

Florida Assessment of Coastal Trends (FACT)

Introduction

Overview

Many governmental agencies operate programs for years and spend millions of dollars without ever attempting to make any assessment of the impacts or documenting the status and trends of the subject of their efforts. The result can be the loss of focus for the program, the inefficient use of financial and personnel resources, and the loss of public and political support. For the past five years planning professionals at all levels of government, particularly environmental planners, have been aggressively working on redesigning their policy planning processes and actively building an intergovernmental partnership to improve their joint public policy management skills by adding measurements of progress, increasing accountability, and focusing on results.

A major area of importance is the development of environmental and growth management indicator systems. Indicators are useful tools for a wide variety of management purposes and the capacity of individual public organizations to develop policy is greatly enhanced by the availability of good indicator systems.

The multiple uses of indicators and the pivotal role they play in any serious attempt to improve public management have focused much attention on procedural and technical issues concerning the development of indicator systems at all governmental levels. International, national, and regional conferences and a variety of publications on indicators and indicator systems development have created increasingly high levels of interest, especially among state and regional agencies. In 1990, only a handful of states were using indicators in any direct sense, and only two, Florida and North Carolina, had made any explicit attempt to systematically develop and document a comprehensive environmental indicator system. Federal agencies were only beginning to develop explicit indicator systems.

That has radically changed. There is now so much indicator work going on that the situation is almost chaotic. Almost 30 states have developed or are finishing initial work on environmental indicators or closely related state of the environment documents, and virtually all states report they expect to undertake indicator development projects in the near future. At the federal level a number of interagency and intraagency organizations are at work to develop indicator systems and, perhaps more importantly, to begin the process of the redesign of federal environmental monitoring systems. Just now beginning is a movement at the local level, and even at the community level, to use indicators.

Florida Assessment of Coastal Trends (FACT)

The Florida Coastal Management Program (FCMP) provided national leadership by becoming the first state coastal program to develop an explicit indicator system when in 1995 they developed the first Florida Assessment of Coastal Trends (FACT 1995). This tool provided a comprehensive perspective of the important environmental, economic, and social values associated with the coast; a means of evaluating Florida's progress in protecting its coastal areas; a basis for making strategic decisions about programs and financial resources; and information about coastal issues and problems to other decision-makers and the general public.

The Florida Coastal Management Program contracted with the Florida Center for Public Management (FCPM) of Florida State University to assist in the design and development of this system. FCPM was charged with preparing:

a report containing a structured collection of environmental, growth management, economic and social indicators that collectively describe the status of Florida's coastal areas, that portray the historic trends affecting coastal Florida, and that project Florida's coastal future.

FCCPM was required to accomplish the following to successfully complete this objective:

- work intensively with Florida Coastal Management Program staff to develop a design and structure for the system that completely reflects what is needed and desired for the system, assess existing sources of indicator data and information already known and accessible to FCCPM and utilize that which is appropriate,
- conduct research as needed to identify other desirable data and information needed to develop additional key indicators, and
- prepare specific technical documentation to support each indicator to include a discussion of the concept of the indicator, the source of the data, a contact person with address and phone number, the format in which the data resides, any costs associated with its acquisition, the frequency of collection of the data, the geographic coverage, an assessment of the strengths and limitations of the indicator and its data, a discussion of how the data will be collected, a brief analysis of the data, and a graphic or tabular display.

The original **Florida Assessment of Coastal Trends (FACT 1995)** document represented the product of these activities. Structured across its nine issue areas are 98 indicators that reflect important measurements of key environmental, social, economic, cultural, and aesthetic issues affecting Florida's coastal areas.

In 1996, the trends and conditions outlined in **FACT 1995** were used as the foundation for the development of the first **Florida State of the Coast Report**, a summary discussion of critical information regarding coastal issues in Florida.

This current document – **Florida Assessment of Coastal Trends (FACT 1997)** – is the first update and revision of FACT and represents a significant step forward in refining, refocusing and consolidating the original indicator system. While the general structure of **FACT 1995** was retained along with many of the original indicators, a number of weak or unsupported indicators were deleted and new, more powerful data sources were identified to support new indicators.

