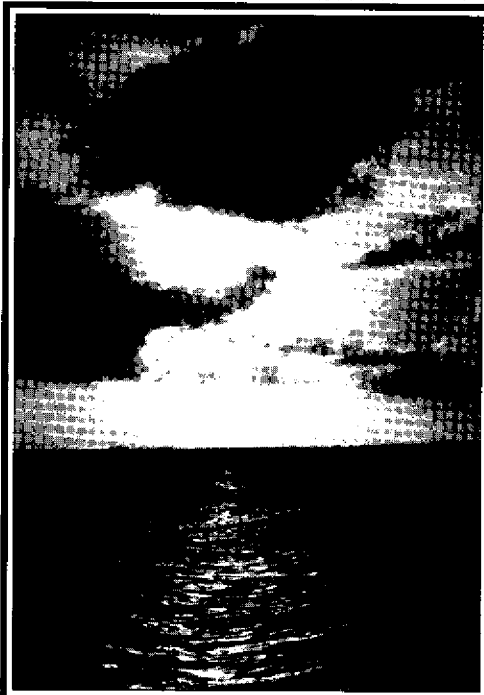


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GEORGIA
SEA GRANT
COLLEGE
PROGRAM

*STRATEGIC
PLAN
1995-2000*

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GEORGIA SEA GRANT COLLEGE PROGRAM STRATEGIC PLAN 1995 - 2000

In drafting a strategic plan, Georgia Sea Grant solicited input from its widely varied constituency — fishermen, scientists, resource managers, agencies, conservationists, educators, and business persons. As might be imagined, opinions varied within such a diverse group, but nearly all participants voiced environmental concerns. Coastal Georgia is experiencing unprecedented growth. If we are to avoid the mistakes made in other coastal regions, Georgia must strike the right balance between economic growth and environmental responsibility.

BACKGROUND

The National Sea Grant College Program was established by Congress in 1966 to advance the wise use and sustainable development of the nation's marine resources through a coordinated program of research, education, and advisory service. In this effort, the federal government works in partnership with universities, colleges, state agencies, and private industry.

The University of Georgia entered the National Sea Grant College Program in 1971 with funding for a study of salt-marsh ecosystems, an area of research in which the university had excelled since the early 1950s. Continuing development of programs in marine education and advisory services earned institutional status for the university in 1974. A record of sustained excellence in all three areas of Sea Grant endeavor (marine research, education, and advisory service) won Sea Grant College status in 1980. The University of Georgia was the

15th university in the nation to receive this designation, and, in 1990, the Georgia Sea Grant College Program's performance was validated through intensive on-site review, and its recertification was approved by the National Sea Grant College Program.

The Georgia Sea Grant College Program has proven itself to be productive, innovative, and efficient. Broadly speaking, it has focused expertise residing in the University System in five areas: (1) environmental quality, (2) marine ecological processes, (3) shellfish aquaculture, (4) seafood safety and technology, and (5) marine fisheries and technology.

The program has made many technological advances, including revolutionary changes in fishing gear, which have significantly increased the efficiency of the shrimping industry, and the development of improved methods for handling seafood processing wastewater and for byproduct recovery.

"Commercial fishermen, just as recreational fishermen, depend on a clean, healthy, and productive marine environment. We must preserve all functional wetlands which provide nutrients for plants and juvenile and larval-stage marine animals. Stop the draining and ditching of wetlands. Try to do something to decrease pollution by insecticides, fertilizers, and weed killing chemicals!"

— a Georgia shrimp fisherman

SITUATION STATEMENT

Georgia's unusual coastal setting is a combination of natural attributes and good fortune. Within its coastline, less than 100 miles in length, lie over 375,000 acres of salt marsh — one-fourth of the remaining salt marshes on the east coast of the United States. Salt marshes play many dynamic roles in the coastal ocean interface. They help prevent erosion and provide a vital component of the marine food web. They serve as nursery grounds for a multitude of marine species, and they help moderate the effects of pollutants in the water. Because the condition of Georgia's salt marshes is relatively pristine, they offer an ideal opportunity for multidisciplinary estuarine research. Two internationally known marine research centers are located on the Georgia coast — the Skidaway Institute of Oceanography on Skidaway Island and The University of Georgia's Marine Institute on Sapelo Island.

