THE LENGTH, BREADTH AND SWEEP OF MARSHLAND PROTECTION IN GEORGIA: Protection Afforded by Georgia's Coastal Marshland Protection Act and Coastal Nonpoint Source Program

by

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(Under the Direction of LAURIE FOWLER)

ABSTRACT

The Coastal Marshland Protection Act (CMPA) and the Coastal Nonpoint Source (NPS) Program are two of Georgia's primary instruments for controlling human influence on the coastal marshlands. Understanding the history of these measures and their contemporary management challenges provides context for current efforts to improve coastal protection. Contemporary circumstances raise concerns about the ability of the CMPA to protect the marshlands from impacts of upland development. The Coastal NPS Program has the potential to address these development impacts but faces challenges of its own. University-based programs and environmental NGOs can strengthen coastal conservation efforts in Georgia by leveraging the existing resources and institutional infrastructure of these programs. This can be aided by focusing direct actions and assistance at the county level, promoting the collection and more consistent use of scientific information in coastal permitting decisions, and strengthening institutional and organizational networks.

INDEX WORDS: Coastal Georgia, Coastal Zone Management, Nonpoint Source Pollution, Coastal Marshland Protection Act

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DEDICATION

"The length and the breadth and the sweep of the Marshes of Glynn"

Sidney Lanier 1878

To all those that worked to pass Georgia's Coastal Marshland Protection Act.

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CHAPTER 1

INTRODUCTION

This thesis is meant to serve as both an historical and analytical exploration of coastal management in Georgia and a summary of practical and tangible suggestions and resources to inform university-based programs and environmental NGO's working to enhance the protection of Georgia's coastal ecosystems. The state of Georgia is unique with respect to its coastline and its coastal policy. Georgia has over 2,344 linear miles of coastline.[1] This network of wetlands, floodplains and barrier islands contains about 162,000 hectares of salt and brackish water marsh[2] that lie between the mainland and barrier islands, in addition to the largest area of tidal freshwater wetlands on the East Coast.[3]

The habitat created by the unique vegetation and tidal fluctuation in the coastal marshlands is critical for a variety of species and ecosystem processes. This intertidal habitat, forms the basis of a nutrient cycle critical to coastal ecosystems. Decomposing marsh grasses are an essential source of food and nutrients for a wide variety of species, both terrestrial and marine,[4] and coastal marsh areas are important breeding, nursery, and feeding areas for shellfish and finfish species.[5] The coastal marshes also help to purify

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[1] NOAA and GA DNR, (2003). *State of Georgia coastal management program and program document*. p.16.
[2] Kundell et al.(1988).
[3] (2007). *At the tipping point*. Southern Environmental Law Center. p.13.
[4] Teal, J., & Teal, M. (1969). *Life and death of the salt marsh*. New York: Ballantine Books
[5] Pfeiffer, W., & Weigert, R. (1981). Grazers on spartina and their predators. In L. Pomeroy & R. Weigert (Eds.), *The Ecology of a Saltmarsh* (pp. 97-112). New York: Springer-Verlag.

water and protect inland areas from severe weather by reducing impacts from storms and floods.[6]

Most of the coastal marshes in Georgia are held by the state "in trust for the public", and Georgia's Coastal Marshland Protection Act (CMPA) is one of the most comprehensive marshland protection measures in the nation. It is unique in its specific focus on marshlands, as most other states regulate marshland development and activity through broader coastal or water quality legislation. The Coastal Marshland Protection Act is one of the most important tools the state of Georgia has for regulating human influence on marsh ecosystems. It was the result of a statewide campaign in the late 1960s, when the efforts of a small group of scientists, natural resource managers, state legislators, and activists was augmented by a groundswell of Georgia residents who demanded protection for the state's marshes. The history of marshland protection in Georgia can offer important insights and lessons for the future as the state faces the ongoing challenge of balancing protection of its coastal resources with economic and development trends.

Coastal Georgia's Comprehensive Plan (2008) notes that Coastal Georgia is the second fastest growing region in the state, second only to Atlanta.[7] In 2006, the Coastal Georgia Regional Development Center (now the Coastal Regional Development Commission) and Georgia Tech conducted a joint population study. They predicted an overall population of 844,161 people by 2030 in coastal counties. This represents a fifty

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[6] Siewicki (Eds.), *Sustainable Development in the Southern Coastal Zone* (pp. 117-133). Columbia, South Carolina: University of South Carolina Press.

[7] In 2005 Governor Perdue directed the Department of Community Affairs to complete a coastal development plan promoting sustainable future development. Now called the Coastal Comprehensive Plan it covers tourism, economic development, environmental management, housing, and transportation.

percent increase in population from the estimated 558,000 people living there in 2000.[8] With this anticipated growth comes increased development driven by both private interests and through state sponsored initiatives like the Savannah Port expansion.

This thesis discusses past and current regulatory and incentive based approaches to manage Georgia's coastal region, focusing on coastal marshlands. It includes a summary of ongoing initiatives and programs that are currently being developed. Many of these programs are successful or promising but hindered by limited financial support, technical expertise, or staff. The impact of these programs could increase exponentially with some additional and creative support. University programs, in particular, are well positioned to positively impact efforts to protect Georgia's coasts by providing technical and legal consultation and research assistance to existing programs and initiatives.

In this thesis, I focus on the Coastal Marshland Protection Act and the Coastal Nonpoint Source Program (part of the Coastal Zone Management Program). While these are two of the primary instruments the state of Georgia has for managing the coastal region, they are not its only tools. I begin with the CMPA because it is a key part of regulatory coastal protection and was important in the growth of an environmental movement in the state of Georgia. It is unique in its focus on coastal salt marshes and is a fascinating and inspiring political and organizing story. My discussion of current management efforts focuses on the Coastal Zone Management Act, particularly the Coastal Nonpoint Source (Coastal NPS) program, because the development of this program is both a considerable success and a contemporary management challenge that

[8] (2006). *Georgia coast 2030: Population projections for the 10-county coastal region*. Center for Quality Growth and Regional Development at the Georgia Institute of Technology.

can potentially address some of the development impacts that are not currently controlled through the CMPA.

This thesis addresses the following questions. What is the current status of marshland protection in the state of Georgia? What regulatory and voluntary measures exist? What gaps exist in current legislation and policy? What are the current challenges for marshland protection? What is the most effective way for a university-based institution or program to help improve coastal management in Georgia? I address these overarching questions by first examining how the campaign to pass the CMPA has shaped contemporary management, conservation, and development trends in coastal Georgia. What made the CMPA campaign of the late 1960s successful? How is the CMPA functioning today and how have changing times affected its impact? Next I focus on the Coastal NPS Program as a compliment to the CMPA and ask what the current status of Georgia's Coastal NPS plan is, and what the biggest challenges are in meeting its outstanding conditions.

Methods

This work was carried out through a combination of archival research, analysis of scholarly articles, management plans, guidance documents, and program websites, and through a series of interviews with professionals in natural resource management at the federal and state levels. Chapter one is informed by archival research in the Reid Harris Papers collection at the Richard B. Russell Library for Political Research and Study at the University of Georgia. I also interviewed five people with either primary or secondary knowledge of the campaign to pass the CMPA. This included a scientist involved in the campaign and the establishment of the first Coastal Marshland Protection Committee, the

son of one of the primary environmental activists involved in the campaign, Eugene Odum's biographer, a student activist involved in the campaign, and the director of a Georgia-based environmental NGO with knowledge of the campaign and its effects on the state.

For chapters two through four, which focus on current management efforts, I interviewed a total of twenty-two people. This included two people from the National Oceanic and Atmospheric Association (NOAA), two people from the Environmental Protection Agency (EPA), six people from the Georgia Department of Natural Resources (GA DNR), including four from the Coastal Resources Division (CRD). I also interviewed five staff members from coastal conservation organizations including the Georgia Land Trust, Southern Environmental Law Center, Center for a Sustainable Coast, Altamaha Riverkeeper, and the Georgia Conservancy, three independent consultants in natural resource management, a member of Georgia's Coastal Regional Commission[9], two professors of coastal ecology, one a former scientist with UGA Marine Institute at Sapelo Island (UGAMI), the other a faculty member at the Skidaway Institute of Oceanography (SKIO), and a staff member from the North Carolina Division of Water Quality (NCDWQ).

