ever_Exp	Township, Range, and Section in East Everglades Expansion
In_Near_Municipalities	Township, Range, and Section in or near Municipalities
Interest_Conveyed	Options (values): Fee Simple, Leasehold, and Leased Fee
Municipalities	All Municipalities In and Near the Project
Near_Big_Cypress_Exp	Township, Range, and Section near Big Cypress Expansion
Near_Corps_Project	Township, Range, and Section near Corps Project
Near_East_Ever_Exp	Township, Range, and Section near East Everglades Expansion
Near_Howard_Br_TRS	Township, Range, and Section near Howard St. Bridge
Near_Richmond_Br_TRS	Township, Range, and Section near Richmond St. Bridge
Near_SW_288th_Br_TRS	Township, Range, and Section near SW 288th St. Bridge
Near_Tamiami_Br_TRS	Township, Range, and Section near Tamiami Trail Bridge
Part_Type	Partition Type (Ex. E1/4, SW1/4)
Regulations	All Possible Applicable Regulations

States	U.S. States, Canadian Provinces, and Mexican States
Use_Type	Land Use Types
Water_Type	Types of Water Frontage
Compiled by Pritchett, Ball & Wise, Inc.	

A detailed listing of the subordinate tables is located in the Addenda, labeled as Exhibit K.

A data file over 41,000 ownership records in the Dade County data file used by the county tax assessors was received from Dade County on CD-ROM. The data file was converted into a Microsoft Access database. The data was used to verify and complete the sales data, particularly the Grantee information, on the Sales database for the East Everglades.

Sales were matched to the Dade County data file by two methods: 1) folio number and 2) owner or Grantee name. Database queries were written to do the matching, matches were hand-checked, and data was taken from the Dade County data file to enter into the Sales database. After data entry for the main Sales database was completed, the data for the East Everglades and Big Cypress areas was converted into separate outputs for statistical analysis by the SPSS (Statistical Package for the Social Sciences) software. The structure of the selected sales consisted of a set of variables that were defined to SPSS standards for the analysis process (the statistical study).

Each variable in the statistical study was derived from the main Sales database. Other variables were defined between the descriptive database and the selected statistical data to associate two or more variables. For example, variables were defined for property size and accessibility.

Another set of variables was defined to associate size and accessibility, such as 1 to 3 acre sales on all weather roads or 1 to 3 acre sales on dirt/grass roads. These associative or interaction variables were used by SPSS to determine any significant statistical relationships between and among the variables.

There are 336 sales in the data sets used for statistical or paired sales analysis. Of these, 229 are within the Overlay Ordinance (any Management Area). Only three management areas, MA 1 (34 sales), MA 2A (98 sales), and MA 3B (51 sales) proved to have a direct influence on the price of land. Tracts in MA 2A sold for significantly less per acre, all other variables accounted for. Tracts in MA 1 and MA 3B generally sold for more per acre, but the differences were not always statistically significant at the $p = 0.05$ level of significance. The other management areas (MA 2B, MA 3A and MA 3C) were not statistically significant variables. However, we concluded that in general the market for lands controlled by the Dade County Overlay Ordinance is different than the market for similar land wherein land use is not as closely controlled.

One hundred and seventy-seven (177) sales are in the East Everglades Expansion Area, 58 are "near" (within one mile of) the Expansion Area, and 101 are "not near" (more than one mile from the Expansion Area). These variables were used as a means of estimating potential project influence, and they also help in understanding the impact of the regulatory environment both within and outside the areas governed by the Dade County overlay ordinance. Our analysis shows that the announcement of the federal projects (the expansion of East Everglades National Park and /or the Corps of Engineers project) did not have an influence on the price paid for land.

Eighty-four (84) of the sales were of property used for some type of agriculture at the time the tract was sold or, if agricultural use at the time of the sale could not be determined, at the time we inspected the sale. The rest of the tracts were best classified as a limited recreational land use. The agricultural sales sold for a significantly higher price per acre than the other sales. Consequently, we generally partitioned the sales by land use and made separate comparisons for the agricultural and non-agricultural sales.

Ninety (90) of the sales indicated purchase money notes or other owner financing. The balance of the sales were for cash or third party financing. Very few of the comments indicated that any third party lenders were involved in smaller acreage transactions. The evidence seems to show that owner financing generally increases the price paid for wetlands, even if the terms of the owner financing are similar to terms offered by third-party lenders.

Access to the property is one of the more important variables affecting value. 81 sales have direct access to a paved road and 23 sales on a gravel/limestone road. Both of these types of access affect the price paid for the land. Seventy-seven

(77) of the sales indicated a dirt road or grass road access, 76 via either airboat or buggy, 10 by airboat only, 5 by buggy only and 64 with no vehicular access, in which case access is via either helicopter or walking. There is some evidence that direct access by a dirt/grass road is superior to airboat and buggy access, but no evidence that airboat and/or swamp buggy access is superior to no known access.

A total of one hundred and seventy (170) of the sales were within a mile of a paved road, but, by itself, this variable was not significant. However, for parcels without an all weather direct access to the property, proximity to a paved road appears to be a positive influence on price.

Fifteen (15) of the sales were within a mile of one of the four bridges that provide access from the east to the west of the L31-N Canal. This variable made a significant difference in the price paid for land. In some cases, being within a mile of both a major road and a major bridge affected the value of the land.

IV. THE ANALYTICAL MODELS

The analytical data is made up of sales of vacant tracts of land in the freshwater wetlands of south Florida. Much of this land is under water for between three and nine months of the year. Many of the tracts are inaccessible and have very little identifiable functional utility. It is difficult to ascribe rational, economically based motives to the buy-sell decisions. Consequently, there is an unusual degree of variability in the data. Two tracts that appear to have virtually the same objective criteria (date of sale, size, location, physical characteristics, etc.) will often have sold at very different prices. The problem for the analyst is to be able to distinguish between the objective criteria that actually influence the price paid for these freshwater wetlands from the "noise" that comes from a relatively inefficient, unusual real estate market wherein all of the buyers and sellers are not equally well informed or well advised.

One of the essential characteristics of real estate is that it is not fungible. Each parcel is uniquely fixed in space. At the same time we still believe that the economic principal of substitution applies. That is to say that the market value of a property can be determined by comparing the sales of other parcels with similar physical characteristics and similar functional utility. This is the concept embodied in the sales comparison or "market" approach to the appraisal of real estate, and the sales comparison approach is the primary approach applied to the appraisal of vacant parcels. Basic appraisal practice requires that the appraiser select at least three "market value" sales of reasonably comparable properties, and that he or she adjust the comparable sales to make them more like the subject. The adjustments are to be based on indications from the market about the direction and magnitude of value differences associated with observable differences wherein the comparable property is considered to be superior or inferior to the subject property. [For a more detailed discussion of the sales comparison approach, see generally THE APPRAISAL OF REAL ESTATE, ELEVENTH EDITION, The Appraisal Institute, Chicago, IL., 1996, Chapters 18 and 19, pp. 397-446.]

The process of selecting and adjusting comparable sales is an exercise in judgment for the appraisers, but we believe it mirrors the calculus of the market of willing buyers and willing sellers, each equally well informed or well advised. It is important to consider at least three sales because three sales are the fewest number that will indicate the degree of central tendency and dispersion in the market. If all three sales are reasonably similar (i.e. require few adjustments) and if all three indicate about the same price (i.e. indicate a strong central tendency and little dispersion), then the buyer, seller and appraiser generally agree that the market value of the subject is about the value indicated by the adjusted value of the three comparable sales. On the other hand, if the adjusted value of the three sales shows a relatively wide dispersion, the buyer, seller and appraiser are generally dissatisfied and wish to seek out more sales to better indicate the magnitude and direction of adjustments and to better verify the central tendency reflected by the judgment of the marketplace.

Appraisal judgments are based on the appraiser's broad knowledge of the market and are reinforced and refreshed by interviews with market participants as a background to his or her selection and examination of comparable sales. In most cases, when the appraiser is fortunate enough to be working with property in a relatively rational, economically based market, differences in price can be rationally explained by observable differences that objectively reflect differences in the functional utility of the different parcels. Generally speaking, the important differences in functional utility can be uncovered by a careful matched pairs examination of fewer than ten comparable sales. The adjustments can be rationally defended; thereby reducing the dispersion in the data, and the indication of central tendency in the data is clearly reflected by the appraiser's judgment about the market value of the subject property.

Unfortunately, the sales of south Florida's freshwater wetlands have very few of the characteristics of a rational marketplace. Even though there are several hundred sales in the database, there is a wide dispersion of prices within the data and the differences in functional utility between parcels are as extreme.

An analyst faced with an array of data seeks to find information from the data by using measures of central tendency and dispersion. Most of the time, the analyst makes judgments about the information contained in the data based on the

indications of central tendency. The three most common descriptions of central tendency are the mean (mathematical average), the median (mid-point of the array), and the mode (most frequently occurring value in the array).

The most common descriptions of the measure of dispersion are the range or extremes of the array and the standard deviation of the data points relative to the mean. The smaller the range and the smaller the standard deviation, the greater the degree of confidence that the analyst can place in judgments based on the central tendency.

The mean and standard deviation are also the most useful descriptive statistics because they are mathematical constructs, which means that they can be measured and compared mathematically. This ability is particularly helpful with data, such as that generated by the subject, where "answers" are not readily apparent.

TABLE 4,

EXAMPLE OF MEAN AND STANDARD DEVIATION FROM TWO DATA ARRAYS

		MARKET A;	***MARKET B***	
SALE NO.		***$/ACRE***	***$/ACRE***	
1		$7,250	$5,250	
2		$6,450	$4,950	
3		$6,150	$5,150	
4		$5,350	$7,250	
5		$5,500	$4,750	
6		$5,000	$5,000	
7		$4,200	$5,050	
8		$4,200	$2,500	
9		$3,400	$5,150	
10		$2,500	$4,950	
MEAN		$5,000	$5,000	
STANDARD DEVIATION		$1,377	$1,072	

For example, if we partition or split the array of data into two sets based on some observed difference, such as date-of-

sale in the hypothetical example above, we may find that both sets have the same average price per acre (a mean of $5,000/acre), but that the standard deviation of one set (Market B) is substantially smaller than the standard deviation of the other set (Market A). A comparison of the two average values alone may lead to an erroneous judgment that the observed difference in market areas doesn't matter, whereas a comparison of the two standard deviations shows that difference in market area probably does affect the price per acre.

A mathematically based statistical analysis could make use of the difference in the standard deviation of the two arrays to assign a probability that any observed relationship (average value given market area in this example) was just due to chance for Market A, but that it was statistically significant (probably not due to chance given a stated confidence interval) for Market B. If all we know about the two groups of sales is the sales price/acre, the only statistics we can use to "best" describe the data are statistics about central tendency like the average, the median and the mode(s) and statistics about dispersion like the standard deviation and the range.

The analysis of data from the south Florida wetlands was performed utilizing three basic methods: statistical analysis, paired data analysis, and qualitative analysis. Each method is described in the following paragraphs.

Statistical Analysis

All analytical methods use statistics to a greater or lesser extent. If we compare matched pairs of data wherein we have more than one pair, we will generally base our judgment on the central tendency and dispersion shown by the multiple matched pairs (i.e. "Most of the matched pairs indicate an adjustment of $X"). If we base our judgment on interviews with knowledgeable market participants, we generally report that "a majority of" the market players said thus and so. In the statistical analysis component of the market study we are much more rigorous and formal in the foundation of our judgment, because we actually specify our confidence interval and make our judgment about the variables that affect value by following a body of mathematically based statistical rules and techniques.

The size and complexity of the descriptive database strongly suggested the use of statistical analysis. We employed a stepwise, multi-linear regression analysis to uncover trends and relationships subtly embedded in the data. This methodology has a strong history in the study of real estate and, when used as an adjunct to rather than as a substitute for expert judgment, can be an excellent tool for a market analysis.

The object of regression analysis is to examine the relationships between a dependent variable, such as sale price or price-per-acre and a set of independent variables with which sale price or price-per-acre may be associated. The independent variables of interest are those factors that appear to "cause" or determine the differences in the prices paid for land in the Florida freshwater wetlands. Each potential independent variable was studied in turn by modeling its relationship to the dependent variable (price or price-per-acre). Most of these factors are qualitative rather than quantitative in nature. For example, "location" is a variable that is not naturally numeric but must be converted into a numeric form before the regression analysis could be conducted. The same point applies to many of the factors under study. The qualitative information contained in the database therefore was converted into either a set of binary variables (0,1) or numeric variables (number of miles from a paved road or the number of months from the date of the first sale).

Once all information has been quantified, regression analysis calculates equations that best account for the variability in the dependent variable. The regression equations are attempts at explaining why price per acre varied based on changes in the studied factors (*e.g.*, location, size, land use controls, etc.). The algorithm used to calculate the regression equations is the least-squares algorithm, and the statistical package employed was SPSS, one of the statistical packages commonly employed by social scientists.

The following hypothetical example shows the same two arrays of data presented above with the addition of data on the size (in acres) of the sales.

TABLE 5

EXAMPLE OF MEAN AND STANDARD DEVIATION FROM TWO DATA ARRAYS

		MARKET A	***MARKET B***	
SALE NO.	***SIZE***	***$/ACRE***	***$/ACRE***	

1	1.75	$7,250	$5,250	
2	2.25	$6,450	$4,950	
3	2.5	$6,150	$5,150	
4	3.5	$5,350	$7,250	
5	3.75	$5,500	$4,750	
6	5.25	$5,000	$5,000	
7	6.5	$4,200	$5,050	
8	6.5	$4,200	$2,500	
9	8	$3,400	$5,150	
10	10	$2,500	$4,950	
MEAN	5	$5,000	$5,000	
STANDARD DEVIATION	2.58	$1,377	$1,072	

In Figure 3 showing the relationship between size and price/acre for Market A (Table 5, above), the scatter diagram shows that most of the data lies on a downward sloping line. This indicates that larger parcels sell for a lower price-per-acre than smaller parcels. The straight line drawn through the data points is called the "best fit" line or the "least squares" line. It represents the point at which the sum of the squared difference (deviation) between the line and each observed data point (sale) is at a minimum. The formula [y=-471.52x + 7593.3] is the formula for the line {Y = A + B(x)} wherein B(x) [471.52 (x)] describes the slope of the line and A [7593.3] is the constant or point at which the line intercepts the Y axis.

R^2 is a statistic that describes the extent to which variations in "size", which is the independent variable, explain the variation in "$/acre", which is the dependent variable. In this example 97% of the variation in $/acre is "caused" or explained by differences in the size of the parcel.

The following Figure 4 shows the relationship between size and price-per-acre for the array of data labeled Market B.

In this case the scatter diagram of sales does not show the clear pattern of a strong relationship between size and $/acre indicated by Market A. All but two of the sales fall roughly along a line representing about $5,000/acre, regardless of the difference in the size of the parcel. We calculated a "best fit" line or regression line through the data points [y=-126.67x + 5696.7], but the R^2 calculation is only 0.1152, which is to say that only 11.5% of the variation in the $/acre is associated with or explained by differences in the size of the parcels.

If we were to add a test of the statistical significance at the p = 0.05 confidence interval to the regression model for Market B, we would be able to calculate a "p" value for the regression of p= 0.72. The value of "p" for any regression is a function of the amount of explained and unexplained dispersion in the data given the size of the sample and the number of variables being considered. With a "p" value that is as high as 0.72, we would reject the observation that difference in size was correlated to $/acre, because we would believe that the perceived weak relationship was due only to chance (p =

0.72 which is > p = 0.05).

To sum up what we hope to show using this hypothetical example, in both cases we started with an array of ten sales. These arrays each have a measure of central tendency or average value, or mean of $5,000/acre. They both had a measure of dispersion or range of between $2,500/acre and $7,200/acre. In the case of Market A, our understanding of the difference in $/acre among the ten sales is substantially (97%) explained by differences in the size of the parcels. In the case of Market B, very little of the difference is explained by differences in the size of the parcels.

An analyst given only the data shown in the hypothetical example above would be able to conclude that best indication of the market value of the Market B sales was $5,000/acre, and that differences in the size of the tract (within a range of from 1.75 acres to 10 acres) do not affect the $/acre. However, for the Market B sales, although the average price was also $5,000/acre, the actual value of any single tract was substantially affected by differences in the size of the tract. As size increased (or decreased) from the average of 5 acres, $/acre decreased for the larger sales and increased for the smaller sales by about $470/acre.