Georgia's coastal marshlands vary from four to six miles in width and fall between the mainland and a series of eight island complexes containing 13 barrier islands. Nearly 88 miles of beaches and 76,000 acres are contained within these islands' cumulative shorelines. Barrier islands protect the mainland from storm surges and tidal action. Dating back 4,000 to 5,000 years, Georgia's outer islands are mere

youngsters compared to the older, inner islands which were formed 25,000 to 36,000 years ago near the end of the Pleistocene epoch.

Unlike many barrier island complexes found within the United States, Georgia's have experienced comparatively little development. Beginning in the 1890s, many of Georgia's "Golden Isles" were purchased by wealthy northern families. Jekyll, Cumberland, Ossabaw, Sea Island, Sapelo, St. Catherine's and Wassau Island were privately owned by the early 20th Century and remained so until mid-century. Large tract ownership provided a period of stability for these islands which helped protect them from exploitation. Most have since been sold to the state and federal governments which is indicative of public interest and conservation motives on the

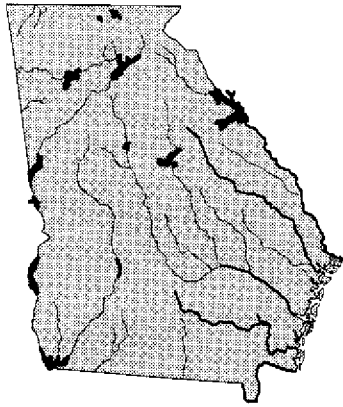
part of the original owners' successors. Today many of Georgia's barrier islands are relatively pristine because they are part of state or federal parks, sanctuaries or wildlife preserves.

Increasingly, scientists acknowledge that many coastal environmental problems are a function of watershed dynamics. Georgia's watershed is unique. With the exception of the tributary headwaters of the Savannah River, no river flows into Georgia from outside the state's boundaries. Rivers are formed from runoff from the mountains in the northernmost part of the state and the upper Piedmont area. Georgia's watershed is, in effect, a closed system, unlike Louisiana's for example, which is "the end of the pipe" for the Mississippi River and by extension suffers the effects of non-point sources of pollution from states bordering



the entire Missouri-Ohio-Mississippi complex. In Georgia, non-point sources of pollution originate within our state, which makes the task of monitoring, controlling and remediating them somewhat easier.

Drainage for the state's seven major river systems is separated by a major continental divide between the Flint and Ocmulgee Rivers. The two rivers which form the Flint system drain (through Alabama and Florida) into the Gulf; the other five systems drain into the Atlantic. Second largest in the eastern U.S., the Altamaha River basin originates in the Georgia Piedmont with the Oconee and Ocmulgee Rivers, which then converge into the Altamaha approximately 80 miles from Darien, GA. Near the coast, the Altamaha has extensive tidal swamps and marshes and bottomland hardwood forests. Tidal effects have been documented as far as 30 miles upstream, and brackish water has been noted as far as 36 km upstream, although typically saline and brackish vegetation is found in the lower three miles. The Altamaha has experienced little engineering; there are two impoundments along its reach. The State of Georgia owns most of the tidal wetlands in the lower Altamaha, and the Georgia Department of Natural Resources operates a wildlife management preserve in the brackish and freshwater areas.



Georgia's second largest river system is the Savannah. Widely used as an avenue of commerce since the earliest days of the city of Savannah's settlement, the river has been dredged and channelized repeatedly. Levee systems built to control flooding also have contributed to its "domestication." Three major impoundments are located above the fall line at Augusta: Lakes Hartwell and Russell and the Clarke Hill Reservoir. Together these three bodies of water support a wide range of recreational activities and development. Because the Savannah has been heavily engineered, it lacks the extensive vegetated floodplain in the freshwater tidal zone that characterizes the Altamaha, although it does have vast areas of saline intertidal vegetation closer to the sea. On its lower reaches the Savannah passes through the Savannah River Plant, one of the nation's weapons-grade plutonium production sites.

