

Final Evaluation Findings

**Sapelo Island National Estuarine Research Reserve**

*January 2000 – December 2004*



Office of Ocean and Coastal Resource Management  
National Ocean Service  
National Oceanic and Atmospheric Administration



## TABLE OF CONTENTS

<b>I.</b>	<b>Executive Summary..</b>	<b>.1</b>
	A. Overview	
	B. Summary of Accomplishments	
	C. Summary of Recommendations	
<b>II.</b>	<b>Program Review Procedures</b>	<b>.4</b>
	A. Overview	
	B. Document Review and Issue Development	
	C. Site Visit to Sapelo Island, Georgia	
<b>III.</b>	<b>Reserve Program Description</b>	<b>.6</b>
	A. The National Estuarine Research Reserve System	
	B. The Sapelo Island National Estuarine Research Reserve	
	1. Reserve Site Description	
	2. Reserve Administration	
<b>IV.</b>	<b>Review Findings, Accomplishments and Recommendations</b>	<b>.9</b>
	A. Operations and Management	
	1. Staffing	
	2. SINERR Management and Planning	
	3. Resource Advisory Committee	
	4. Facilities	
	B. SINERR Partnerships and Collaborations	
	1. University of Georgia	
	2. Georgia Coastal Management Program	
	3. R. J. Reynolds Wildlife Management Area	
	4. Gray's Reef National Marine Sanctuary	
	5. Non-Governmental Partners	
	C. Research and Monitoring	
	1. Research Highlights	
	2. Monitoring Programs	
	3. Site Profile	
	4. Graduate Research Fellowships	
	5. Research Program Visibility	
	D. Education, Interpretation and Outreach	
	1. Education Program	

- 2. Coastal Training Program
- 4. Outreach and Communications

E. Stewardship Efforts

- 1. Stewardship Program
- 2. Volunteer Program and the Friends of Sapelo

**VI. Conclusion** . . . . . **.33**

**VII. Appendices** . . . . . **.34**

- Appendix A. Program Response to Previous Evaluation Findings
- Appendix B. People and Institutions Contacted
- Appendix C. People Attending Public Meeting
- Appendix D. NOAA’s Response to Written Comments

## I. EXECUTIVE SUMMARY

### A. OVERVIEW

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System (NERRS). Sections 312 and 315 of the CZMA require the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic performance reviews or evaluations of all federally approved National Estuarine Research Reserves (NERR). The review described in this document examined the operation and management of the Sapelo Island National Estuarine Research Reserve (SINERR) during the period of February 2000 through December 2004. The Sapelo Island National Estuarine Research Reserve is administered by the Georgia Department of Natural Resources (DNR) Wildlife Resources Division.

This document describes the evaluation findings of the Director of NOAA's Office of Ocean and Coastal Resource Management (OCRM) with respect to SINERR during the review period. The fundamental conclusion of these findings is that DNR is successfully implementing and enforcing its federally approved NERR. The recommendations made by this evaluation appear in **bold** and follow the relevant section of findings. Two types of recommendations are possible: (1) Necessary Actions address programmatic requirements and *must* be implemented by the indicated date; and (2) Program Suggestions describe actions that NOAA believes DNR should take to improve the program but that are not currently mandatory. Program Suggestions that are reiterated in consecutive evaluations due to continuing problems may be elevated to Necessary Actions. If no dates are indicated, DNR is expected to address the recommendations by the time of the next §312 evaluation, which will occur approximately three to five years following the release of these final evaluation findings. This document contains fourteen Program Suggestions and three Necessary Actions. NOAA will consider the findings made by this evaluation when making future financial award decisions regarding SINERR.

### B. SUMMARY OF ACCOMPLISHMENTS

The evaluation team documented a number of SINERR accomplishments during the review period. These include:

Issue Area	Accomplishment
Reserve Advisory Committee	The SINERR has improved and increased its collaboration with Reserve Advisory Committee representative organizations resulting in meaningful research and education efforts to better understand and protect the Reserve.
Research and Monitoring Program	NOAA commends SINERR for creating a learning opportunity out of the necessary restoration of the Dean Creek causeway. This impressive research collaboration will result in much needed data for the coastal management community.
Education	SINERR greatly expanded and enhanced its educational programming

Program	during the review period. The Reserve is reaching many more students through curricula development and building strong education collaborations with regional partners.
Coastal Training Program	SINERR has done an admirable job of identifying coastal resource manager and coastal decision-maker needs and of developing opportunities for public education and training to address them.
Stewardship Program	SINERR has successfully developed an active Stewardship Program during the review period; the Stewardship Coordinator has initiated various efforts that complement the Reserve's research and education programs.
Volunteer Program	NOAA commends SINERR for its active volunteer program, which engages Georgia communities on the coast and inland, and provides critical support to reserve activities.

### C. SUMMARY OF RECOMMENDATIONS

In addition to the accomplishments listed above, the evaluation team identified several areas where the program could be strengthened. Recommendations are in the form of Program Suggestions (PS) or Necessary Actions (NA). Areas for program improvement include:

Issue Area	Recommendation
Staffing	NA: To ensure the long-term stability of the Research Coordinator's position, the SINERR must continue to work within DNR to pursue its original commitment to find a permanent source of state funding.
Management Plan	NA: By October 2006, the SINERR must submit a final draft of its updated management plan. As part of the management plan revision process, the SINERR must include appropriate staff from other DNR offices on Sapelo (Wildlife Management Area and Parks and Recreation), the UGA System, and the Hog Hammock Community.
Island Visitation	PS: NOAA strongly encourages SINERR to facilitate action by and work with the Island Manager to assess current and potential stressors to the Reserve resulting from visitation and address relevant recommendations from the 2000 island visitation trends study.
Commercial Timbering	PS: SINERR should continue moving forward with appropriate language to formalize, and identify and ensure SINERR's role in future compliance with, restrictions on commercial timbering within the Reserve boundaries in its management plan.
Strategies to Reduce Impacts	NA: As part of the management plan update, the SINERR must work with the Island Manager to develop strategies to reduce, minimize, and find ways to avoid the impacts within the Reserve that result from Island-wide users and uses (e.g., visitation, vehicle and boat traffic, solid waste, etc.).
Reserve Advisory Committee	PS: The SINERR should work with the Reserve Advisory Committee to re-evaluate its role in developing strategies and identifying priority areas for input into SINERR issues, and include a description of their enhanced

	role in the updated management plan. The RAC and SINERR should also reassess membership and remedy any gaps in representation.
Visitors Center	PS: As part of the revision and update to the management plan, NOAA encourages SINERR to develop strategies to better utilize and improve the mainland Visitors Center for use in its education program, especially in light of anticipated increases in Island visitation requests.
Visitors Center	PS: NOAA encourages SINERR to incorporate information about potential visitor impacts to Sapelo Island, and particularly the Reserve, into the education and interpretive efforts at the Visitors Center and on SINERR, where appropriate.
Research Dormitory	PS: SINERR should initiate an agreement, such as a Memorandum of Understanding, with UGAMI on the priority uses, space allocation, and management processes for the new research dormitory, and include the agreement in the update of the SINERR Management Plan.
Island Partner MOUs	PS: The SINERR should work proactively with the Island Manager on a form of agreement, such as an MOU, or coordination process with other DNR components on Sapelo, and the UGA System, to improve the relationship among the Island partners.
Research Translation	PS: NOAA encourages SINERR to develop more educational and outreach materials, such as fact sheets or one-pagers, that translate current research being conducted by Reserve staff and partners on Sapelo Island.
Education Program Evaluations	PS: NOAA strongly encourages SINERR to develop a mechanism to evaluate educator trainings and educational tours to better gauge program effectiveness and future needs.
Outreach	PS: NOAA encourages SINERR to explore ways to fund, and to work with the ERD communications director on, the development of a communications strategy for all aspects of the Reserve programming.
Stewardship Program	PS: NOAA strongly encourages the SINERR to identify the long term goals of the Stewardship Program and the roles and responsibilities of the Stewardship Coordinator (as part of the update of the management plan).
GIS	PS: NOAA strongly encourages the SINERR to work towards making the wealth of GIS information available via the web in order to allow the Stewardship Coordinator more time to work on other program efforts.
GIS	PS: NOAA encourages the SINERR to make a priority of securing formal GIS training (e.g. NOAA Coastal Services Center Geo-Tools) for the Stewardship Coordinator.
Friends of Sapelo	PS: NOAA encourages SINERR to work with the Friends of Sapelo advisory board, and utilize the National Friends Network and ERD, to develop strategies (marketing, communication, other) to ensure the longevity of the organization.

## II. PROGRAM REVIEW PROCEDURES

### A. OVERVIEW

NOAA began its review of SINERR in October 2004. The §312 evaluation process involves four distinct components:

1. An initial document review and identification of specific issues of particular concern;
2. A site visit to Georgia including interviews and a public meeting;
3. Development of draft evaluation findings; and
4. Preparation of the final evaluation findings, partly based on comments from the state regarding the content and timetables of recommendations specified in the draft document.

### B. DOCUMENT REVIEW AND ISSUE DEVELOPMENT

The evaluation team reviewed a wide variety of documents prior to the site visit, including: (1) federally approved Environmental Impact Statement and program documents; (2) financial assistance awards and work products; (3) semi-annual performance reports; (4) official correspondence; (5) previous evaluation findings; and (6) relevant publications on natural resource management issues in Georgia.

Based on this review and on discussions with OCRM's Estuarine Reserves Division, the evaluation team identified the following priority issues:

- Major accomplishments during the review period;
- Status of the reserve's general administration, including grants, fiscal management and staffing;
- Status and visibility of research, education and stewardship programs, including local and system-wide initiatives such as the System-wide Monitoring Program (SWMP) and the Coastal Training Program (CTP);
- The manner in which SINERR coordinates with other federal, state, and local agencies and programs;
- Status of SINERR facilities, land acquisition projects and resource management;
- The status and effectiveness of SINERR staffing and programs, and participation in national research, monitoring and education programs;

- Status of SINERR’s management plan revision and compatibility of existing and planned uses;
- SINERR’s role at the local level, and its integration with partners; and
- The manner in which SINERR has addressed the recommendations contained in the §312 evaluation findings released in 2000.

### **C. SITE VISIT TO SAPELO ISLAND, GEORGIA**

Notification of the scheduled evaluation was sent to DNR, SINERR, relevant federal environmental agencies, and regional newspapers. In addition, a notice of NOAA’s “Intent to Evaluate” was published in the *Federal Register* on October 15, 2004.

The site visit to Georgia was conducted on December 7-12, 2004. Joelle Gore, Evaluation Team Leader, and Kim Penn, OCRM National Policy and Evaluation Division; Susan White, SINERR Program Specialist, OCRM Estuarine Reserves Division; and Michael McKenzie, Manager, ACE Basin National Estuarine Research Reserve, South Carolina, formed the evaluation team.

During the site visit, the evaluation team interviewed SINERR staff, senior DNR and other state officials, federal agency representatives, coastal researchers, environmental educators, nongovernmental representatives and private citizens. Appendix B lists persons and institutions contacted during this review.

As required by the CZMA, NOAA held an advertised public meeting during the evaluation on December 8, 2004, at 7:00 p.m., at the Sapelo Island Visitor Center, Landing Road / Rt. 1, Meridian, Georgia. The public meeting gave members of the general public the opportunity to express their opinions about the overall operation and management of SINERR. Appendix C lists individuals who registered at the meeting.

NOAA OCRM also accepted written comments during and for up to three weeks after the evaluation site visit. OCRM received two sets of written comments. A summary of the comments and NOAA’s responses are included in Appendix D.