I began by contacting employees in charge of coastal programs and nonpoint source pollution programs in the relevant federal and state agencies (NOAA, EPA, GA DNR and CRD). Conservation nonprofit organizations were selected based on recommendations from professors in the School of Ecology and Marine Sciences Department at the University of Georgia and through an Internet search for conservation

[9] Coastal Regional Commissions are "multi-county planning and development agencies serving municipal and county governments, that provide local and regional comprehensive planning services." More information available at: http://www.crc.ga.gov/Pages/faq.aspx.

organizations in Georgia. Interviews took place over the phone and were thirty minutes to an hour and fifteen minutes in length. They were conducted between November 2011 and February 2012. The interviews were semi-formal and included questions about interviewee's roles in coastal management, the goals of their organizations or agencies, the biggest challenges to coastal management in the state of Georgia, and Georgia's Coastal NPS Program. I conducted interviews with those working on coastal management in a professional capacity, either as natural resource managers, academics, or staff of environmental NGOs.

Coastal management in the state of Georgia is a complex undertaking involving many federal, state and local agencies as well as county level jurisdiction. It involves stakeholders in industry, conservation, and development as well as city planners, scientists, academics and concerned residents. People that work on coastal management issues in the state of Georgia are constantly navigating complex social, political, and ecological realms. Many of the issues, programs, and initiatives have levels of complexity that I will not be able to address here. This is an overview of important trends and issues related to Georgia coastal zone management and marshland protection conducted in order to provide university-based institutions and environmental NGOs with recommendations for beginning or expanding coastal programs.

Summary of the CMPA

In the late 1960s the Kerr-McGee Corporation approached the state of Georgia with a proposal to mine phosphate along the Georgia coast. They petitioned the state to lease 25,000 acres of coastal marshland, an action that caused immediate concern among scientists, natural resource managers, state politicians and Georgia residents. After a

concerted and successful effort to prevent Kerr-McGee from obtaining the lease and mining along the coast this coalition turned its attention to securing permanent protection for the marshes. This was accomplished in 1970 when HB 212, the Coastal Marshland Protection Act, was passed by the state legislature.

Under the CMPA the Coastal Resource Division of GA DNR regulates dredging, draining, filling, construction projects or any other alteration to Georgia's coastal marshlands. The Coastal Marshland Protection Committee (CMPC) is the regulatory body that grants permits for most marshland construction or alteration including the construction of coastal marinas, community docks, commercial docks, and restoration and bank stabilization projects. The CMPC is composed of five members. This must include the Commissioner of Natural Resources, and at least three of the other four members must be residents of a coastal county. The committee has the authority to grant, deny, revoke, and amend permits under its jurisdiction. The CMPA has jurisdiction over "all tidally influenced waters, marshes, and marshlands lying within a tide-elevation range from 5.6 feet above mean tide level and below".[10] GA DNR has the authority to administer and enforce the rules and regulations of the CMPA, conduct public hearings, and prosecute court actions necessary to enforce compliance.[11]

The committee is required to provide a public notice of applications at least seven days prior to a committee meeting. Any member of the public may join the mailing list to receive these notices. A public hearing is not required for each application but the committee can call a public hearing if they believe there is sufficient public interest.[12]

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[10] GA CODE ANN. §§12-5-282
[11] GA CODE ANN. §§12-5-284
[12] GA CODE ANN. §§12-5-286(f)

Applicants can dispute a committee decision and have the right to a hearing before an administrative law judge appointed by the Board of Natural Resources.[13]

In their deliberations the CMPC is instructed to consider the impact of a project on the "public interest". A project that results in "unreasonably harmful" obstruction to or alteration of navigational waters, increased erosion, shoaling of channels or stagnant water, or "unreasonably interferes" with the conservation of finfish, shellfish, or other wildlife, or water quality is considered contrary to the public interest.[14] In order to receive a permit, applicants must show that all possible action has been taken to reduce negative impacts on the marshes. If a non-marshland alternative is available the permit will not be granted. Some state agencies (i.e. State Highway Department) and all private residential/recreational docks are exempt from the CMPA.

Private docks are permitted with either Programmatic General Permits or Individual Permits. DNR CRD and the Army Corps of Engineers have jurisdiction over both permits although the process of preparing applications and issuing permits has been delegated to CRD. A Revocable License (RL) for the use of state-owned tidal wetlands must also be obtained as part of the permitting process for any structure built over the marshes, including all structures permitted under the CMPA, or with a Programmatic General Permit or Individual Permit.

Any alteration in the marshlands that affects an area less than 0.10 acres is considered a "minor alteration". Minor alterations can be issued by the Commissioner of Natural Resources and do not have to go through the CMPC. The commissioner can base his/her decision on recommendations of staff, previous committee decisions, and public

[13] GA CODE ANN. §§12-5-283(b)
[14] GA CODE ANN. §§12-5-286(g)

comments. He/she may also refer the decision to the CMPC if they feel that it should receive further consideration.[15]

In 2006 the conservation organization Center for a Sustainable Coast (CSC) sued the CMPC to challenge a permit granted to the developers of the Cumberland Harbor resort community in St. Marys Georgia. CSC contested the permit because it included upland development that could have negative downstream effects on the marshes. CSC said the CMPC should not grant permits for projects with upland components that were located outside the marsh area but had negative impacts on the marshes (i.e. from stormwater runoff). The administrative law judge that first heard the case agreed with the CSC but the case was appealed and in 2008 the Georgia Supreme Court ruled in Center for a Sustainable Coast v. Coastal Marshland Protection Committee, that "the permitting power of the Committee did not extend to regulating residential upland portions of development".[16] This ruling left many conservationists and natural resource managers worried about the lack of regulation for stormwater runoff and nonpoint source pollution.

Summary of the Coastal Zone Management Act and Coastal Nonpoint Source Program

The federal Coastal Zone Management Act (CZMA) was passed by Congress in 1972. It is overseen by NOAA and encourages states and tribes to "preserve, protect, develop and where possible, restore or enhance the resources of the nation's coastal zone".[17] It includes states that border the Atlantic, Pacific, and Arctic Oceans, Gulf of Mexico, Long Island Sound and Great Lakes.[18] Participation in the CZM program is voluntary and federal funding is granted to states in the program under section 306 of the

[15] GA CODE ANN. §§12-5-283(d)
[16] Center For A Sustainable Coast v. Coastal Marshland Protection Committee. 284 Ga. 736, 736, 670 S.E. 2nd 429, 430 (2008)
[17] 16 U.S.C. §§ 1451-1465
[18] 16 U.S.C. §§ 1451-1465

CZMA and section 319 of the Clean Water Act (CWA). In order to be eligible for federal funding states must develop and enact a comprehensive coastal management program.

In 1990 Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA). Section 6217 of CZARA identified nonpoint source pollution as a major source of pollution in the nation's coastal waterways and required states in the CZM program to develop and implement coastal nonpoint source programs often referred to as Coastal NPS Programs. These are not the same as state Nonpoint Source Programs (State NPSMP) that are funded through section 319 (h) of the Clean Water Act. Section 6217 is managed jointly by NOAA and EPA who must both approve state plans. In 1993 EPA released a technical guidance document to assist states with the development of their Coastal NPS Programs. This document contains fifty-six management measures to control urban runoff, agriculture runoff, forestry runoff, marinas and recreational boating, and hydromodification.[19]

As of 2011 twenty-three states had received full approval of their Coastal NPS plans and eleven, including Georgia, had conditional approval. Conditional approval is granted to states that have Coastal NPS plans but have not met all the management measures in the EPA guidance document. Section 6217 includes penalties for states that do not meet deadlines for the completion of their Coastal NPS plans. In the original version of section 6217 a state that failed to develop a fully approved plan by 1996 would lose a percentage of their federal funding for each year that they were noncompliant. In 1995 changes were made to CZARA to give states more time and flexibility in developing and implementing their programs. Many states still do not have fully

[19] U.S. Environmental Protection Devision, (1993). *Guidance specifying management measures for sources of nonpoint pollution in coastal waters*.

approved programs. However NOAA and EPA have never withheld funding or penalized a state for noncompliance even though many states have had conditional approval for over a decade.