The three remaining rivers draining east to the Atlantic, all

significantly smaller than either the Savannah or Altamaha, are known as "blackwater streams." Unlike the other major rivers in the state, these three rivers are either unaffected or only little affected by the characteristic red clay soil of the Piedmont. Instead they derive their black coloration from the rich humic materials of the pervasive floodplain swamps bordering these rivers. These three rivers are the Satilla, the Ogeechee and the Saint Mary's. Their levels of development and recreational activity are far less than those on other river systems in the state because they are smaller in size, they drain a smaller area, and they have no major impoundments.

Unlike most coastal states, the great majority of Georgia's population lives far inland. Over 40% of Georgians live in and around metro Atlanta, which is more than 200 miles from the coast. Georgia's six coastal counties — Chatham, Bryan, Liberty, McIntosh, Glynn and Camden — contain a wealth of contradictions. In a state that boasts 159 counties, three of the six coastal counties rank among the ten poorest in the state in terms of per capita income (Camden, McIntosh, Liberty). Conversely, two of the six rank among the ten richest counties in per capita income (Glynn, Chatham) (The Georgia County Guide 1995). A similar disparity is reflected in coastal environmental conditions. While Georgia's salt marshes are

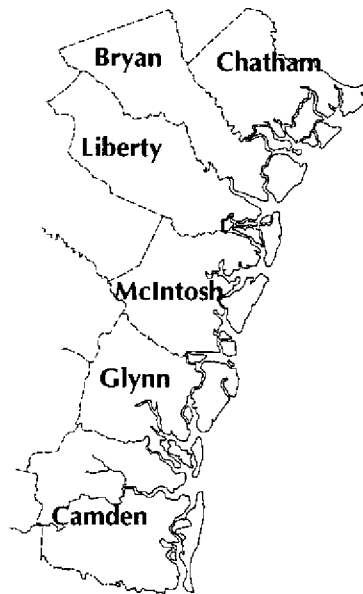
relatively pristine and its barrier islands have experienced comparatively little development, two of Georgia's coastal counties (Chatham #1 and Glynn #2) lead the state in pollution, and the City of Brunswick is host to a Superfund site (Linden Chemicals and Plastics Plant) that may be the most contaminated spot in the eastern United States. The following county sketches present salient demographic and pollution-related considerations.

Chatham County, home to the city of Savannah, is the most urban of the six coastal counties and enjoys a robust tourist industry. The port of Savannah, Georgia's largest, handles mostly containerized cargo including clay, iron, steel, pulp and paper products, wheat and soybeans. Its annual contribution to the regional economy is an estimated \$3.5 billion.

One of two predominantly rural counties on Georgia's coast, Bryan, nevertheless, was the second fastest growing coastal county in the decade 1980-1990. The U.S. Army's flight training center, Fort Stewart, occupies much of the county's area. The fastest growing municipality, Richmond Hill, is experiencing suburban expansion southward from Savannah. Much of Bryan County remains undeveloped, however, with extensive

marshland bordering Richmond Hill State Park and Ossabaw Island. Fish camps are clustered along the coastline in Bryan.

Like Bryan, a significant portion of Liberty County is taken up by Fort Stewart, which shapes much of the county's demographics and economy. The federal government is the leading employer in the county (31.2% of the workforce). With a median



age of 24, Liberty has the "youngest" population of any coastal county. Any pollution concerns that may exist are largely confined to Fort Stewart.

McIntosh County is the least densely settled and the only one of six coastal counties classified as 100% rural. The largest municipality is Darien, located at the mouth of the Altamaha River. The coast of McIntosh is largely

undisturbed marshland and features a number of wildlife refuges and wilderness areas. The University of Georgia's Marine Institute is located offshore on Sapelo Island (Sapelo Island National Estuarine Research Reserve).