The crucial support of SINERR staff with the site visit’s planning and logistics is gratefully acknowledged.



### **III. RESERVE PROGRAM DESCRIPTION**

#### **A. THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM**

The Coastal Zone Management Act of 1972, as amended, established a system of National Estuarine Research Reserves (NERRS) that are funded cooperatively by NOAA's Office of Ocean and Coastal Resource Management (OCRM) and the host states or territories, who manage the reserves. The NERRS has two primary missions: (1) to establish and maintain, through federal and state cooperation, a national system of reserves representative of various biogeographic regions in the United States; and (2) to conduct long-term research, educational and interpretive activities in support of national coastal zone management priorities.

Toward those missions, reserve sites are selected to represent the range of biogeographic regions, estuarine types and coastal management challenges occurring throughout the Nation. To date, NOAA has designated 26 NERRs that collectively protect more than one million acres of estuarine land and water, and represent 17 of the 29 biogeographic subregions identified by the program. Two additional sites are in various stages of the designation process.

#### **B. THE SAPELO ISLAND NATIONAL ESTUARINE RESEARCH RESERVE**

##### **1. Reserve Site Description**

The Sapelo Island NERR was the second reserve to be established under §315 of the CZMA in December 1976. Sapelo Island, located about 7.5 miles northeast of Darien in McIntosh County, is the fourth largest of the 13 barrier islands fringing the Georgia coast. The 6,110-acre NERR encompasses the western and southern portions of the island, or roughly one-third of the island's total acreage. With the exception of the 434 acres of privately-owned land in the south-central section of the island making up the Hog Hammock Community and several small tracts on the north end, Sapelo Island is owned and managed by the State.

The Reserve is bounded to the southwest by Doboy Sound and includes the Duplin River estuary and most of the associated watershed. The Reserve also contains a beach and dune system fronting on the Atlantic Ocean and isolated fresh water ponds. The estuarine system is representative of the Carolinian biogeographical classification, which extends from North Carolina to Florida. The Carolinian system is characterized by extensive marsh systems protected by a chain of barrier islands.

The SINERR contains 2,100 acres of upland maritime forest and 4,000 acres of relatively undisturbed salt marsh habitat. The Duplin River, a tidal creek which flows through the heart of the Reserve, serves as a nursery area for the development of juvenile shrimp, menhaden, Atlantic blue crabs, sea trout, sea bass, oysters, clams and other forms of marine life. The creeks and marshes on the island are used for fishing, cast-netting, and crabbing.

A considerable portion of the Reserve's upland habitat is located within the R.J. Reynolds Wildlife Management Area. These upland maritime forests are dominated by a mix of native

hardwoods such as live oak and timber stands of slash and loblolly pine. This property is managed by Georgia Department of Natural Resources Wildlife Resources Division (WRD) for game species (white-tailed deer and wild turkey) and other wildlife, with seasonal hunting occurring on portions of this holding, as well as timbering and other forest management practices. More than 400 species of birds are known to frequent the island, including endangered, threatened, or rare species such as the southern bald eagle, brown pelicans, wood storks, Wilson's plovers, and peregrine falcons. Sapelo Island has become a popular destination for bird watchers and photographers. Loggerhead sea turtles and the American alligator are known to nest on the island. In addition to its natural resource base, the island is a rich source for archeological sites, both historic and prehistoric.

Other major Sapelo Island stakeholders include the University of Georgia Marine Institute (UGAMI) and the Hog Hammock Community.

#### *University of Georgia Marine Institute*

The Marine Institute, established in 1953 and located within the Reserve on 1,500 acres leased from the State, continues to support a strong tradition of research on the importance and functioning of salt marsh-dominated estuaries. The existence of the field laboratory was a dominant factor in the Reserve's designation. The Institute administers programs for visiting scientists and graduate students. In 1994, UGAMI was placed administratively under the University of Georgia's School of Marine Programs, at which time the Institute assumed a broader role in education and outreach.

#### *Hog Hammock Community*

The Hog Hammock community is home to about 70 permanent residents, many of whom are descendants of the plantation slaves brought to the island in the early 1800s. Hog Hammock represents one of the few remaining sites on the south Atlantic coast where the integrity of this African-American culture is maintained. To this end, strategies are being pursued by community leaders to promote appropriate economic opportunities for residents and to establish a land trust to maintain ownership levels, ensuring the protection of the culture and character of the community. The community is unique in its form of self-governance, and its interests are voiced through several organizations, including the Hog Hammock Community Foundation and the Sapelo Island Cultural and Revitalization Society.

## **2. Reserve Administration**

The Georgia Department of Natural Resources (DNR) has been responsible for the administration of the Reserve since its inception, although internal management has been shifted over time among several Divisions within DNR. In 1997, responsibility for the management of the Reserve was transferred back to the Game Management Section of the Wildlife Resources Division (WRD) from the Parks, Recreation and Historic Sites Division (Parks Division). The Reserve Manager reports to the Island Manager (See page 11), who is responsible for WRD's overall mission on the island. The Parks Division has retained responsibility for managing the Reynolds Mansion located in the Reserve. The Coastal Resources Division plays an important

role in supporting the SINERR; the Division assumed responsibility for administering the state's coastal management program in 1998.

The SINERR maintains a SINERR Advisory Committee (Reserve Advisory Committee or RAC), whose Chairman and 13 members are appointed by the Commissioner of DNR. The RAC meets two times annually in order to advise the program on policy, programs, and overall direction. The committee facilitates coordination and fosters cooperation among entities involved with or affected by the Reserve. Education and research task forces have also been established to work directly with each of the Reserve's coordinators, drawing upon additional sources of expertise from both of these professional communities. The range of governmental agencies, organizations, and interest groups represented on the RAC includes:

- the scientific and educational community, including the UGA Marine Institute and the Georgia Marine Extension Service;
- the Sapelo Island Cultural and Revitalization Society;
- the U.S. Fish and Wildlife Service;
- environmental/conservation interest groups, including the Georgia Conservancy, The Nature Conservancy (current chair), the Georgia Wildlife Federation, and Friends of Sapelo;
- local commercial and recreational fishing interests; and
- forestry management interests.

Additional ex-officio members of the RAC include: Director of the Georgia Coastal Zone Management Program; the Director of the UGA School of Marine Programs; the Regional Supervisor for DNR WRD; the Island Manager; and the NOAA Estuarine Reserves Division Program Specialist.

In order to balance protection of the environment and resources on the island with rights of island property owners, DNR established the "Sapelo rules and regulations" in 1996, governing future development and other uses on the island. In conjunction with this step, DNR initiated a comprehensive planning process to enable island and regional stakeholder groups the opportunity to review and recommend changes for current island management approaches. Subcommittees were established to identify areas of concern and proposed management actions for: wildlife habitat management; public access; public outdoor recreation opportunities; public hunting opportunities; and archeological and historical resources. The Island Comprehensive Management Plan (CMP) for Sapelo Island was adopted in February 1998.

## IV. REVIEW FINDINGS, ACCOMPLISHMENTS AND RECOMMENDATIONS

### A. OPERATIONS AND MANAGEMENT

#### 1. Staffing

The Reserve staff are dedicated, and consistently respond to and proactively consider the needs of their partners on Sapelo Island and along the coast of Georgia. The staff's enthusiasm for and commitment to their work has gained respect for the Reserve both within DNR and the Georgia coastal community. A clear understanding of current threats to the state's coastal resources and a strong focus on priority coastal issues is evident in the Reserve's approach to its programs in research, education, outreach and stewardship. Staff are also successful in creating regional opportunities for its programs, and they successfully network both regionally and nationally within the Reserve System to glean lessons from others. The Reserve has also benefited greatly from the hiring of the Coastal Training Program and Stewardship Coordinators, as well as the hiring of a full-time monitoring technician.

The Reserve Manager continues to focus on the federal/state partnership and the overall administration of the Reserve within DNR. He has successfully created an atmosphere where communication among staff is solid and effective and camaraderie is evident. Reserve staff feel both supported by the manager and that they are given flexibility and independence to be creative with their work. With DNR's hiring of an Island Manager for Sapelo, the Reserve Manager is also able to focus on Reserve-specific issues, rather than conflicts or other Island-wide issues.

The Reserve's full-time Research Coordinator has been on board since 1998 and continues to focus on, conduct and coordinate management-based research that is important to the Reserve, Sapelo Island, and the Georgia coast. The original funding arrangement included a mix of state and private foundation funding which supported the position through 2001; the position has been supported solely with federal funds from the NOAA cooperative agreement since 2002. The NOAA Estuarine Reserves Division Chief met in February 2001 with the DNR Wildlife Resources Division Chief who reaffirmed the state's commitment to the position, though the state has yet to find state funding. Therefore, the Research Coordinator's position continues to be supported with federal funding from NOAA.

One of the limitations of this arrangement is that the Research Coordinator is not able to use any portion of his salary as a way to leverage (as match) against other potential federal funding sources. Another limitation is that the position's support is reliant on federal appropriations, rather than being fully integrated and supported in the state's budget system. It also leaves fewer federal resources available for research and project support, since much of a coordinator's work is of an administrative or coordinative nature.

**Necessary Action: To ensure the long-term stability of the Research Coordinator’s position, the SINERR must continue to work within DNR to pursue its original commitment to find a permanent source of state funding.**

## **2. SINERR Management and Planning**

In designating the SINERR in 1976, the State and NOAA recognized the national significance of the relatively pristine environment on Sapelo Island as a natural field laboratory for long-term research, education and interpretation. Likewise, in order to receive designation, the State had to demonstrate that the “key land and water areas of the Reserve...are under adequate state control to provide long-term protection for reserve resources to ensure a stable environment for research.”<sup>1</sup> With this in mind, much of the success of the Reserve and its ability to remain an environment conducive to long-term research is dependent on collaboration and communication with the other federal and state entities that manage the Island and the Hog Hammock residents that reside there.

The State of Georgia owns most of Sapelo Island and the major management areas include the R.J. Reynolds Wildlife Management Area, the Natural Area—on which the R.J. Reynolds mansion is located, and the SINERR. Management of each of these areas is guided by the differing priorities and management strategies which are, in part, dictated by the federal funding used to purchase each of the areas. As a result, the island supports a myriad of public uses within these areas, including camping, commercial and recreational fishing, hunting, boating, bird watching, timbering, and others.

SINERR’s designated boundary also includes the several primary transport hubs and docking areas on the island: Marsh Landing, Community Dock, Long Tabby and Hunt Camp docks, and Timber Landing barge operations. These, and especially Marsh Landing as the docking location for the daily passenger ferry, make SINERR the official “gateway” onto Sapelo Island for people and transported materials. Like any other gateway, these are places of high activity and, as discussed later in the findings, the review team felt management of these areas should be improved. Visitation to the Island has increased, both to the state owned areas and the Hog Hammock community. As the various uses of the Island intensifies, conflicts and the potential for conflicts between the uses and among the users increases, creating a more complex and critical setting in which SINERR must achieve its mission and goals.

### *SINERR Management Plan*

Priorities and overall goals for SINERR are found in its management plan. The SINERR Management Plan was last updated in 1999, and is now due for its 5-year update and revision. As part of the update process, the evaluation team believes it is necessary for SINERR to involve appropriate staff on Sapelo from other DNR offices, the UGA System, and the Hog Hammock Community. During interviews with other Sapelo entities, including other components of DNR, it became clear to the evaluation team that there was a basic lack of understanding about the SINERR’s mission, relationship with NOAA, and the existence of federal regulations with which

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<sup>1</sup> See the NERRS Program Regulations at 15 CFT Part 921.30(a)(2)

SINERR is required to comply. The evaluation team believes, therefore, that bringing these staff into the process would help both in improving understanding of the SINERR and its programs, and be an opportunity to explore further collaborative efforts among the groups.

