

South Florida Water Management District

Biscayne Bay Economic Study Work Plan and Progress to Date

May 14, 2004

Project Objectives

1. Economic Contribution of Biscayne Bay to: local area; county; south Florida; State
Contributions are sales, income, employment, # of firms by industry type from 1980 to present
2. Compare to overall economies
3. Impact of Bay Management Scenarios on Bay's Economic Contribution



Project has four study areas

- Local area is east of US 1 and west of A1A if north of Gov't Cut and all of barrier islands if south of Gov't Cut
- County area is Miami-Dade County
- Regional area is southeast Florida – Palm Beach, Broward, Miami-Dade and Monroe counties
- Statewide area is all of Florida

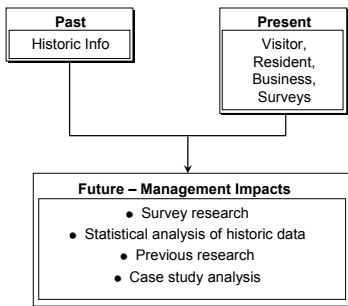


Project evaluates three time periods

- Current period is 2004
- Historic period is 1980 to 2003
- Future is 2005 through 2030



Model uses prior research, historic and new survey information to describe Biscayne Bay economy



Tasks and completion dates

- Task 1 – Initial meeting, Work Plan and presentation (Jan. 2004)
- Task 2 – Compile economic data (Jul. 2004)
- Task 3 – Develop economic baseline and trend analysis (Dec. 2004)
- Task 4 – Develop methods to evaluate management scenarios (Feb. 2005)
- Task 5 – Apply methods to evaluate scenarios (Aug. 2005)
- Task 6 – Final Project Report (Oct. 2005)

Direct, indirect and induced economic contribution of Biscayne Bay will be estimated

- Two types of direct businesses:
 1. Provides Bay-related recreation goods and services – survey research
 2. Bay used to produce goods and services – commercial fishing, shipping and cruise ship operations – existing data
- Indirect businesses supply goods and services to the direct businesses
- Induced refers to businesses that provide goods and services to the indirect businesses and all employees

Land use databases provide current and, possibly, historic information

- County supplied GIS databases of current land uses by land use type, location, property sales
- Historic info might be extracted from county databases
- GIS database available from InfoUSA provides business location, type, sales and employment at the location, owner name and address (current year only)
- Both databases appear to be very high quality

Current recreation uses and economic contribution of the Bay

- Intercept surveys of visitors and residents using Bay and General Visitor Survey
 - Feb to Apr 2004 and July to Sept 2004
- Resident and Resident Boater mail surveys
 - May 2004
- Survey responses used to estimate:
 - ▶ Number of person-days by recreation activity
 - ▶ Itemized Bay-related expenditures converted to sales, income, employment, taxes generated using IMPLAN Model
 - ▶ Responses to potential Bay management scenarios statistically evaluated

Current uses and economic contribution of Bay as businesses use Bay to provide goods and services

- Commercial fishing – historic species landings and value from State of Florida
- Cruise ship industry – economic impact report from Port Everglades should be available soon
- Other businesses – available reports and InfoUSA business database (current number, sales and employment of businesses in County)
- IMPLAN Model converts direct sales to direct, indirect and induced sales, income, employment and taxes at county, region and state level

IMPLAN Regional Economic Input-Output Model

- Computer model simulates supply of and demand for goods and services within county or county groups
- Uses county level data on sales, income, employment, taxes
- Available for all 50 states
- Developed in the 1980s by the USFS
- Privatized in 1993 by the Minnesota IMPLAN Group

Other information sources to assess current uses

- BNP uses and economic contribution from NPS (also historic)
- Biscayne Bay Strategic Plan for Public Access
 - Map of Bay for use in surveys
 - Inventory of land uses, public access areas, infrastructure, amenities, Bay user groups
- County GIS databases
- Hotel/motel information from county

Historic uses and economic contribution of Bay will be inferred from available information

1. Estimate uses and sales of direct businesses using all available information
2. Use versions of IMPLAN model representing historic economic conditions to obtain total sales, income, employment and taxes to county, region, state generated from Bay uses

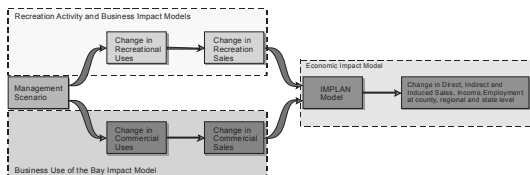


Impact of management scenarios on uses and economic contribution of Bay

- Changes in water quality
- Changes in restrictions on Bay uses
- Changes in access to Bay



Schematic of Biscayne Bay Economic Impact Model



Biscayne Bay economic model forecasts management impacts on sales, income, employment

Sub-Model	Purpose
1. Recreation Activity Impact Model	<ul style="list-style-type: none">• Estimates changes in user-days and expenditures by type• Feeds into Model 2
2. Recreational Business Impact Model	<ul style="list-style-type: none">• Estimates direct effects – changes in sales to recreation businesses
3. Business Bay Use Impact Model	<ul style="list-style-type: none">• Estimates direct effects – changes in sales to businesses that use Bay
4. Economic Impact Model	<ul style="list-style-type: none">• IMPLAN w/ input data and production functions checked• Input is direct effects from Models 2 and 3• Output is total effects to local area, region, state

Types of models to develop management impacts simulation

1. Statistical model using historic data
2. Application of results from similar studies
3. Statistical modeling using survey research – recreational Bay uses
4. Case study model – non-recreational Bay uses



Statistical model using historic data

- Statistically estimate parameters of equations using historic annual data
- Equations express direct business sales as function of economic, tourist, population, trend, and Biscayne Bay variables
- Each equation represents one type of direct business
- Economic theory and available data will determine exact form of the model
- Estimated equations predict impact of Biscayne Bay variables on direct sales

Statistical model using survey research

- Surveys used to collect current use information and potential impact of water quality and access on future Bay uses
- Responses used to estimate two equations:
 1. Probability that a person uses the Bay for recreation, and
 2. Number of days that the person uses the Bay for recreation as function of person's socioeconomic characteristics, Bay quality and access, travel cost

All surveys ask management questions related to water quality and access

Four surveys underway:

- Biscayne Bay User Survey – Residents
- Biscayne Bay User Survey – Visitors
- Biscayne Bay Resident Survey
- Biscayne Bay Resident Boater Survey

Project will search for relevant studies

- Identify studies that estimated use impacts before and after management action to water body
- Relevant information will be used in this study

Case study analysis provides useful information

- Used in many studies that evaluate impact of environmental regulations and programs
- Identify characteristics of a business that would cause one business to react differently to management than another business
- Design model businesses based on these characteristics
- Simulate the impact of management scenario on the model businesses
- Infer results to rest of businesses
- Develop computer model to evaluate impacts using different scenario parameters

For each management scenario, Biscayne Bay Management Economic Impact Model will provide changes in:

- Number of person-days by recreation activity
- Uses of Bay by non-recreation businesses
- Sales of direct businesses by business type
- Total direct, indirect and induced sales, income, employment, taxes generated from Bay uses in county, region and State
- Results presented for 2005 and 2030

Biscayne Bay Economic Study Summary

1. Uses and economic contribution of Bay
 - Historic – 1980 to 2003
 - Current – 2004
 - Future – 2005 to 2030
2. Impact of management on Bay uses and economic contribution