The "Marshes of Glynn" are no doubt considerably less pristine today than when Sidney Lanier wrote his classic poem of the same name in the mid-19th century. Like Chatham, Glynn County is largely urban/suburban. It is also the home of Georgia's second largest port facility, Brunswick. A busy international harbor, Brunswick handles rolling stock, such as automobiles, trucks and machinery, and bulk shipments. Glynn County has Georgia's most extensively developed barrier islands offshore. Jekyll, St. Simons and Sea Island, all accessible by causeway from the mainland, support a vital tourist industry that has a significant impact on local and state economies.

Georgia's southernmost coastal county is Camden. It is the fastest growing county on the coast and in the state despite the fact that nearly 50% of it is still classified as rural. The U.S. submarine base at Kingsland is located in Camden County and represents the engine for much of the local economy. Camden is bordered by two of coastal Georgia's blackwater rivers, the Satilla to the north and the Saint

Marys to the south. Much of Camden's coastline is relatively undisturbed marshland. The Cumberland Island National Seashore lies offshore. Camden's meteoric growth represents some cause for concern for the inevitable pollution-related problems that attend rapid expansion, and other concerns relate to the Navy's nuclear submarine base. To accommodate frequent submarine traffic, dredging activity in the channel is an ongoing process.

The seafood processing industry is an important element of the coastal Georgia economy. Nearly 40 seafood packing houses and processing plants are located there. Packing houses involve minimal processing. Seafood is offloaded from boats and packed for shipment all over Georgia and the Southeast. Fourteen processing plants utilize shrimp and crab almost exclusively in producing crabmeat and ready-to-eat and ready-to-fry products, such as breaded shrimp, for markets all over the country. Two national processing companies, together employing nearly 1,000 full-time workers, are located in Brunswick and are among the area's largest employers. A number of smaller processors, which employ 30 to 70 workers, also are located in the area. Stiff competition from imported products and a rapidly dwindling workforce tend to create an



economic vise that makes business especially challenging for these smaller processors. Crab processors also suffer from the fact that more locally caught crabs are now sold to the "basket market" — restaurants and distributors who serve and sell whole crabs.

The most valuable fishery in the U.S. is the southern shrimp fishery. Nationally the catch has an exvessel value of more than half a billion dollars. In Georgia, the shrimp fishery is based on two species, white shrimp (*Peneaus setiferus*) and brown shrimp (*P. aztecus*). Five other species are known to exist but are not caught in commercial quantities. While the fishery operates only about six months a year, from June to December, it is still Georgia's most valuable. Georgia's landing statistics for 1993 (the most recent year available) were 4,938,256 pounds (of tails) caught with an exvessel value of \$17,484,879.

The state's second most valuable fishery is hard blue crabs. Landing statistics for 1993 indicate nearly 8 million pounds (whole animal) of blue crabs were harvested with an exvessel value of almost \$3 million.

Coastal Georgia's recreational boating and fishing populations also contribute significantly to the coastal economy. Recently, a recreational boat survey was conducted by staff at the University of Georgia's Marine Extension Service in Brunswick. Thirty-six marinas and boatyards which met certain minimum criteria in terms of dock length (500' or over), wet slips (at least 15), or dry stack storage were included. Many smaller fish camps and boat hoists, however, were excluded from the survey. Of the 3,970 boats (Georgia-owned and transients) docked or stored at the 36 marinas, nearly 87% were located in Chatham and Glynn County marinas. Survey data also indicated that

during peak seasons, coastal Georgia is approaching saturation of its available boat handling capacity. The impact of the 1996 Olympic sailing events in Savannah will undoubtedly put even more pressure on these facilities, such that expansion of existing marinas and construction of new ones are certain to happen.

While recreational fishing statistics are complicated by the fact that Georgia does not have a saltwater fishing license, there is no doubt that saltwater anglers do contribute significantly to the coastal economy. A 1994 survey initiated by the Georgia Department of Natural Resources and carried out by Georgia

Southern University utilized data from several thousand telephone interviews to determine the numbers of fresh and saltwater anglers in the state. The number of anglers (ages 6 and older) who classify themselves exclusively as saltwater fishermen is 165,538; additionally, 443,717 fish both salt and fresh water.