Overview of Thesis

In the late 1960s the effort to stop the Kerr-McGee Corporation and the campaign for the CMPA was led by a coalition of politicians, scientists and government officials, environmental activists, university students, garden club members and coastal land owners. They framed their arguments around the idea of democracy as the pursuit of the common good and their campaign drew on the language of democracy, rights, control, and collective identity. The sentiment that the tidal marshes "belong to everyone in this state", was voiced by politicians, coastal residents, and scientists. CMPA supporters argued that protecting the marshes would improve or benefit the state's economy, public resources, and public health. When the bill was drafted, its purpose was described as balancing between the "protection of the environment on the one hand and industrial and commercial development on the other".[20]

This campaign is an example of the early use of economic valuation and what has developed into the concept of "ecosystem services"; that natural systems provide human society with benefits or services. The campaign to stop Kerr-McGee inspired strong public support and participation by connecting conservation to broad public concerns through the use of scientific knowledge, public education, and the economic valuation of natural resources. It is a case study in the development of many of the strategies, arguments, and foundational ideas underlying contemporary coastal management.

[20] GA CODE ANN. §§12-5-280 to 297

A discussion of the history of the passage of Georgia's Coastal Marshland Protection Act is followed by a chapter on the current status of the CMPA. Contemporary context and unanticipated circumstances now raise concerns about the ability of the CMPA to deliver on the original intent of the bill. Scientists, conservationists and activist now identify threats that were not anticipated at the time the CMPA was passed and therefore were not included in the legislation. In 1968 the primary threat to the marshes was from large-scale mining operations, building directly on the marshes and the direct input of pollution into coastal waterways. Today development along the coast is primarily residential or based on the tourism industry. An increasing number of permits are being sought for the construction of condominiums, marinas and docks.

Since the passage of the Clean Water Act, point source pollution has been greatly reduced and increasingly regulated, and nonpoint source pollution associated with residential development has emerged as a primary threat to coastal areas. Chapter three discusses the 2008 court ruling that limits the ability of the Coastal Marshland Protection Committee to regulate nonpoint sources of pollution and control stormwater impacts on the marshes. Many scientists, conservationists, and activists feel that this represents a critical gap in marshland protection and in the state's ability to regulate coastal development.

Georgia's Coastal Nonpoint Source Pollution program is another state management mechanism that has the potential to fill the gap in protection created by the 2008 court ruling. Chapter four discusses Georgia's Coastal NPS Program, and what it means that the program has conditional rather than full approval. It also addresses the main challenges and concerns about coastal management identified by interview subjects.

It includes a number of general trends in coastal management and specific recommendations for expanding on, contributing to, or building off of existing initiatives in order to improve coastal protection. Interviewees recommended working to increase scientific input in the decision-making process of the CMPA and assisting with the development, adoption, and implementation of local county ordinances, management plans, and Best Management Practices (BMP)s.

Chapter five discusses recommendations for improving Georgia's marshland protection and coastal management programs. These are recommendations made by the professionals interviewed as well as my own research into successful programs in other jurisdictions.

CHAPTER 2

THE MARSHES OF GLYNN: GEORGIA'S COASTAL MARSHLAND PROTECTION ACT

In 1968, coastal marshlands in the state of Georgia were threatened by the interests of Kerr-McGee, an Oklahoma based mining company. The company sought to lease 25,000 acres of coastal marshland to establish a phosphate mining operation. They planned to dredge 3-5 million tons of phosphate per year.[21] This created considerable concern among state officials, university scientists, and politicians, who feared the environmental destruction caused by mining activities, and anticipated dire consequences for other industries, Georgia's economy, and public health. They campaigned for the rejection of the Kerr-McGee bid to lease the marshlands and the passage of legislation to permanently protect Georgia's marshes. In 1970, after two years of struggle, the Georgia legislature enacted the Coastal Marshlands Protection Act (CMPA). Its passage is an example of American representative democracy in action. The campaign inspired strong public support and participation by connecting conservation to broad public concerns through the use of scientific knowledge, public education, and the economic valuation of natural resources.

In 1968, scientists at UGAMI estimated that Georgia's six coastal counties covered a little over 0.18 million acres, 405,000 of which were swamp and tidal marshland.[22] The

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[21] Cohen, B. (1968, June 15). Phosphate mining bills multiplying. *Atlanta Constitution*; Cohen, B. (1970, January 18). Marshlands stand gains supporters. *Savannah News*.
[22]Burke, J. (1968, June 30). Economic value of marshlands assessed. *Savannah Morning News*.

salt marshes occupy a four to eight mile-wide expanse inshore of Georgia's barrier islands. They are an unusually dynamic ecosystem, marking the transition between land and sea and creating habitat where fresh and salt water mix. The tides, changing twice daily, are the lifeblood of the marsh, sustaining the system and the movement of nutrients. Tall cane-like grass, called smooth cord grass or *Spartina alterniflora*, is the most prominent symbol of the marshlands. Scientific research conducted in the 1960s demonstrated that salt marshes are highly productive systems producing nutrients vital to marine and terrestrial food webs. Marshes also serve as nursery grounds for fish and shellfish that supply commercial and sport fisheries. Along with high levels of primary productivity and diverse fisheries, the salt marshes are valued for their role in preventing erosion, filtering water and waste, and providing protection against storms and severe weather. In the 1960s, broad stretches of marshland along the Northeastern coast of the United States had been drained, filled, and converted under development pressure. In contrast, Georgia's marshlands were considered relatively pristine, and were estimated to constitute one third of the remaining coastal marshland in the nation. They were a source of pride, inspiring poets, artists, and writers. They were also the focal point for the development of new scientific knowledge.

On May 25th 1968, an article in the Atlanta Constitution notified the public that an Oklahoma-based oil company had submitted a proposal to the Georgia Mineral Leasing Commission to lease 25,000 acres[23] of Georgia coastal marshland for phosphate mining.[24] The Kerr-McGee Corporation, a subsidiary of Fanjo Inc., owned Little Tybee

[23] Harris argues that while 25,000 acres is the acreage cited in the Kerr-McGee proposal, the operation would also affect an additional 75,000 acres of ocean bottom. Harris, R. (2008). *And the coastlands wait*. Self Published. p. 41.
[24] Riner, D. (1968, May 25). Oil firm makes pitch for offshore phosphate. *Atlanta Constitution.*

and Cabbage Islands and had the option to buy half of Wilmington Island. The proposal they presented before the Georgia Mineral Leasing Commission included plans for mining marshes, beaches, and river bottoms near Tybee, Skidaway, Wassaw, Ossabaw and St. Catherine's Islands.

A.T.F. Seale, senior vice president of Kerr-McGee, described the company's goals as "two-fold", focused on "mining and land reclamation".[25] The first stage was the dredging of 70-120 feet of overburden in order to reach phosphate deposits.[26] After the phosphate had been removed, the leftover sediments would be used to fill the marshes, creating additional land front. This included plans for beach development and tourist access on Little Tybee Island. The company believed that the resources in Georgia were significant enough to allow them to compete with the phosphate mining industry in Florida, which at the time was producing one million tons of phosphate a year. Kerr-McGee had plans to dredge 3-5 million tons a year from the coasts of Georgia.[27] This announcement caused immediate concern among politicians, scientists, and government officials involved in water issues and game and fisheries management.

One of these men was Representative Reid Harris. Representative Harris was a native of Brunswick Georgia and was a member of the Georgia House of Representatives for six years beginning in 1964. Harris felt a personal connection to the coast and marshes. As an elected official he took a tour of a phosphate mining operation in Florida, which he writes about in his book, And the Coastlands Wait. Harris recalls, "the slime pits [and] the bleak landscape the mining left in its wake after the phosphate had been

[25] Cohen, B. (1968, May 25). Sea mining lease sought in Chatham. *Savannah Morning News*.
[26] Riner, D. (1968). Mining of phosphate offshore believed near. *Atlanta Constitution*.
[27] Cohen, B. (1968, May 25). Bid made to state authorities. *Savannah Morning News*.

extracted and [I] wondered if this could be the fate of Georgia's countryside".[28] This image remained in his mind and the desire to prevent the same thing from happening in Georgia spurred him to take action. The announcement of Kerr-McGee's proposal confirmed his fears that Georgia's coastlands, and the marshes in particular, remained vulnerable to exploitation. In his memoir, Harris describes the May 25th article as "an announcement that would change [his] life forever".[29]