Ultimately, the team hopes that a more inclusive management plan development process will be a way to improve island-wide management and help maintain Sapelo as a viable location that meets the mission of the SINERR and NERRS Program Regulations to ensure a stable environment for research through long-term protection of SINERR resources. (See 15 CFR Part 921.30 (a)(2)).

**Necessary Action: By October 2006, the SINERR must submit a final draft of its updated management plan. As part of the management plan revision process, the SINERR must include appropriate staff from other DNR offices on Sapelo (Wildlife Management Area and Parks and Recreation), the UGA System, and the Hog Hammock Community.**

#### *Island Manager*

One of the major steps DNR accomplished towards better coordination and communication on the Island is filling the vacancy for Island Manager. The Island Manager resides on Sapelo and is the coordinating voice to the regional supervisor of the Game Management Division of DNR, under whose jurisdiction the SINERR and the Wildlife Management Area/Natural Area reside. The manager also attempts to facilitate better communication between all of the state entities and Hog Hammock community through a weekly e-mail newsletter/communication report and serves as a first point of contact with the state for private residents. Since many of the potential conflicts surrounding the various public and private uses of Sapelo will affect the Reserve due to its 'gateway' location, as mentioned above, the Island Manager and his role to improve communication and work towards reducing any potential conflicts in many of the public uses are critical.

One of the issues that was raised in the previous evaluation which resulted in a Necessary Action was that a permanent decision-making body, like that recommended in the Sapelo Comprehensive Plan, had not been established on which SINERR and other island stakeholders had representation. There was a lot of concern that some management decisions made by DNR's Wildlife Resources Division were adversely affecting the Reserve or its ability to support long-term research and that SINERR did not have a voice in those management decisions.

In response to the Necessary Action, the WRD constituted an Island Conflict Resolution Committee to meet on an ad hoc basis as conflicts arise, in the absence of an Island Manager whose job it would be to work with Island stakeholders to resolve conflicts. The Committee met once during the evaluation period. Now that the Island Manager is on staff, NOAA strongly encourages the Manager to reinstate the conflict resolution committee or create another decision-making body to provide an appropriate forum to work through use conflicts among Island users and interest groups. The forum should also be used to ensure that SINERR has sufficient knowledge of and input into management decisions made by WRD that may affect the Reserve.

### *Island Visitation*

Visitation to Sapelo has steadily increased over the past twenty years. In response to the last Section 312 evaluation, SINERR conducted a visitation analysis for 1999 and 2000. Total visitation for non-resident guests sponsored by DNR increased from 15,930 visitors in 1999 to 16,267 in 2000, which includes non-resident staff, and visitors on tours, seasonal hunts, overnight stays at the Cabretta Campground, and Reynolds Mansion. Total visitation for UGAMI decreased from 6803 visitors in 1999 to 6247 in 2000, which includes non-resident researchers and staff, and guest groups. Total visitation for the Hog Hammock community increased from 18,824 visitors in 1999 to 22,070 in 2000, which includes non-resident churchgoers and community guests, and visitors of community businesses related to tours and overnight accommodations. There is concern from SINERR and the UGA System that predicted continued increased visitation will adversely impact Sapelo resources and minimize the value of the resources for long-term research.

Currently, the primary means of visitation is on the State-operated ferry and is limited by its capacity. There have been proposals, however, for use of larger private boats to carry visitors to the Island, which have thus far been denied.

Though the stresses on SINERR resources from visitation need to be more fully understood and researched, some issues, such as threats to the septic capacity at the restroom facilities at the DNR offices at Long Tabby, and the collection and removal of solid waste (household trash, and larger items), are evident and should be promptly redressed. The restroom facilities at the Marsh Landing Dock are also overstressed, outdated, and need to be modernized. Since the evaluation, the Island Manager reports that it is the hope of DNR to update the facility as early as 2006 and to create a demonstration project using the latest in sewage treatment technologies for sensitive and restricted areas like Sapelo. Other stressors—on Sapelo’s flora and fauna—are harder to link directly to visitation. But, the evaluation team heard concerns from the scientific community about the state’s need to better balance its goals to promote Sapelo as a tourism destination and maintaining necessary protection of the island ecosystem to support research.

Development pressures on the Hog Hammock community must also be monitored closely. Recently, at least two resident families that were faced with economic struggles sold to buyers outside of the community. As the Hog Hammock community faces threats and pressures to their social and cultural fabric, those pressures will certainly be felt by other parts of the Island, including SINERR.

One of the recommendations in the visitation study is for the state to install a computerized manifest for the ferry system. An electronic manifest would improve planning and logistics of ferry travel, especially as requests for tours to the island continue to increase; and improve the ability and efficiency in conducting further visitation analyses. This data could also prove helpful in setting measurable objectives for visitation and setting up necessary programs for monitoring and assessing visitation impacts.

As with island-wide communication and conflict resolution, visitation is managed by the Island Manager. And while the evaluation team has chosen not to find it *necessary* that the SINERR

work to address the recommendations from the island visitation trends study as included in the previous evaluation findings, it is at least an approach that the team encourages and strongly believes that the SINERR should be involved in helping the Island Manager.

**Program Suggestion: NOAA strongly encourages SINERR to facilitate action by and work with the Island Manager to assess current and potential stressors to the Reserve resulting from visitation and address relevant recommendations from the 2000 island visitation trends study.**

### *Increased Vehicles*

As the number of cars increases among both long-term and short-term Island residents, the ferry parking lot at Marsh Landing has reached its full capacity. More and more cars are parked on the causeway along the edge of the marsh, posing a continuing threat from oil and other leaks into and affecting the marsh. There is also a proliferation of private vehicles at the smaller Community Dock, and a large number of discarded vehicles and motorized machinery at the Lumber Landing Dock that have yet to be barged off the Island after several years.

During the evaluation, the Island Manager discussed with the SINERR Manager the idea of an additional parking lot at Marsh Landing that would be sited just upland of the causeway through the marsh. It is a less aggressive approach than limiting the number of vehicles that are allowed onto the Island. But, it is a potential remedy to reducing the number of vehicles at the edge of the marsh. The Island Manager also acknowledged the need to barge the derelict vehicles and machinery off the Island from Lumber Landing and out of the Reserve. There is a constraint for DNR as they will have to work out the necessary agreements with a barge operation (either state or private) and provide the financial resources for such a service. While the evaluation team understands that Lumber Landing is the only area on Sapelo Island appropriate for barging solid waste (it was originally built for barging timber off of the Island), there should be clearer objectives and strategies for how the area will be managed.

### *Timber Practices*

As stated in the SINERR management plan since its designation, “commercial timber harvesting at commercial maturity” in the existing pine plantation within the SINERR boundaries occurs periodically. While timbering and prescribed burning have continued within SINERR, since 2000 the Reserve has supported timbering with a management objective of encouraging succession of the live oak, a native species to the island.

However, one of the central conflicts with the timbering that occurs within the SINERR is the lack of communication that exists between other components of DNR and the SINERR regarding when and where timbering practices take place. One of the results of this lack of communication was the destruction of access to a long-term research site which was being used by the Georgia Marine Institute. Another area within the SINERR that was timbered was under a long-term lease to UGA for research and education programs.

As a result of these mishaps, and since the evaluation site visit in December, the SINERR has worked with the Island Manager to make appropriate requests to DNR to halt commercial



timbering and burning in the SINERR, except forest management practices for infestations that threaten the health of the larger forest ecosystem. With the approval of DNR leadership, the Island Manager has responsibility for drafting appropriate language that will be included in both the update of the SINERR management plan and the Sapelo Island comprehensive plan that are expected to be updated by early 2006.

**Program Suggestion: SINERR should continue moving forward with appropriate language to formalize, and identify and ensure SINERR's role in future compliance with, restrictions on commercial timbering within the Reserve boundaries in its management plan.**

#### *Strategies Needed to Reduce Impacts*

As part of the management plan update, the evaluation team discussed with the SINERR and the Island Manager the critical need to integrate strategies that would address or work towards addressing the Island uses that currently or have the potential to cause harm or threat to Sapelo resources and affect (or further affect) SINERR's capacity for long-term research. Strategies to reduce, minimize and avoid impacts from visitation, vehicle use, timbering, and solid waste, are necessary; likewise, exploring approaches for estimating uncontrolled uses (e.g., visitation not managed by the state) on the island is essential. Ultimately, the evaluation team found that without such strategies and action to manage and mitigate impacts that the viability of the SINERR is at risk.

**Necessary Action: As part of the management plan update, the SINERR must work with the Island Manager to develop strategies to reduce, minimize, and find ways to avoid, the impacts within the Reserve that result from Island-wide users and uses (e.g., visitation, vehicle and boat traffic, solid waste, etc.). These strategies should be included in each of the relevant chapters of the management plan.**

Likewise, as part of the management plan update, as written in NOAA's *Guidelines for Management Plan Revisions National Estuarine Research Reserve System*, the SINERR needs to include a boundary map which clearly delineates its core and buffer areas. Core designated areas include the SINERR's key land and water areas that are vital to the estuarine ecosystem and long-term research. Buffer areas protect the core, provide additional protection for estuarine flora and fauna, and may include, with NOAA's approval, necessary facilities required for research and interpretation. The updated boundary map, and facilities and land use maps can be used to help assess threats to SINERR's core areas and resources.

NOAA also expects that DNR policies regarding public and land use within the Reserve will be re-evaluated as part of the of the management plan update to ensure the protection of Reserve resources, especially in the core areas.

### **3. SINERR Advisory Committee**

SINERR continues to support and rely on the activity of its Reserve Advisory Committee (RAC). The committee meets twice a year and has improved the results of these meetings by

organizing the agenda on specific topics rather than using the time to conduct a round-robin with organizations simply providing updates on their work. One of the benefits from the shift is that the communication is more focused among the networks of the various committee members, with a higher potential of identifying collaborative opportunities. The committee also continues to keep active its research and education Task Forces.

One of the valuable benefits of SINERR's work with its Advisory Committee is improved partnerships with the RAC representative organizations, such as The Nature Conservancy (specific partnership projects are discussed later in the findings). Many Coastal Training Workshops are co-sponsored by representative organizations, as are some long-term planning and research efforts.

**Accomplishment: The SINERR has improved and increased its collaboration with Reserve Advisory Committee representative organizations resulting in meaningful research and education efforts to better understand and protect the Reserve.**

Ultimately, however, the Advisory Committee members whom we interviewed felt that the Committee could accomplish more with and for the Reserve. Committee members also mentioned that they and SINERR needed to explore gaps in Committee membership (e.g., developers, other representatives) and work with the DNR's Commissioner to get additional members appointed. Some RAC members end up representing more than one interest due to their experience and representation gaps. Likewise, SINERR felt that it could take better advantage of the Committee in communicating SINERR's mission and work to their extended networks, increasing partnership opportunities, and helping build better political support.

**Program Suggestion: The SINERR should work with the Reserve Advisory Committee to re-evaluate its role in developing strategies and identifying priority areas for input into SINERR issues, and include a description of their enhanced role in the updated management plan. The RAC and SINERR should also reassess membership and remedy any gaps in representation.**

#### **4. Facilities**

The Reserve continues to make improvements to its facilities both on the mainland and on-Island. Recent improvements, and those planned for the future, will continue to enhance educational and stewardship opportunities for visitors, researchers, students, teachers, and volunteers.

