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Characterization of the Rookery Bay National Estuarine Research Reserve

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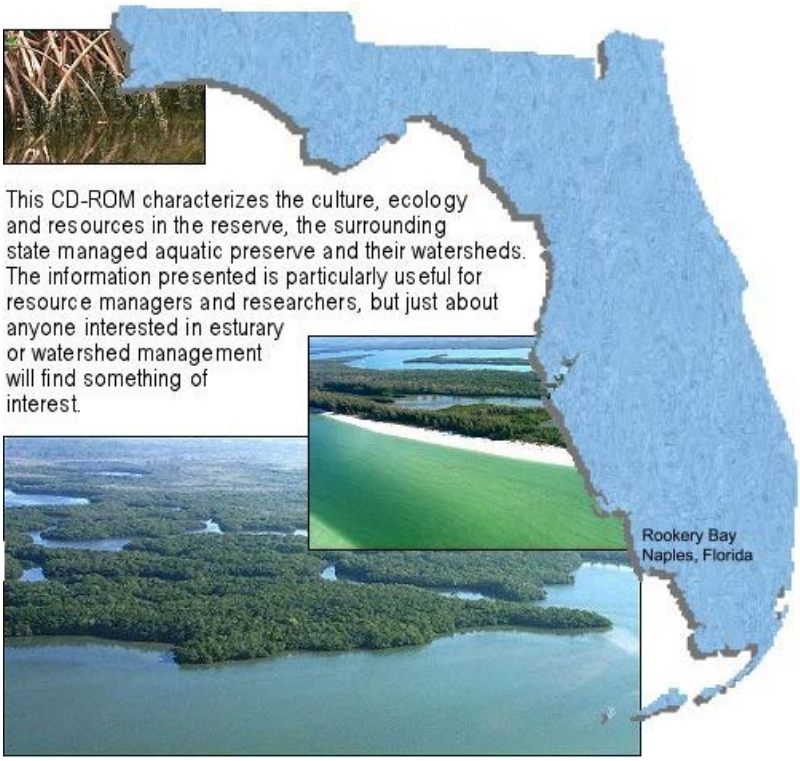

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Rookery Bay NERR

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Rookery Bay

Slide Show

The Rookery Bay and Ten Thousand Islands ecosystem is a prime example of a nearly pristine subtropical mangrove forested estuary. RBNERR is located in the West Florida subregion of the West Indian Biogeographic Region. The total estimated surface area of open waters encompassed within proposed boundaries is 70,000 acres, 64 percent of RBNERR. The remaining 40,000 acres are composed primarily of mangroves, fresh to brackish water marshes, and upland habitats. Rookery Bay has a surface area of 1,034 acres and a mean depth of about 1 m. Salinities range from 18.5 to 39.4 parts per thousand with lower values occurring during the wet season from May through October. Highest values occur during the dry seasons (winter and spring) and can exceed those of the open Gulf of Mexico (35-36 parts per thousand).

Approximately 3,772 acres within the RBNERR boundaries are leased to the Department of Environmental Protection (DEP) by NAS, The Nature Conservancy, and CSF. State-owned lands, including 70,000 acres of submerged lands and approximately 22,928 acres of acquired lands, are held in fee simple title by the Board of Trustees. Approximately 13,300 additional acres within the boundaries were acquired by the state as part of a settlement agreement with the Deltona Corporation. Parcels totaling approximately 500 acres represent privately-owned inholdings within RBNERR. DEP has proposed for NOAA consideration that the boundaries of the RBNERR be expanded to incorporate adjacent state-owned coastal and submerged lands. DEP has designated all tidally connected waters within the boundaries of RBNERR and Cape Romano/Ten Thousand Islands Aquatic Preserves as Class II and Outstanding Florida Waters (OFW). OFW designation implements the state's highest standards for proposed developments, and does not allow for direct discharges that would lower ambient water quality, or indirect discharges that would significantly degrade water quality.

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Ecology

Many habitat and land use maps, created even in the 1990s, depict the entire coastal fringe of southwest Collier County as solid areas of mangroves. While it is true that mangroves are the predominant wetland in and around the Reserve and the Ten Thousand Islands, the communities of Rookery Bay National Estuarine Research Reserve and its watersheds are a rich and varied mosaic of saltwater, freshwater, and upland ecosystems. There are over 500 plant, 22 mammal, 90 bird, 210 fish, 60 crustacean, and 40 reptile and amphibian species documented in the Reserve.