In 1968 Harris drew up a resolution for an interim committee to study the need for mining legislation in Georgia. After committee members visited phosphate, iron, kaolin and marble mines in Florida, Alabama and Georgia, they argued for legislation to regulate strip mining. Harris wrote the Surface Mining Land Use Act, which mandates the reclamation of land after mining[30]. He convinced a more senior legislator, state senator Richard Russell (who later became a U.S. senator), to sponsor it, and it passed later that year. While Harris felt that this was a necessary and useful step toward protecting the Georgia coast, he remained concerned about future development.[31]

Dr. Eugene Odum of the University of Georgia (UGA), and Dr. Fred Marland and Dr. Thomas Linton from UGAMI, were also early and outspoken critics of the Kerr-McGee proposal . Dr. Odum was well respected and well known for his groundbreaking work on ecosystem ecology which has been cited as a foundation for the growing American environmental movement in the 1960s and 1970s.[33] Odum's work in the 1960s

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[28]Harris, R. (2008). *And the coastlands wait*. Self Published.
[29]Harris, R. (2008). p.23.
[30] Surface Mining Land Use Act, OCGA 12-4-70
[31] Harris, R. (2008). p.17.
[33] Worseter, D. (1994). *Nature's economy: A history of ecological ideas*. New York: Cambridge University Press.; Craige, B. (2000). *Eugene Odum: Ecosystem ecologist and environmentalist*. Athens, GA: UGA Press.; Hagen, J. (1992). *An entangled bank: The origins of ecosystem ecology*. New Brunswick: Rutgers University Press.

focused on ecosystem equilibrium, the flows of energy through systems, and the organisms and mechanisms needed to maintain those flows. The research done by Odum, Marland, Linton and their many colleagues and students revealed the vital roles the marshes play in protecting the inland against natural disasters, supporting fish, shellfish, and bird populations, and in maintaining a clean freshwater supply. Odum's research on *Spartina* marsh grass was especially influential. It showed that cycles of *Spartina* growth and decay were integral to the life cycles of many marine, marsh, and terrestrial species. The marshes also contributed to water filtration, the balance of nutrients, and other necessary ecological processes.[34]

Based on their research, Drs. Odum, Marland, and Linton were concerned about how far reaching the disturbances caused by mining operations might be. They saw the potential destruction of areas far vaster than those Kerr-McGee had described in their proposal. They feared the destruction of an ecosystem that they felt a personal attachment to, as well as the loss of ecological processes that human society and coastal communities depended on and benefited from.[35] Soon after the announcement on May 25th 1968, they began contacting colleagues, public officials, and Representative Harris, in order to share their concerns.

On May 30th 1968, Drs. Marland and Linton sent a letter to Representative Harris and scientific colleagues in Georgia. In it they described their concerns about the effects of the dredging and filling process outlined in the Kerr-McGee proposal. They wrote " the dredging and removal of these marshes and beaches preclude all other desirable uses

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[34] Odum, E. (1961). The role of tidal marshes in estuarine production. *Conservationist*, *15*, 12-15.; Odum, E., & Cruz, A. (1967). Particulate organic detritus in a Georgia salt-marsh- estuarine ecosystem In G. Lauff (Ed.), *Estuaries* (pp. 383-388). Washington, DC: American Association for the Advancement of Science.

[35] Marland, F. (2011, June 6). [Personal Communication].

such as nursery grounds for fish and shellfish, aquaculture, boating, sport fishing, water skiing, water fowl hunting, bird watching, etc.". They voiced concerns that the private, out-of-state corporation would benefit twice from the mining and land reclamation process. First, from the money earned through the mining operation, and second from the creation and sale of new real estate. Meanwhile, the people of Georgia would lose valuable resources. They wrote "the mining of the ore and sediment will thus make a double payoff for Kerr-McGee at taxpayer's expense".[36] They were also concerned that approval of this particular lease would set a precedent for the rest of the South Atlantic coast, along which similar deposits of phosphate had been located.

Some of the earliest and swiftest action was taken by government officials responsible for natural resource management. R.S. "Rock" Howard, the head of Georgia's Water Quality Control Board, expressed concern at the initial presentation of the Kerr-McGee's proposal, on May 24th, saying that the mining would "destroy forever nursing grounds for shrimp and fish and ruin the estuaries now under study by Oceanographers".[37] Before the end of the month, Jack Crawford and Leon Kirkland, from Georgia Game and Fish Commission, and Jim Morrison, Georgia Game and Fish Commission's Chief of Information and Education, also began speaking out. They wrote editorials, spoke on Georgia radio stations, and gave public talks on the role of the marshes in maintaining Georgia's coastal fisheries. In September 1968 Georgia Game and Fish magazine carried an article by Jim Morrison. Morrison encouraged readers to oppose the Kerr-McGee proposal. He said that the "three principle threats presented by the proposal" were "1. Possible destruction of the freshwater supply of Savannah. 2.

[36] Marland, F., & Linton, T. (1968, May 30). [Letter] *in* Harris, R. (2008). p.26.
[37] Cohen, B. (1968, May 25). Bid made to state authorities. *Savannah Morning News*.

Pollution of ocean water and destruction of sport fish and seafood production areas. 3. Filling of marshes, resulting in total destruction forever of the seafood industry and sport fishing in the area that is dependent on the marsh".[38]

In a letter sent on May 30th 1968, Rock Howard shared his concerns with Arthur K. Bolton, Georgia's Attorney General. Howard spoke about the possibility that dredging could pierce the aquifer that supplies water to the area. An infusion of saltwater and silt from the operation could spoil the entire region's freshwater supply which would be costly for coastal communities. He said that "more than 160,000 people in Savannah and surrounding communities are dependent on wells for freshwater" and that "should the dredging break into the freshwater limestone layer, saltwater probably would flow into the area wells, forcing Savannah to construct a ten to fifteen million dollar surface water treatment plant".[39]

The combination of concerns about environmental destruction, impacts on fisheries, the loss of recreational activities and potential impacts on human health and wellbeing served to raise public concern. In addition, several articles were published in national[40] and state papers questioning the productivity of the phosphate mining industry.[41] At public hearings and in editorials, professionals and citizens argued that the phosphate mining industry was over saturated and, regardless of its environmental impacts, was a risky investment at best. Victor Skorapa, a Georgia citizen, wrote to the Atlanta Constitution, saying "concerning the very unhealthy state of the fertilizer industry, the

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[38] Morrison, J. (1968, September 3). *Georgia Game and Fish Magazine,* inside front cover.
[39] Howard, R., & Bolton, A. (1968, May 30). [Letter]. *in* Harris, R. (2008). p.26.
[40] O'Halan, T. (1968). All that fertilizer and no place to grow. *Fortune Magazine.*
[41] Douthat, B. (1968, June 16). Phosphate mining: Asset or liability? . *Savannah Morning News.;* Gailey, P. (1968, June 14). Experts warn of perils in mining offshore. *Atlanta Constitution*.

news that Georgia is about to become involved in a 'multimillion-dollar a year phosphate industry' venture is alarming".[42]

Kerr-McGee's claim that Georgia would benefit economically from their operations was also undermined by concern for the seafood industry. Some feared that if nursery grounds and spawning areas were destroyed it would close down Georgia's fisheries. This would result in additional loss of income to the state and permanent loss of an economically important resource. Representative Charles M. Jones summed up this overall sentiment when he said that "[a]ll Georgians will agree that the possible economic benefits to the state and the area that would be ceded are much outweighed by the economic detriments that would probably result".[43]

Press coverage at this time was significant and generated substantial public interest and concern. Beginning with the lease application announcement, state and local papers printed a continuous stream of stories on the issue, including stories on the phosphate mining industry, the ecological importance of the marshes, and the economic benefits of the seafood industry for the state. In 1968 and 1969, the majority of these articles covered the actions and arguments of those opposed to the Kerr-McGee proposal.