Correlation is not the same as causality. A comparison of the two samples may indicate to the analyst that there is a difference between Market A and Market B. However, there is nothing in the data that explains why a difference in size of parcel affects value in Market A whereas it does not affect the value in Market B. Explanations of causality are matters of judgment, not statistics.

This is an example of simple linear regression. Multiple linear regression examines a range of potential explanatory variables, each of which is theoretically independent of each other explanatory variable. The explanatory power of each statistically independent variable is added to the explanatory power of all other statistically significant independent variables to calculate the multiple R^2 for the equation. Whereas the equation for a simple linear regression was Y = A [the intercept or calculated constant] + B(X) [being the slope of the line], the multi-linear regression model is $A + B_1(X_1) + B_2(X_2) + B_n(X_n)$ where A represents the calculated constant or average value as-if none of the X variables affected the dependent (Y) variable, and the B subscripts represent the slopes of the "best fit" line for each of the "n" independent (X) variables to be considered.

The "calculated constant" for a multi-linear regression is similar to the intercept for a simple linear regression model. It represents the "A" in the regression model $Y = A + B_1(X_1) + B_2(X_2) + B_n(X_n)$. If one could visualize a multi-linear regression in two dimensional space, it represents the point at which the "best fit" line crosses the Y access. If none of the n number of "X" variables affected the Y variable, that is to say that there are no significant independent variables, the calculated constant represents the "average" or "typical" value of the dependent variable (say $/acre). In a regression model wherein there are statistically significant X variables, the calculated constant represents the average value before considering the influence of the statistically significant independent variables.

The calculated equations represent regression's "best guess" at the underlying relationship between the dependent variable and the independent factors. Regression has a way of expressing its confidence in these "best guesses". The p-value is a ratio ranging from 1 to 0 that expresses random rather than true relationships (noise rather than correlation).

A high p-value indicates that there is little confidence in the estimated equations, that they are probably just random events and that they do not represent any strong relationship between the independent or "explanatory" variable and the dependent variable. This is what is meant by the term "statistical significance". A p-value of .05 or less would indicate that there is a 95% or greater probability that the observed relationship impacts value (or more properly, that there is only a 5% or less probability that the observed relationship is due to random events).

In the sections which follow, the results of the regression analysis and their statistical significance will be discussed. Rather than present equations, the discussions will focus on the practical interpretations of the regression results. At its best, the statistical model shows correlation, not causality. That is to say that the statistics can document that a relationship exists between the variables. However, the judgment about the causative nature of the relationship between (or among) the variables reflects the judgment of the analyst.

The stepwise function multi-linear regression model was used to consider the potential impact of the independent variables (such as type of road providing access to a parcel) and interactions between variables (such as type of access and proximity to a major road). "Stepwise" means that each potential independent variable was tested in every possible combination with all other potential independent variables to test for problems of co-linearity (two possible independent variables related to each other). "Multi-linear" means considering multiple independent variables each adding their impact to "cause" changes in the dependent variable. At the 0.05 level of significance, eleven (11) of these variables "qualified" as being independent variables that "caused" changes in the price of land. The Multiple R (best fit statistic, which is sometimes called "Pearson's r" or the correlation coefficient) from our "best" model is 0.80682, and the R^2 statistic is 0.65. Whereas the Multiple R is a statistic about other statistics and does not translate into a "real world"

useful meaning, R^2 can be understood as the percentage of the change in the dependent variable (price) explained by changes in the independent variables. In the East Everglades analysis, 65% of the difference in land prices is explained by the statistically significant variables.

We created a statistical data set from the 336 sales that we believe represent market transactions that may indicate the variables affecting the value of the East Everglades Expansion Area. We identified 177 potential independent variables (including interaction variables) for each of the sales, plus several potential dependent variables, primarily price per acre ($/acre) and total transaction price (price). Each sale is identified by a unique number that we assigned (PBW No.) and another sequential number assigned by SPSS. This 336 row by 181 column data set is reproduced as an Excel spreadsheet called the East Everglades Statistical Data Set (East_e~1.xls). A copy of the statistical data set is reproduced on the CD that accompanies this report.

A simplified version that lists only the 32 basic potential independent variables (not counting interaction variables) was developed to permit matched pairs comparisons. This 336 row by 34 column data set is reproduced on the CD as an Excel spreadsheet called the East Everglades Matched Pairs Data Set (Eerevise.xls). Using the Excel software's "filter" command it is possible to recreate any interaction variable (i.e. less than 3 acre sale after the East Everglades Expansion announcement but before the Corps of Engineers announcement located on a paved road in Homestead City near a major bridge).

The following is a list of the statistically significant independent variables in order of importance.

TABLE 6, SIGNIFICANT VARIABLES	
Variable	**Probability Outcome Due To Chance**
SIGNIFICANT VARIABLES FOR >3 ACRE TRACTS; $/ACRE AS DEPENDENT VARIABLE	
Agricultural Use	p = 0.0000
6-15 Acre Tract Near a Bridge	P = 0.0008
Later Sales (after 5/92 following both project announcements)	P = 0.0003
Management Area 2A	P = 0.0010
6-15 acre Tract with Paved Road Access	p = 0.0008
100 Acre or Larger Tracts	p = 0.0076
15 to 55 Acre Tracts Near a Bridge	p = 0.0000
Not Near Bridge Or Paved Road	P = 0.0397
Size As A Continuous Variable	P = 0.0274
Near (within 1 mile of) a Bridge and Major	p = 0.0397

Road	
15-55 acre Tract with Grass/Dirt Road Access	p = 0.0237
SIGNIFICANT VARIABLES FOR	
Near A Bridge	P = 0.0000
Near (Within One Mile Of) The Expansion Area	p = 0.0000
Compiled by Pritchett, Ball & Wise, Inc.	

One of our most important findings is that total transaction price (price) rather than price per acre ($/acre) is the most appropriate dependent variable for the less than three acre sales (3 ac.) sales.

Florida uses the government survey method for legal descriptions of parcels, rather than the metes and bounds system. A natural consequence of this system is that parcel sizes tend to be clustered at the points best described by the survey system, that is at 1.25 acres, 2.5 acres, 5 acres, 10 acres, 20 acres, 40 acres, etc., rather than evenly distributed along a continuum of size. As one can see from an examination of the scatter drawing below, the 71 sales of parcels that are less than three acres in size are primarily located at 1.25 acres, and at 2.5 acres.

When we use $/acre as the unit of comparison (dependent variable), the average $/acre is approximately $5,000/acre, regardless of the size of the parcel. The "best fit" line that can be drawn through the data is almost a level line (no slope) and the calculated R^2 is very small (0.0002), showing that differences in size among these

The data presented in Figure 6, below, shows the same 2 for the data using total sales price is 0.08, showing that as the size of the parcel increased from 1.25 acres to 2.5 acres, the price increased about 8% from the average price of about $5,000 for a 1.25 acre tract.

If $/acre was the appropriate unit of comparison for these smaller sales, a 2.5 acre tract would sell for twice as much as a 1.25 acre tract. In that case we would expect to see an upward sloping line at a 45 degree angle and a close relationship between the observed sales and the line. Figure 6 shows that the slope of the line is only at about a 15 degree angle and that the data is not closely grouped around the line.

We further tested the idea that total sale price was a more meaningful unit of comparison for the 3 acre sales, by running full multi-linear regression models on all of the data, on the 3 acre sales. When we used $/acre as the dependent variable for all sales the calculated R^2 is 0.55. When we split the data into two data sets and calculated the R^2 for the smaller sales, R^2 was reduced to 0.52, which is a very minor change (5% inferior). However, the R^2 for the larger sales was increased to 0.65, which is a substantial improvement in the explanatory power of the regression model (18% superior).

Given the problems of identifying functional utility in these wetlands in the first place, it is not surprising that in many cases a "useable" parcel may have to encompass 2.5 acres, rather than 1.25 acres, in order to have a tract that contains a hammock or other desirable feature. It appears that these buyers may be willing to pay a little more for a 2.5 acre tract than for a 1.25 acre tract, but not much more. Once we discovered that the appropriate dependent variable was different for the

We used the regression model to forecast the prices for each of the sales, and then examined the "residuals" (the differences between the prices that the regression model calculated and the actual sales prices) to see if there are any other patterns than might indicate other explanatory variables. No additional variables were significant from this study of the residuals.

In summary, we believe that the regression model is a useful tool to assist in an understanding of the variables that show evidence of affecting the price of the freshwater wetlands in south Florida, and in promoting consistency in appraisal

judgments by focusing attention on the variables that have the greatest influence. With our study we have identified 11 important variables, and eliminated 166 potential variables as items that do not warrant careful attention. With it we can explain 65% of the variation in the observed price of parcels that sold between 1972 and 1997. At the same time, we believe that traditional paired data comparison is a useful and persuasive method to value any single parcel. However, the appraiser who bases his or her conclusion on paired sales can not ignore the variables identified above and still claim to be using sales that are comparables.

Paired Data Analysis

Introduction

In an ideal situation, paired data analysis is a procedure in which two properties are compared for the purpose of determining the effect on value "caused" by an observed difference between the properties. To start the analysis, two comparable properties or sets of comparables that are identical in all characteristics except one are matched as pairs. With these two sets being identical except for one characteristic, the difference in the sales price per acre is attributed to the single difference.

The Appraisal Institute defines Paired Data Analysis in *The Dictionary of Real Estate Appraisal* on Page 258 in the following way:

A quantitative technique used to identify and measure adjustments to the sale prices or rents of comparable properties; to apply this technique, sales or rental data on nearly identical properties are analyzed to isolate a single characteristic's effect on value or rent.

This procedure was formally known as a matched pair analysis.

In a real world situation, the ideal setting described above is not usually attainable. Paired data analysis must be used with caution when the analysis must be performed in less than ideal conditions. It is usually not possible to find two sets of comparable properties that are identical in all but one characteristic. At best, the analyst will be able to find:

1. two comparable data sets that are similar with regard to several major characteristics but are different with regard to many minor characteristics. In this situation, a price difference can only be attributed to the array of minor characteristics that differ between the two comparable data sets.
2. two comparable data sets that are similar with regard to several major characteristics but are different with regard to one major characteristic plus many minor characteristics. In this situation, a price difference can be attributed to the difference in the major characteristic as well as the array of minor characteristics that differ between the two comparable data sets.

The paired data analysis performed in this study was constrained by these two limitations. It was also constrained by the quantity and the quality of the sales information available to the analysts. Even though we have several hundred sales in our statistical data set, we quickly run out of sales when we try matched pair analysis on multiple variables. In some cases we were able to develop matched pairs using three variables, but usually we ran out of data on any match with more than three variables.

Anyone who makes judgments about the market value of any parcel in the freshwater wetlands of south Florida must recognize that there is a great deal of unexplained variation in the sales data. It would be possible to select a "high" sale (or a small group of "high" sales to be compared to a "low" sale (or small group of "low" sales) on some supposed variable that explained market behavior in a matched pair and come to an erroneous conclusion about a perceived difference, due only to the amount of variability in each group of sales.

Identification of the Major Characteristics for the Paired Data Analysis

We established a list of the variables expected to be major influences in the analysis. This list was based on the collective experience and knowledge of the principal investigators with regard to land sales. This list was then compared to the list of characteristics as outlined in the RFP. All of the essential elements of the RFP were captured in the study.

The variables that proved to be important are:

1. Land Use-Agricultural or Recreational
2. Management Area (Land Use Regulation in Dade County)
3. Date (Sales After Both Announcements)
4. Access Characteristic (Type of Direct Access to the Property)

5. Property Size (Both as a continuous Variable and by Discrete Size Categories)
6. Location Characteristic (within one mile of a major bridge and/or a paved road)

The Data Set

The data set for the paired data analysis is the same as for the statistical analysis, with the exception that we eliminated the interaction variables and the variables for which we had no sales. This made a manageable data set of 32 variables for each sale. Any of the interaction matrices can be recreated using the "filter" function in the Excel spreadsheet program. Several of the property characteristics appeared in too few cases to be useful. This was the case with the following variables: (1) Management Area 2B, which contained 1 data point, (2) "near" (within one mile) of a municipality, which contained zero data points; and (3) West Palm, Broward and Monroe Counties which contained no (0) data points, respectively.

For example, we examined the importance of the Dade County Management Area Overlay Ordinance. Table 7 shows a preliminary partition of the data into sales of parcels controlled by the Overlay Ordinance and sales outside any of the management areas.

The substantial land use restrictions imposed by the Dade County Management Area Overlay Ordinance have had a pronounced impact on the value of the land in the freshwater wetlands. As we explain more fully in a later section of this report, Dade County passed a Zoning Overlay Ordinance in 1982 substantially limiting development in most of the freshwater wetlands to the west of the L31-N canal. There are six Management Areas established by this ordinance: MA 1, MA 2 A and 2 B, MA 3 A, 3 B, and 3 C.

We examined approximately 229 sales from within Management Areas, as compared with 107 sales not in a Management Area. We further split the data into the 71 small sales wherein total sales price is the appropriate unit of comparison and the 265 larger than 3 acre sales wherein $/acre is the appropriate unit of comparison. The study shows clearly that the market for land not governed by the Overlay Ordinance is different, and that sales not in a Management Area (MA) should not be used as comparables to indicate the value of land within a MA. This conclusion is hardly surprising. The Overlay Ordinance has had the practical result of restricting the opportunity to build a residence to properties consisting of at least 40 contiguous acres.

Use of Paired Data

We believe that, given the variability within the data, it is not reasonable to undertake a paired data analysis unless there are at least three sales that represent the qualities that one is attempting to hold constant. Often, once the data is sorted on as few as three variables, there are no longer at least three sales that represent the match criteria. In most cases we show the data as a table, reporting the number of observations in a cell, the average and the standard deviation. In some cases we show the results as a scatter diagram wherein we can show the correlation or lack of correlation. In a few cases we show the actual data in the body of the report. The actual paired data upon which the table or chart is based is provided on the accompanying CD.

Qualitative Analysis

The qualitative analysis represents anecdotal evidence from our discussions with the sellers and buyers of properties, real estate brokers, federal, state, and local government officials, and other knowledgeable market participants. It also includes our analysis of published information obtained from numerous public and private sources. Anecdotal evidence from knowledgeable market participants and observers is an independent method of seeking to learn about the variables that may impact value.

V. PHYSICAL DESCRIPTION OF THE EVERGLADES

The freshwater wetlands that make up the Everglades stretch over 4,000 square miles from Lake Okeechobee to Florida Bay. The area has a southern oriented slope of less than three inches (3") per mile. The very slow sheet flow of surface waters, coupled with the periodic wet and dry conditions, create a unique ecology. Maps illustrating the East Everglades along with the Everglades National Park boundaries and Expansion Areas are in the Addenda as Exhibits C and E.

The area of primary concern in this report is the approximately 109,000 acres to the north of the Everglades National Park, to the east of Big Cypress National preserve, to the south of US Route 41 (Tamiami Trail) and to the west of the L31-N Canal. This area is known as the East Everglades Expansion Area and approved for acquisition by Congress in December 1989.

The 1979 edition of the Dade County Comprehensive Development Master Plan (CDMP) contains a detailed description

of the area's geography and ecology that is very useful for a basic understanding of the physical and environmental constraints that affect the land use of the freshwater wetlands. The 1997 edition of the CDMP contains detailed information on the land use regulations and other governmental constraints to access, road maintenance and the development potential of the freshwater wetlands areas.

The Natural System

South Florida is a sub-tropical, wet and dry climate. The average annual rainfall is about 60 inches, about seventy percent (70%) of which falls between June and October. During the rainy season, most of the freshwater wetlands flood for between six and nine months. Because the slopes in the area are so gentle, the largest percentage of the floodwaters evaporate, both directly from sunlight and from the transpiration of the plants. Other waters percolate through the limestone substrata to recharge the Biscayne aquifer. Additionally, there is a gentle, shallow sheet flow of the surface water towards the sea through the sloughs, primarily Taylor Slough at the southern tip of Dade County, and through the transverse glades into Biscayne Bay. (CMDP, '79, p. 23 & 38) Exhibit F shows generally the major drainage patterns in south Florida.