Process for Developing **FACT 1997**

The process of developing **FACT 1995** included the following steps:

FACT is structured around nine strategic issues judged to be critical to the future of Florida's coast over the next 20 years. These broad strategic issues were refined into two-to-four sub-issues or components of each issue. These sub-issues then became the final framework around which indicators were developed. The nine issues and their associated sub-issues are as follows:

- | | |
|---|--|
| <p>1) Impact of Growth in the Coastal Zone</p> <ul style="list-style-type: none">• Impacts of Population Growth• Patterns of Development• Sufficiency of Infrastructure• Economic Impacts | <p>5) Managing Fresh Water Allocation</p> <ul style="list-style-type: none">• Fresh Water Allocated for Ecological Maintenance• Fresh Water Allocated to Meet Residential Needs• Fresh Water Allocated to Meet Commercial/Industrial Needs• Fresh Water Allocated to Meet Agricultural Needs |
| <p>2) Disruption of Coastal Physical Processes</p> <ul style="list-style-type: none">• Alteration of Existing Natural Systems• Construction of Altering Structures | <p>6) Sustaining the Human Uses of the Coast</p> <ul style="list-style-type: none">• Maintenance of Recreational Value• Sustainable Economic Use• Balancing Development with Coastal Resources |
| <p>3) Responding to Coastal Threats and Hazards</p> <ul style="list-style-type: none">• Coastal Hazard Mitigation• Incompatible Living Areas• Industrial Impacts | <p>7) Balancing Public and Private Uses of Resources</p> <ul style="list-style-type: none">• Private Property Issues (no indicators have been developed for this sub-issue)• Stewardship of Coastal Resources |
| <p>4) Degradation and Restoration of Coastal Ecosystems</p> <ul style="list-style-type: none">• Habitat Change• Species Population Trends• Water Quality Trends | |

8) Preservation of Cultural and Aesthetic Resources

- Preservation of Archaeological and Historical Resources
- Preservation of Living Resources
- Conservation of Coastal Open Space

9) Encouraging Public Awareness and Involvement

- Public Awareness
- Public Participation

Good indicator systems require regular maintenance to remain effective. The scheduled revisitation of **FACT 1995** which led to this **FACT 1997** is responding to three major needs:

- the need to periodically update the data in the indicators to continue the demonstration of relevant trends,
- the need to periodically assess the existing measures to ensure they are the best possible indicators, and
- the need to ensure that new and emerging issues have appropriate measures.

The revision process that led to **FACT 1997** included the following elements:

Overall Assessment: The entire indicator system was comprehensively reviewed to identify strengths and weaknesses. Groups of indicators were reviewed to assess their joint effectiveness in supporting issue and sub-issue areas. These assessments directed attention toward new or substitute indicators for some areas and suggested deletion of others.

Individual Assessment: Each indicator was individually assessed to make a judgment regarding its contribution to the effectiveness of the system. The ability to observe, reconsider and reevaluate the indicators originally chosen allowed staff to identify the strengths and weaknesses of the indicators. Proposed indicators with no data were dropped as formal indicators. Indicators with weak data or technical flaws were similarly dropped from the system. Where a better source of data to support an existing indicator was discovered, the substitution was made.

Updating Retained Indicators: Indicators retained from the original system were updated and revised to keep them current. When available new data points were added, all tables, graphs and analysis were appropriately modified.

Addition of New Indicators: Since the development of **FACT 1995** new sources of data have been developed or discovered that provided indicators for some dimensions of the issues and sub-issues that had previously been unsupported. Where such data was available, new indicators were developed and provided in the **FACT 1997**.

Reformatting: An explicit effort was made to improve the graphic impact of **FACT 1997** through the use of symbols to code issue groups and types of indicators (environmental, economic, cultural-aesthetic, and quality of life). (See the following section for details.)

Review: All indicators were:

- cross-reviewed by FCPM staff,
- reviewed by Florida Coastal Management Program staff,
- reviewed by the individual or organization supplying the data, and, in some cases,
- reviewed by an outside expert.

Conceptual Frameworks

The following definitions and conceptual frameworks have been used in the development of **FACT 1995 and FACT 1997**.