These stories did not take a direct stand on the issue but were far more generous in airing the concerns of those lining up in opposition than the Kerr-McGee proponents. For example, on June 14th, 1968 the Atlanta Journal- Constitution published "Conservationists Raise Doubt on Off-Shore Mining Project." The story opens by saying " a huge question mark has been projected by an alliance of conservationists over a

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[42]Skorapa, V. (1968, July 7). Letter to the Atlanta Constitution. *Atlanta Constitution*.
[43] Representative Jones attacks phosphate project. (1968, January). *unknown in* Folder 2, Reid Harris Collection, Richard B. Russell Collection, Richard B. Russell Library for Political Research and Studies, University of Georgia Libraries, Athens GA.

proposed phosphate mining operation". The next paragraph says that "the company making the proposal ...says there is no need for alarm.. it will further allay fears at a June 20 meeting." The remainder of the article reports on the content of a press conference held by UGA and state personnel. It summarizes their arguments and provides detailed quotes from their prepared statement about the reasons why the lease should not be granted.[44] Also on June 14th, The Atlanta Journal Constitution published the story "Experts Warn of Perils in Mining Offshore".[45] On June 15th, they published "Phosphate Mining Bills Multiplying"[46], June 16th "Water Board Joins Fight Against Tideland Mining"[47], and July 26th "Fertilizer Industry Overdeveloped".[49]

A similar string of articles introducing arguments against phosphate mining in general and the Kerr-McGee proposal in particular were run in the Savannah Morning News. These included "Funk Asks Caution on Mining Project"[50] (May 28), "Lets get the facts"[51] (June 3), "Phosphate Mining: Asset or Liability?"[52](June 16), and on June 30th "Economic Value of the Marshlands Assessed".[53] While not editorials directly arguing against Kerr-McGee, these articles provided coverage and therefore voice to politicians, scientists, and natural resource managers worried about the adverse effects of the mining project.

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[44] Murphy, H. (1968, June 14). Conservationists raise doubt on off-shore mining project. *Atlanta Journal Constitution*.
[45] Gailey, P. (1968, June 14).
[46] Cohen, B. (1968, June 15).
[47] Shinn, R. (1968, June 16).
[49] Skorapa, V. (1968, July 7).
[50] Funk asks caution on mining project. (1968, May 28). *Savannah Morning News*.
[51] (1968, June 3). *Savannah Morning News*. *in* Folder 2, Reid Harris Collection, Richard B. Russell Collection, Richard B. Russell Library for Political Research and Studies, University of Georgia Libraries, Athens GA.
[52] Douthat, Bill. June 16 1968, Savannah Morning News, "Phosphate Mining: Asset or Liability?"
[53] Burke, J. (1968, June 30).;

Georgia news papers also covered a steady stream of statements and formal announcements from organizations declaring their official opposition to the lease proposal. On June 14, 1968 the Atlanta Journal -Constitution reported on a June 13th press conference during which Dr. Odum read a statement for the Georgia Conservancy that said " on the basis of information available and reviewed, there is every reason to believe that extensive pollution, damage to sport and commercial fishing, reduction of potential protein food resources, and damage to recreational areas and esthetic value would result should strip mining be allowed over large stretches of the GA coast".[54] On June 16th, the Georgia Water Quality Control Board announced its opposition and similar declarations from other organizations followed.[55]

Newspaper articles from 1968 show that opposition to the Kerr-McGee permit voiced concerns that were not strictly environmental. Their arguments were articulated as a call for sound political, economic, and public health decisions that would benefit both industry and the people of Georgia. Articles covered discussions about the economic value to the state of the seafood industry and recreational fishing and hunting, about the risk of saltwater intrusion to the aquifer, the destruction left in the wake of mining operations elsewhere, and the resources and future income the state of Georgia would likely have to forgo for the revenue and real estate Kerr-McGee claimed it could generate. They were arguing against offshore phosphate mining and for dialogue about what the state should to do to protect its marshland habitat.

Those opposed to the project used the language of economic prudence and encouraged thought about the type of development and industry the people of Georgia

[54] Murphy, H. (1968, June 14).
[55] Shinn, R. (1968, June 16).

wanted to see in their state. They were careful not to frame their position as an overarching argument against mining or development. In public statements, Rock Howard, Eugene Odum and their colleagues said the people of Georgia needed to decide if this was the type of development and industry they wanted, not that development and industry should always be opposed. Dr. Odum was quoted as saying "we are not against mining of mineral resources... we recognize that such mining done under proper conditions will be an important activity in the future. Rather, we believe that hasty action is not in the public interest. We are opposed to the railroading of any agreement without adequate study".[56]

On June 16th, 1968 the Savannah Morning News quoted Rock Howard as saying "I hate to have the image we are against it [development] but we are trying to protect the area for other industries". [57] The Atlanta Constitution quoted him as saying "[i]f we are going to maintain our perpetual industries- the shrimp, fish and crab industries- we have to protect them. You can't have your cake and eat it too. We have to be very selective as to what industries we introduce into Georgia's waters... I can't see how phosphate mining could possibly be carried on with the procedures and equipment now being used without transgressing our coastal water guidelines and hurting the game and fish waters."[58]

In the face of this opposition, Kerr-McGee was surprisingly quiet. Other than the initial announcement, Kerr-McGee barely presented a public argument in support of their proposal. On September 19th 1968, the Savannah Morning News ran a story entitled "Governor Baffled By Firm's Silence" which discussed the Governor's surprise that the

[56] Gailey, P. (1968, June 14).
[57] Douthat, B. (1968, June 16).
[58] Shinn, R. (1968, June 16).

Kerr-McGee company was not attempting to answer questions and concerns raised by the public. Governor Maddox was quoted as saying " the company has never given any detailed response to a lot of questions that have been raised".[59] They did not provide data or counter points to refute the dire predictions made by scientists and politicians and did not provided the Governor with the more detailed plans he had requested.

The relative silence of Kerr-McGee worked in favor of the opposition. Kerr-McGee was cast as a specific, external threat whose proposal was risky and exploitative. A statement read by Odum for the Georgia Conservancy says "We don't want the kind of industry that comes and runs... This destructive type of industry needs restraints. This is not somebody that's going to be a citizen of your state. They aren't interested in that. They're interested in getting some money out of the marshes."[60] Public opposition was partly if not greatly driven by fear of this scenario. Public officials, politicians and scientists told the people of Georgia to stand up against an outside entity that wanted to come in, exploit their resources, and leave them with little.

The number of people who turned out for public hearings demonstrates that the general public found these arguments compelling. There was enough public concern generated in the months following the lease announcement that the first public hearing, held in Atlanta on September 16 1968 had to be carried over to the 17th in order to accommodate all those who came to talk. The second public hearing, which took place on September 30th in Savannah, had to be moved from its initial location to a larger venue, again to accommodate the number of attendees, most of whom expressed opposition to

[59] Cohen, B. (1968, September 19). Governor baffled by firm's silence. *Savannah Morning News*.
[60] Murphy, H. (1968, June 14). Conservationists raise doubt on off-shore mining project. *Atlanta Journal Constitution*.

the lease.[61] By this point, formal opposition had been announced by the Chatham County Commission, the US Bureau of Outdoor Recreation, the National Parks Service, the Georgia Sportsmen Federation, the Brunswick- Golden Isle Chamber of Commerce, Sea Island Real Estate Company, and the elected representatives from St Mary's, Hinesville, and Brunswick.[62]

Between October 1968 and January of 1969, collaboration between scientists and politicians deepened. The "Future of the Marshlands and Sea Island of Georgia Conference" was held on October 13th and 14th 1968 at the Cloister Hotel on Sea Island. Attendees, primarily experts in their fields, included ecologists, geologists, regional planners, and politicians. The conference was designed to facilitate networking and dialogue, and was an opportunity for people to begin discussing their visions for the coast. Rather than just focusing on what they didn't want, they discussed what they wanted to see; the kind of management, access, and protection that would be desirable. The articles, presentations and research plans discussed at the conference create the picture of a campaign that was becoming less reactionary and more visionary. The opposition was becoming more formalized and more organized as their goals expanded. Through the efforts to network and accumulate data and research, arguments against Kerr-McGee were strengthened and people began talking more broadly about the need to protect the marshlands.

While public opposition had already made it unlikely that the Mineral Leasing Commission would approve the lease requested by Kerr-McGee, what appeared to solidify the decision not to grant it was a report written by scientists from the University

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[61] Harris, R. (2008).
[62] Morrison, J. (1968, September 3). *Georgia Game and Fish Magazine*, inside front cover.

System of Georgia. Governor Maddox had commissioned the group earlier in the year to evaluate the impacts of the Kerr-McGee proposal on Georgia's marshes.[64] The committee was made up of five professors from a variety of disciplines including economics, geology and ecology. Eugene Odum chaired the committee and spoke at length to the press about their findings that were formally filed with the Mineral Leasing Commission in October 1968. The report included an analysis of the potential economic benefits of the phosphate mining operation. They concluded that the project would cause irreparable damage to a valuable natural resource and was not worth the relatively minor gain. On December 5th, 1968 the Mineral Leasing Commission and the Attorney General announced that the lease would not be granted.