Exhibit G shows the primary drainage network affecting the East Everglades. It shows the major canals, levees, impoundment areas and drainage structures constructed over the past 100 years. The primary structures affecting the Everglades National Park (ENP) and the East Everglades Expansion Area are the L-31 N levee and the C-111 canal. Recognizing the influence of both the natural systems and the manmade systems, about 32% of the rainfall is accounted for by surface evaporation, 5% by consumptive water use, 9% by seepage to the ocean, 27% by irrigation, evapotranspiration and private wells, and 27% via the canals. (CDMP, '79, p.35)

The Geology

The geology of Florida is a thick layer of porous limestone sediment. The entire mainland of Dade County is underlain by Miami limestone (a mix of oolites and bryozoan deposits characterized by its extreme porous condition and a high degree of water transmissivity). The Everglade Plain, generally west of the L-31 N levee and east of Big Cypress Preserve is very flat, with elevations ranging from a high of between 9' and 10' above mean sea level (MSL) to one foot at Florida Bay. Most of the Everglades National Park is at 2' MSL. The elevation of the coastal ridge ranges from a low of 10' to 15' at the Broward and Dade county border to a high of 23' at Coconut Grove and is broken by shallow valleys called transverse glades. Most of the drainage canals have been constructed in these glades.

The soils in this area are generally classified as sands, rockland, marls, peats, mucks and manmade (resulting from "rockplowing", which is the crushing and mixing of the rockland with the organic soils). In many areas the overburden has been washed away (or never formed) and the surface of the ground is the rough, eroded outcropping of the oolitic or bryozoan limestone. The marl soils were formed from the particulates of calcium carbonate, whereas the mucks and peats were formed of the partially decomposed plant materials. The plant life variations are closely associated with the composition of the underlying soils. The peats and mucks generally support the sawgrass, mangroves and cypress, whereas the bluegreen algae mats are generally associated with the marls.

The limerock itself constitutes the most significant mineral resource in Dade County. It is used as the base material for roads, for landfill, as construction aggregate, and in the manufacture of concrete. The mining costs are minimal, as there is little overburden, and mining is conducted via open pits. The location of the mines is close to the sites where the material is used. The open pits become lakes. There are more than 350 such lakes in Dade County, covering more than 7,000 acres, and about half of the lakes have become the site for residential developments. Many of the existing quarries have permits that will allow them to operate over the next twenty or thirty years. (CDMP, '79, p.33-34) A copy of the area of past and present mining activity and of the deposits of Miami Limestone and of High Hardness Limestone from the CDMP, '97, p. I-74 is reproduced as Exhibit H in the Addenda.

The primary source of the information in the following rock mining paragraphs was provided by the Dade Environmental Management Division (DERM) biologist, Mr. Michael Spenelli. Rock mining is presently not allowed in the East Everglades, either in the Everglades National Park (ENP) or in the Expansion Area. This is generally the area west of L-31 N Levee. The constraints are imposed by the Overlay Ordinance and by the Comprehensive Development Master Plan (CDMP). Only one company, The LaFarge Company in Section 26 & 35, T 54, R 38 (National Park Service Parcel numbers 110-1 and 110-2), about 2 to 3 miles south of SW 8th Street immediately west of L-31, is trying to obtain a permit, and they are running into a great deal of difficulty.

In the areas where rock mining is permitted, the permit process is rather simple. The mining company presents a site plan and a mitigation plan to the county. The major controversies have been over the locations of mines and mitigation plans. Mining is generally permitted, and there are no governmental constraints on the depth of digs, although present

technology generally limits depth to 80' to 85'. The State Legislature is considering a "lakeland" district plan to govern rock mining in a more comprehensive manner, based on a more complete understanding of the impact of rock mining on the hydrology and the biology of the region.

Water Quality

The quality of the groundwater in Dade County is intimately related to man's activity. Because of the relatively immature and shallow soils and the permeability of the limestone, water quality is quickly affected by discharge or exfiltration of untreated or improperly treated domestic and industrial wastewater, accidental spillage or leakage of chemicals on or under the ground, and washdown or runoff from equipment storage yards, parking lots and roadways. The potential for degradation also arises from the cumulative impact of many small individual sources, such as the chemicals used in routine lawn maintenance, household chemicals, cleaning and disinfecting agents discharged through septic tank drainage fields, etc. The Biscayne Aquifer is the only source of potable water for this entire metropolitan area. The areas of particular concern are within the cones of influence of the wells from which potable water is drawn and the backwater areas within 300' of a lake or other standing body of water. (CDMP, '79, p. 45-47).

The Local Ecosystems

The local ecosystems vary depending on the elevation, water table, and presence or absence of fire. Exhibit I shows the interrelationship. The uplands or Coastal Ridge area is home to pineland forests and hardwood hammocks. At one time there were over 180,000 acres of pine. Currently, outside the ENP, there are only three pinelands greater than 100 acres. There may be 200 stands of pine of about five acres in size. Periodic fire is an essential component of a pineland, or the area will change to hardwoods or exotics. (CDMP, '79 p.54) The hardwood hammocks are the other natural ecosystem of the uplands. As few as 50 of these remain, most of which are in public ownership. These rank among the most unusual biotic communities in the continental United States. Trees characteristic of the West Indies, such as Gumbo-Limbo, Lysiloma, Jamaican Dogwood, White Stopper, Madeira Mahogany and Strangler Fig mix with Live Oak, Red Bay, Mulberry and many other hardwood species typical of the temperate zones.

Exotics

The south Florida ecosystems have become vulnerable to the invasion of exotic plant and animal species, several of which have become serious problems. The most notable of the exotic plant species are the Melaleuca, Brazilian Pepper and Casuarina trees. The Melaleuca or "punk tree" is a particular problem in and near the Everglades. The tree is both drought and flood resistant and naturally protected from fire by a thick bark. Cutting induces a more vigorous growth by root crown sprouting. The tree can grow anywhere, but prefers areas that have been disturbed, fallow agricultural fields for example. Brazilian pepper and Australian Pine (Casuarina) are similar problem trees. Brazilian Pepper grows in very dense clusters, crowding out almost all other plant life. The sap is irritating to many people and the fruit is poisonous. A mature stand will very seldom burn, and cutting increases propagation. The plant is almost immune to herbicides. Australian Pine is a greater threat to the beach areas than to the Everglades, but it too is a major problem in areas where it has excluded native vegetation and eliminated habitat areas for nesting birds, sea turtles and crocodiles. (CDMP, '79, p. 58).

The Freshwater Wetlands

The lowest order communities are the periphyton, or blue-green alga mat. The most complicated biosystems are the hammocks. The distribution of biotic communities throughout the Everglades is a function of the soils, elevation, water table levels and periods of inundation. The four major subsystems are: 1) the Cypress Hammocks and wet prairies in the northwest, 2) the extensive Sawgrass Marshes interspersed with deeper sloughs, wet prairies and occasional elevated tree islands of the central segment, 3) the Rocky Glades, which generally lie between the central Everglades basin to the northwest and the coastal marsh region of the ENP to the south, and 4) the Coastal Marls or Marl Glades. The Rocky Glades are land that is characterized by rough, rocky outcroppings of limestone known as pinnacle rock. (CDMP, '79, p. 59-62)

VI. ANALYSIS OF VARIABLES

The following paragraphs discuss each listed variable relative to its potential impact on value, the number of sales analyzed, the analysis of the sales, and our conclusions. A summary of the pertinent sales utilized for each factor's analysis is included in the respective sections. A summary description of all the sales is located in the addenda, and the actual data is reproduced on the accompanying CD.

AGRICULTURAL LAND USE

Explanation of Potential Impact: One of the few economically viable land uses for the Florida freshwater wetlands has been the growing of crops and groves for Lechee, Avocado, Citrus Fruit and ornamental plants. Both the Overlay Ordinance and the water management regulations permit continued use of agricultural lands in most instances. Consequently, it is reasonable to expect that the market for land that has been used for agricultural purposes will be different than the market for wetlands intended for passive recreational uses.

Number and Types of Sales Analyzed*:* A total of 84 sales were coded for agricultural land use based on the historical use at the time of the sale, the stated intended use according to parties to the sale, or the appraiser's comments about highest and best use. Most of the sales that are economically viable for agricultural use are the larger sales. The database contains only two

Statistical Analysis: The multi-linear regression model shows that agricultural land use is a statistically significant explanatory variable (p = 0.0000).

Matched Pairs: Table 8, which follows, partitions the >3 acre sales by size group into agricultural land use sales and non-agricultural land use sales. The table clearly illustrates that the agricultural land use parcels sold at a significantly higher price/acre than the non-agricultural land use parcels.

Figure 7,on the following page, looks more closely at the 26 of these sales that are 100 acres or greater in size. The figure shows the relationship between size and $/acre. It is very interesting to note that the average $/acre for the non-agricultural sales (the lower line on the graph) does not vary as the size of the parcel increases from a low of 112 acres to a high of 864 acres, whereas the $/acre for the agricultural sales decreases from an average of about $8,000/acre to about $5,000/acre as the size of the parcel increases from about 120 acres to over 5,000 acres.

Conclusions: The magnitude of difference in average $/acre of agricultural land as compared to the passive recreational land is so substantial that appraisers would find very few occasions wherein it made sense to select agricultural use sales as a comparable for non-agricultural land. We believe that the reason for the pronounced difference, and the reason that the agricultural lands decrease in value as size increases, is because the agricultural use lands have a recognizable economically-based utility, whereas the functional utility of the balance of the land is marginal.

Once we recognized the magnitude of the difference, we partitioned the data by land use. In most of the tables presented in this report we include a section for the agricultural sales as distinct from the non-agricultural sales, or we select only non-agricultural sales as the basis for comparison.

PROJECT INFLUENCE

Explanation of Potential Impact: One of the more interesting questions we investigated is whether or not we could find any evidence that the announcement of the expansion of the Everglades National Park in December 1989 or the announcement of the Corps of Engineers project in May 1992 had any influence on the value of land in the freshwater wetlands. Under the Federal land acquisition regulations, the government will not pay for the enhanced value of land associated with a government project, nor will they discount value if the announcement of a project has caused land values to go down. This phenomena is referred to as "project influence."

We believe that "project influence" of the Expansion Area project could show up by comparing the sales price of parcels before the project was announced to the sales price of parcels after December of 1989, everything else held constant. If the announcement influenced the market, the patterns of land sales should have changed. The same would be the case for the Corps announcement in May of 1992.

We also believe that we could discover the impact of the project announcements by comparing sales within the project boundaries to sales of parcels that were not within the project boundaries. To be more certain about our results, we classified sales not in the project boundaries as being "near", that is within one mile of the project boundaries, or "not near", that is more than one mile from the project boundaries.

The interaction of these two sets of variables produces a three-by-three matrix of possible outcomes. A sale could be "in" the Expansion Area, and before 12/89. It could be "in" and after the NPS announcement, but before the Corps announcement in 5/92 (between), or it could be "in" and after both announcements. The same could be true of the "near" sales and the "not near" sales. Conceptually, a comparison of sales in the expansion area before the announcement dates to sales in the expansion area after the announcement dates might show that the project announcement had an influence on the price paid for land in the expansion area. Also, a comparison of land in the expansion area after the announcement dates to sales of land near the expansion area after the announcement dates might show that the project announcement had an impact on the value of land. We believed that the land not near the expansion area, both before and after the announcement dates, could be used as a control group.

Number and Types of Sales Analyzed: For the analysis of project influence, Table 9 breaks down the number of transactions available by type:

TABLE 9, NUMBER OF TRANSACTIONS EMPLOYED BY TYPE

Critical Date	In Expansion Area	Near Expansion	Not Near Expansion
Before EitherAnnouncement	130	23	20
After 1st Announcement (12/89)	26	16	20
After 2nd Announcement (5/92)	21	19	61
Totals	177	58	101
Compiled by Pritchett, Ball & Wise, Inc. Grand total: 336			

As illustrated above, we analyzed the total East Everglades database. This included 177 sales that occurred within the Expansion Area, 58 sales that were near the Expansion Area, and 102 sales not near the project.

Table 9-A and Figure 8 shows the sales in each different area on an annual basis. The Park Service announcement date was at the end of December in 1989 and the Corps announcement date was in May of 1992. The high number of annual sales for tracts within the Expansion Area was in 1987, with 27 sales. There had been 23 sales in 1986 and there were 21 sales in 1988. In 1989 there were 15 sales, about the same number as the 16 sales in 1984. Clearly the annual number of sales from our database that are "In" the Expansion Area decreased "After" the Park Service announcement date, but the decrease started almost a year before the announcement date. The rate of sales decreased steadily to 3 sales in 1993. There were six sales in 1994, one in 1995 and nine in 1996.

The rate of sales "Near" the Expansion Area increased to a high of 10/year in 1988 and decreased steadily to two sales in 1994, four in 1995 and one in 1996.

The pattern is different for the tracts that are more than a mile from the Expansion Area. In this case the sales increased steadily from a low of one or two a year, 1977-1987, to a high of 18 in 1991, 12 in 1992, 14 in 1993 and 15 in 1994. In 1995 there are only seven such sales in our database, and none in 1996.

It is important to remember that our data set does not represent all of the sales that took place 1974-1997. Our sales result from appraisals prepared for the Park Service, the Corps of Engineers, the Department of Justice, the South Florida Water Management Authority and similar agencies. The number of sales per year in our data is probably a function of the number of appraisal assignments per year, rather than the total number of sales/year. We believe that the sales in our data set are representative of the market value of land, but we have no reason to believe that the annual frequency of sales in our data set tracks the frequency of sales in the market in general.

TABLE 9-A: ANNUAL SALES BY LOCATION

YEAR	TOTAL	IN	NEAR	NOT-NEAR

1974	1	1		
1975	2	2		
1977	1	1		
1979	2	1	0	1
1980	2	2		
1981	3	3		
1982	3	3		
1983	7	5		2
1984	7	6		1
1985	19	16	1	2
1986	23	19	2	2
1987	30	23	6	1
1988	35	27	4	4
1989	38	21	10	7
1990	32	15	8	9
1991	22	9	7	6
1992	26	3	5	18
1993	22	6	4	12
1994	19	1	4	14
1995	21	4	2	15
1996	20	9	4	7
1997	1		1	

Compiled by Pritchett, Ball & Wise, Inc.				

Even recognizing that the frequency of sales in the data set may not represent the actual frequency of sales in the real estate market as a whole, there is nothing in the data set to suggest that the rate of sales was affected by the announcement of either of the projects.

Statistical Analysis: The regression model that we ran for the >3 acre sales shows that the average sales prices for land increased by about 45% for the period following both announcements. The regression model for the

The fact that the average $/acre of land increased following both announcement dates does not indicate anything about project influence. Regression shows correlation, not causality. We have not been able to formulate a reasonable scenario wherein the announcement of the projects would "cause" an increase in value of the land within the Expansion Area, near the Expansion Area and more than a mile away from the Expansion area all to increase. A more probable explanation is that 50 of the 54 relatively higher priced transactions (such as agricultural sales and/or sales on paved roads) took place after 1989 as compared to four such that took place before the projects were announced.

Our regression models test the nine interaction variables using all of the sales. We looked at the 3 acre sales using $/acre as the dependent variable. When we looked at all of the sales, none of these nine variables that might show project influence was statistically significant. That means that when we accounted for all of the variables that were statistically significant at the p=0.5 level of confidence (such as management area, size, land use and type of access to the parcel), none of the project influence variables showed a strong enough correlation with price to be statistically significant.

We then removed the nine project influence variables from the analysis (in both the 3 acre regressions) and used the regression model to calculate (predict) the sales prices for all sales in the data set. We compared the predicted (calculated) prices to the actual sales prices. The difference between the predicted price and the actual price is called a residual. We examined the residuals absent the nine interaction variables to determine if there was any relationship between the residuals and the project influence variables not explained by the other variables in our study. Nothing in this analysis of residuals indicated that the announcement of either the NPS project or the Corps project had any measurable impact on price/acre.

The R^2 for this second test is 0.6540, or only 0.002 less than for the overall model using all of the potential explanatory variables. An intuitive, real world explanation of this set of statistics is to say that including all of the "project influence" variables with all of the other possible independent variables "explains" 65% of all of the variation in $/acre, whereas once the "project influence" variables are eliminated, the model explains 68% of all of the variation in the $/acre. In these analyses, we are confident that the results could be due to chance less than 5% of the time (p = .05).