Coastal Georgia is blessed with bountiful natural resources — vast and largely unspoiled salt marshes, a barrier island complex that features some of the least developed islands on the eastern seaboard, and a self-contained watershed that gives us the opportunity to correct our own pollution problems.

As Georgia continues to experience rapid growth, however, one of its greatest legacies may turn out to be a mixed blessing. Because so much of coastal Georgia is state or federally owned, population growth and development necessarily will occur in areas already under pressure from urbanization, or, as in Camden County, from a dramatically increasing population. If coastal Georgia is to benefit from such meteoric growth, it is crucial that the growth be managed responsibly. Georgia's coast is a jewel ready to be polished, but we must first be aware of its many facets in order to bring out its great lustre and beauty.

THE CHALLENGE

As we approach the beginning of a new century, no venue for action is more important or exciting than the area from our coastal river systems to the inner continental shelf. This is Georgia Sea Grant's arena — one that poses engrossing challenges for scientists attempting to understand the complex interactions between the physical, chemical, biological, and geological processes that hold sway in the area where land and sea come together.

Here, also, is the area where social, political, economic, and legal conflicts are likely to escalate as a growing coastal population makes increasing demands on limited natural resources. At the same time, the coastal zone is vulnerable to environmental degradation through collective effects from growing inland populations and their industrial, agricultural, residential, and recreational activities.

Clearly, coastal issues and problems are not simple, and Sea Grant's audience extends beyond the coastal area. Constituencies include not only those who make their living directly from the sea, but inland groups such as consumers of seafood, investors, tourists, originators of non-point pollution, and voters who may hold the balance of power in environmental policy issues.

Moreover, the economic interests of present-day populations must be balanced with those of future generations.

Sea Grant strives for balance. Learning to use coastal and marine resources in a sustainable manner is a critical goal. Traditional industries, such as seafood, tourism, and aquatic recreation depend on maintaining a quality environment. What



industries are compatible with environmentally sound management practices? How does the state accommodate rapid growth without destroying the resources that attract people to the coastal region? In an atmosphere of international competition, how can research in advanced marine technologies, such as aquaculture and other biotechnologies, improve our capacity to compete in the world marketplace?

Sea Grant was designed to address these complex questions. With support and advice from government and from industry, Sea Grant taps the multidisciplinary expertise of the university community in research, transfers technology, and educates scientists, workers, citizens, and community leaders for the future. Sea Grant also provides a network for collegial sharing among Sea Grant programs and their constituents nationwide.

In drafting the plan of action which follows, the scientists, administrators, educators, researchers, and constituents who have collaborated in identifying coastal Georgia's needs over the next five years have tried to make maximum use of Sea Grant support, the Sea Grant network, and the talent which resides in our state's universities, the private sector, and government agencies.

STRATEGIC AREAS

Taking into consideration the needs expressed by a broad spectrum of constituents, and a realistic assessment of today's funding climate, Georgia Sea Grant has compiled two portfolios for action — an Economic Leadership Portfolio and a Coastal Ecosystem Health Portfolio.

ECONOMIC LEADERSHIP PORTFOLIO

ECONOMIC OPPORTUNITY AND SUSTAINABLE DEVELOPMENT

Goal: Create sustainable economic opportunities that do not degrade the natural resources of Georgia's coastal region

Sustainable development is the key to future opportunity. To this end, Sea Grant will continue to assist the Georgia Marine Business Association and

the Georgia Seafood Council and to provide technical support to marine-related businesses. Assistance will also be supplied in the development of a charter boat association which will foster recreational uses of the coastal margin without adding greatly to the

already burgeoning boat traffic.

Success will be measured by the effect on economic growth of these organizations as they set the standards for their industries and articulate their concerns in a unified voice.

SEAFOOD SUPPLY

Goal: Enhance quality and supply of seafoods as well as the economic health of the aquaculture and seafood harvesting, processing, and marketing sectors

In matters of seafood supply, Sea Grant will work to benefit both the supplier and the consumer. Broadly speaking, our goal is to enhance the safety, the quality, and the supply of seafoods by improving the economic health of

aquaculture and the seafood harvesting, processing, and marketing sectors.