##### *Visitors Center*

The Sapelo Island Visitors Center is the Reserve's primary public outreach facility. The state-funded facility is located on the mainland in Meridian in proximity to the dock for the Sapelo Island ferry. Since ferry capacity and resource protection concerns limit public visitation to Sapelo, the Center's interpretive exhibits, decks, boardwalks, trails, and on-site staff provide those unable to tour the island with a surrogate educational experience. For example, SINERR

has worked with partners during this evaluation period to develop and install new exhibits at the Visitors Center that explore and explain island cultural and natural history. These include exhibits on the restoration of the Sapelo Island Lighthouse, the history of UGAMI, and the ecology of Sapelo Island via a digital portal. The Lighthouse exhibit even includes a telescope through which visitors can view the Island's lighthouse.

As interest in visiting Sapelo Island continues to increase, and the capacity of the ferry—and Island—remain the same, the Visitors Center will need to continue to enhance its role as an alternative to the Island experience. During our interviews, the review team heard about several opportunities and ways that the Center's education capacity could be enhanced, such as the development of a wet lab that could be used for teacher training and school groups, and improved trails and interpretive exhibits on the surrounding property. Also, the evaluation team felt there was an opportunity for SINERR to work with DNR partners to develop education materials to be exhibited and/or distributed in the Visitors Center about the various stresses visitation and visitor uses has on the Island.

The Visitors Center is situated adjacent to the salt marshes and tidal estuary, overlooking Sapelo Island, and is constructed to be compatible with its surroundings. It has recently been determined that the building, originally constructed in 1995-96, is in need of renovation. The evaluation team was encouraged to hear that renovation plans to the Center are being discussed that would align with Leadership in Energy and Environmental Design (LEED) national standards.

**Program Suggestion: As part of the revision and update to the management plan, NOAA encourages SINERR to develop strategies to better utilize and improve the mainland Visitors Center for use in its education program, especially in light of anticipated increases in Island visitation requests.**

**Program Suggestion: NOAA encourages SINERR to incorporate information about potential visitor impacts to Sapelo Island, and particularly the Reserve, into the education and interpretive efforts at the Visitors Center and on SINERR, where appropriate.**

#### *Research Dormitory*

The SINERR received a \$400,000 construction grant from NOAA in 2001 for the architectural and engineering costs of a new research and education dormitory and laboratory on the south end of Sapelo Island. The dormitory will be constructed within the SINERR boundaries in a joint effort with the University of Georgia Marine Institute. Ground breaking was expected in early 2004. While a ceremonial ground breaking has taken place, actual construction has been postponed for various administrative reasons.

Once constructed, the SINERR and UGAMI-shared dormitory will be used by visiting scientists, researchers, Graduate Research Fellows, and the education program for summer outreach programs and teacher workshops. At the time of this evaluation, however, the SINERR was unclear how usage of the dormitory rooms and other common space in the facility would be

shared with UGAMI. Given construction costs and necessary reductions in the planned facility capacity, it is imperative that SINERR have a clear, open and documented communication with UGAMI to identify respective priority needs, space allocation, and usage.

**Program Suggestion: SINERR should initiate an agreement, such as a Memorandum of Understanding, with UGAMI on the priority uses, space allocation, and management processes for the new research dormitory, and include the agreement in the update of the SINERR Management Plan.**

#### *SINERR Education Lab*

After its completion in 2000 at the close of the last evaluation, SINERR's Education Facility at Long Tabby has been utilized successfully and fully over the past four years. The Island education facility houses a 40-seat classroom with audio-visual capabilities and a wet lab equipped with work stations, microscopes, and aquaria. Laboratory-based programs include "Sapelo's Saltwater Systems," which incorporates field and lab activities that focus on local marsh and ocean habitats. The Sapelo Island Nature Trail, recently renovated and enhanced with new interpretive signage, is also available to visiting groups, and features five barrier island systems stretching approximately 1 mile from the maritime forest, through salt marsh, to Nannygoat Beach.

## **B. SINERR PARTNERSHIPS and COLLABORATIONS**

The SINERR works cooperatively with many partners both on and off Sapelo Island. Primary partners include other components in DNR such as the Georgia Coastal Management Program; the University of Georgia System, such as the Long Term Ecological Research Project and the Marine Institute; and nonprofit organizations related both to conservation and education. And while most of these partnerships seem strong, the evaluation team found opportunities for some of the partnerships to be strengthened – in particular with DNR Wildlife Resources Division's Wildlife Management Area staff and the Marine Institute.

**Program Suggestion: The SINERR should work proactively with the Island Manager on a form of agreement, such as an MOU, or coordination process with other DNR components on Sapelo, and the UGA System, to improve the relationship among the Island partners.**

### **1. University of Georgia**

In January 2004, a new director was named for the University of Georgia Marine Institute. For several years preceding this appointment there was no permanent director for the Institute, and the research community has dwindled to a few senior researchers, with only one resident professional research scientist. With the future of the Institute unclear, the state located the new director in Athens rather than on Sapelo in the hopes of building better support and access to financial resources for the Institute and its current and future work on Sapelo.

The SINERR collaborates with UGAMI on some efforts. Efforts include the monitoring restoration of Dean Creek, graduate research fellow sponsorships, and work to change UGAMI data sensors to YSI data loggers that collect information using NERRS national parameters. The UGAMI director is also co-chair of the Reserve Advisory Committee. Although the director regularly visits the UGAMI facility on Sapelo, at the time of the evaluation, the director had not had the opportunity to attend a committee meeting.

While UGAMI's current focus is reassessing its own research direction and rebuilding its staff, NOAA encourages SINERR to work with the new director as well as current staff to discover new partnerships. The suggested MOU could help facilitate better coordinated efforts in research, including the use of the new research dormitory.

While the previous evaluation found that there was no need for a formal agreement between the UGA System and SINERR, the evaluation team believes that with the shift in leadership, new dormitory, and feedback from some interviews that more opportunities and better joint planning are needed. Therefore NOAA believes it is appropriate to reinvigorate this program suggestion (which was included in the evaluation findings for the period of 1992-1996).

Some of SINERR's primary partnerships are with both the Georgia Long-Term Ecological Research Project (LTER) and the Georgia Marine Extension Service (MAREX). Specific cooperative research projects are detailed in the findings on the research program below, including: efforts with the LTER to collect data for the National Atmospheric Deposition Program (NADP), collection of primary meteorological data using SWMP monitoring stations, and hosting/supporting work of regional affiliates on Sapelo. Efforts with MAREX include the characterization and mapping of the intertidal oyster reef and spat monitoring on the Duplin River with support from a NERR Graduate Research Fellow, the acquisition of NOAA low-level photogrammetry of Sapelo and Ossabaw, and monitoring for invasive species, to name a few.

## **2. Georgia Coastal Management Program**

SINERR works closely and successfully with the Georgia Coastal Management Program (GCMP) to provide technical assistance to local coastal communities. GCMP community liaisons, being well-informed about and responsive to current coastal issues, will frequently approach the Reserve to obtain technical information or to identify applied research needs. The Research Coordinator has in turn authored GCMP Coastal Incentive Grant proposals addressing such issues. Recent examples of this successful collaboration include studying marsh die-off, mapping on-site septic systems in McIntosh County using GIS, and various resource management workshops. One such workshop focused on Open Marsh Water Management (January 2004), a technique used to control salt marsh mosquitoes. Workshop participants explored the utility and feasibility of the technique in Georgia salt marsh systems and discussed concerns over permitting issues with this practice. As discussed in detail in the research findings below, the SINERR and the GCMP also hope that the lessons learned on a SINERR project to restore Dean Creek will be helpful in establishing best management practices to mitigate the effects of coastal causeway construction.

### **3. R. J. Reynolds Wildlife Management Area**

The evaluation team is convinced that it will take collective and collaborative management to protect and enhance Sapelo's natural resources. NOAA is encouraged that the new Island Manager is supportive of this, and hopes that he will help to better define the Reserve's role in contributing to research-based decision making for the Island and the other state entities which use it, especially the WRD Wildlife Management Area.

Since the WRD's Wildlife Management Area (WMA) comprises the largest portion of land on Sapelo and is directly adjacent and upland of SINERR, collaboration and coordination with the WMA is imperative. There have been some cooperative efforts between the SINERR and WRD, including the sharing of GIS images catalogued by the SINERR Stewardship Coordinator. WRD also informed the evaluation team that a new regional biologist has been hired, with goals to enhance collaborative research efforts with the SINERR and to better coordinate management and strategic plans. At the time of the evaluation, the WMA was preparing to embark on the development and updating of its 50-year management plan, 5-year strategic plan, and its annual work plan. The regional supervisor of WRD intends to facilitate input, and sometimes technical assistance (e.g., provide GIS maps, and insights into habitat conservation goals/planning) from SINERR on these initiatives.

Likewise, as mentioned in the previous section of the findings, the evaluation team put forward a necessary action that SINERR include the WMA in updating of its management plan. There is also a suggestion that there be an MOU included in the SINERR plan that outlines and initiates a more formal cooperative arrangement with the WRD.

### **4. Gray's Reef National Marine Sanctuary**

The Gray's Reef National Marine Sanctuary has been a long-time collaborator with the Reserve. The Sanctuary, a 17-mile area of open ocean located 32 kilometers off the coast of Sapelo Island, was designated in 1979 to protect a rocky, underwater reef supporting a flourishing live bottom habitat. The Altamaha watershed-Sapelo Island-ocean linkage continues to provide focus to collaborative activities. The Sanctuary is taking advantage of the Reserve's Coastal Training Program as a forum to share its *Rivers to Reef* education module, which was produced in cooperation with SINERR.

Likewise, the SINERR and the Sanctuary share long-term monitoring data, and coordinate on research efforts such as the marsh die-off studies and the state-wide monitoring effort on invasive species. Both efforts are discussed in the findings on SINERR's research program below. The evaluation team also supports the exploration of regional collaborative efforts between the Sanctuary and SINERR (e.g., ocean observation system efforts, promotion of a conservation corridor in the Altamaha watershed, etc.).

## 5. Non-Governmental Partners

SINERR has also actively sought partnerships with non-governmental organizations and local community groups. One of its strongest collaborations is with *The Nature Conservancy*, with whom it co-sponsored the Exotic Species Awareness Workshop (October 2003) on the green mussel, which is discussed further below in the findings on SINERR's research program. The SINERR is working with The Nature Conservancy on the development of a Coastal Conservation Plan focused on marsh planning and protection. The Research Coordinator has played a major role in developing the plan by identifying threats both upriver and in closer proximity to the marsh, and developing management strategies to better protect and methodologies for measuring change to the marsh. SINERR and The Nature Conservancy are also exploring opportunities to acquire additional marsh as part of the Reserve; NOAA encourages SINERR to continue those explorations.

The SINERR also has noteworthy relationships with the *Altamaha Riverkeeper* and the *Georgia Conservancy* organizations. The Riverkeeper has co-sponsored several coastal training workshops, including workshops on septic and animal waste issues, and works diligently to identify and invite local decision-makers to these and other coastal training workshops. Likewise, the Georgia Conservancy co-sponsors workshops, including one on dock permitting and policies. The Conservancy is working with SINERR for input and research on the threats from development of marsh hammocks within the SINERR boundary.

NOAA is very impressed with SINERR's collaborative efforts and relationships with non-governmental organizations.