We further partitioned the data based on variables that we knew to be important in order to see if "project influence" would show up when we examined the more valuable types of properties. The regression model shows that sales in MA 1 and MA 3B, which are furthest to the east, have generally the best access and have the shortest periods of inundation, generally sell for more per acre than other parcels. There are 29 sales >3 acres in MA 1 and 27 similar sales in MA 3B, for a total of 56 of these potentially more valuable sales. None of the project influence variables showed up as statistically significant when we ran the regression model for this subset.

The only indication that provides any support for the idea that "project influence" affected the price of land is found in our analysis of the 95 sales of >3 acre parcels with direct access via a paved or lime/gravel road. Within this data set, two of the "project influence" variables showed up as statistically significant and seem to indicate that properties near (but not in) the Expansion Area were worth less after the East Everglades Expansion was announced.

The specific project influence variables that were statistically significant were "near-before" and the interaction variable "time-near-before." The "near-before" variable indicated that land within one mile of the Expansion Area sold for more before the project was announced than it did after the project was announced. The "time-near-before" variable showed that $/acre value indications were moving downward for parcels within one mile of the Expansion Area by about 5%/year before the project was announced, but that there was no change in price associated with time after the project was announced. Other statistically significant variables in this model were the size of the parcel, agricultural land use, being within a mile of both a major bridge and a major road, MA 1, a 6-15 acre parcel and a > 100 acre parcel.

Overall the R^2 for this regression equation is 0.75, which is among the highest in any of the models we calculated.

Unfortunately, there are only five sales "near-before" in the database, and they do not show much evidence of a strong central tendency. Two of the five sales are relatively high $/acre sales that are not controlled by the Dade County

Overlay.

We have not been able to formulate a model to explain how the East Everglades expansion or the Corps of Engineers project could affect the value of land not directly affected by either project, but located within a mile of these projects.

In summary, the statistical analysis indicates that on the average, land values are higher for all of the wetland properties following the announcement of both projects (after 5/92), but the evidence does not support the contention that the announcement of either the East Everglades Expansion or the Corps of Engineers project affected the value of land in this market.

Paired Data Analysis: Tables 10, 11, and 12 are all attempts to use matched pairs to try to find evidence of project influence. We began the matched pairs analysis by splitting the data set into the smaller than three acre sales and the three acre or larger sales, because we needed to use a different unit-of-comparison for each of these data sets. Table 10 shows the data for the nine variables that may indicate project influence for the smaller sales.

TABLE 10: RELATIONSHIP BETWEEN ANNOUNCEMENT DATE AND LOCATION				
LESS THAN 3 ACRES				
	IN-BEFORE	**NEAR-BEFORE**	**NOT NEAR-BEFORE**	**TOTALS**
NO. OF SALES	37	4	1	42
AVG. $/ACRE	$6,124	$16,318	NA	$6,966
STDEV	$8,226	$18,460	NA	$9,720
	IN-BETWEEN	NEAR-BETWEEN	NOT NEAR-BETWEEN	TOTALS
NO. OF SALES	13	4	0	17
AVG. $/ACRE	$6,692	$12,875	NA	$9,361
STDEV	$8,627	$5,543	NA	$9,558
NO. OF SALES	IN-AFTER	NEAR-AFTER	NOT NEAR-AFTER	TOTALS
AVG. $/ACRE	5	5	6	16
STDEV	$10,740	$15,100	$13,250	$13,044
	$5,740	$10,585	$13,213	$10,003

SUBTOTALS	IN	NEAR	NOT NEAR	TOTALS
NO. OF SALES	55	13	7	75
AVG. $/ACRE	$6,678	$14,790	$11,457	$8,530
STDEV	$8,113	$11,501	$12,961	$9,662
Compiled by Pritchett, Ball & Wise, Inc.				

Table 10 shows that there are 75

After the Corps announcement, the five properties in the Expansion Area sold for an average of $10,740, or higher than either of the prior periods, and the five parcels near the Expansion Area sold for a higher price that before the Corps announcement. The standard deviation for each of these

The only set of comparisons in the matrix that has data in all three cells is the comparison after both announcement dates. There are not enough observations to permit a meaningful further partition of this data on any of the variables that are statistically significant. When we looked at the individual sales, we saw that two of the sales near the Expansion Area were relatively high priced sales either in MA 1 or not within the constraints of the Overlay Ordinance, and four of the six sales not near the Expansion Area were on paved roads. Both of these statistically significant variables probably explain why the average values in these cells were higher than the average value for the sales in the Expansion Area.

The following Table 11 is a tabulation of the >3 acre sales.

TABLE 11: RELATIONSHIP BETWEEN ANNOUNCEMENT DATE AND LOCATION				
EQUAL TO OR GREATER THAN 3 ACRES				
	IN-BEFORE	**NEAR-BEFORE**	**NOT NEAR-BEFORE**	**TOTALS**
NO. OF SALES	93	19	19	131
AVG. $/ACRE	$1,838	$5,006	$3,148	$2,488
STDEV	$1,823	$4,134	$4,331	$2,934
	IN-BETWEEN	NEAR-BETWEEN	NOT NEAR-BETWEEN	TOTALS
NO. OF SALES	13	12	19	44

AVG. $/ACRE	$3,521	$5,785	$7,155	$5,708
STDEV	$3,879	$2,029	$5,274	$4,390
	IN-AFTER	NEAR-AFTER	NOT NEAR-AFTER	TOTALS
NO. OF SALES	16	14	56	86
AVG. $/ACRE	$3,188	$8,247	$10,089	$8,505
STDEV	$4,009	$3,327	$6,004	$5,903
TOTAL	IN	NEAR	NOT NEAR	TOTALS
NO. OF SALES	122	45	94	261
AVG. $/ACRE	$2,195	$6,222	$2,500	$5,013
STDEV	$2,535	$3,645	$1,314	$5,120
Compiled by Pritchett, Ball & Wise, Inc.				

With a total of 261 larger sales to partition, we hoped to have enough observations in each of the nine project influence cells to make reasonably comparable matched pairs. In this case the statistics are reported in $/acre.

Table 11 shows that 122 of these larger sales are in the Expansion Area, 45 are outside, but within one mile of the Expansion Area and 94 are more than a mile from the Expansion Area. The 93 sales within the Expansion Area sold for an average price of $1,838/acre before either project announcement and the 19 sales near the Expansion Area sold for an average of $5,006 before the Expansion Area announcement date. The 19 sales more than a mile from the Expansion Area before either project was announced sold for an average of $3,148/acre.

Following the announcement of the expansion of the East Everglades, but before the announcement of the Corps project, the 13 parcels in the Expansion Area sold for an average of $3,521/acre, or about twice the price before the announcement date. On the other hand, the 12 properties near the Expansion Area sold for $5,785, or just slightly more than the comparable properties before the Park announcement. The 19 sales not near the Expansion Area sold for an average price of $7,155, or more than double the price of the comparable properties prior to the Park announcement. This is about the same magnitude of increase as the sales within the Expansion Area.

After the Corps announcement, the 16 properties in the Expansion Area sold for an average of $3,188/acre, or about the price of the comparable properties following the Park announcement. The 14 parcels near the Expansion Area sold for $8,247, which is a higher price than before either project announcement. The value of land not near the Expansion Area, as indicated by the 56 sales following the Corps announcement, continued to increase to an average price of $10,089/acre. Once again the standard deviation for each of these statistics is so high that the observed differences are probably due to chance (as indicated by the multi-linear regression model), rather than to any real differences, but we have enough observations in each of the cells to try a further partitioning of the data.

The statistical analysis shows that properties on an all weather road (either paved or gravel/limestone) consistently sell

for higher prices than properties on a dirt/grass road, airboat, buggy or with no vehicular access. We reexamined the larger sales for those that were not on an all weather road, were not in MA 2A, and were not agricultural lands. [There were no sales on an all weather road in the Expansion Area following both announcements, so we could not use sales as a basis of comparison. All of the sales near or not near the Expansion Area are either in MA 1 or 3B, which are the highest priced lands within any Management Area, or are outside the area controlled by the Overlay Ordinance.]

The following Table 12 shows a comparison wherein we have controlled for almost all of the statistically significant variables. All of the sales in this table are three acre or larger sales that have very limited access (dirt/grass road or less). They are not agricultural lands, and they are not in MA 2A.

There are a total of 79 sales that meet the basic selection criteria. Thirty-eight of the sales are in the Expansion Area, 26 are near the Expansion Area and 15 are not near the Expansion Area. Thirty-nine of the sales took place before the Park Service project announcement, 19 took place after the park announcement but before the Corps project announcement, and 21 took place after both announcements.

One can see that the dispersion in the data in Table 12, as measured by the standard deviation for each of the average values, is much smaller in this sample than it was for 263 > 3 acre sales we examined in Table 11. The dispersion is reduced because we have controlled for many of the variables that "cause" differences in the price paid for the land as indicated by the statistical analysis.

Table 12; => 3 ACRES, NOT MA 2A, NOT AGRICULTURAL, NOT ON AN ALL WEATHER ROAD				
	IN-BEFORE	**NEAR-BEFORE**	**NOT NEAR-BEFORE**	**TOTALS**
NO. OF SALES	23	12	4	39
AVG. $/ACRE	$2,588	$3,619	$634	
STDEV	$1,771	$1,764	$686	
	IN-BETWEEN	NEAR-BETWEEN	NOT NEAR-BETWEEN	TOTALS
NO. OF SALES	8	6	5	19
AVG. $/ACRE	$3,331	$6,126	$802	
STDEV	$2,498	$2,611	$316	
	IN-AFTER	NEAR-AFTER	NOT NEAR-AFTER	TOTALS

NO. OF SALES	7	8	6	21
AVG. $/ACRE	$5,661	$7,930	$1,082	
STDEV	$5,025	$2,608	$513	
TOTAL	IN	NEAR	NOT NEAR	TOTALS
NO. OF SALES	38	26	15	79
Compiled By Pritchett, Ball & Wise, Inc.				

Table 12-A is an examination of the 84 agricultural use sales partitioned by location (in, near or not near) and by sale date (before, between or after). There were only three sales "in" the Expansion Area, two of which were before the Park Service announcement, and one between the Park Service announcement and the Corps announcement. However, there were enough sales in the other six cells to extract meaningful comparisons.

TABLE 12 - A: =>3 ACRE AGRICULTURAL SALES				
	IN-BEFORE	**NEAR-BEFORE**	**NOT NEAR-BEFORE**	**TOTALS**
NO. OF SALES	2	4	4	10
AVG. $/ACRE	NA	$5,067	$9,863	
STDEV	NA	$686	$5,783	
	IN-BETWEEN	NEAR-BETWEEN	NOT NEAR-BETWEEN	TOTALS
NO. OF SALES	1	6	14	21
AVG. $/ACRE	NA	$5,444	$10,344	

STDEV	NA	$1,400	$3,904	
	IN-AFTER	NEAR-AFTER	NOT NEAR-AFTER	TOTALS
NO. OF SALES	0	8	45	53
AVG. $/ACRE	NA	$8,505	$12,276	
STDEV	NA	$3,860	$4,480	
TOTAL	IN	NEAR	NOT NEAR	TOTALS
NO. OF SALES	3	18	63	84
Compiled By Pritchett, Ball & Wise, Inc.				

The data shows approximately the same pattern for the "near" agricultural sales as for the "not-near" agricultural sales. There is nothing in this data that suggests that the agricultural sales were affected by the announcement of either the Park Service or the Corps projects.

The test we devised to determine if there was any measurable project influence is to compare changes in the value of the land in the Expansion Area to changes in the value of the land near the Expansion Area using the land more than a mile from the Expansion Area as a control. For example, if land in the Expansion Area decreased following the Parks announcement, but land near the Expansion Area increased, we would have some reason to believe that the announcement of the Park expansion had an influence on the price of land. Following the same logic, if land near the Expansion Area increased following the Park announcement, but land in the Expansion Area did not increase, we would have evidence of some project influence. We can not observe any different pattern of change for sales in the Expansion Area as compared to properties near or not near the Expansion Area.

Qualitative Analysis: Many buyers of property in the East Everglades were not aware of the project announcements at the time that they purchased the property. Others reported that they knew that the National Park Service (NPS) was going to buy the land, but they believe that the government moves so slowly that the purchase would take place sometime in an indefinite future. The physical characteristics of the land, the difficulty in getting to most of the parcels and the very restrictive existing land use regulations also tend to mute the possible impact of the announcement of the federal projects. Most of the knowledgeable people with whom we spoke did not believe that the announcement of either federal project had any influence on the value of the land.

Conclusion: Given the results of our statistical and qualitative analysis described above, we believe that there is no evidence of project influence on the value of land in the south Florida wetlands on the eastern side of the state.

FINANCING

Explanation of Potential Impact: It is typical for sales transactions to be analyzed based on an all cash or cash equivalent basis. Many times, the actual transfer is subject to financing which may or may not be favorable to the buyer. The effect of financing was studied by analyzing cash and non-cash transactions for any differences in the prices paid when "cash" was paid versus any form of financing. It is possible that the price paid for non-cash transactions is either

higher, lower, or the same as the prices paid for all cash sales.

Number and Types of Sales Analyzed: Ninety-one (91) of the transactions involved owner financing. Of these, 14 were 3 acre sales. However, only 35 had sufficient information to calculate a cash equivalent adjustment. Of those 35 transactions, five were adjusted for favorable seller financing. The remaining 30 sales had financing that resulted in a negligible difference in the financing terms or were at terms less than favorable when compared to market financing terms. The following table illustrates the five sales with favorable seller financing.

TABLE 13, LAND SALES SUMMARY CHART

Cash Equivalent Sales

PBW No.	Sale Date	Size (Ac.)	$/Acre	CE $/Acre	Difference
1060	Jan-89	40	$1,875	$1,815	
7507	Jan-94	25	$5,500	$4,715	
12273	Oct-87	20	$350	$125	
12445	May-90	5	$2,600	$1,795	
12535	Nov-90	25	$3,000	$2,963	
Compiled by Pritchett, Ball & Wise, Inc.					

The owner-financed sales were adjusted by calculating the payments based on market terms at the time of the sale as compared to owner financing terms. The difference in the monthly payments was multiplied by the length of the loan. This amount is the calculated cash equivalent adjustment, which was deducted from the original sale price to arrive at a cash equivalent sales price. The calculated cash equivalency adjustment is a very technical method and connotes a degree of accuracy that may not be utilized by purchasers of this type property. However, it serves to illustrate the impact of owner financing on sales transactions within the East Everglades Expansion Area.

***Statistical Analysis*:** The regression model for all sales in Management Areas shows that owner financing is not a statistically significant variable ($p = 0.3295$, which is $> p = 0.05$).

Paired Data Analysis: The following sales are paired on size, location in MA 1 or MA 3B (which are the more valuable Management Areas) and on a dirt/grass road, but within a mile of a major paved road. All of the sales are also matched on approximate date-of-sale. None are agricultural use sales.

TABLE 14: SALES OF 3-6 ACRE PARCELS ON A DIRT/GRASS ROAD

BUT WITHIN A MILE OF A MAJOR ROAD IN MA 1 OR MA 3B

3-6 ACRES, NOT AGRICULTURAL USE

OWNER FINANCING

pbw no.	date of sale	owner financing=1	1 mi. of paved road	in ma 1	in ma 3B	agricultural use	size (acres)	price per acre

12485	6/23/89	1	1	0	1	0	5.0	$5,000
12477	5/1/91	1	1	1	0	0	5.0	$7,300
12499	5/31/91	1	1	0	1	0	5.0	$6,500
							Count	3
							Average	$6,267
							Stdev.	$1,168
CASH OR THIRD PARTY FINANCING								
20104	7/1/86	0	1	1	0	0	5.0	$6,000
20062	10/15/87	0	1	0	1	0	4.1	$3,852
20113	3/23/88	0	1	0	1	0	5.0	$5,000
12488	2/14/89	0	1	0	1	0	5.0	$5,000
12527	4/1/89	0	1	1	0	0	5.0	$752
12483	10/31/89	0	1	0	1	0	5.0	$4,250
1058	9/24/90	0	1	1	0	0	5.0	$7,000
12407	7/10/91	0	1	0	1	0	3.6	$3,453
							Count	8
							Average	$4,413
							Stdev.	$1,873
Compiled by Pritchett, Ball & Wise, Inc.								

The cash or third-party financed sales appear to have sold for 30% less per acre than the owner financed sales. We looked at a few other reasonable matched pairs. The sales on paved roads also indicate that the cash sales were for about 27% less/acre than the owner financed.