The plant communities of southwest Florida have been categorized several different ways. Five of these are presented in Davis (1943). Florida Natural Areas Inventory (FNAI) and the contributors to Ecosystems of Florida (Myers and Ewel 1990) have suggested more recent classifications for all of Florida. A classification scheme that is appropriate for a specific reserve, however, needs to meet criteria determined by management issues, scale of management or research, and site-specific structure and function.

This section presents 22 classifications based on pertinent management practices, primarily fire and inundation requirements, and in some instances, susceptibility to exotic plant colonization. The descriptions provided are based on vegetation because this is the easiest recognizable feature. More detailed species lists, for both flora and fauna, are provided, but gaps in completeness exist. These descriptions have been tailored to specific findings in the RBNERR communities representative of each class where available.

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Resource Management

Diversity Management | Watersheds | Environmental Contaminants | Harmful Algal Blooms

Resource Management

The Reserve's stewardship activities were initiated in 1990 and a formal staffed program developed in 1993 to address the stewardship, restoration and land acquisition needs for the Reserve. Since that time, this program has worked effectively to maintain the ecological integrity of the Reserve to provide a stable environment for research and education consistent with the NERRS mission. Current staffing (2001) for the RBNERR Resource Management program includes a program coordinator, watershed manager and field biologist. Additional temporary staff (OPS), funded through grant and management funds, assist with priority projects.

Key elements of the RBNERR resource protection strategy:

- Facilitating public acquisition of key lands associated with the Rookery Bay and Ten Thousand Islands ecosystems to help ensure long-term preservation of resources.
- Identifying essential habitats within RBNERR.
- Working in cooperation with federal and state agencies to protect listed species such as the West Indian manatee, American crocodile, Florida scrub jay and loggerhead sea turtle.
- Working with the regulatory and development community to address potential impacts associated with planned development projects within the watersheds of the Reserve.
- Designing and conducting restoration of disturbed wetlands, altered watershed inflows, and plant communities infested with invasive non-native plants.

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Research

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Research

The Reserve's Research program provides the scientific information necessary to support an adaptive management strategy for conservation of natural biodiversity for the area managed by the Reserve. This strategy entails 1) identifying areas of scientific uncertainty, 2) planning and conducting field experiments to test hypotheses related to real-world management strategies, 3) exporting this information to environmental managers and decision makers, and 4) recommending improved management strategies based on the results of these experiments. A primary function of the Research program is to develop and monitor indicators of natural biodiversity at the levels of watershed, community, population and organism. This science-based hierarchical approach is necessary to more effectively manage the Reserve's natural resources and assess, prioritize and improve the effectiveness of future habitat restoration projects. To be successful, these activities are closely coordinated with the Reserve's Resource Management, Public Access and Education programs.

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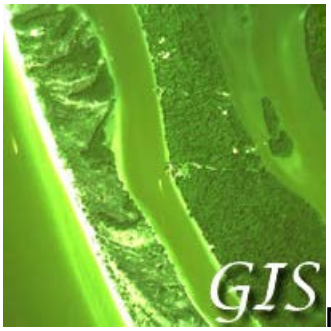

Models

GIS Importance
Composite Models
Dynamic Models

Five resource management issues at the Reserve are particularly conducive to assessment using GIS models and simulations. Determining the restoration and recharge potential of acquisitions prior to clearing or planting improves long-term success of work completed and insures better allocation of funds. Simulation of rain events, historic and with varying levels of development, illustrate potential areas of freshwater flows too high or too low for existing ecosystems. Determining areas of sensitivity to specific human uses allows the mapping of buffer zones to increase protection of endangered species and rare communities. Testing hypothesis about rates of and areas advantageous to invasive non-native species will lead to improved ability to prioritize removal efforts and requests for realistic manpower and funding.

A flowchart and verbal description of example models are presented and, for three example models, a map that illustrates results.

Bibliography

An extensive body of research has been completed at RBNERR, both by staff and visiting investigators. Some of this is available in refereed journals and government reports available to the general public. However, a significant amount is available only as technical reports, dissertations, thesis and unpublished manuscripts. Further, a fair amount of the published work was completed in conjunction with other higher interest sites, making it difficult to locate references specific to Rookery Bay and the western Ten Thousand Islands.

This bibliography is a compilation of all research currently summarized for the Reserve, the Aquatic Preserve and their watersheds. The ProCite data file is included for the convenience of authors in need of citations. For directions on use of this feature, click here. If you do not have ProCite and do not wish to load the read-only version of ProCite, all the citations are listed here, and most are included in subject bibliographies made from the ProCite database.

The unpublished references will soon be available for review at Florida Gulf Coast University library.