## C. RESEARCH AND MONITORING

Overall, the evaluation team found SINERR research and monitoring efforts to be extraordinary. The Research Coordinator is closely involved with coastal management and research groups, and actively seeks opportunities where Reserve research can benefit resource management. The Research Coordinator acts as a scientific advisor for programs as diverse as the Georgia Coastal Management Program's Coastal Advisory Council, the McIntosh County Sustainable Economic and Environmental Development, the Ossabaw Island Research Development Committee, Altamaha Riverkeeper, and the Sapelo Island Cultural and Revitalization Society. These memberships have enhanced Reserve program visibility and strengthened partnerships with coastal stakeholders. They have also allowed the Research Coordinator to keep a finger on the pulse of Georgia's coastal issues in order to focus applied research on the Reserve. Consequently, research conducted by and through SINERR is management-based and timely, seeking to answer questions that are applicable to Georgia coastal ecosystems. For example, the Georgia Coastal Research Council has identified coastal construction and exotic species as two of the biggest issues right now in the state's coastal counties; SINERR is currently conducting research in both areas in collaboration with partner organizations. SINERR has thus developed a strong research and monitoring program, through which the Research Coordinator and collaborators engage in research that directly addresses coastal management needs in Georgia.

## 1. Research Highlights

NOAA found that SINERR is conducting essential and applicable research, which will benefit resource management not only in the Reserve and on Sapelo Island, but also throughout coastal Georgia. Though presenting each project individually is outside the scope of this document, some highlights of the research Program follow.

### *Georgia Coastal Ecosystems Long Term Ecological Research Project*

SINERR worked closely with the Georgia Department of Natural Resources, the United States Geological Service (USGS) and the University of Georgia throughout the establishment of the Georgia Coastal Ecosystems Long Term Ecological Research Project (Long Term Ecological Project). The Research Coordinator was involved from initial site selection to the identification of primary research directives for the project. The project is funded by the National Science Foundation for an initial period of six years. The study site encompasses the riverine estuary of the Altamaha River and the barrier island and tidal marsh complex in the vicinity of Sapelo Island. Research will be targeted towards the role of water transport in the ecological linkages between upland areas and the coastal zone in central Georgia. Future research through the Long Term Ecological Project will include using the long-term data collected to study the impacts of human activities in the rapidly developing coastal Georgia watershed. A public Data Portal web site provides access to current and historic data and plots from monitoring stations around Sapelo Island and the study area.

### *Restoration of Dean Creek*

In order to get to Sapelo Island's Nannygoat Beach, one must pass over Dean Creek. A causeway was thus constructed over the Creek in the 1930s, using a culvert pipe and bulkhead system. Recently, however, this land bridge has been undermined by the natural processes of erosion and corrosion, rendering the road to the Beach impassable to vehicles. This situation provides a unique opportunity to explore a new approach to meeting current coastal construction needs. DNR, with support from the state Department of Transportation (DOT), will be replacing the causeway with a narrow spanning bridge, which ideally will restore a greater tidal influx into the creek system. SINERR staff and graduate research fellows, in close collaboration with scientists from UGA and the Long Ecological Project, will examine the multitude of ecosystem changes that will result from the project. Monitoring of the Dean Creek system has already begun, so that pre-, during, and post-construction conditions can be compared. The multidisciplinary approach includes studies of sedimentation, water quality, benthic ecology, emergent vegetative communities and avifauna. Researchers will be able to evaluate the ecological consequences of culvert piping versus spanning bridgework, and then potentially to recommend a Best Management Practice (BMP) for coastal Georgia.

This impressive research, construction and restoration collaboration will result in much needed data for the coastal management community. The causeway construction over Dean Creek will provide coastal managers with quantitative information on the environmental effects of different construction alternatives. The GCMP can then use the results to make recommendations for BMPs under the Georgia Marsh and Shoreline Protection Act. NOAA encourages SINERR to



document lessons learned from the research and restoration of the Dean Creek causeway in order to guide a more ecological approach to coastal construction in the future.

**Accomplishment: NOAA commends SINERR for creating a learning opportunity out of the necessary restoration of the Dean Creek causeway. This impressive research collaboration will result in much needed data for the coastal management community.**

#### *Marsh Die-Off Studies*

Large scale marsh die-off areas began to be reported in Georgia in spring of 2002, and since then, die-off has been observed in all of the state's coastal counties. Die-off (also known as dieback) areas, now estimated at 1000 acres (Georgia Coastal Research Council 2004), are left with little or no live vegetation above ground. In Georgia, marsh die-off has affected the growth and survival of both *Juncus roemerianus* and *Spartina alterniflora*. SINERR has been working with a team of scientists from the University of Georgia (UGA) School of Marine Programs, Georgia DNR Coastal Resources Division, and Savannah State University to study the environmental indicators associated with this phenomenon. Current hypotheses identify both meteorological and biological causal factors (e.g., drought, fungal infections), with the former weakening the ecosystem initially, and the latter dealing a final blow to the vulnerable marsh grasses. Also in response to this widespread problem, SINERR supported and participated in a two day workshop on Marsh Dieback (February 2004) organized by the Georgia Coastal Research Council. The workshop provided a forum for scientists from academia and government to exchange technical information and research findings, and to plan a course of action for future investigations.

#### *Tallow tree, *Sapium serviferum*, Eradication Study*

The Chinese tallow tree is a non-native species that was introduced in Georgia in the 1750s. It invades and degrades coastal habitats by excluding native plants, especially in naturally disturbed areas. On Sapelo and Ossabaw Islands, tallow trees can be found in the sensitive interdune meadow habitats on the south ends. The reserve recently conducted a study to test the efficacy of two herbicides, Arsenal and Garlon 3-A, and their potential for safe and reliable eradication of the invasive. This study was a joint effort of the research and stewardship programs within SINERR. Treatments began in November 2003 and results were assessed in November 2004. Preliminary data indicated that Arsenal was more effective than Garlon-3-A; however, it still did not meet project goals for eradication levels. A follow-up study using discrete application of Garlon-4 is currently being conducted. The relatively simple application method and hydrophilic properties of this herbicide could prove to be an effective technique in controlling populations of tallow tree on Georgia coastal islands. A technical report on the efficacy of this control method will be produced to provide information for management of the species throughout its expanding range.

#### *Apiculture Research*

Another notable SINERR research project has resulted in commercial bee-keeping (apiculture) on Sapelo and an innovative partnership with the Sapelo Island Cultural and Revitalization Society (SICARS). This research is being conducted in association with the United States

Department of Agriculture – Apiculture Laboratory in Patuxent, MD. Researchers are using the island, a naturally isolated study site, to examine and understand the vectors and ultimate effects of the parasitic Varroa mite on bee communities. The Varroa mite is an external parasite that is responsible for reducing the vitality, and thus production, of honeybees nationwide. In addition to the research benefit, beekeeping on the island has allowed for the infusion of a product—honey—and training in apiculture into the Hog Hammock community through a partnership with SICARS. The evaluation team found this to be a unique opportunity to both promote research objectives and provide for island community needs.

## **2. Monitoring Programs**

SINERR conducts a variety of monitoring programs on Sapelo Island and in the surrounding water bodies. Variables range from the abiotic parameters assessed in the System-Wide Monitoring Program, which is mandatory for the NERRS, to biotic monitoring of the green mussel for exotic species management in coastal Georgia. NOAA commends SINERR on its strong, and diverse, monitoring programs. They are critically important to research and resource management in coastal Georgia, as well as to the NERR system. During the review period, SINERR also made progress by hiring a full time monitoring technician. This addressed Program Suggestion 4a from the 2000 Findings document.

### *System Wide Monitoring Program*

Participation in and contribution to system-wide efforts are important aspects of being part of the NERRS. National programs and initiatives are developed in collaboration with all reserves and NOAA. One example of a system-wide effort is the National System Wide Monitoring Program (SWMP). The goal of SWMP is to identify and track short-term variability and long-term changes in estuarine water quality, habitat and land use in each reserve. The data gathered through SWMP provides standardized information about how estuaries function and change over time, enabling scientists to predict how these systems will respond to anthropogenic pressures. The program has three components and a phased approach to implementation. The three components are: (1) abiotic variables, (2) biotic variables, and (3) habitat mapping and change. Data from abiotic variables are currently collected at each reserve using a set of automated instruments and weather stations and are submitted to the Central Data Management Office (CDMO). Biotic variables are being incorporated into reserve monitoring programs as funds become available. The habitat mapping component of SWMP will be developed to identify changes in coastal ecological conditions, with the goal of tracking and evaluating changes in coastal habitats and watershed land use.

SINERR has four permanent SWMP stations sampling abiotic variables, which are maintained through a partnership with the University of Georgia - Marine Extension Service (MAREX). With the recent relocation of two of these stations, the Reserve's monitoring program is now in compliance with NERRS standards. New stations are located in near-ocean tidal creeks, Cabretta and Dean Creeks, replacing those at Marsh Landing and Flume Dock. New YSI equipment has also improved the collection of water quality data, consistent with NOAA and Central Data Management Office protocols. The Reserve's monitoring program has also been enhanced by the addition of a continuous, real-time, water quality monitoring station at the

mouth of Hudson Creek, in Meridian at the Sapelo ferry dock, which is a part of the Reserve's partnership with the Long Term Ecological Project.

SINERR has also begun to conduct biological monitoring in conjunction with the expanded SWMP program. Biotic variables monitored include: oyster spat recruitment, decapod species concentrations (for exotic benthic crab presence/absence, as well as presence of Hematodinium), marsh die-off, and ichthyoplankton species concentrations.

#### *Weather Stations*

SINERR currently sponsors two meteorological stations. Data is collected in 30-minute continuous intervals at both locations. The weather station at Marsh Landing has been relocated based on both NERR and Campbell suggested protocol. This station is now erected on a 30-foot tower platform (tower funded via a partnership with the Long Term Ecological Project, platform funded through SINERR) and all probes are deployed per recommended standards. (This addresses a Program Suggestion from the 2000 SINERR Findings document.) SINERR maintains the station and downloads the weather data weekly via a T-1 line and modem. Staff QA/QC the data, which is then submitted to the Centralized Data Management Office and made available via the Long Term Ecological Project website.

Meteorological data is also collect at the Sapelo Ferry dock on the Hudson Creek. Both weather and water quality variables are collected at this station which is maintained via a cooperative agreement with the USGS storm watch initiative and the Long Term Ecological Project. Data are transferred every four hours to the USGS website via satellite telemetry.

#### *National Atmospheric Deposition Program*

During the review period, SINERR established, and now supervises, an atmospheric deposition station on Sapelo Island (Station GA 33). Data collection is funded through SINERR partnerships with the Environmental Protection Agency's (EPA's) National Atmospheric Deposition Program (NADP) and the GCE-LTER. Upon site designation, the NADP provided the initial site equipment, and now SINERR and the GCE-LTER are responsible for technical costs associated with maintenance and weekly data collection. The stewardship coordinator monitors the stations weekly and sends samples to an EPA laboratory for analyses of a suite of parameters including: total weekly rainfall, pH, Ca, Mg, K, Na, NH<sub>4</sub>, NO<sub>3</sub>, Cl, SO<sub>4</sub>, and PO<sub>4</sub>. NOAA commends SINERR on its initiative to be a part of this national program, and encourages the Reserve to explore ways to fund the collection of mercury deposition data as well.

#### *State-wide Monitoring for the Green Mussel, *Perna viridis**

Focused research on the invasive green mussel, *Perna viridis*, was a direct result of the strong network of NERRS research coordinators in the southeast. Recognizing the potential for the species to migrate up the Georgia coast, SINERR worked with The Nature Conservancy and MAREX to educate resource managers and the public through the Exotic Species Awareness Workshop (October 2003). Just days following the workshop, a DNR employee identified the first green mussel in Georgia waters. Given the serious ecological and economics affects the species could have, a state-wide monitoring program was initiated, and is conducted and funded via a SINERR - MAREX collaboration. Green mussel occurrence and growth rate, as well as

environment variables (salinity gradients, habitat) are being monitored in three estuaries along the Georgia coast, one being the Altamaha River basin at Doboy Sound in the Reserve. Preliminary results from this research are being prepared for submission to the Journal of Shellfish Research.