TABLE 15: => 3 ACRES, PAVED, NOT AG, MA 1 OR 3B		
	OWNER $	CASH
NO. OF SALES	3	3
AVG. $/ACRE	$3,400	$2,491
STDEV	$1,819	$66
Compiled by Pritchett, Ball & Wise, Inc.		

Table 15-A shows that there is apparently no difference between owner financing and cash for the agricultural sales.

TABLE 15-A: => 3 ACRES, PAVED, AGRICULTURAL USE			
	OWNER $	CASH	TOTAL
NO. OF SALES	36	48	84
AVG. $/ACRE	$10,310	$10,521	$10,431
STDEV	$4,859	$4,773	$4,782
Compiled by Pritchett, Ball & Wise, Inc.			

Qualitative Analysis: It is not unusual in this market and other markets for sellers to provide owner financing, and it is unusual for a buyer to be able to obtain bank financing for wetlands. Discussions with purchasers who obtain owner financing indicate that they are willing to pay a higher price for this benefit, even if the financing terms are generally similar to terms offered by third-party lenders.

Conclusion: Our research shows that only five of the 30 owner financed sales for which we had sufficient information to calculate a cash equivalency adjustment were for terms different than the terms generally available through third-party lenders at the time of the sale. In spite of this, the owner financed parcels appear to have sold for more than parcels sold for cash. The statistical analysis does not support this observation given the amount of variance in the data. Even for the most closely matched pairs, the standard deviation is a very high percentage of the mean.

Third party lenders are generally not willing to make loans when the collateral is land in the freshwater wetlands, so owners willing to finance appear to charge more for their land, regardless of the terms they offer. If an appraiser wishes to use an owner financed sale as a comparable, he or she probably should make an adjustment to that sale in addition to the adjustment that may result from an arithmetical adjustment for down payment and interest rates. However, since

only approximately 27% of the transactions in the data set are owner financed, an appraiser would be best served to utilize cash sales as comparables when estimating land values.

When appraising agricultural use tracts, there is no apparent reason to avoid using owner financed sales as comparables unless field research on a specific comparable reveals that the transaction price is different for an owner financed sale than it would have been for a cash sale. Our examination of the owner financed agricultural sales indicates that they sold at the same average price (and had approximately the same standard deviation) as the cash sales.

TABLE 13, LAND SALES SUMMARY CHART

Cash Equivalent Sales

Explanation of Potential Impact: The sales were analyzed over a 23 year period (1974 through 1997). Variations in prices over a given time period are primarily caused by general economic and demographic trends and conditions. It is necessary to separate and understand the changes caused by these general market conditions in order to reliably measure the impact of other outside influences such as regulatory changes.

Number and Types of Sales Analyzed: The market, as indicated by the number of sales, was most active in the 12 years between 1985 and 1996 when 91% or 309 of the 336 sales took place.

Statistical Analysis: In the statistical analysis we used two measurements of change in price associated with the date of the sale. We looked to see if prices consistently changed over time (as a continuous variable) and we looked to see if prices changed differently in different time periods. The statistical analysis shows that date of sale is not a continuous variable ($p = 0.72$), but the statistical model shows that sales from 1989 forward increased, whereas sales prior to 1989 were relatively flat ($p = 0.003$). These patterns are best illustrated by the graphs in the paired sales analysis.

Paired Sales Analysis: Because we are trying to illustrate the impact of date of sale, which naturally is a linear variable, we believe that the following sets of graphs are most useful.

The patterns are clearer in Figure 9 which shows the >3 acre sales, but the patterns in both charts are similar. They show that sale prices were relatively flat through about 1988, and then began to increase over time.

When we looked at the sales in the more remote areas, we did not see any evidence of a change in value over time. For example, Figure 10 looks only at the tracts in MA 2A over time:

When we looked at the agricultural use lands, as shown by Figure 11, we did not see any indication of a change in value over time.

The agricultural land use sales graphed in Figure 11 show almost no relationship between date of sale and $/acre.

The following 10 recreational land use sales on Table 16 are closely matched in that they are not governed by the Overlay Ordinance, they are not owner financed, and they do have direct access via an all weather road. The sales took place between November 1989 and March 1996 at an average price of $979/acre with a standard deviation of $472. Of course, ten sales is a relatively small number of sales upon which to base a judgment, and the variance of the data is substantial, but these sales do not show any relationship between date of sale and $/acre. Figure 12 is a graphical representation of these sales.

Having looked at the types of sales on a component-by-component basis, we learned that the sales that indicated that there might be an increase in value over time are located in MA 1 and MA 3A, MA 3B and MA 3C. Land in MA1 and MA 3B is inundated for a shorter period than land in MA 3A or MA 3C, and it is further to the east, thereby making it potentially more accessible. We noticed that the average $/acre for land in MA 1 and MA 3B sold for a higher average price/acre than land in MA 3A or MA 3C, holding constant other variables that we know affect value. The strongest relationship between date of sale and $/acre shows up for the more valuable recreational use parcels (those parcels that are in MA 1 or MA 3B). The following graph shows the simple linear relationship for the >3 acre parcels sold after 1/1/89 that meet the above criteria:

If we include all of the data points shown on Figure 13, above, a regression of date of sale on $/acre shows an upward sloping line that explains about 14% of the change in $/acre, after controlling for Management Area and land use. The average price/acre increased from about $4,000/acre to $7,000/acre over the eight years, or about 7%/year.

When we look at the data more closely, we see that there are three modal points. There were 11 sales for $6,000/acre or more, and five sales for $1,200/acre or less. There are 18 sales closely grouped around $3,200/acre. If we look only at these 18 sales, we have no evidence of a change in price over time, 1989-1997. Also, if we look only at the extremes, either

the high sales or the low sales, there is no indication of change over time.

When we looked at the less valuable tracts in either MA 3A or MA 3C, the pattern is repeated, but the average $/acre is lower, as shown on the following chart, Figure 10-A:

The recreational use cash sales in MA 3A and MA 3C shown in Figure 13-A, above, include a group of 28 sales. We see that the same pattern of an upward trend in prices as seen in MA 1 and MA 3B, and the simple linear regression model indicates that changes in time appear to "explain" 12% of the increase in price per acre.

Here also we observed that there are three modal points. There is a group of seven sales out of the 28 that sold for more than $5,000/acre and another group of seven sales for less than $800/acre. There were 14 sales between $1,000/acre and $3,250/acre. As was the case with MA1 and MA3B, if we look only at the sales greater than $5,000/acre, or only at the sales less than $800/acre, or at the majority of the sales, there is no indication of change in value over time.

Although the average price per acre for a tract in MA1 and MA3B is higher than the average price per acre of a tract in MA 3A and MA 3C, the pattern is the same. If we include all of the sales, the $/acre increases over time. If we look only at the majority of the sales that are reasonably grouped around the population mean, there is no indication of change over time.

The reason that the overall patterns show an increase in the value of land over time (either in MA1 and MA3B or MA3A and MA3C) is that more of the high price sales took place later and more of the low price sales that took place earlier. There is a correlation between date of sale and sales price, however, correlation does not mean causality. The patterns that show an increase in the value of land over time are the results of the timing of the high priced sales. They do not necessarily indicate that the overall growth of the economy "caused" the increase in property values over time. The timing of the high priced sales may reflect a change in INS policy towards immigrants who own land in the U.S., it may reflect the random timing of another "swampland in Florida" marketing campaign, or it may have been due only to chance. We have no information that permits us to show the cause of the timing of the high priced sales.

I looked at each of the sales in MA 1, MA 3A, MA 3B and MA 3C, and do not see any factual reason to exclude either the high priced sales or the low priced sales. I don't know why there was a small group of people who paid a higher than expected price per acre for this land, and I don't know why there was another small group of people who sold for a lower than expected price per acre. I do know that these groups exist and that they make up the "extremes" of the range of sales.

We conducted three different multi-linear residual analyzes, one on the combined data set, one on the MA1 and MA3B transactions and another on the MA3A and MA3C transactions. In each case price per acre was regressed against all possible explanatory variables except those related to time (date of sale). Residuals were calculated and regressed against the time variables. If prices really increased over time, all other variables held constant, we should have been able to observe a trend in the residuals as an upward sloping line, and date-of-sale should have shown up as a significant explanatory variable. We did not observe either phenomenon.

Qualitative Analysis: We spoke with a few knowledgeable appraisers and brokers concerning our observations. One appraiser believed that potential buyers of properties not governed by the Overlay Ordinance may have been discouraged by the impact of Hurricane Andrew. Since these parcels were not governed by the Overlay Ordinance, it may be possible to use the parcels as residential building sites. Three of the four lower value sales followed the date of the hurricane. Even though Hurricane Andrew did not show up as a statistically significant variable in our overall analysis, it may be an explanatory variable for this small set of sales. Another possible explanation is that near the end of the 1980s the County removed a concrete slab bridge over the canal at 216th Street, adding miles of bad road to the drive through this area. We do not know how many tracts may have been affected by the removal of the bridge.

Conclusions: There is very little evidence of change in price over time through about 1988, regardless of the size and location of the tracts. Between 1989 and 1997 there is a small group of sales for which the buyer paid substantially more than the majority of the buyers, and another small group of sales wherein the seller accepted substantially less than the majority of the sellers. However, we can not discover any measurable or objective criteria that indicates that there was any change in the market value of the South Florida wetlands associated with date of sale, 1974-1997.

PROPERTY SIZE

Explanation of Potential Impact: Traditional appraisal theory holds that larger properties tend to sell for lower unit rates due to economies of scale. The sales have been analyzed (mainly using regression analysis) to determine if this hypothesis holds true in the case of transfers in the Everglades National Park. We also examined the data by several categories grouping the data by reasonably comparable sizes.

Number and Types of Sales Analyzed: Our analysis of the

We used $/acre for the unit of comparison for the larger sales. We believe that five size categories best describe the data: 3 to 6 acres, 6 to 15 acres, 15 to 55 acres, 55 to 100 acres and 100 acres or larger. Given the federal survey basis for legal descriptions in Florida, most of the >3 acre sales were actually at the typical legal description division points. For example, 52 of the 70 sales in the 3-6 acre group were actually 5 acre sales, and 37 of the 64 6-15 acre sales were actually 10 acre parcels.

Statistical Analysis: Within the Expansion Area "size" is a weak but statistically significant variable (p = .0274). The analysis shows that for all size categories, the larger the acreage, the smaller the $/acre by about $1.40/acre. This is a very small adjustment, even if it is statistically significant, requiring a downward adjustment of about 4% for each 100 acres difference in size.

One size grouping, *the 100 acres or larger* sales, sold for an average of about 50% less per acre than the

Two other size categories showed statistically significant differences in combination with another variable. *The 6-15 acre sales on a paved road* sold for about 80% more than the calculated constant (p = 0.0008). If the *6-15 acre tract was near one of the four bridges* crossing the canal, it sold for about 2.6 times the price/acre of the calculated constant (p = 0.0048). Also, if a *15-55 acre tract was accessible via a dirt/grass road*, the sales price was reduced to about 45% of the calculated constant for all tracts >3 acres in size.

The importance of these observations is that the market for *6-15 acre tracts on paved roads* or *6-15 acre tracts within a mile of a bridge* is significantly different than the market for tracts that do not share these characteristics. We are not suggesting that an appraiser apply a 55% upward adjustment to *15-55 acre tracts on a dirt/grass road*. What we are suggesting is that *15-55 acre tracts on a dirt/grass road* sold for a significantly lower price per acre than we would have expected if size and access were to have no impact on value. Consequently, we believe that an appraiser should select comparables that are 15-55 acre tracts on dirt/grass roads if they are appraising a tract that meets those characteristics, and they may wish to avoid 15-55 acre tracts on dirt/grass roads if the subject property does not meet those characteristics.

Paired Data Analysis: Our first examination is of the price per acre indications of $/acre by the various size categories. In that analysis, average $/acre decreased between 10% and 20% per size category as the size of the parcels increased. The relationship between size and $/acre was a downward sloping line, which is generally what one would expect. Figure 15 shows this relationship

Figures 15 and 16, which show the agricultural use tracts separate from the recreational use tracts, indicate a downward sloping line, which is what one would expect, but differences in the size of the tracts explains only between 12% and 16% of the variation in the data, and the slope is a rather gentle angle, indicating that price/acre does not decrease very much as the size of the tracts increase.

The magnitude of the change in $/acre is illustrated in Table 8 (p. 28) wherein we separate the agricultural use tracts from the recreational use tracts and report the differences in average $/acre for each of the size categories we established. Table 8 is recast in terms of percentage change, below, as Table 17:

TABLE 17: IMPACT OF SIZE ON $/ACRE		
	AG USE	**NOT AG USE**
	3-6 ACRES	
NO. OF SALES	8	62
AVG. $/ACRE	$10,735	$3,904

	6-15 ACRES	
NO. OF SALES	15	49
AVG. $/ACRE	$13,246	$2,870
CHANGE FROM PRIOR CATEGORY	123%	74%
	15-55 ACRES	
NO. OF SALES	36	45
AVG. $/ACRE	$10,654	$1,329
CHANGE FROM PRIOR CATEGORY	80%	46%
	55-100 ACRES	
NO. OF SALES	10	14
AVG. $/ACRE	$11,022	$1,007
CHANGE FROM PRIOR CATEGORY	103%	76%
	100 + ACRES	
NO. OF SALES	13	13
AVG. $/ACRE	$5,903	$1,133
CHANGE FROM PRIOR CATEGORY	54%	113%
Compiled by Pritchett, Ball & Wise, Inc.		

In most cases the "matched pairs" confirm that price decreases as size increases. In the two cells wherein this is not the case, the reader should remember that there is a great deal of variance within the data and that the grouping of the sales into size categories is a convenience imposed by the analysts and generally does not represent a recognized market difference.

Qualitative Analysis: Our discussions with buyers, sellers, and brokers in the East Everglades area indicated that they believed that there is an inverse relationship between size and price per acre - as the size increases, the price per acre decreases. The overall consensus was that this inverse relationship held true for sales in East Everglades just as it does in most types of traditional real estate sales.

Conclusion: We believe that in most cases appraisers can ignore the relatively small adjustment for differences in size as a continuous variable. At $1/40/acre downward adjustment, a 100 acre difference would require a $140/acre downward adjustment, but reasonable appraisers wold not use a one acre parcel as a comparable for a 100 acre parcel. However, for the >100 acre parcels, the per acre size adjustment may be useful. We have relatively few very large acreage sales in the database, although the largest sale is a 5,174 acre tract. An appraiser may have to use 100 to 400 acre tracts as comparables for a 1,000 acre tract, in which case he or she would want to make an adjustment for differences in size.

We did find that there appear to be distinct markets for different size tracts based on roughly grouped tracts by size. We believe that the 3-6 acre tract is a reasonable grouping, as are the 6-15 acre tracts, the 15-55 acre tracts, the 55-100 acre tracts and the 100 acre plus tracts. We believe that if an appraiser stays generally within these size groupings, $/acre is a reasonable unit of comparison. However, unless one is appraising a tract at the boundary of one of these size categories, say a 15 acre tract wherein one may choose 10 to 20 acre tracts as reasonable comparables, one should probably not ignore differences in market perception based on differences in size categories.

LOCATION

Explanation of Potential Impact: There are many locational variables which can affect property value. In the case of the Everglades National Park Expansion area, these could include location within the Expansion Area boundaries, location within a Management Area, proximity to a major road or bridge, or proximity to a population center.

An attempt was made to analyze each of the identifiable location variables, both separately and checking to see if they acted differently when grouped (such as being near both a bridge and a paved road, as compared to either separately), because logic follows that many of them are interdependent.

Number and Types of Sales Analyzed: We examined several location variables that may have an influence on the price paid for these wetlands, including county, municipality, proximity to a major bridge, and proximity to a paved road. There simply were not enough observations in counties other than Dade to make reliable conclusions about the impact of differences in county. Differences due to impacts of being in or near municipalities also are limited. We had only 13 sales in or near Homestead or Florida City, neither of which made a statistically significant difference.