To sustain the natural seafood resources, commercial and recreational needs must be balanced with environmental concerns. Appropriate technology also must be developed and shared to create an economically viable shellfish aquaculture industry in Georgia.

The following tasks aim toward these objectives.

Fisheries

- Transfer bycatch reduction device (BRD) technology to the harvesting sector
- Identify critical recruitment processes controlling replenishment of fisheries
- Facilitate resolution of fishery resource conflicts

through educational programs that reflect the concerns and needs of various user groups

Aquaculture

- Develop and transfer molluscan aquaculture technology to help create an economically viable industry

Seafood Technology

- Provide research and technology transfer for development of value-added seafood products

- Transfer technology to help implement Hazard Analysis Critical Control Point (HACCP), Good Manufacturing Practices, and quality assurance programs

- Conduct consumer education programs on quality, safety (e.g., pathology reduction), risk assessment, and seafood distribution

- Develop the means to improve energy and processing efficiency in marine industries, especially in the areas of

waste management and water usage

Success in the area of Seafood Supply will be evaluated through surveys to determine Sea Grant's role in helping to resolve fisheries conflicts. Annual sales and employment figures will determine success in fostering aquaculture, and the use of new and improved technologies that enhance quality and safety will be documented, including their economic impact on the industry.

COASTAL ECOSYSTEM HEALTH PORTFOLIO

COASTAL ECOSYSTEM SCIENCE AND RESEARCH TECHNOLOGY

Goal: Focus scientific inquiry on the relatively pristine state of Georgia's coastal rivers and estuarine complexes in an effort to understand the fundamental environmental processes that govern ecosystem health

A coordinated research program will continue to study coastal processes, seeking to establish the linkages between human activities in inland and coastal watersheds and the

ecological processes that influence the relative health of estuarine ecosystems. The resulting information will provide coastal and marine industries and decision-makers with the technological and management tools which will allow wise utilization and sustainable development of limited resources. To clarify these fundamental processes, Sea Grant researchers will work in conjunction with the NSF Land Margin Ecosystem Research

(LMER) project, NOAA's National Marine Sanctuary Program, and the Coastal Ocean Program. They will work also to create innovative technologies for rapid and cost-effective measurement of ecosystem health.

Success will be measured by documenting the use of research information and measurement tools by managers in their decision-making process.

COASTAL ECOSYSTEM STEWARDSHIP

Goal: Provide Georgia policymakers with unbiased information, facilitate dialogue among various coastal constituencies, and educate Georgia citizens about how coastal ecosystems function and how watershed utilization affects coastal resources

Sea Grant's commitment to environmental education ranges from advisory service, training, and formal instruction to the support of graduate students. By training teachers, interns, and docents, a cadre of environmental education "multipliers" will be created. Sea Grant will also work to strengthen its advisory role to Georgia government and to encourage networking among other scientific

(e.g., NSF, GA LMER), regulatory (e.g., GA DNR, NMFS), policy making programs (e.g., CZM), and interest groups (e.g., GA Fishermen's Association, The Georgia Conservancy). The following tasks will help to accomplish these goals and objectives.

- Facilitate regional use of the Sea Grant network to provide technical information about coastal development and coastal hazards
- Expand the use of mass media, internet, distance learning technology, publications, and forums for discussion of coastal issues and research
- Emphasize the inclusion of minorities in the continuing training programs for students, interns, teachers, and volunteers

- Investigate the nature and origins of resource conflicts and serve as an objective "third party" to promote conflict resolution

Success will be measured by calculating the numbers of students (K-12, undergraduate, and graduate) who participate in educational programs. Surveys will be used to evaluate the advisory and conflict resolution roles performed by Sea Grant with agencies and interest groups.

While the areas of endeavor outlined here indicate high priority for action, it should be remembered that Sea Grant, as a partnership, retains the flexibility and the commitment to respond to the unexpected demands of a rapidly changing coastal arena.