### **3. Site Profile**

NERRS implementing regulations require each reserve to develop a comprehensive site profile. A site profile is designed to: (1) compile scientific datasets relating to the reserve, (2) characterize the physical and biotic components of the environment, (3) synthesize the known ecological relationships within the reserve and its watershed, (4) trace the impact of natural and human disturbances, and (5) explore the need for future research, education and management initiatives. SINERR completed its site profile in 1997. In the last 312 findings, NOAA encouraged the reserve to develop a strategy to revise the format and expand the content of the site profile. Given all of the research conducted since 1997, much of which can be applied to coastal management in Georgia and the southeast coast as a whole, NOAA will continue to encourage an update of the SINERR Site Profile.

### **4. Graduate Research Fellowships (GRFs)**

The SINERR continues to successfully support student researchers through the Graduate Research Fellowship program. Research fellows address current ecosystem management issues, such as the invasive ecology of the green porcelain crab and oyster reef restoration processes, and develop strong partnerships with other Georgia research entities. NOAA encourages the Research Coordinator to continue building a strong network through which to recruit fellows, reaching out to different schools and programs.

### **5. Research Program Visibility**

As illustrated above, research conducted at SINERR is well-informed and highly respected by the coastal management community. The Research Coordinator nurtures strong collaborations with governmental, non-governmental and academic programs in Georgia, greatly increasing the Reserve research program's visibility. Coastal managers rely on research conducted through the Reserve to inform policy making and local management efforts. In addition, many of the nonprofit organizations represented on the Reserve Advisory Committee, such as The Nature Conservancy and The Georgia Conservancy, regularly use research results for natural resource policy advocacy. NOAA commends SINERR on developing strong relationships with various resource management entities.

While the visibility of SINERR's research program among natural resource professionals is certainly to be commended, the Reserve could improve upon the general public's knowledge and understanding of research on Sapelo. The Research Coordinator should continue to work with other staff to identify ways to communicate current research to the public through workshops, outreach materials, and short-term exhibits at the Visitors Center. For example, fact sheets on current research being conducted through the Reserve could be made available to the public at

the Sapelo Island Visitors Center. Informational one-pagers could also be made available to educators across the region.

**Program Suggestion: NOAA encourages SINERR to develop more educational and outreach materials, such as fact sheets or one-pagers, that translate current research being conducted by Reserve staff and partners on Sapelo Island.**

## **D. EDUCATION, INTERPRETATION AND OUTREACH**

National Estuarine Research Reserves are federally designated "to serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation." The NERRS provides a range of educational programming to key audiences, depending on watershed and community needs and Reserve specific capacity. SINERR offers a variety of education programs for school groups, teachers, coastal decision makers and the general public. Programs highlight salt marsh, estuarine and barrier island ecology, current research efforts on the reserve, and the Island's rich cultural history.

SINERR's education program has grown considerably in this evaluation period, particularly through the completion of an education classroom and lab, new curricula development and the Coastal Training Program. Staff providing education, interpretation and outreach have had many successes, consistently extended themselves above and beyond the call to meet the needs of Sapelo Island, state agencies, and coastal communities. NOAA commends them on their work.

### **1. Education Program**

The SINERR Education Coordinator has greatly expanded and enhanced the educational programming provided by the Reserve. Building on her professional expertise and recognizing the limits on Island visitation, the Education Coordinator has focused her attention and SINERR resources on teacher training. She has thus developed strong collaborations with local school districts, regional education programs, and partner organizations to provide educational opportunities to teachers across the state (and even out-of-state).

**Accomplishment: SINERR greatly expanded and enhanced its educational programming during the review period. The Reserve is reaching many more students through curricula development and building strong education collaborations with regional partners.**

#### *Curricula Development and Teacher Workshops*

Due to the limitations inherent in visiting the Reserve on Sapelo Island, the Education Coordinator has partnered with local educators and naturalists to develop new curricula to introduce students to Georgia's coastal resources without leaving the classroom. For example, SINERR funded the development of two workshops and related curricula on shorebird conservation and sea turtle ecology. There are plans to develop and host teacher workshops on coastal flora and barrier island ecology in 2005. Using the educational tools and materials

gained through these workshops, teachers are able to engage students in learning about coastal resources and research when field trips to Sapelo are not possible. NOAA believes that these educational resources are invaluable to the community and commends SINERR on supporting their development.

Among the unique educational materials developed by SINERR is the *Explore Sapelo* CD-ROM. This innovative, digital interactive “visit” to Sapelo Island was distributed to schools and teacher workshop participants. This educational tool is also available for exploration in the Visitors Center. It has been well received by educators, students and the public.

SINERR also collaborates with other marine science education organizations, including the Southeast Center for Ocean Sciences Education Excellence (SECOSEE), to jointly host a very successful Teacher Workshop series. Approximately 150 teachers participate in summer programs using curricula developed by the education coordinator and various partners. Teachers receive curricula and materials to use in their own classrooms on coastal resource topics such as sea turtle ecology, shorebird conservation and coastal botany. SINERR also partnered to sponsor the 2004 Ocean Sciences Leadership Institute, a 7-day workshop offered to teachers from North Carolina, South Carolina, and Georgia. The Education Coordinator helped to lead training activities throughout the week.

NOAA commends the Education Coordinator for identifying a niche for the Reserve’s education program and working to develop quality trainings and educational materials to augment its role. By all accounts, SINERR-sponsored teacher workshops are robust and highly valued by science educators. NOAA believes it would be useful for the Reserve to develop a mechanism to evaluate educator trainings as the Education Coordinator continues to expand the education program. Information gained from evaluations will help the Reserve to continue to improve programming in response to customer (teacher) suggestions.

**Program Suggestion: NOAA strongly encourages SINERR to develop a mechanism to evaluate educator trainings and educational tours to better gauge program effectiveness and future needs.**

### *Student Programs*

The Education Coordinator has successfully increased the participation of school science classes in SINERR’s educational programming during this evaluation period. For example, every 5<sup>th</sup> grader in McIntosh County’s public school system now visits Sapelo Island twice during the year for science class. The first visit introduces the students to the Island with a tour of the beach and a cultural history lesson; the second allows students to participate in Reserve research with field work in a creek and exploration in the laboratory. In order to augment field trips to the Island without increasing visitation, the Education Coordinator has also developed an in-classroom curriculum to prepare students for the visits. This Reserve curriculum is very highly regarded among educators, parents and students in McIntosh County. NOAA commends the Reserve on developing such an innovative and valuable program to introduce students to the ecological and cultural resources that exist in their backyards. Given the great success of SINERR’s 5<sup>th</sup> grade

science education program, NOAA encourages the Reserve to consider a stepped school program that engages students beyond the 5<sup>th</sup> grade.

SINERR has also partnered with SECOSEE in the development of the Sapelo SeaStar Science Camp, a program for Sapelo Island school children. Science majors from Savannah State University, having participated in a series of workshops through the 2004 spring semester, served as program leaders for the camp. This program was very well received; the evaluation team heard praise from participating teachers, Friends of Sapelo (FOS) volunteers and Island residents. This effort connects children in the Hog Hammock community (15 participants in 2004) with potential role models from local universities who teach them about the ecology literally in their backyard. The camp is scheduled again for 2005, and NOAA encourages the program to continue and expand these efforts for locals.

#### *Georgia Coastal Education Group*

The Georgia Coastal Education Group (GCEG) was formed in 2001 by educators from several coastal state and federal agencies to collaborate on educational programming and avoid duplication of efforts among programs. Current members include: Gray's Reef National Marine Sanctuary, the University of Georgia Cooperative and Extension Services (including SeaGrant), DNR Coastal Resources and Wildlife Resources Divisions, US Fish and Wildlife Service, and the National Park Service. GCEG meets quarterly and fulfills an advisory role for the Reserve's education program. Such coordination among entities providing science education has helped the Education Coordinator to identify areas in which SINERR can develop its niche further.

## **2. Coastal Training Program**

An important aspect of a reserve's education program is the Coastal Training Program (CTP). The program is designed to: (1) inform coastal decision-making; (2) improve coastal stewardship at local and regional levels by increasing the application of science-based knowledge and skills by coastal decision-makers, and (3) increase dialogue and collaboration among decision-makers. Planning for the program includes establishing a training advisory committee, conducting a market survey of training providers and an audience needs assessment, developing a program strategy that outlines priority coastal issues to be addressed, prioritizing target audiences, and creating a marketing plan.

SINERR began development of its CTP as an expansion of its overall education program in 2001. The program was developed initially through a partnership with University of Georgia - Marine Extension Service (MAREX), and has expanded to work with The Nature Conservancy's Altamaha Bioreserve (TNC), and other state and local entities. SINERR has since hired a CTP coordinator, established a program advisory committee, and completed a market analysis (2003).

The coordinator has structured a public outreach strategy to advertise CTP opportunities through the development of a brochure and website, both based on successful models in the NERRS community. These outreach tools have increased public awareness of the Program and helped to connect SINERR's CTP to others in the reserve system. In just the past year, SINERR has worked with over 300 local decision makers. CTP topics have included ecotourism, land-use

planning and storm water planning and permitting. The CTP coordinator has found that her biggest challenge is marketing to actual decision-makers, such as elected officials. She has thus made it a priority to reach out to audiences not previously involved in the workshops and plans to start focusing on legislative staffers and public interest groups.

**Accomplishment: SINERR has done an admirable job of identifying coastal resource manager and coastal decision-maker needs and of developing opportunities for public education and training to address them.**

### **3. Outreach and Communications**

SINERR relies on a variety of approaches to reach, educate and engage the public. These include press releases, the Reserve's web site, the Sapelo Soundings newsletter, brochures, Island tours, volunteer opportunities, and CTP workshops, to name a few. All staff members are involved in outreach and communication activities, for promotion of both their individual programs as well as the Reserve as a whole. NOAA commends them on their efforts.

During the course of the site visit, however, the evaluation team discussed with several staff members the need to develop a coordinated outreach strategy for Reserve programming. While current approaches are certainly effective in engaging the public in general, a strategic public relations plan would be valuable in targeting audience- and/or program-specific outreach. For example, a public relations strategy could identify and standardize the optimal mechanisms to reach various target audiences, such as program partners, teachers, decision-makers, coastal managers, and the general public. It could also guide science translation and the dissemination of new research results from the Reserve, as well as marketing tactics for educational training opportunities (including the CTP workshops).

**Program Suggestion: NOAA encourages SINERR to explore ways to fund, and to work with the ERD communications director on, the development of a communications strategy for all aspects of the Reserve programming.**

## **D. STEWARDSHIP EFFORTS**

### **1. Stewardship Program**

Over the last few years, the NERRS has focused on developing a stewardship component to complement its existing research and education programs. At most reserves, stewardship coordinators are acting in a very functional role, participating in aspects of research, monitoring, education, policy and implementation of resource management actions. SINERR thus hired a Stewardship Coordinator in 2002. NOAA finds that the Stewardship Coordinator has done an excellent job bridging the research and education components at SINERR through her diverse range of duties. She has been proactive in identifying reserve and Island needs, resourceful with the capacity available, and professional in providing support to various Island user groups.



**Accomplishment: SINERR has successfully developed an active Stewardship Program during the review period; the Stewardship Coordinator has initiated various efforts that complement the Reserve's research and education programs.**

SINERR's stewardship coordinator duties include: developing and maintaining the Reserve's GIS library and laboratory; managing the technical operations of the National Atmospheric Deposition Program (NADP) site on Sapelo; helping with invasive species control and other research projects; and supporting teacher trainings and CTP workshops. This is a diverse list of activities, each of which the Stewardship Coordinator approaches with great energy and dedication. That said, NOAA believes that SINERR and the Stewardship Coordinator should work to develop a Stewardship Program with its own identity, clear responsibilities and goals.