Definitions. Basic indicator-related definitions include:

- **Parameter:** A property that is measured or observed.
- **Indicator:** A parameter, or a value derived from a parameter, which points to/provides information about/describes the state of a phenomenon/environment/area with a significance extending beyond that directly associated with a parameter value.
- **Index:** A set of aggregated or weighted parameters or indicators.

Uses. It is axiomatic that environmental agencies at all levels should use indicators to make key strategic decisions concerning the success of their efforts and to make important program and budget adjustments. Startlingly, this is much too often not the case. Federal environmental agencies and their associated state agencies are driven by huge, monolithic programs which over the years have taken on importance unto themselves. Most of the measurement and reporting that occurs deals with program activities rather than measures that deal with what is actually happening. With leadership from some federal agencies and a few of the states, this is starting to change with the initiation of projects that are beginning to use results-based data and information as the foundation for making decisions.

Indicators represent components or processes of real world systems. This means that they function as models and have all of the possibilities and limitations that models offer. The numerical values of indicators tend to have special meaning to particular observers – a meaning that goes beyond the numerical value itself. For example, the number of top trophic level predator birds could be used to represent the vitality of a whole ecosystem based on the species habitat requirements. In other words, indicators generally simplify in order to make complex phenomena quantifiable in such a manner that communication is either enabled or promoted.

Indicators are only as useful as the information they are based upon. The measuring devices that are used to evaluate problems, their causes, and the steps taken to address those problems need to be selected carefully from this information and presented to decision-makers and to the general public in ways that are relevant to them and can be readily understood.

Indicators are useful tools for a wide variety of management purposes. The availability of indicator systems at the state level of government can increase the capacity of individual states to develop policy. Indicators can be used as a:

- mission-level tool to provide a broad evaluation of an agency's performance,
- measurement foundation for structuring goals,
- basis for measuring and communicating achievement and progress,
- basis for making strategic planning and budgeting decisions,
- means of evaluating the performance of individual programs and activities,
- tool in building particular constituencies,
- basis for the development of education programs, and
- tool for public relations and information dissemination.

In order to measure success and failure of environmental protection programs by their environmental results rather than by bureaucratic inputs – regulators, the regulated community, and the public should be encouraged to find the least costly, most effective ways to achieve those results within a geographic jurisdiction.

The relatively young and emerging science and art of developing indicators and indicator systems is evolving some simple conceptual tools to provide clarity and order to the process. The following presents several conceptual approaches presently in use by FCPM in describing and displaying the indicator systems with which they are associated.

Qualification Standards. For each individual indicator system being developed, it is useful to list with as much precision and completeness as possible the specific criteria used to define an acceptable indicator for that system. Described in such criteria might be such concerns as:

- the geographic scope of the indicators (national, statewide, regional, ecosystem, local),
- the selection criteria used,
- the acceptable types of indicators (environmental, program, administrative),
- the availability of data (is it available now or is it a prospective indicator?), or
- how it is intended to be used (its purpose).

By clearly identifying such standards early in the process and constantly comparing the selection of indicators against them, attention can remain focused on indicators appropriate for the system being developed.

Indicator qualification standards employed in the development of *FACT* include:

- the geographic scope of the indicators must measure an activity or condition that affects Florida's coast or its 35 coastal counties,
- the indicator must reflect an important dimension of one of the nine strategic issues, and
- any Type A indicator (see below) must meet FCPM Indicator Selection Criteria (see following page).

Selection Criteria. Ideally, each indicator finally included in an indicator system should meet a series of standards designed to ensure high and consistent quality. Listed below are the selection criteria employed by FCPM in all its indicator work. Selection criteria are of two types:

1. **essential** – criteria an indicator **must** meet, and
2. **preferable** – criteria an indicator **should** meet.