Statistical Analysis: An overall significant impact was discovered in the data for sales within a mile of one of the four bridges that provide access to the east of the L31-N Canal (the Howard Street Bridge, the Richmond Street Bridge, the SW 288th Street Bridge, and the Tamiami Trail Bridge). This variable showed up as statistically significant for the 6-15 acre parcels ($p = 0.0008$) and for the 15-55 acre parcels ($p = 0.0000$). We believe that the reason proximity to a bridge showed up as statistically significant for only these two size categories had to do with the fact that most sales near a bridge were within these size categories. We believe that proximity to a bridge is an important variable for all sales within a mile of a bridge, not just for the 15-55 acre sales. Also, parcels that were more than a mile from both a bridge and a paved road sold for less than the typical parcel ($p = 0.0397$)

We also found that sales within MA 1 and MA 3B ($p = 0.0029$) sold for about 25% higher prices than the typical parcel, and parcels in MA 2A ($p = 0.0000$) sold for about 45% lower prices than the typical parcel.

We tested to see if property values within the Expansion Area were different than property values outside the Expansion Area. We found that when we controlled for the statistically significant variables, like type of access, Management Area, size and proximity to a bridge, there is no evidence that properties within the Expansion Area were different because of their location within the Expansion Area. However, since land within the Expansion Area is generally the farthest from a bridge, has the least useful direct access, will be within the control of the Overlay

Ordinance, and is generally not agricultural use land, generally sales from within the Expansion Area are for prices lower than other sales.

Paired Data Analysis: We utilized the paired sales analysis to illustrate each of the statistically significant variables associated with location:

Proximity to a Bridge: We tried to locate pairs of data that illustrate the differences indicated by the statistical analysis. We selected all of the 15-55 acre sales that differed primarily on proximity to a bridge:

TABLE 18, COMPARISON OF 15-55 ACRE SALES NOT COVERED BY THE OVERLAY ORDINANCE				
	NOT AGRICULTURAL SALES		AGRICULTURAL SALES	
	NEAR BRIDGE	NOT NEAR BRIDGE	NEAR BRIDGE	NOT NEAR BRIDGE
NO. OF SALES	1	5	3	21
AVG. $/ACRE	NA	$2,408	$14,549	$11,672
STDEV	NA	$3,942	$804	$3,801
Compiled by Pritchett, Ball & Wise, Inc.				

There are not enough non-agricultural sales near a bridge to provide reasonable data. The best set of comparisons are for the agricultural use sales that show about a 20% advantage in price/acre associated with being within a mile of a bridge.

TABLE 19: COMPARISON OF AGRICULTURAL SALES EAST AND WEST OF THE L-31N CANAL AGRICULTURAL SALES			
	NEAR A BRIDGE		NOT NEAR BRIDGE
	EAST	WEST	WEST
NO. OF SALES	4	5	12
AVG. $/ACRE	$13,405	$7,390	$4,076
STDEV	$1,190	$1,560	$1,734
Compiled by Pritchett, Ball & Wise, Inc.			

Table 19 looks at all of the >3 acre agricultural use tracts within a mile of a bridge partitioned into the group that are to the east of the L-31 N canal and those that are west of the canal (and therefore subject to the restrictions of the Overlay Ordinance). It also looks at agricultural tracts west of the canal that are more than a mile from a bridge. The tracts that are to the east of the canal are closer to the developed areas of Dade County, so distance from a bridge is likely to be less of an impediment to access. The pattern shows clearly that proximity to a bridge increases the price paid for agricultural land, regardless of the side of the canal.

We also checked to see if size was a factor among the sales that are near a bridge, and found that among the non agricultural sales $/acre decreases as size increases, but that the pattern is not as clear among the agricultural land uses. Figure 15 shows the five non-ag. Sales and Figure 16 shows the data for the nine ag. sales near a bridge.

Qualitative Analysis: As more completely discussed in the Land Use Regulations section of this report, Management Area is one of the most consistent determinants of price for properties in the East Everglades, as Management Area defines the use of the property. Therefore, our experience suggests that the less restrictive Management Areas would experience higher overall land sale prices. Our conversations with brokers and some buyers alerted us to the possibility that proximity to a bridge may be an important variable. Based upon our research, it is apparent that East Everglades properties in proximity to one of the four bridges are generally more desirable in the market-place, as the canals are barriers that increase the travel time from the developed portion of Dade County to the wetlands.

Conclusion: Intuitively, we expect that properties located near the bridges would enjoy higher sales prices. This is supported by the statistical analysis and the matched pairs analysis. Most of the properties in the Expansion Area are not near a bridge, but appraisers should be aware that proximity to a bridge is a significant variable that should be considered. [Note: We also concluded that proximity to a paved road was an important variable for tracts that did not have direct access on a paved or gravel-limestone road. We present the evidence for this conclusion on pages 71-72, following our discussion direct about road access.]

LAND USE REGULATIONS

Explanation of Potential Impact: There are numerous federal, state, and county regulations impacting land use within the project area, including the following:

Federal

- Rivers and Harbors Act of 1899, Section 10
- Federal Water Pollution Control Act
- Clean Water Act
- Safe Drinking Water Act
- Clean Air Act
- Water Quality Act of 1987
- Flood Insurance Act of 1973
- Fish and Wildlife Coordination Act
- Endangered Species Act

State Department of Environmental Regulations

- Navigation, dredge and fill operations, Chap. 253
- Environmental Control, Chap. 403
- Storm Water Rules, FAC, Chap. 17-25
- Wetlands Protection Act of 1984, Chap. 17-12
- Land and Water Management Act of 1985, Chap. 380
- South Florida Water Management District regulations, Chap. 373FS
- Water Resource Act of 1972, FAC, Chap. 40E
- Concurrency

Dade County

- Water pollution control, dredge and fill operations, and Class IV permits, Dade County Code, Chap. 24
- Zoning
- Comprehensive Development Master Plan
- Zoning Overlay and Severable Use Right Ordinances, Chapter 33-B, Articles 1 and 2

The above regulations, through either their enhancement or limitation of use, could impact property values. A discussion of the administration of land use regulations as they relate to the East Everglades follows.

Almost 20 federal, state and local land use regulations governing clean water and air, water pollution control, fish and wildlife protection and management, endangered species protection, navigation, dredging and fill, environmental control, storm water management, water resources management, local land use and zoning ordinances, and "concurrency" affect the potential use and development of the Florida freshwater wetlands. In this study, we have concentrated on understanding and explaining the major components of the regulatory process, identifying the ways in which the administration of the regulations influences the value of the lands in question, and measuring the impact of the regulations as a group on the value of the land.

There are three primary sets of regulations that are specific to the Florida freshwater wetlands that exercise the greatest degree of influence over the functional utility of any parcel of land. These are (1) the U. S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) administration of the Clean Water Act, Section 404, (2) the South Florida Water Management District (SFWMD) administration of the Surface Water Improvement and Management (SWIM) plan, and (3) the County's Comprehensive Development Management Plan (CDMP) and related zoning and development regulatory ordinances.

Federal Regulations

Although there are many federal regulations that can impact man's use of the Everglades, the most important and wide reaching is associated with the enforcement of the Clean Water Act. In 1983 the EPA accepted primary jurisdiction for the protection of the freshwater wetlands, eliminating a range of overlapping jurisdictions. The Corps was charged with enforcement. In 1987, the Corps prohibited the Senior Corporation and Henry Rem from rockplowing a large area of good quality glades. The 404-C disturbance permits were not issued, the regulation was not challenged, and since that time agricultural and residential expansion has not been permitted. The most typical violations have been the unpermitted construction of agricultural sheds. (The information for this section is based on interviews with Jean Evoy, DERM, and Marcia Chivington, Bob Barron and Charles Schnepel of the U.S. Corps of Engineers.)

Presently, the Corps is involved with the regulation of about 12,000,000 acres of wetlands in Florida. Administrative operating orders were in place late in 1978, and the first issue addressed concerned regulations for rockmining of freshwater wetlands.

At about the same time, late in 1978, representatives of the Corps, the US Attorney's office, a farmer and a bulldozer operator met on a site west of the 8 1/2 Square Mile area to demonstrate and observe the rockplowing of the wetlands. Rockplowing is a process of grinding and mixing the limestone with the surface muck in preparation for agriculture. The Corps determined that it caused a negative impact on the wetlands and would require a permit under 404-C. They issued a "cease and desist" order, thus beginning the regulation of the use of the wetlands in South Florida.

The Corp's first big regulatory victory came in 1981-1983, associated with the actions of two real estate developers, Carter and Cartier, who had property at the extreme western edge of the 8 1/2 Square Mile area. Carter and Cartier were building residential house pads on five acre lots. The developers lost a court case, and were required to reclaim and restore the wetlands. The Carter house, which is the only structure in the area standing after Hurricane Andrew, was acquired by the National Parks Service, and is used as a ranger station. Since that time, only three houses were permitted west of the L31-N Levee. Mr. Soto obtained a permit in 1983 or 1984. Near the intersection of SW 168th St. and SW 237th Avenue, two houses were constructed on an 80 acre existing farm field about six or seven years ago. The Corps determined that the fields were not a part of the wetlands, and since the owner had 40 acres for each house, Dade County permitted the units.

The Corps permitted some rockplowing in the agricultural area between 1981 and 1986. One permit was issued as late as 1989. In 1987, Henry Rem attempted to obtain a permit for a 160 acre estate west of the L31-N Levee, near the 8 1/2 Square Mile area. The Corps was willing to negotiate a compromise calling for rockplowing only on 50 or 60 acres, but the EPA, which has oversight, overruled the Corps. The Senior Corporation, developers connected with Aerojet, owned thousands of acres of wetlands. Following the closing of their plant, SFWMD acquired most of their acreage in the Frogpond area (between L31W and L31). The Senior Corp. also owned about 1,200 acres of land on both sides of SW 232 Ave. Once the Corps prevailed in enforcing the 404-C regulations with Henry Rem, the Senior Corp. did not press further to obtain rockplowing permits for their property.

State Regulations

The South Florida Water Management District (SFWMD) is a state agency charged with the study, protection and management of surface water for the southern portion of the state, generally running south from Lake Okeechobee. The Everglades SWIM Plan, adopted March 12, 1992, reports the ecological foundation for the planning process, identifies sensitive areas in need of protection and restoration, and lays out a management plan for the region. In combination

with the state and local government environmental protection departments, planning and zoning departments and development controls (inspection and permitting) departments, the enforcement of the SWIM plans acts as a substantial constraint on the use and development of the freshwater wetlands. Property owners must obtain permits for any improvements or land use changes that affect the surface water flow (including storm water runoff) within the freshwater wetlands, and the SFWMD only grants permits in compliance with their approved plans.

The SWIM plan results from a continual process of balancing among somewhat conflicting agency missions. For example, achieving optimum water quality may not be consistent with maximum water supply, and flood control may conflict with environmental enhancement. Consequently, the plans and regulations are continually updated. (SWIM p. 21)

Also, the Everglades SWIM plan must be integrated with other area SWIM plans. A portion of the Everglades Agricultural Area falls within the boundaries of both the Everglades and the Okeechobee SWIM plans. The Biscayne Bay SWIM plan and the Everglades SWIM plan share an overlapping boundary at Barnes Sound/Manatee Bay and the C-111 Basin. The 10,000 Island area of the Everglades National Park (ENP) will be included in the SWIM plan for the lower west coast, once that plan is developed. (SWIM p.22)

The Impact of Manmade Interventions

Over the last hundred years, private parties and the state constructed canals through the Everglades. The early canals were to drain the interior swamps and provide navigational access to Lake Okeechobee. The canals created problems of over drainage during periods of low rainfall, which led to extensive fires in the interior and the infusion of saltwater to the water table along the coast. In the mid-20th century, the federal (Corps of Engineers) Central and Southern Florida Project (C&SF) was constructed to improve flood control and water supply within the region, correct hydrologic deficiencies, protect the remaining wetlands and reduce saltwater infusion. The "further refinements of the C&SF Project have resulted in the highly managed, artificial system of canals, impounded marshes, levees, pumps and water control structures that exist today." (SWIM p. 24)

Regulation comes about through SFWMD's implementation of the SWIM plan. Any proposed project that affects flooding, runoff or surface flow, other than the construction of a single family house on an existing lot of record, must obtain a permit from the District. All of the projects are subjected to modeling, and the decision to permit and the conditions attached to the permit depend on the sensitivity of the affected area. Even existing croplands and groves can not change their present configurations if the changes affect the surface water flows or increase runoff. SFWMD began enforcing freshwater wetlands quality protection standards in 1987. Prior to that time, the District was primarily concerned with flooding.

The second most important state law, which is primarily administered by the local governments rather than by a substate regional agency, is the Florida Concurrency Statute, Section 163.3202, which mandates that available public service facilities and services must meet or exceed the level of service (LOS) standards for each facility or service before the local government can permit a proposed development. "Concurrency" means that the local roads, storm drainage, schools, police fire and emergency services and all of the other components of municipal infrastructure must be in place or paid for by the developer before new development can take place.

Local Regulations

Dade County is the primary local government jurisdiction that controls the development of the East Everglades Expansion Area, and our study of local government regulations concentrates on Dade County. However, Broward County, West Palm County and Monroe County impose similar development constraints on lands in the freshwater wetlands.

The Comprehensive Development Master Plan (CDMP) For Dade County, as amended through May 1, 1997, sets overall development constraints on an area by area basis, and the zoning ordinance specifies the development regulations for each lot of record. The code enforcement process further governs the actual construction of the septic tank or sewer connections, storm water control, solid waste management and the other components of any permitted improvements. The most important impact of the CDMP as it affects the freshwater wetlands is the definition of the Urban Development Boundary and the Environmental Protection land use designation. The Urban Development Boundary sets the limits for any private land use that is urban in nature, and the Environmental Protection land use designation generally limits residential development to a density of one house per five acres. The 1997 edition of the CDMP shows that the Urban Development Boundary is east of the L-31N Levee, outside the East Everglades Expansion Area, and the entire 109,492 acres of the East Everglades Expansion Area was designated as an Environmentally Protected Park by an ordinance adopted 10/10/96. Prior to that date it was designated as "Environmental Protection for Parks and Recreation."

The most important specific constraint on the development of the East Everglades Expansion Area was the 1981 and 1982 adoption of the Zoning Overlay and the Severable Use Rights (SUR) Ordinances (Chapter 33-B, Articles 1 and 2). The Overlay Ordinance established six zones wherein development was limited to one dwelling unit per 40 acres of contiguous land under a single ownership. In some of the zones under some conditions dwelling units were to be permitted at a density of one unit per 20 acres or one per five acres, but as a practical matter, no site qualified for the higher densities. (Interviews with Ms. Deena Millinix, Zoning Administrator, and Ms. Laura Manos, Computer Support, Dade County Planning Department.) The Management Areas were generally defined by their micro-hydrology:

- The 22.5 square miles that constitute Management Area 1 floods only once every five to seven years. The 8 1/2 square mile residential component of Management Area 1 had an overall residential density of one house per 20 acres and contained 98% of all of the existing dwelling units in the East Everglades. This component was intended for agriculture with a residential character. The Corps' "Modified Water Deliveries to Everglades National Park" project runs along the western edge of this 8 ½ square mile area.
- Most of the 14 square mile agricultural component of Management Area 1 is or has been used for row crops or groves, and was intended to be preserved for agriculture. This area is located just to the west of the L31-N Levee, and is most accessible.
- The 156 square miles that make up Management Areas 2A and 2B are the Northeast Shark Slough and the Southeast Saline Everglades. The area is flooded at least nine months of the year, and was intended for passive recreation and conservation.
- The 37 square miles that make up Management Area 3A is an area of tree islands and/or wet prairies that floods three months of the year. It also was intended for passive recreation and conservation. These are among the least accessible areas within the East Everglades.
- The 19 square miles of Management Area 3B was designated for agricultural expansion, provided it was hydrologically suited for farming (without additional drainage), that it was adjacent or proximate to existing farming, and that all required federal permits could be acquired. Otherwise it was intended for passive recreation and/or conservation. This area is flooded less than three months per year and is covered in native vegetation. This area is also adjacent to the west of L 31-N, and more accessible than most of the East Everglades.
- The 44 square miles of Management Area 3C was considered a transition area. It permitted agriculture under the same conditions as for Area 3B, provided no land was available in Management Areas 1 or 3B. Otherwise, it was to be used for passive recreation and/or conservation. There are very few roads leading to this area.