**Program Suggestion: NOAA strongly encourages the SINERR to identify the long term goals of the Stewardship Program and the roles and responsibilities of the Stewardship Coordinator (as part of the update of the management plan).**

#### *Geographic Information Systems Library & Laboratory Development*

Geographic Information Systems (GIS) reference sources are one of the many tools that SINERR is developing to provide to researchers and coastal managers. The stewardship coordinator has built an impressive GIS library at the Reserve. She is working diligently to complete maps of the Island, painstakingly piecing together, digitally-scanning and rectifying historic and current photographs. The Stewardship Coordinator has also worked with the University of Georgia and Georgia Tech to rectify and create smaller imagery files so the information can be shared more readily. Some of the most recent imagery has been included on the web for public access. This availability has been, and will be, very valuable to those conducting research on the Island, to examine marsh die-off for example.

The GIS and aerial imagery products developed by the Stewardship Coordinator are a tremendous resource to all of Sapelo Island. Recent additions to the collection have included Global Positioning Systems (GPS) locations for the National Geodetic Survey bench markers, and timber and fire management GIS layers. The Stewardship Coordinator regularly provides maps and information to individuals working on the Island, including those from the DNR Wildlife Management Area and UGAMI, as well as scientists using the Reserve as a research platform. These requests to provide data and find or create maps take up approximately 80% of the Stewardship Coordinator's time. If more of these products were readily available on the web, that capacity would allow the Stewardship Coordinator to concentrate on other program efforts.

**Program Suggestion: NOAA strongly encourages the SINERR to work towards making the wealth of GIS information available via the web in order to allow the Stewardship Coordinator more time to work on other program efforts.**

The Stewardship Coordinator has shown great ingenuity with regards to GIS instruction. She has thus far been able to take advantage of informal training opportunities from various sources, generally through UGA. In order to keep up-to-date with technological advances occurring in the GIS field, the stewardship coordinator should receive additional, formal, GIS training (e.g. NOAA Coastal Services Center Geo-Tools). Such training would enable the Stewardship Coordinator to stay abreast of new applications and opportunities for using maps for resource management.

**Program Suggestion: NOAA encourages the SINERR to make a priority of securing formal GIS training (e.g. NOAA Coastal Services Center Geo-Tools) for the Stewardship Coordinator.**

## **2. Volunteer Program and the Friends of Sapelo**

Fundamental to inspiring a sense of resource stewardship within the coastal community is providing opportunities for the public to experience, to understand, and thus, to care about, Sapelo Island. One way that community members can be active stewards of the resource is by volunteering. SINERR has an excellent volunteer program that greatly benefits the reserve and its programs, the Island, and coastal Georgia as a whole. The volunteer coordinator has been instrumental in engaging volunteers in a wide range of activities that support the research, education and outreach efforts of the Reserve.

The public is involved in the volunteer program primarily through the Friends of Sapelo (FOS), a formal organization sponsored and coordinated by SINERR since 1995. FOS volunteers continue to be an energetic and helpful group, supporting a multitude of efforts both within and outside of SINERR, from collecting field data to maintaining reserve facilities. Current activities include: Adopt-a-Stream water quality testing throughout McIntosh County, Nannygoat Beach sweeps (part of the National Marine Debris Monitoring Program) and phytoplankton monitoring. This program also serves as a strong link to the local coastal communities, providing critical outreach for the reserve.

**Accomplishment: NOAA commends SINERR for its active volunteer program, which engages Georgia communities on the coast and inland, and provides critical support to reserve activities.**

Currently, McIntosh County's active retiree population makes up the majority of reserve volunteers. This was raised as a concern by some of the FOS members—those who themselves are retirees—at the evaluation public meeting. Strategies to attract and encourage a younger membership were discussed and included: a community service internship program, a steward mentor program, and a junior FOS group. FOS members also mentioned a desire to see how the data they collect gets used. The SINERR might consider providing data compilations and reports to the volunteers, so they are able to see their contributions to Reserve research. SINERR could also work with the Friends to make volunteer programs and events available on weekends and evenings to broaden the opportunities for participation and engage a wider demographic.

**Program Suggestion: NOAA encourages SINERR to work with the Friends of Sapelo advisory board, and utilize the National Friends Network and ERD, to develop strategies (marketing, communication, other) to ensure the longevity of the organization.**

## V. CONCLUSIONS

For the reasons stated herein, I find that Georgia is adhering to the programmatic requirements of the National Estuarine Research Reserve System in the operation of its approved Sapelo Island National Estuarine Research Reserve (SINERR).

SINERR has made notable progress in the following areas: halting commercial timbering in within SINERR boundaries; increased collaboration with its Reserve Advisory Committee; creating a learning opportunity out of a necessary restoration effort; expanding and enhancing its Education Program; continuing to develop opportunities for decision makers to address coastal resource management needs; and successfully and actively developing a Stewardship Program.

These evaluation findings also contain fifteen recommendations. These recommendations are in the form of three Necessary Actions and twelve Program Suggestions. The state must address the Necessary Actions by the dates indicated. The Program Suggestions should be addressed before the next regularly scheduled program evaluation, but they are not mandatory at this time. Program Suggestions that must be repeated in subsequent evaluations may be elevated to Necessary Actions. Summary tables of program accomplishments and recommendations are provided in the Executive Summary.

This is a programmatic evaluation of SINERR that may have implications regarding the state's financial assistance awards. However, it does not make any judgment about or replace any financial audits.

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Douglas L. Brown  
Acting Director, Office of Ocean and Coastal  
Resource Management

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Date

## VI. APPENDICES

### APPENDIX A. SINERR'S RESPONSE TO 2000 EVALUATION FINDINGS

**1. Necessary Action:** (a) By January 2001, DNR must establish and regularly convene a decision-making body, such as the steering committee recommended by the Island-wide Comprehensive Management Plan, to be made up of major stakeholders on the Island, to consider all issues having the potential to impact the resources of the Reserve. The Reserve must have a separate seat and voice on the committee.

*SINERR Response:* An Island Conflict Resolution Committee was constituted as required. The Committee meets on an "as needed" basis, at the discretion of the Island Manager, principally to address concerns by island stakeholders. SINERR holds a separate and permanent seat on the Committee. The Island Manager position was vacant at the time of the last 312 evaluation, but is now filled, and it is he who acts as the DNR liaison between the State of Georgia and other island stakeholders.

(b) The Reserve must work within the decision-making body that is established to formulate and address recommendations from the island visitation trends study that are pertinent to the protection of reserve resources. Such recommendations could include updating the results of the study for 1999 and 2000, supporting additional efforts to correlate visitation levels with resource impacts, and exploring approaches for estimating relevant uncontrolled uses occurring on the island. The Reserve should report on pertinent recommendations made and actions taken in its semi-annual performance reports to NOAA.

*SINERR Response:* SINERR is neither conducting nor planning to conduct research on visitor impacts, as funding sources for such have not been identified. Under the current management structure of the island and visitation (limited access, required sponsorship, etc.), visitor impacts are viewed as very low in comparison to other, realized impacts such as those from exotic flora and fauna. The Reserve's visitation has remained static for the last six years in terms of educational outreach (public tours, school field trips, etc.), due to ferry space limitations. Ferry usage studies have been completed and data provided to NOAA/ERD for the period 1993-2000. SINERR has made no recommendations to Georgia DNR regarding any aspect of these studies, as increased visitation to the Island is not currently an issue. Georgia DNR recognizes that visitation management is important for the long-term management of Sapelo Island, and such planning will be the responsibility of the Island Manager.

(c) The Reserve must work with WRD to develop a research strategy by July 2001 for assessing the benefits and impacts from management practices and uses occurring on the island, including pre-existing uses such as timbering, which could have a potential impact on Reserve land and water, to determine if increased management restrictions are warranted.

*SINERR Response:* No such specific research strategy has been developed. However SINERR does conduct, or serve as a platform for, a variety of research projects exploring the impacts of resource use and management practices. For example, the Reserve has attempted to gain an understanding of commercial fisheries impacts through trammel net studies, and long-term monitoring of hematodinium within the blue crab fishery of the Duplin. (New restrictions upon commercial or recreational fishing, however, are not anticipated due to Georgia state law which states that all navigable waters within the state will allow for recreational fishing, regardless of adjacent bank ownership.) The Research Coordinator has also been active in forestry management on the Island. He has been apprised of forestry programs and has served as DNR liaison with the UGAMI south-end forest management. Forestry research projects include the characterization (age, basal area, species composition, GIS maps) of sensitive Long-leaf pine habitats and an eradication study on the invasive tallow tree within sensitive habitats.

(d) Within five months from the receipt of these final findings, WRD must: (1) prepare an oil spill plan covering the fuel transport, storage, and pumping operations to ensure that environmental safety measures are outlined and necessary equipment identified and made available in the event of a spill disaster; and (2) prepare and execute a monitoring plan capable of detecting chronic levels of petroleum hydrocarbon runoff in surface and groundwater in the vicinity of the fuel depot.

*SINERR Response:* An oil spill response plan has been formulated and published, with a copy provided to NOAA/ERD. The present fuel facility is equipped with a multiplicity of monitoring devices to provide warning of impending problems, including spills, runoff and other assorted problems. The fuel facility is also linked to a real-time, continuous monitoring station operated by the Georgia Environmental Facilities Authority. Sensors are in place to detect leaks in both the diesel and gasoline tanks. The sensors and monitoring network satisfy the requirements of the GA Environmental Protection Division with regard to in-ground storage tanks and are sufficient to detect potential harm to the resources of the SINERR.

**2. Necessary Action:** To ensure the long-term stability of the Research Coordinator position, the DNR must activate a strategy by October 2000 for locating a permanent source of state funding for this full-time position by October 2001. The Reserve should describe administrative and legislative efforts for securing the position in all future semi-annual performance reports issued to NOAA.

*SINERR Response:* The Research Coordinator position continues to be funded through the NOAA annual award. Largely due to state budgetary shortfalls there is little

likelihood that the Research Coordinator position will be state funded in the near future. The state (Wildlife Resources Division of DNR) has, however, guaranteed that this position will continue to be supported.

**1. Program Suggestion:** The Reserve should revise its FY2000 construction proposal for an education and research dormitory facility to NOAA, based on the availability of federal funds. The facility plan should be revised to incorporate dedicated laboratory, office and storage space in order to meet the needs of reserve staff, researchers, and students involved in conducting research and monitoring activities on the island.

*SINERR Response:* The Reserve, through NOAA, provided \$400,000 (matched by the State of Georgia in the amount of \$175k and \$1 million in ear-marked funds) towards the cost of the jointly-shared research and education dormitory with the University of Georgia. Currently, no facility plan has been developed, and details regarding the availability of space in the new building for the Reserve's specific use are still unclear.

**2. Program Suggestion:** The Reserve should develop a prioritized inventory of research and monitoring equipment necessary for conducting or facilitating the conduct of field and lab work on Sapelo Island and factor the need for the equipment into future grant requests to NOAA and other appropriate funding sources.

*SINERR Response:* The Reserve has completed a prioritization of equipment needs.

**3. Program Suggestion:** The Reserve should develop a funding plan for a full-time monitoring technician position to increase its capacity to support a fully functional System-wide Monitoring Program.

*SINERR Response:* SINERR has filled a full-time monitoring technician position. The Research and Monitoring Program is also considering adding a new part-time monitoring technician.

**4. Program Suggestion:** The Reserve should move the new weather station to a location that satisfies the proper criteria for accurate data collection and meets the strategic needs of the research and monitoring program.