The Legislation

The threat posed by Kerr-McGee's proposal had been halted, but Representative Harris and his colleagues took advantage of the political momentum and moved to secure more permanent protection for the marshes. In January of 1969 Representative Harris drafted and submitted House Bill 212. The bill, known today as the Georgia Coastal Marshland Protection Act, established the Coastal Marshland Protection Agency, housed within the State Game and Fish Commission. The bill states that "no person shall remove, fill, dredge, drain or otherwise alter any marshland in this State within estuarine area thereof without first obtaining a permit from the Coastal Marshlands Protection Agency".[66]

The agency was to approve or reject a permit based on a project's expected impact on the "public interest". In evaluating the impact the committee members were to

[64] Universities will pay for mining study. (1968, June 26). *Atlanta Constitution*.
[66] GA CODE ANN. §§12-5-281

consider if the project would create an "obstruction to, or alteration of, the natural flow of navigable water", "harmful or increased erosion, shoaling of channels, or stagnant areas of water" or "interfere with the conservation of any marine life or wildlife or other natural resources, including but not limited to, water and oxygen supply".[67] Along with reviewing permits, the agency was responsible for general administration of the act, including, public awareness of the rules and regulations, oversight of the marshes to ensure compliance, and prosecution of those in violation. Initially the agency was composed of seven members from natural resource management and regional planning, the agencies that were going to oversee the granting of permits for development in the marshes.[68] Today, the body overseeing the CMPA is known as the Coastal Marshland Protection Committee (CMPC) and is housed within the Georgia Department of Natural Resources. The CMPC has five members instead of seven, but its mandate remains the same.

The process of passing the CMPA involved considerable debate and modification. Representative Harris originally submitted the bill on January 23, 1969 and it was quickly sent to the State Institutions and Property Committee. While House Bill 212 was being reviewed by the Committee, Representative Harris sent copies to city commissioners and industry leaders in the hopes of gaining support or at least having the opportunity to hear opposition and make adjustments. Most of the recipients opposed the bill outright,

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[67] GA CODE ANN. §§12-5-281

[68] Director of the State Game and Fish Commission, Executive Director of the Ocean Science Center of the Atlantic, Executive Secretary of the Water Quality Control Board, Director of the Coastal Area Planning and Development Commission, Executive Director of the Georgia Ports Authority, Director of the Georgia Natural Areas Council, the Attorney General. These individuals were allowed to appoint a representative from the same agency to take their place.

especially members of the Chamber of Commerce in Brunswick.[69] Because of the intense opposition, the Chairman of the State Institutions and Property Committee called a public hearing for February 11th, during which many people spoke out against the bill. Harris and his colleagues had not dealt with this kind of opposition in their work to stop Kerr McGee. However, the resistance was not unexpected.

In the effort to stop Kerr-McGee from obtaining a lease the Kerr-McGee Corporation was cast as a specific external threat. The passage of legislation to permanently restrict development along the coast appeared to some to be very different. There was no longer a single identifiable corporation that could easily be cast as the enemy of all Georgia citizens. Politicians, developers, and land owners in the state described it as a threat to private property rights.[70] On February, 6th 1969 The Glynn County Commission requested the withdrawal of the bill from the General Assembly, based on the concern that it would be "a violation of basic rights of property owners and could result in the state taking away private property without just compensation".[71] An article in the Atlanta Constitution on February 5, 1969 said Mayor Ralph Croft disapproved of the bill because it threatened Georgia's home rule laws, and a city attorney was quoted opposing the bill because it would be "taking marshland property of citizens without due process of law".[72]

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[69] Marsh bill voted new chance. (1969, March 7). *Atlanta Constitution.*
[70] (1969, March 4). *Brunswick News.*
[71] County commission reviews wetlands bill, trash pickup. (1969, February 6). *unknown in* Folder 2, Reid Harris Collection, Richard B. Russell Collection, Richard B. Russell Library for Political Research and Studies, University of Georgia Libraries, Athens GA.
[72] 2.2 million city budget to be discussed February 12. (1969, Febrary 5). *Atlanta Constitution*.

Other groups, like the Brunswick Lion's Club, expressed concern that it would be too restrictive for industry.[73] The Savannah Port Authority adopted a resolution against the CMPA, which said that it would "restrict and deter the balanced development of Georgia's coastal and estuarine areas" and that it would "subject small property owners to onerous procedures, regulations, fees, and penalties in carrying forward innocent improvements incidental to the peaceful and legitimate enjoyment of their residential property rights"[74]Many in Harris' home town of Brunswick were strongly opposed to the legislation and to Harris' efforts.[75]

In response, Representative Harris made adjustments to the bill. He eliminated the Coastal Marshland Agency, and said instead that anyone making alterations to the marsh had to petition their local government to make sure the alteration did not violate local ordinances, or aversely affect the "general health and welfare of the community". If the local government made such a determination, the applicant would then have to submit a title insurance policy to the Secretary of State confirming their ownership, and the Secretary would issue the permit. Harris also introduced six exemptions which were retained in the final version of the bill. These included the State Highway Department, state agencies responsible for navigation, public utilities regulated by the Public Service Commission, railroads, water and sewage lines, and private docks on pilings above the marsh by highland property owners. This revised bill received some criticism in the press

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[73] Lion's club adopts resolution against wetlands measure. (1969, February 18). *Brunswick News.*
[74] Defeated wetlands bill: Spa. (1969). *Savannah Morning News.*
[75] In opposition to the bill: City of Brunswick Commission, Hercules Power Company, Brunswick Pulp and Paper Company, Sea Island Company, Brunswick-Glyn County Chamber of Commerce, Brunswick Central Labor Council, Glyn County Real Estate Board, Georgia Business and Industry Association; Opponents from coastal counties: Representative Jones from Hinesville, Representative Harrison from St Mary's and Representative Scarlett from Brunswick. Marsh bill voted new chance. (1969, March 7). *Atlanta Constitution*.

from those who felt it lacked authority, was "watered down"[76], and "does not really protect the marshes" but "only makes it a little more difficult to ruin them"[77]. However, it was unanimously approved in the subcommittee, sent on to the State Institutions and Property Committee, and then the House floor. In the House it failed by two votes.

The supporting data and science had been collected and compiled, a vision for marshland conservation had been articulated, and the mechanisms to enforce it had been drafted. As Representative Harris moved to get the bill back into the House for reconsideration, new leaders joined the effort and worked to convince Georgians that the CMPA was necessary to protect their communities, their economy, and their health, and, that it was not an affront to private property rights but an expression of their collective right to control development on land held in the public trust.

The coalition of politicians, scientists and government officials that had been most outspoken about the Kerr-McGee permit now expanded to include environmental activists, university students, garden club members and coastal land owners. They framed their arguments around the idea of democracy as the pursuit of the common good. The CMPA campaign drew on the language of democracy, rights, control and collective identity. An examination of newspaper articles between 1968 and 1970 show discussion of a collective Georgian identity. This identity included a right to make decisions about what happened in the marshes. In a politically charged article in support of the CMPA, Rob Harrell wrote about Georgians as a group, speaking about "our Georgia" and what "we have lost" as Georgians. He describes the Marshland Oversight Board[78] as

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[76] Wetlands bill is delayed for another year. (1969, March 26). *Brunswick News.*
[77] The coastal marshes. (1969, March 9). *The Atlanta Journal and the Atlanta Constitution*.
[78] "Marshland Oversight Board" was one of the terms used in earlier versions of the CMPA to refer to what is now the Coastal Marshland Protection Committee.