Also, Environmental Performance Standards were adopted within the Overlay Area that required:

- Fill shall not significantly impede surface water flow and shall be limited to 1/2 acre or less;
- Excavation shall be limited to discontinuous agricultural ditching and shallow lakes for recreation and/or fill;
- Roads shall be prohibited in Management Area 2;
- Native vegetation tree islands shall be preserved;
- Landscaping shall not include noxious exotic plants;
- Solid waste that is not degradable onsite shall not be deposited in the area;
- Agriculture shall be managed so that exotic plants will not proliferate, no net change in infiltration occurs and plant beds, farm roads and farm buildings shall not inhibit surface water flows.
- The corollary SUR Ordinance permitted one SUR for parcels already zoned for dwelling units as of 1/14/81 (provided they registered that SUR within one year) and one SUR per five acres for properties in the 8 1/2 Square Mile Residential Area of Management Area 1, or one SUR per 12 acres in Management Area 3B, or one SUR per 20 acres in the balance of Management Area 1, or one SUR per 40 acres in Management Area 3C. No SURs were permitted in Management Areas 2A, 2B or 3A.

Management Area 1 contains 14,700 acres; Management Area 2 contains 72,000 acres; and Management Area 3 contains 67,300 acres. The effect of this overlay zone was to "down zone" many areas of the county to eliminate development. Concurrently, the county created Severable Use Rights (SURs), which are transferable to others in conjunction with development of land outside the incorporated areas of the county but within the Urban Development Boundary (UDB) (outside of the East Everglades). The following table summarizes the SURs allowed under each Management Area.

TABLE 19, Management Area	SURs
Management Area 1	One (1) SUR per five (5) acres
Management Area 2A	No SURs

Management Area 2B	No SURs
Management Area 3A	No SURs
Management Area 3B	One (1) SUR per twelve (12) acres
Management Area 3C	One (1) SUR per forty (40) acres
Source: Dade County Ordinance No. 81-122	
Compiled by Pritchett, Ball & Wise, Inc.	

Except for isolated properties which may have been "grandfathered in" prior to the overlay in 1981, only agricultural uses are permitted in Management Areas 1 and 3B. According to the zoning overlay, all land in these Management Areas is classified AU, Agricultural District, whereas all land in the remaining Management Area's is designated GU, Interim District. This zoning overlay supersedes any underlying zoning within the Management Areas.

A map illustrating the location of these Management Areas is identified as Exhibit J in the Addenda as Summary of Major Ordinance Requirements.

Also, Dade County specified that it would not construct any new roads in this area, and that it would only maintain SW 136th Street from 187 Avenue to SW 209 Avenue; SW 168th Street from Levee 31-N to SW 237th Avenue; SW 237th Avenue from 168th Street to SW 163 Street and Ingrahm Highway (formerly SR 27). The County would not accept the dedication of privately constructed roads within this area. This warning is included on Warranty Deeds for properties throughout the Overlay areas.

As a practical matter, following the effective date of the Overlay Ordinances, new houses required ownership of a contiguous parcel of at least 40 acres. About 4,300 Severable Use Rights (SURs) were established that could be sold and used to increase the otherwise permitted development density anywhere in unincorporated Dade County within the Urban Development Boundary. However, because the entire area was designated as an Environmental Protection Area, all of the federal, state and local water, air and land environmental protections, fish and wildlife protections and endangered species protections were and are closely watched and strictly enforced, making any new development as difficult to accomplish as possible.

In summary, the regulatory climate imposed by the federal, state and local government has precluded almost all land use that requires disturbance of the freshwater wetlands or risks the environmental degradation of the protected areas. Dade County's imposition of the Zoning Overlay Ordinances in 1981 and 1982 precluded most activity by effectively requiring a 40 acre site before a house could be developed. The 1987 actions by the Corps of Engineers to refuse to permit additional rockplowing effectively stopped the further encroachment of agriculture into the wetlands. Also, in about 1987, the regulatory power of the state, through the SFWMD, imposed water quality protection regulations that further discouraged development affecting the wetlands.

Number and Types of Sales Analyzed: To study the relationship between Management Area and price per acre, transactions were sorted by the Management Area. The following table provides the transaction breakdown as well as important information about each respective Management Area.

TABLE 20, LAND SALES SUMMARY CHART

MANAGEMENT AREA

Mgmt. Area	1	2A	2B	3A	3B	3C	NONE

No. Sales	34	98	1	12	51	33	107
Use	Agri.	General	General	General	Agri.	General	NA
SURs	1 for 5	None	None	None	1 for 12	1 for 40	N/A
Compiled by Pritchett, Ball & Wise, Inc.							

Statistical Analysis: Analysis of the data revealed a statistically significant relationship between management area designations and price per acre in Management Areas 1 and 3B, which were the more valuable management areas (p = 0.0500) and MA 2A, which is the least valuable management area (p = 0.0010). The >3 acre land in MA 1 and MA 3B sold for significantly more than the calculated constant for all >3 acre sales, and the MA 2A land sold for significantly less than the calculated constant for all >3 acre tracts. We ran a separate multi-linear analysis including only >3 acre sales within any management area. In this case the multi-linear regression model showed that tracts in MA 2A sold for significantly less than the calculated constant from this selected group of sales. [The differences between the MA 1 and MA 3B tracts as compared to the other tracts was not statistically significant at the 0.05 level in this second regression model].

We believe that the multi-linear regression models show that for MA 2A, the amount by which prices vary based on differences in management area is very large. We have slightly less persuasive evidence that sales in MA 1 and MA 3B represent "different" markets than the other management areas. Consequently, appraisers should be careful about management area comparability when selecting sales comparables.

Paired Data Analysis: The following Table 21 shows a relatively consistent pattern of difference in value associated with the different Management Areas:

Throughout the table the pairs of data show that sales in MA 1 and MA 3B sold for higher prices than sales in MA 3A and 3C, and sales in MA 2A sold for a lower price. Land not constrained by the overlay ordinance sold at higher prices than land within the management areas. Because we cannot control for all of the other significant variables using matched pairs, the indication of the amount of dispersion (standard deviation) in many of the cells is quite high.

We had only one sale from MA 2B in our database, so we cannot draw any conclusion about this area directly from the data. However, since the land is similar to land in MA 2A in both problems of access and periods of inundation, we believe that sales from land in MA 2B would be similar to sales in MA 2A.

Qualitative Analysis: Most of the knowledgeable people we interviewed believe that the regulations that had the greatest impact on land values were the Overlay ordinances in 1981 and 1982. These regulations effectively prohibited further development of the wetlands within the Management Areas. Based on our conversations with brokers and government regulators, we had expected to find some market based evidence of a reduction in land values post-1987 as compared to pre-1987. This was the time frame within which the Corps of Engineers stopped permitting additional wetlands disturbance (primarily rockplowing) and was also the time that the SFWMD began enforcing state regulations affecting surface flow as well as drainage and pollution. However, there is no time-line indication from the sales data of a change in market value associated with 1987.

The statistical analysis, matched pair analysis, and market research all indicate that sales located in less restrictive Management Areas (such as Management Areas 1 and 3 B) have higher sales prices than sales in more restrictive Management Areas. This issue is further discussed in the Land Use Regulations section of this report. The practical impact of the Overlay Ordinance has been to preclude any development within any Management Area. We believe that there is no evidence to indicate that SURs affect the market value of land, as we will show in the following section. Consequently, we do not believe that the fact that MA 1 permits the greatest number of SURs/acre and MA 3B permits the second highest number of SURs/acre explains why it is that tracts in MA 1 and MA 3B sell for higher prices. We believe that tracts in these two Management Areas sell for higher prices because the periods of inundation within these two Management Areas are shorter than for other protected areas, and because tracts in these two Management Areas have better road access and are furthest to the east.

There are too many other variables that affect value to directly measure the dollar impact of the individual regulations,

all other variables held constant. Consequently, an appraiser or analyst should select comparables that are within similar Management Area Overlay designations, and adjust for the other more important variables such as road access and size by category.

ROAD FRONTAGE/ACCESS

Explanation of Potential Impact: In order to accurately study this variable, the various types of roads/access are analyzed and divided into seven categories: concrete or asphalt paved, gravel/limestone paved (these two variables are sometimes referred to as "all-weather" roads), dirt/grass roads, airboat, swamp buggy, airboat and swamp buggy, and no vehicular access. Descriptive examples and photographs of each type of access are described below.

- Paved Road - A vehicular pathway with an elevated above grade surface covered with concrete or asphalt. Roadway can be utilized by a conventional two-wheel drive passenger vehicle for 12 months of the year.

Paved Road Access

- Gravel Road/Lime Rock Road - The pathway surface is elevated above grade and covered with gravel/lime road and can be used by a conventional four-wheel drive vehicle 12 months of the year.

Gravel/Lime Rock Road Access

- The third category includes all other forms of access including dirt/grass roads, swamp buggy trails, airboat trails, footpaths, and no access. These sub-categories are described below:

Dirt/Grass Road Access

- Buggy Trails - A defined on-grade pathway which cannot be traveled by use of conventional four-wheel drive vehicles, but requires the use of swamp buggies which are specially designed and built for such conditions.

Swamp Buggy Access

- Airboat Trails - A defined pathway which can only be traveled by use of air boats.

Foot Paths - A defined pathway that is not capable of supporting any form of vehicular traffic and can be used for pedestrian travel only.

No access - There is no discernible trail or pathway that provides reasonable vehicular or any other type of access to the property.

Each of the sales was classified based on a hierarchy of access, with the highest class of access being the one that allowed the most people to have the most convenient access to the property. The sales were analyzed to determine the impact of road frontage, type of access, quality of access, and the nature of access (public access, easement access, permissive access, or usage access). We tested each of the variables one at a time and in combination to determine that the four classifications described above are the narrowest classifications that show significant differences in value.

Number and Types of Sales Analyzed: To investigate the impact of road frontage, properties were segregated based upon the quality of their primary access: paved - 81 sales; gravel/lime - 23 transactions; dirt/grass 77 transactions; both airboat and swamp buggy - 76 transactions; airboat only - 10 transactions; buggy only - 5 transactions, and no vehicular access - 64 transactions.

Statistical Analysis: Results were highly significant (p-value of .0010) and intuitively satisfying. Compared to properties with all weather access, properties with dirt or grass access tended to sell for about 30% less (p-value of .0237). There were no statistically significant differences among the categories of less than dirt/grass access.

Paired Data Analysis: The following table illustrates the difference in sales price/acre for different types of access. In the following table we controlled for size and looked at the non-agricultural land.

The patterns uncovered by the regression model show up most clearly in the 3 acre sales on a paved or gravel/limestone road, and did not find any different relationship between changes in the size of the tract and $/acre for these more accessible tracts than for other tracts.

In Table 22-A we examined the data set of agricultural sales.

TABLE 22-A; IMPACT OF TYPE OF ACCESS ON SALES PRICE, AGRICULTURAL LAND USE							
	USING $/ACRE AS UNIT OF COMPARISON						
	3-6 ACRES						
	PAVED	**GRAVEL**	**DIRT**	**AIR/BUGGY**	**AIR**	**BUGGY**	**NONE**
NO. OF SALES	4	0	5	0	0	0	0
AVG. $/ACRE	$11,500		$7,976	$0			
STDEV	$7,681		$4,077	$0			
	6-15 ACRES						
	PAVED	GRAVEL	DIRT	AIR/BUGGY	AIR	BUGGY	NONE
NO. OF SALES	8	1	6	0	0	0	0
AVG. $/ACRE	$16,290	na	$10,609				
STDEV	$5,647	na	$1,327				
	15-55 ACRES						
	PAVED	GRAVEL	DIRT	AIR/BUGGY	AIR	BUGGY	NONE
NO. OF SALES	19	5	11	0	0	0	0
AVG. $/ACRE	$11,754	$8,939	$9,579				
STDEV	$4,091	$5,582	$4,280				
	55+ ACRES						

	PAVED	GRAVEL	DIRT	AIR/BUGGY	AIR	BUGGY	>NONE
NO. OF SALES	16	2	5	0	0	0	0
AVG. $/ACRE	$8,679	na	$6,107				
STDEV	$3,468	na	$6,128				
Compiled by Pritchett, Ball & Wise, Inc.							

Eighty-two of the eighty-four agricultural use tracts are larger than 3 acres and all are located either on paved, gravel or dirt roads. In almost every case the pattern shows that the better quality the access, the more valuable the land.

Qualitative Analysis: Our discussions with buyers, sellers, and brokers in the East Everglades area indicated a strong correlation between access and price per acre. Sites with all weather access via a paved or graveled road are believed to be more valuable than sites with dirt/grass access and significantly more valuable than sites with only airboat, swamp buggy, or no vehicular access.

Conclusion: Based on the statistical, paired data, and qualitative analyses, we believe that properties with dirt or grass access sold for approximately 30% less than properties with all weather access. Properties with off road only access sold for a weighted average of approximately 40% less than properties with all weather access. The direct correlation between the type of road frontage/access and price per acre is logical. We suggest that an appraiser select comparables sales with the same type of access as the property that they are appraising.

Proximity To A Paved Road:

As we show in the section on access to the property, we believe that parcels that have direct access via a paved or gravel/limestone road sold for a higher price than parcels accessible via a dirt/grass road, airboat, swamp buggy or no vehicular access. Another of the possible location variables that we researched was to see if parcels that did not have direct access via an all weather road, but were within a mile of a paved road, sold for a different price than parcels with inferior direct access that were more than a mile from a paved road.

***Statistical Analysis*:** The multi-linear regression model shows that sales that are within one mile of both a paved road and one of the four bridges crossing the L-31N canal sell for a significantly higher price than other parcels ($p = 0.0397$). However, by itself, proximity to a paved road was not one of the significant variables.

Matched Pairs Analysis: The matched pairs analysis suggests that for most of the property categories, proximity to a paved road does affect value and should be considered by appraisers. These pairs are controlled by excluding agricultural land uses and partitioning the data by size categories. We are not able to control for other significant variables, such as management area, and still have enough observations in each of the cells.

TABLE 23, IMPACT OF BEING WITHIN ONE MILE OF A PAVED ROAD NOT AGRICULTURAL LAND USE GIVEN NO ALL WEATHER ROAD DIRECT ACCESS		
	LESS THAN 3 ACRES (TOTAL SALES PRICE)	
	LESS THAN I MILE FROM	**MORE THAN 1 MILE FROM A**

	A PAVED RD.	PAVED RD.
NO. OF SALES	18	44
AVG. $/ACRE	$9,210	$5,693
STDEV	$9,915	$6,278
	3 TO 6 ACRES ($/ACRE)	
NO. OF SALES	22	34
AVG. $/ACRE	$4,655	$3,537
STDEV	$2,597	$3,059
	6 TO 15 ACRES ($/ACRE)	
NO. OF SALES	6	33
AVG. $/ACRE	$3,655	$2,395
STDEV	$4,208	$2,394
	15 TO 55 ACRES	
NO. OF SALES	4	30
AVG. $/ACRE	$2,827	$1,020
STDEV	$4,416	$1,295
	55 PLUS ACRES($/ACRE)	
NO. OF SALES	3	10

AVG. $/ACRE	$754	$511
STDEV	$379	$396
	48%	-32%
Compiled by Pritchett, Ball & Wise, Inc.		

Overall, the small parcels that had inferior direct access to the parcel and were more than a mile away from a paved road sold for about 38% less than similar parcels near a paved road. The larger parcels with inferior direct access that were not near a paved road sold for about 40% less than their counterparts within a mile of a paved road. However, when we controlled for the size category for the larger sales, the differences ranged from -24% for the 3-6 acre category to -64% for the 15-55 acre category. The data set does not contain any agricultural use sales that are not on either a paved, gravel or dirt road.

Qualitative Analysis: Most of the knowledgeable market participants with whom we spoke stated that the quality and convenience of access was one of the most important variables affecting the value of these wetlands, because of the general difficulty in getting to parcels in this area.

Conclusions: In our opinion, an appraiser should pay particular attention to the relative difficulty in driving to a potential comparable as compared to the subject. We believe that in the event neither the subject nor the comparable have direct access via a paved or gravel/limestone road, properties within a mile of a paved road are likely to be more valuable than properties more than a mile from a paved road.

MINERAL RIGHTS

Explanation of Potential Impact: Mineral Rights can be severed from the other rights of ownership and transferred separately. This practice is common in areas where the land is rich in deposits of minerals, fossil fuels, or other natural resources. The mineral rights can be separately transferred as a whole, or be transferred fractionally, with the fee simple grantor reserving a portion of the mineral rights. The sales were analyzed in order to determine the contributory value, if any, of the mineral rights as opposed to the value of the mineral rights as if conveyed separately.