Essential Criteria include:

- **Measurable:** The indicator measures a feature of the environment that can be quantified simply using standard methodologies with a known degree of performance and precision.
- **Data quality:** The data supporting the indicators are adequately supported by sound collection methodologies, data management systems, and quality assurance procedures to ensure that the indicator is accurately represented. The data should be clearly defined, verifiable, scientifically acceptable, and easy to reproduce.
- **Importance:** The indicator must measure some aspect of environmental quality that reflects an issue of major national importance to states and to the federal government in demonstrating the current and future conditions of the environment.
- **Relevance:** The indicator should be relevant to a desired significant policy goal, issue, legal mandate, or agency mission (e.g., contaminated fish fillets for consumption advisories; species of recreational or commercial value) that provides information of obvious value that can be easily related to the public and decision-makers.
- **Representative:** Changes in the indicator are highly correlated to trends in the other parameters or systems they are selected to represent.
- **Appropriate scale:** The indicator responds to changes on an appropriate geographic (e.g., national or regional) and/or temporal (e.g., yearly) scale.
- **Trends:** The data for the indicator should have been collected over a sufficient period of time to allow some analysis of trends or should provide a baseline for future trends. The indicator should show reliability over time, bringing to light a representative trend, preferably annual.
- **Decision support:** The indicator should provide information to a level appropriate for making policy decisions. Highly specific and special parameters, useful to technical staff, will not be of much significance to policy staff or management decision-makers.

Preferable Criteria include:

- **Results:** The indicator should measure a direct environmental result (e.g., an impact on human health or ecological conditions). Indicators expressing changes in ambient conditions or changes in measures reflecting discharges or releases are acceptable, but not preferred. Process measures (e.g., permits, compliance and enforcement activities, etc.) are not acceptable.
- **Understandable:** The indicator should be simple and clear, and sufficiently non-technical to be comprehensible to the general public with brief explanation. The indicator should lend itself to effective and appealing display and presentation.
- **Sensitivity:** The indicator is able to distinguish meaningful differences in environmental conditions with an acceptable degree of resolution. Small changes in the indicator show measurable results.
- **Integrates effects/exposures:** The indicator integrates effects or exposures over time and space and responds to the cumulative impacts of multiple stressors. It is broadly applicable to many stressors and sites.
- **Data comparability:** The data supporting an indicator can be compared to existing and past measures of conditions to develop trends and define variation.
- **Cost effective/availability:** The information for an indicator is available or can be obtained with reasonable cost and effort and provides maximum information per unit effort.
- **Anticipatory:** The indicator is capable of providing an early warning of environmental change.

Hierarchy of Indicators. The “hierarchy of indicators for environmental resources” was developed to assist in the classification of measurements of pollution constituents that are subject to governmental regulation and it is most effective when it is employed for that purpose. It has more limited utility when used to classify other types of environmental concerns, particularly ecological issues. The hierarchy is thus not being used for non-environmental resource indicators, including the social, cultural and economic indicators in this edition of FACT. The ranking, where appropriate, is found in the Data Characteristics section of the indicator sheet.

Hierarchy of Indicators for Environmental Resources					
Output		Outcome			
1	2	3	4	5	6
Actions to Protect Coastal Environmental Resources by Federal or State Agencies	Responses of the Community that Affect the Protection of Coastal Environmental Resources	Changes in Human Inputs that Lead to Coastal Environmental Degradation	Changes in Ambient Conditions or in the Quantities of Coastal Environmental Resources	Changes in Uptake and/or Assimilation by Coastal Biota	Changes in the Health of Humans, Biota, or Ecological Systems in Coastal Areas

Theme Icons. Measuring complex systems eventually reveals their interdependent nature. The coastal ecology, our quality of life, the economic structure, and our cultural and aesthetic values are deeply interconnected and our overall health and welfare is made up of a combination of these factors. Each indicator measures one or more of these characteristics and, in an attempt to illustrate these connections, has been labeled with a series of icons representing each component. Arguments can be made in most cases that an indicator measures some aspect of each category, but only the most direct connections were highlighted for clarity. Connections which were less evident or not truly accurate are shown in a light shading. (Note: The manatee graphic was provided by Bonnie J. Abellera.)



Ecology - represents indicators which measure some component of coastal ecology.



Economic - represents indicators which measure some component of the coastal economy.



Quality of Life - represents indicators which measure some quality of life component.



Cultural/Aesthetic - represents indicators which measure some Cultural/Aesthetic component.

This document is available on the internet at:
<http://www.fsu.edu/~cpm/FACT97/index.html>