"guardians" of the marshes. Harrell wrote that the bill "gives Georgians a chance to preserve and protect what is theirs" and tells people to contact their congressmen and "impress on him your concern for what is yours".[79] The sentiment that the tidal marshes "belong to everyone in this state" was voiced by politicians, coastal residents, and scientists.[80]

CMPA supporters also developed innovative strategies for explaining how protection of the marshes was not just an environmental issue, but was connected directly to concerns about the economy, public resources, and public health. In mobilizing political support, supporters of the CMPA spoke about ecosystem functions provided by the marshes as services that the entire Georgia community needed. The agency and permitting committee overseeing the marshes was not described as a mechanism to halt all development but as a mechanism for recognizing the value of the marshes and that development which was consistent with protecting that value. The enabling language of the CMPA describes its purpose as balancing between the "protection of the environment on the one hand and industrial and commercial development on the other".[81]

In this campaign we see the early use of economic valuation and what has developed into the concept of ecosystem services. The ecological studies conducted by Odum and his colleagues were demonstrating, in scientific, quantifiable, and economic terms, how marsh ecosystems benefit human populations. An editorial in the Atlanta Journal from January 24, 1969 spoke about the knowledge generated from recent research at UGAMI and said that "[s]entimentalists have worked to save the Georgia

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[79] Representative Arthur Funk from Savannah quoted in: Georgians should speak up to preserve Georgia beauty. (1969, February 7). *Atlanta Constitution.*
[80] Cohen, B. (1969, March 6). Harris' marshlands bill fails to get necessary house vote. *Savannah Morning News.*
[81] GA CODE ANN. §§12-5-280 to 297

coastal marsh for years. Now the hard-headed realists have joined them, impressed by the dollar and cents value of their ultimate product".[83]

In press conferences and news articles scientists spoke about the monetary value of the marshes. In a presentation Odum made at a conference in Atlanta for officials of state planning commissions he said the marshlands "contribute directly to the state's $5 million shrimp industry and $2 million crab industry".[84] Proponents of the CMPA often referred to the monetary value of the coastal fisheries. The combined value of all Georgia's coastal fisheries was estimated to be around $30 million dollars a year with the shrimp industry contributing $5 million, the crab fishery between $2 and $5 million, and oyster industry around $0.5 million.[85]

The CMPA was now being described as an economically wise move and proponents used economic terms to emphasize this point. Harris spoke about the marshes as "a tremendously valuable commodity." Prit Vesilind described them as a "resource which will continue to provide food and life to the coast for millions of years to come- and with absolutely no over-head".[86] J. Roy Dougan, President of King Shrimp Co. of Brunswick called shrimp a "self-rendering crop" and said it was "short sighted to mine for $50 million worth of phosphate- a one shot deal- and lose the shellfish".[87] In talking about Georgia's marshlands, Dr. Marland said, "these marshlands are the most fertile in

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[83] Who owns the marsh?. (1969, January). *Atlanta Journal*.
[84] Nesmith, J. (1968, June 14). Scientist urges state to save sea marshes. *Atlanta Journal Constitution*.
[85] Burke, J. (1968, June 30).; Shinn, R. (1968, June 16).
[86] Vesilind, P. (1969, August). Industry itching to dig: Marshlands must be saved. *Atlanta Journal*.
[87] Ford, E. (1969, April 27). Shrimp industry uneasy; marshlands have feet of clay. *Atlanta Journal Constitution*.

the world, and they are natural. They do not cost the taxpayer one penny, for they are irrigated twice a day by the tides".[88]

Proponents of the bill also reminded the public that although the Kerr-McGee permit had been denied in 1969, the threat they represented would not disappear until legislation was passed to permanently protect the marshes. They spoke about Kerr-McGee as one example of many outside groups that were still free to exploit the marsh ecosystem. In an article entitled "Industry Itching to Dig: Marshlands Must be Saved" Prit Vesilind wrote "just because Kerr-McGee got its hands slapped once does not mean that it won't come back for more". [89] The campaign focused on the idea that the people of Georgia were in danger of losing their rights to the coastal marshlands and had to take action to secure them against outside interests. "Firms such as Oklahoma's Kerr-McGee Corporation have been observed pawing the ground toward Georgia's coastal Marshlands with intentions of mining the sub-surface limestone, filling in the marshes, and plugging ticky-tacky dwellings into the new high ground to help ease Savannah's housing shortage and expand their own bank rolls."

Arguments in support of the CMPA were about preventing others from coming in and using resources that belong to the people of Georgia. Any external entity that could take away their control was described as a potential threat. In 1969, Rep Nesmith introduced a resolution for a one year Coastal Island Study Committee to study the state's ability to "acquire coastal lands for development". The article reported that this was because some of Georgia's marshlands are "being eyed by the U.S. Department of the Interior for development". Nesmith was quoted as saying that if the islands were acquired

[88] Burke, J. (1968, June 30).
[89]Vesilind, P. (1969, August).

by the US Department of the Interior "the state of Georgia would have no voice in the development of the islands and would stand to lose vast amounts of potential revenues".[90] Secretary of State Ben Fortson argued for the passage of the CMPA telling the general assembly, "if you don't do something, two or three corporations are going to own the coast of Georgia"[91] This suggests that the campaign drew on people's fear of losing control over what was considered theirs or a fear of losing access to one's rights. This is an effective strategy; in her discussion of environmental organizing in Warren County North Carolina, McGurty notes that "anger about the loss of control over land-use decisions was a powerful mobilizing factor".[92]

It was also an instance in which scientists took on the role of advocates and activists. Eugene Odum believed fully in the power of education to change people's minds and motivate them to work toward a better future. He had always been seen by his students as an exceptional and engaging teacher. His biographer, Betty Jean Craige characterizes his work on the CMPA as one of the first times he used his knowledge and passion to reach out to the public and influence policy.[93] Odum spoke publically about his work, wrote articles, served on the Governor's commission to evaluate the effects of mining on the marsh, and spoke to the press on a regular basis. He accepted any opportunity he was offered to share his research, his knowledge of the marshland ecosystem and the benefits humans gained from these natural processes.

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[90] Title search, study of marshland urged. (1969, January 23). *Atlanta Constitution*.
[91] Legislative happenings. (1969, February). *Brunswick News.*
[92] McGurty, E. (2009). From NIMBY to civil rights: The origins of the environmental justice movement. In P. Sutter & M. Christopher (Eds.), *Environmental History and the American South* (pp. 372-399). p.384.
[93] Craige, B. (2000).

Odum saw the innate connections between ecology and politics. He spoke about saving the marshes as an issue of collective verses individual rights. For him, the political will to protect the marshes and the establishment of legislation to do so was about recognizing and protecting the public good. Craige writes that Odum "moved freely" between "scientific descriptions and advocacy for conservation".[94] He also recruited a number of his graduate students who ran an effective campaign based on reaching out to other university students to translate science into formats accessible to a variety of audiences. They also developed lesson plans about the marshes for elementary and secondary school children. The curriculum combining social studies and science was designed to teach children the importance of the marshes in the hopes that they would share this information with their parents.

Two of the students involved in this effort were Joyce and Dick Murlless. Joyce was in the education department, and her husband Dick was one of Odum's students. Joyce recalled that when Odum first came to his students to explain the situation with Kerr-McGee and the CMPA , he not only explained the potential ecological devastation to the marshes but "said with authority that he could get the protective act written"[95]. She recalls the feeling that "the University in Athens was a perfect place to get the word out – even in days long before personal computers and before email or social media... It was going to take time, but because there were students in Athens from all over the state, the word could get out." The ecology students reached out to students in other departments, educating them about the importance of the marshes and asking them to spread the word. "We involved clubs of all sorts, and everyone who was taking classes outside the biology,

[94] Craige, B. (2000). p.43
[95] Murlless, J. (2011, May 19). [Personal Communication].

geology and forestry departments was asked to talk up the issue to everyone they knew in other classes".[96]

The student group collected information on the potential impacts of mining on the marshes. Included were impacts on various seafood industries, commercial and recreational fisheries, the aesthetic value, and its value as an important archaeological site. They drew a great deal of their information from research being conducted on Sapelo Island. They adopted the slogan "Save Our Marshes" and distributed 6,000 bumper stickers and buttons.[97] They provided information sheets that included a list of elected officials and letter templates and signatures for a petition. The elementary school curriculum included information about contacting legislators, and students were asked to enlist their parents to do so. The curriculum was mailed out to every science and elementary school teacher in the state.[98]

While Odum and his students were campaigning on the UGA campus, environmental activist Jane Yarn was reaching other constituents through her work with Garden clubs and other civic groups. Yarn was dubbed "The Great Dame of Conservation" by UGA ecologist Dr. Charles Wharton. She was an aristocrat and the wife of a well-known plastic surgeon. She moved within Atlanta's elite social circles and identified as "deep south", having personal connections to Alabama, Florida, the Carolinas and Georgia.[99] Yarn drew on her existing networks and was skilled at forging new connections. As a Garden Club member, she had the ear of women all over the state. Georgia's garden clubs became an outspoken proponent of the Coastal Marshland

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[96] Murlless, J. (2011, May 19). [Personal Communication].
[97] Craige, B. (2000). p.101.
[98] Murlless, J. (2011, May 19).
[99] Lenz, R. (1996). Jane hurt yarn: The great dame of conservation. *Southern Wildlife*, *1*(1), 22-30.