Number and Types of Sales Analyzed: Specific information regarding the transfer of mineral rights was available on only six of the 336 transactions in the Everglades statistical data set. The following sales took place with less than 100% of the mineral rights transferred with the property. We showed the sales arranged by size and showed the variables on which the sales differed:

TABLE 24, SALES WHERE IN LESS THAN 100% OF MINERAL RIGHTS TRANSFERRED

Statistical Analysis: Mineral rights was not statistically significant as an explanatory variable.

Paired Data Analysis: We can not determine any pattern that indicated any change in the value of a property absent mineral rights from these sales.

Qualitative Analysis: During the verification process, the buyers and sellers were queried about the existence of minerals on their properties, and queried as to whether or not mineral rights were transferred. The majority of the respondents were not aware of any mineral deposits and did not know whether mineral rights transferred with the sale of their properties. Most respondents did not enter into sales transactions with consideration for minerals or mineral rights. Interviews with other market participants and authorities familiar with the East Everglades area also supported the contention that mineral deposits and resources in the area are of negligible value, and are not a major factor in real estate transactions.

Conclusion: The lack of good information on mineral rights might be interpreted as general market indifference toward the variable and therefore be further evidence of no relationship between mineral rights transferred and transaction price. The most significant evidence within the analysis is the anecdotal information gathered from the buyers and sellers during the verification process which indicated more often than not, buyers were not aware of the existence of mineral rights and did not considered them in their purchase

decision. We believe that mineral rights as a general rule do not impact value in the East Everglades Expansion Area.

SEVERABLE USE RIGHTS (SURs)

Explanation of Potential Impact: SURs are transferable development rights which were created by the Dade County Management Area overlay in 1981. They are tied directly to the Management Areas as discussed previously. Each Management Area has specific development requirements and SURs associated with them. The purpose of this portion of the study was to determine the contributory value of the SURs to the property, not the value of a SUR as if conveyed separately and severed from the land. We eliminated from our database a group of sales to Michael Jones, a broker who makes a market in SURs, because Mr. Jones told us that he based his price only on his opinion of the "wholesale" value of the SUR, not at all on the contributory value of the underlying land. He was willing to buy only the SUR or the SUR with the land, but he would not pay anything extra for the land.

Statistical Analysis: A severable use rights variable was defined by calculating a ratio of 1 SUR to the number of acres required to create a single SUR. This ratio varied for each Management Area. For each transaction within a Management Area, the appropriate ratio was applied to the property size to derive the total number of SURs for the transacted property. [There is a slight distortion in this scheme, because a small group of property owners who had building permits or were eligible for building permits in 1981 were eligible to register a full SUR within the first year of the Ordinance, regardless of the size of their parcel. Consequently, an owner of a 1.5 acre parcel in MA 1 may have registered a full SUR, instead of the 0.3 SUR he would have had if he didn't register the SUR. We do not believe that any "registered" SURs, as opposed to statutory SURs, actually are a part of our database.]

The relationship between total number (or fraction) of SURs and price per acre was then examined. No significant relationship was found for any Management Area or for all Management Areas taken as a whole (p-values ranged from .8857 to .7842). Severable Use Rights do not appear to be related to price per acre paid for the land, regardless of the Management Areas and the statutory density of SURs.

Paired Data Analysis: Although there are 38 sales in the statistical data set from which the SURs had been severed prior to the sale of the land, we were able to develop reasonable matched pairs for two sets of the data. Table 25, below, shows a comparison of eight five acre tracts on dirt/grass roads in MA 1 wherein one SUR had been sold prior to the sale of the land. In this case, the average price paid was $6,132/acre with a standard deviation of $2,621. These sales are compared to nine five acre sales on dirt/grass roads in MA 3B wherein the SURs were transferred with the property. These tracts sold for an average of $4,928/acre with a standard deviation of $800.

The second pair was of three 55-100 acre, non-agricultural tracts from which SURs had been severed prior to the transfer of the land to six similar tracts that were sold with the SURs intact.

In this case the average price for the tracts without SURs was $1,389/acre with a standard deviation of $1,049, whereas the sales price of the tracts sold with the SURs intact was an average of $600 with a standard deviation of $338.

The comparisons appear to show that tracts without SURs sell for higher prices than tracts with the SURs intact. Unfortunately, we were not able to develop any pairs for tracts with and without SURs holding Management Area, type of road access and agricultural use constant. We believe that the observed differences between tracts with and without SURs has to do with these other more important variables. Clearly the data does not show that SURs add value.

Qualitative Analysis: Discussions with Michael Jones and Tom Spehar, who are probably the most knowledgeable people concerning the market for and impact of the SURs, indicated that although there was a small market for the SURs, the sale of this development right from the property does not affect the value of the underlying land. Of all the sales verified by PBW and/or other appraisers, only a few indicated that a SUR was even considered in the sale. By far the majority of the buyers and sellers were unaware of the Management Area Overlay program and did not consider the impact of SURs in the transfer of the property. We believe that there are two major reasons that explain why the absence or presence of a SUR does not affect the value of the land. The first reason is that the market for SURs is very limited. Only a few hundred SURs have been sold, and most of the sales were made by one broker.

The costs of assembling fractions of a SUR are prohibitive relative to the potential sale of the SUR. Consequently, the market is not a realistic option for most small property owners unless they own a registered SUR, and most were not eligible to register a SUR or, if they were eligible, did not register their SUR.

The second reason is that development rights within the jurisdiction of the Overlay Ordinance have been eliminated for most property. One can not do any more with the land with a SUR than one can without a SUR. The Overlay Ordinance didn't affect agricultural use. If one intended to farm, rather than to develop, selling the SURs didn't affect one's ability to farm.

Conclusion: All of the above methodology indicates that severable use rights do not have an impact on the value of the underlying land. A SUR is a property right while it is attached to the land. However, a (whole) SUR can be sold as an intangible. Once it is severed from land in the wetlands, it can exist as an intangible for an indefinite period, and the market for the SUR as an intangible is not correlated to the market for the land from which it was severed. A SUR cannot be reattached to a parcel in the wetlands in order to

permit development. It seems reasonable to conclude that the market for wetlands does not credit a SUR towards the value of the land, and a parcel sold absent the SUR sells for the same price as a parcel with a SUR.

VI. SUMMARY

This market study has attempted to provide detailed analyses of the impact on land prices associated with the nine issues to be studied identified and discussed in the RFP and throughout this report. As developed in the data and analyses representing the body of the report, there is a clear relationship between the selling price of land and several of the variables examined.

The clearest evidence from the data analyzed relates to the influence of land use regulations associated with Management Areas. There is also strong evidence of a relationship between land price and type of access, with all weather road/vehicular access demanding the highest price, followed by dirt/grass roads. This is consistent with logic/intuition and supported by our qualitative analysis derived principally from anecdotal evidence, as described in the report. The study also illustrates the small decreases in price/acre for parcels as the size of the parcel increases, and that the market treats different size categories differently. The other variables had much less clear influence on price, as discussed throughout the report.

The prices paid for land in this unique area vary by substantial amounts. Many times we observed that parcels in reasonably close proximity to each other, both flooded nine or more months out of the year, both accessible only by airboat or swamp buggy, both more than two miles from an all weather road, at about the same date sold for cash for substantially different amounts. Many times buyers told us that they had never seen the property that they purchased, either before nor after the sale. Many reported that they did not know that the use of the property was substantially restricted, both physically by the ecosystem, and legally, by a myriad of federal, state and local regulations.

Because it is hard to relate our independent, third party perceptions of the economically based functional utility of the land to the buyers and sellers motivations, it is satisfying that as much as 65% of the variation in the sales price is explained by identifiable, rationally based, measurable variables discussed in this report. Only a little under 35% of the variation in price/acre is unexplained by these variables.

We are certain that there are subtle differences between parcels that have not been reflected by our models. The appraisal problem of valuing specific parcels to be acquired by the NPS and by the Corps must be solved by knowledgeable appraisers familiar with the conditions of this specialized and highly localized market. We hope that our research and analysis, which is much more broadly based than an appraiser could afford to undertake, is useful to the fee appraisers, staff appraisers, reviewers, acquisition specialists, attorneys, judges and juries that must eventually make the final determinations of the market value of these unusual lands.

The following table summarizes the conclusions.

SUMMARY OF CONCLUSIONS

VARIABLE	FINDINGS	RECOMMENDED ACTION
Project Influence	There is no evidence to suggest that either the NPS announcement of the expansion of Everglades National Park or The Corps of Engineers announcement of its changes to the L31-N canal had any measurable impact on the value of the freshwater wetlands.	An appraiser or analyst should not make any adjustment for Project Influence.
Financing	There is evidence that seller financing has an upward impact on price, even after making mathematical cost equivalency adjustments.	Owner financed transactions should be avoided, if possible, for other than agricultural use tracts. Appraisers should rely on cash or third-party financed sales for other than agricultural use sales. There

		is no evidence that price is affected by owner financing for agricultural use properties.
Market Conditions (Time)	Our study of many land sales in the freshwater wetlands uncovered no persuasive evidence of any change in the price per acre directly associated with the date of sale. Neither Recreational use land sales nor Agricultural land use sales changed due to changes in the date of sale, 1974-1997.	No adjustment necessary for date of sale (Market Conditions).
Property Size	There is strong evidence that "size" is a significant factor for properties generally based on size categories, especially 6-15 acres, 15-55 acres and >100 acres. There is a modest ½%/acre decrease in $/acre as a continuous variable, but this adjustment is not meaningful unless there are very large differences between the size of the comparable sales and the subject. Size is often an interaction variable. For example, a 6-15 acre tract on a paved road or a 6-15 acre tract near a bridge sold for significantly different prices than can be explained by either size or proximity.	Limit comparable sales to similar sized properties generally within the size categories identified within the study. Pay particular attention to 6-15 acre sales on paved roads, 6-15 acre tracts near a bridge and 15-55 acre tracts on dirt/grass roads as statistically significant, distinct markets.
Location	Sales within the Dade county Overlay Ordinance (within Management Areas) sold for a significantly different (lower) price than sales not governed by the Overlay Ordinance. Sales near one of the four bridges across the L31-N canal sell for substantially more than other sales. If there is no all weather road providing direct access to a parcel, being within a mile of a paved road probably affects the value.	Select comparable sales located within the Overlay Ordinance if the subject is within the area governed by the Overlay ordinance. Pay attention to the proximity of the subject or comparables to one of the bridges crossing the L-31N canal. Check for proximity to a paved road if the subject or comparables do not have either a paved or gravel/limestone road providing direct access.

Land Use Regulations	There is good evidence that this variable is a significant factor influencing land prices, specifically regarding restrictions on use imposed by the Management Area overlay	There are too many other variables that affect value to directly measure the dollar impact of the numerous

	zone. Properties in MA-1 and MA-3B sell for substantially more than parcels in other management areas, and parcels in MA 2 sell for less than parcels in other management areas.	regulations, all other variables held constant. Select comparable sales to be relied upon from those within the overlay zone. Refer to the study to understand the relative values within each Management Area.
Road Frontage/Access	This variable has a significant influence on land prices, especially with regard to frontage on a paved road, a gravel/limestone road or a dirt/grass road. The data indicates no distinction in price between access by airboat, swamp buggy or foot paths (no vehicular access).	Try to select comparables with the same access/type of frontage as the property under appraisal. We found that properties with dirt road or grass road access sold for about 30% less per acre than p4roperties with all weather access; properties with airboat, swamp buggy or no road access sold for about 40% less per acre than properties with all-weather road access.
Mineral Rights	There is no evidence of any change in the price per acre, for sales in the freshwater wetlands, directly associated with the issue of Mineral Rights.	No adjustment necessary
Severable Use Rights	There is no evidence of any change in the price per acre, for sales in the freshwater wetlands, directly associated with the issue of Severable Use Rights.	No adjustment necessary
Compiled by Pritchett, Ball & Wise, Inc.		

CERTIFICATION AND CONFORMANCE

The Uniform Standards of Professional Practice (USPAP) in Standard 4 addresses those consulting services by an appraiser other than estimating value.

The following is a synopsis of Standard 4 as it relates to this study:

Standard 4 addresses the important difference between performing an impartial consulting service as a disinterested third party that responds to the clients stated objective (as described in the INTRODUCTION section of this report) and performing a consulting service that is intended to facilitate the achievement of the client's objective.

Standards Rule 4-1

Understand and employ recognized consulting methods and techniques without committing substantial errors or negligence.

The techniques and methods used in this report are described in the INTRODUCTION and other sections of the report.

Standards Rule 4-2

Clearly identify the clients objective and define the problem, the purpose and the use of the study. Collect, reconcile and verify the pertinent data as required. Apply the appropriate consulting tools and base projections on reasonably clear evidence.

These are covered in the INTRODUCTION and the other sections of the report.

Standards Rule 4-3

In performing real estate or real property consulting services, an appraiser must observe the following specific guidelines when a conclusion or recommendation is required by the nature of the assignment:

(a)-(c) not applicable

(d) identify the optimum course of action to achieve the client's objective.

This item is covered in the INTRODUCTION and the other sections of the report.

Standards Rule 4-4

In performing a market analysis, an appraiser must observe the following specific guidelines when applicable:

(a) define and delineate the market area.

This item is covered in the INTRODUCTION and the other sections of the report.

(b)-(d) not applicable.

Standards Rule 4-5

Not applicable. Deals with discounted cash flow.

Standards Rule 4-6

Not applicable. Applies to a feasibility analysis for a specific project.

Standard 5 gives the reporting requirements for a real property consulting service. The report must present a clear, logical and convincing statement that leads to the stated conclusions and achieves the specific goals of the client.

Standards Rules 5-1 and 5-2

Follow the guidelines of Standards Rules 4-1 and 4-2 above.

Standards Rule 5-3

Contains the signed certification requirements which are included and incorporated in this report.

Each written consulting report must contain a signed certification that is similar in contents to the following form:

Standards Rule 5-4

Not applicable. Relates to an oral report.

The Uniform Appraisal Standards For Federal Land Acquisition (USFLA) does not directly address studies or consultations such as this study. However, since this report could become an integral part of value estimates made by others, the standards of USFLA were studied and incorporated, where appropriate, into this study. This includes such subjects as enhancement, verification, prices paid by governments for acquisitions, and Federal eminent domain laws in general.

I certify that to the best of my knowledge and belief:

- the statements of fact contained in this report are true and correct.

- the reported analyses, opinions and conclusions are limited only by the reported

assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions and conclusions.

- I have no present or prospective interest in the property that is the subject of this report, and I have no personal interest or bias with respect to the parties involved.

- my compensation is not contingent on an action or event resulting from the analyses, opinions, or conclusions in, or the use of, this report.

- my analyses, opinions and conclusions were developed, and this report has been prepared in conformity with the Uniform Appraisal Standards for Federal Land Acquisitions and the Uniform Standards of Professional Appraisal Practice.

I have made a personal inspection of the Expansion Areas that are the subject of this report.

This appraisal report may be reviewed by duly authorized representatives of the Appraisal Institute as a part of peer review and/or compliance with the Institute's Standards of Professional Practice or Code of Ethics.

The Appraisal Institute conducts a voluntary program of continuing education for its designated members. Members who meet the minimum standard of this program are awarded periodic educational certification. As of the date of this report, J. H. Pritchett, MAI, Joe W. Ball, MAI, Henry J. Wise, MAI and Jody Wilson Foster, MAI have completed the requirements of the continuing education program of the Appraisal Institute.

- The individuals identified below provided significant professional assistance to the person signing this report:

Joe W. Ball, MAI

Henry J. Wise, MAI

Jody Wilson-Foster, MAI

George S. Petkovich

William M. Looper

Julian Diaz, III, Ph. D.

Joseph Rabianski, Ph. D.

Lloyd Wilkinson

_____

J. H. Pritchett, MAI

Georgia Certified Real Estate Appraiser No. 1436

Standards Rule 5-4

Not applicable. Relates to an oral report.

The Uniform Appraisal Standards For Federal Land Acquisition (USFLA) does not directly address studies or consultations such as this study. However, since this report could become an integral part of value estimates made by others, the standards of USFLA were studied and incorporated, where appropriate, into this study. This includes such subjects as enhancement, verification, prices paid by governments for acquisitions, and Federal eminent domain laws in general.