*SINERR Response:* The weather station at Marsh Landing has been re-deployed based on both NERR and Campbell suggested protocol. A 30 foot tower was erected and all probes are fixed to the platform consistent with recommended standards. SINERR downloads and QA/QCs the data on a weekly basis.

**5. Program Suggestion:** The Reserve should develop a strategy to revise the format and expand the content of the site profile document so that it can be revised when funding becomes available. The document should not be reprinted in its current form until these critical gaps in subject area coverage can be filled.

*SINERR Response:* SINERR has not developed a strategy to revise its site profile. This is not a current priority for the Reserve, but may be addressed in the future by enhancing the existing publication with updated information on research conducted within the Reserve. No timeline has been established for this revision. SINERR asserts that the publication is comprehensive from a perspective of the historical science conducted within the islands' marshes, and is a useful tool for orientation as to the scope of science and history of the island.

**6. Program Suggestion:** As the Reserve expands its public interpretation and outreach program to include the synthesis and delivery of information on coastal management issues, the program is encouraged to use its lecture series and other avenues as a platform for improving visibility and understanding of the structure and purpose of the SINERR.

*SINERR Response:* SINERR has worked diligently in the past few years to promote and better explain SINERR, and the NERRS in general, through outreach materials and by incorporating more Reserve information into Sapelo Island tour programs. The Education Program has grown considerably over the same time period, and the variety and number of programs offered both on the island and off-site have greatly increased. Perhaps the most notable growth has been seen in the development of the Coastal Training Program. In just one year, CTP worked with over 300 local decision makers through a series of training programs. Staff acknowledge, however, that many Island visitors still find the Reserve difficult to explain, as so many groups (UGA, DNR, etc.) are involved in operations on Sapelo Island.

**7. Program Suggestion:** The Reserve should begin to incorporate an evaluation mechanism for its public tours so their full impact on raising awareness, understanding and behavior can be assessed. The Reserve is also encouraged to develop and implement an approach for obtaining a background profile of the people who pass through the SINERR Visitors Center. Both of these steps should give the Reserve a more systematic source of feedback in order to shape the content of the Reserve's education, interpretation, and outreach programming.

*SINERR Response:* SINERR has not yet developed an evaluation mechanism for its public tours, nor does the Reserve currently collect visitor statistics. The public is encouraged to make comments about Reserve programs via email or in writing. Comments can be sent to the Georgia DNR website as well as to SINERR staff via email. The SINERR web address (which publishes staff contact information) is provided on tour brochures. The Education Coordinator does intend to implement an evaluation system



for school and teacher training programs, similar to that developed for the Coastal Training Program.

**8. Program Suggestion:** The Reserve should evaluate the benefit of incorporating all or some portion of the 140-acre parcel of state-owned property containing the Visitors Center within the Reserve boundary. In addition, the Reserve should explore opportunities for acquiring other near-shore and mainland properties adjacent to Sapelo Island containing functional and valuable habitats to increase protection levels and expand opportunities for comparative research and monitoring studies.

*SINERR Response:* Georgia DNR does not wish to pursue incorporation of the Visitors Center and Meridian ferry landing into the Reserve boundaries. DNR Wildlife Resources, which manages this state-owned property which includes the Visitors Center, ferry dock and barge facilities, wishes to maintain exclusive state control and oversight of these areas and keep the Reserve boundaries as they are presently.

**9. Program Suggestion:** The Reserve should consider working with ERD to bring the start date for its federal grant award into synchrony with the state budget cycle.

*SINERR Response:* Due to better administrative procedures and the computerization of most budgetary processes, the ability to manage the two different budget cycles has greatly improved. Therefore, there is no current need to synchronize the state and federal budget cycles.

## APPENDIX B. PERSONS AND INSTITUTIONS CONTACTED

### Sapelo Island National Estuarine Research Reserve

Name	Title	Affiliation
Buddy Sullivan	Director	SINERR
Dorset Hurley	Research Coordinator	SINERR
Brooke Vallaster	Education Coordinator	SINERR
Aimee Gaddis	Stewardship Coordinator	SINERR
Suzanne Van Parreren	CTP Coordinator	SINERR
Wylie Goodloe	Volunteer Coordinator	SINERR
Yvonne Grovner	Tour Coordinator and Guide	SINERR
Patrick Hagan	Monitoring Technician	SINERR
Bill Merriman	Visitors Center Manager	SINERR

### Georgia Department of Natural Resources

Name	Title	Affiliation
Fred Hay	Island Manager	Wildlife Resources Division
Captain Frank Price	Ferry Operations Supervisor	Department of Natural Resources
James Maund	Manager	State Parks and Historic Sites Division, Reynolds Mansion
Carmen Martin	Region 7 Supervisor	Wildlife Resources Division, Game Management
Mike Wilcox	Technician	Wildlife Resources Division, Game Management, RJ Reynolds WMA
Philip Flournoy	Program Manager	Coastal Resources Division, GCMP
Brad Gane	Asst. Director	Ecological Services, Coastal Resources Division
Lea King	Public Affairs	Coastal Resources Division
Jan Mackinnon		Coastal Resources Division, GCMP
Jill Huntington		Coastal Resources Division, GCMP

### Reserve Advisory Committee

Name	Title	Affiliation
Don Cohrs		Friends of Sapelo
Patty McIntosh		The Georgia Conservancy
Christi Lambert		The Nature Conservancy
Carolyn Dowse	Director	Sapelo Island Cultural and Revitalization Society

### Grays Reef National Marine Sanctuary

Name	Title	Affiliation
Reed Bohne	Director	Grays Reef NMS
Cathy Sakas		Grays Reef NMS
Becky Shortland		Grays Reef NMS

### **Educators, Education Program Partners**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Margaret Olsen	Educator	SE COSEE
Robin Damrill	Teacher	McIntosh County
Georgia Graves	Naturalist, Educator	

### **Researchers, Research and Monitoring Program Partners**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Justin Manley	GRF	University of Georgia
Karen Payne	Assistant Research Scientist	University of Georgia
Ron Kneib	Senior Research Scientist	UGA Marine Institute
Bill Miller	Director	UGA Marine Institute

### **Representatives of Local Interests and NGOs**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Deborah Sheppard	Director	Altamaha Riverkeeper
Nancy and Ceasar Banks	Business owners	Hog Hammock Community
Cornelia Bailey	Business owner, writer	Hog Hammock Community

## APPENDIX C: PERSONS ATTENDING THE PUBLIC MEETING

Name	Affiliation
Jan Casey	FOS
Julian Creamer	FOS
Elizabeth Loyd	FOS
Jerry Loyd	FOS
Albert M. Olsen	FOS
Steve Ryner	Educator, FOS
Barbara Ryner	FOS
Jon Traer	FOS
Genevieve Wynegar	

## **APPENDIX D: NOAA’S RESPONSE TO WRITTEN COMMENTS**

NOAA received two sets of written comments regarding the Sapelo Island National Estuarine Research Reserve (SINERR). Each comment is summarized below and followed by NOAA’s response.

### **Vicki and Richard Sipp Townsend, Georgia**

**Comment:** Mrs. and Mr. Sipp write to express their strong support of SINERR efforts and appreciation for the Reserve’s dedicated and enthusiastic staff. The Sipp family have been members of Friends of Sapelo for four years and greatly value the experiences that have been made available to them. They would like SINERR to be acknowledged for their stewardship of Sapelo Island, and for the educational opportunities afforded to coastal Georgia residents and visitors.

NOAA Response: NOAA agrees that SINERR is doing an excellent job engaging the public and providing educational experiences to residents and visitors that promote coastal stewardship. NOAA thanks you for your comments.

### **Ron T. Kneib, PhD Sapelo Island Resident/Research Scientist**

#### **Comment:**

Dr. Kneib shares his perspective as a long-term (24 years) resident of Sapelo Island and a professional research scientist who has studied marsh ecosystems for the past 30 years.

Dr. Kneib notes that there is an increasing emphasis on economic development through tourism, in Georgia and especially along the coastline. He also states that the relevant politically appointed Boards and Commissions which establish policies are mostly pro-development, and that members who endeavor to incorporate environmental concerns into the policy development process are in the minority.

Dr. Kneib acknowledges that while educational activities associated with tourism and recreational uses are allowed in the SINERR, that the “special conditions” of the award establish those uses as secondary, under the condition that “they do not interfere with the primary objectives of the Reserve.” Dr. Kneib believes that there has been an inversion of the primary and secondary objectives of research and education/outreach, respectively. Kneib offers examples and photographs, including the provision of public dock space in SINERR for the use of private landowners; commercial timbering and lack of proper communication regarding the timbering, which affected research sites; the distribution of fuel from a sensitive location within the SINERR boundaries; expansions of docks resulting in increase boat traffic in small tidal creeks, and more pressure on water resources and the handling of sewage and solid waste.

Dr. Kneib believes that the SINERR's mission has shifted over the years with direct and indirect consequences which include: the proliferation of motorized vehicles; impacts on research and upland forest ecosystems from commercial timbering; impacts to fishery science from recreational and commercial fish harvests; impacts from storage and barging of large solid waste from Lumber Landing Dock within the Reserve; and impacts from camping in core area on Little Sapelo Island, and at the Moses Hammock Hunt Camp. He also believes that the symbiotic relationship that was intended between SINERR and the University of Georgia Marine Institute does not exist, and that conditions on the Island and within the Reserve have made it unattractive to any resident research scientists on the Island.

Last, Dr. Kneib offered options for the evaluation team to consider with regard to the future management of the SINERR, which include: do nothing; change current objectives to meet tourism and recreational demands on the Island; restructure administrative authority of DNR policy on the Island to give SINERR veto power to better protect Reserve mission and objectives; avoid interagency conflicts in authority by transferring SINERR authority to another state agency or private organization that is not in the reporting line in DNR; and the state of Georgia could voluntarily remove themselves from the Reserve System and compensate NOAA for its fair market share of the property.

**Response:**

Since the Reserve's designation in 1976, the coast of Georgia has had unprecedented increases in population. Likewise, increases in private and state-sponsored visitation to Sapelo Island and the SINERR, and demands for private property on the Island have resulted in increased complex management challenges that did not exist at the time of SINERR's designation.

NOAA acknowledged in the findings that SINERR resources and its ability to support long-term research are at risk. With these findings, NOAA is requiring SINERR to work with the Island Manager and DNR leadership to develop and implement strategies as part of its updated management plan to redress the stressors and threats to key land and water resources within the Reserve. As noted in the findings, these stressors include, but are not limited to, an increase in vehicles parked, and abandoned, near the marsh; existing and potential impacts from increased visitation; and an increase in boat traffic, especially at docks on tidal creeks.

NOAA is encouraged that SINERR has worked with DNR leadership to halt commercial timbering within the Reserve. And while camping will continue at the Hunt Camp in the SINERR's buffer area, per the Reserve's current management plan, NOAA expects that DNR policies regarding public and land use within the Reserve will be re-evaluated as part of the of the management plan update to ensure recreational activities, and other uses that could affect estuarine resources, do not occur in core areas, and are limited in the buffer areas.

NOAA also expects that the MOU between the Reserve and UGAMI will be updated and included in the new management plan. While an MOU cannot improve coordination between two entities on its own, it will at least be a starting point for communication on the use of the shared research dormitory, and, hopefully, outline ways coordination can be improved.

In conclusion, NOAA believes that these findings emphasize the importance and requirement of SINERR's and WRD's commitment to ensure that key land and water areas in the Reserve are under adequate state control to provide long-term protection for reserve resources to ensure a stable environment for research. NOAA thanks Dr. Kneib for his comments.