Protection Act. Their members, organized and informed by Yarn, wrote letters in favor of the legislation. In addition, many of them had direct access to influential men in the state, either because they were married to them or because they moved within the same social circles.

Yarn was admired for her skill in creating coalitions. She is remembered by those who worked with her for her ability to talk to anyone, move between groups, and facilitate communication between scientists, politicians, businessmen and the public. Eugene Odum said of her "she taught us academics how to deal with and convince the private sector. A scientist is admired by society but not listened to or trusted much."[100] She was also a spokesperson for the CMPA who looked different and spoke differently than the scientists, politicians and public officials who had been at the forefront of the campaign. Wharton, in expanding on the title he granted her, said " She brought dignity and class to conservation, whereas others of us were in the muck of the swamps".[101] By facilitating communication and reaching out to groups that were not previously involved, Yarn helped to increase the scope of the campaign. Her appeal and her charm meant that people who may not have listened to the others listened to her.

Coastal residents also joined the campaign and played an important role in its growth. Two of the most active and outspoken coastal residents were Eugenia Price and Hoyt Brown. They organized the local populace, collected signatures for petitions, and acted as spokespeople for their communities at public hearings. Hoyt Brown traveled and spoke at community meetings and for groups organizing for marshland protection. He often spoke to garden clubs, like the Jekyll Island Garden Club, who invited him as a

[100] Lenz, R. (1996).
[101] Lenz, R. (1996).

guest speaker in March of 1969.[102] Eugenia Price was a well known author of historical fiction. After discovering St. Simons Island in 1961 and making it her home, she wrote a series of novels based on its history. She used her fame as an author and her relationships with those on St Simons and in other coastal communities to gather support for the CMPA. She also wrote about it in Coastal Illustrated, a bi-weekly publication of the Brunswick News that featured articles by residents of Brunswick, and St. Simon's, Jekyll and Sea Islands.[103]

Through the effort of these additional supporters, contacts were made with game and sportsman clubs, the Federation of Women's Clubs, and the League of Women Voters. Many of these organization passed public resolutions in favor of the bill and their members turned up to speak at hearings.[104] The newspapers carried declarations of support from The League of Women Voters, the Association of Landscape Developers and Appraisers, the Council for the Preservation of Natural Areas, the Georgia Sportsmen's Federation and the Parent Teacher Council.[105]

Interest in the marshes was now gaining national attention and becoming part of a growing ethic of concern for environmental health. The November 1969 issue of Life Magazine included an article about the "battle" over Georgia's marshes[106], complete with large glossy images of serene and haunting landscapes and coverage of Dr. Odum's arguments and efforts. In the late 1960s scientists were writing for the general public

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[102] Speaker discusses marsh protection at Jekyll meeting. (1969, March 11). *Brunswick News.*
[103] Price, E. (1970). One point of view. *Coastal Illustrated in* Folder 1, Reid Harris Collection, Richard B. Russell Collection, Richard B. Russell Library for Political Research and Studies, University of Georgia Libraries, Athens GA.
[104] The coastal marshes. (1969, Febuary 13). *Atlanta Constitution*.
[105] County PTA council votes full support for marshlands bill. (1969, December 11). *Atlanta Constitution*.
[106] The length and breadth and the sweep of the marshes of Glynn. (1969, November). *Life* p.88.

about the value and importance of the marshes. One of the best examples is the book Life and Death in the Salt Marsh (1969) by John and Mildred Teal.[107] The book follows the geological development of Georgia's marshes, discusses the flora and fauna, the ecosystem interactions, the benefits to human society, and the challenges for marshland conservation. While funneling knowledge gained through years of work by naturalists and scientists, it is written for the general public and unfolds in a story-like manner.

The coalition's efforts proved fruitful. Legislators were flooded with letters asking them to vote in favor of the CMPA. Senator Al Holloway, Committee Chairman for the Senate Industry and Labor Committee said he received more letters on this issue than on all other issues he had seen go before the Assembly in ten years as a state legislator.[108] At the onset, Senator Holloway was opposed to the CMPA. However pressure from his constituents not only encouraged him to vote for the act, but convinced him that strong protection for the marshes was necessary. He drafted and sponsored a revised version of the bill which reinstated the Marshland Agency and permitting protocol that Harris had originally created. It also kept a few of the alterations, including the six exemptions Harris had added, primarily for public utilities. On February 6, 1970 the Senate passed the newer, stronger, version of the Marshlands Bill, 39 to 0. On February 9th, the House voted 103 to 21 in favor of the Senate's revised version, and on March 27th, in the presence of Eugene Odum, Jane Yarn, Rock Howard and Representative Harris, Governor Maddox signed the bill into law.

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[107] Teal, J., & Teal, M. (1969). *Life and death of the salt marsh*. New York: Ballantine Books p.274

[108] Nesmith, J. (1970, February 9). Marsh bill stirs public. *Atlanta Constitution*.

Analysis

After the passage of the CMPA, Reg Murphy wrote an article for the Atlanta Constitution entitled "The System Works on Marshland Bill"[109]. He opened by asking if the legislative system still works, or if "special interests and old ties" have broken it down. His answer was that the passage of the CMPA is evidence of a system that not only works, but is vibrant and strong.

Murphy wrote about the shift Senator Holloway made from being an opponent of the CMPA to being one of its strongest advocates. Holloway said publically that pressure from his constituents, the Georgia Conservancy, and the Georgia Sportsman's Federation, convinced him that marshland protection was needed. So much so that he wrote and sponsored the stronger final version of the CMPA bill. "A senator wearing a big business tag had to stand up and say 'I was wrong'. Then he became an advocate of the very thing he had fought. He wrote and sponsored a better law than the one he bottled up originally. That is the remarkable strength of the system...People that believe in government, and more specifically, in the power of ordinary citizens to change the course of events, should marvel at the marshlands bill." In this case, the CMPA is described as an example of how the public will, mobilized and voiced, can lead elected representatives to legislative action. A once small group of concerned citizens compiled information, collected data, educated the public, spoke with politicians, reached out to different groups of people, incited action, and ultimately changed public policy.

The picture, of course, is never quite so simple. In an earlier article, published in the Atlanta Constitution, Jeff Nesmith contextualizes Holloway's drastic turnaround a bit

[109]Murphy, R. (1970, February 12). The system works on marshland bill. *Atlanta Constitution.*

differently. Nesmith was equally impressed with the intensity and impact of the campaign, especially of its influence on Holloway. " Senator Al Holloway of Albany, who had more to do with holding last year up than any other senator, sponsored it [the CMPA] this year. He had it completely rewritten, making it stronger and, if anything more troublesome to marsh polluters and developers than it ever was. Now it goes back to the House of Representatives which must agree to senator Holloway's changes."[110]

The question Nesmith raises however is whether this outpouring of public support indicates the growth of a new movement or the peak of a passing fad. He quotes Sen. Holloway's statement about "receiving more mail on it [the CMPA] than on all other issues in 10 years in the state legislature" but he also quotes him saying "about seventy five percent of the letters I've been getting came because somebody like the local garden club president called up a bunch of her friends and asked them to write...They are sincere letters, not stereotyped, but they reflect a lack of knowledge".[111]

The campaign to pass the CMPA increased public interest and public participation in Georgia state politics, but what type of participation was inspired? The campaign increased awareness and provided access to information about the marshes and about ecology. Strategies, effective here for generating public interest, concern, and participation, demonstrate the use of scientific and economic discourse in environmental organizing. As this style of environmental organizing is increasingly common, we must also consider the potential limits of this approach, As times change, economic trends shift, and scientific knowledge develops, it may become challenging to uphold the intent of a bill. The usefulness of the economic valuation of ecosystem processes or the

[110] Nesmith, J. (1970, February 9). Marsh bill stirs public. *Atlanta Constitution*.
[111] Nesmith, J. (1970, February 9).

"ecosystem-services" approach is currently debated among ecological and social scientists, conservation practitioners and others involved in environmental issues. While some see this as a helpful and necessary strategy for gaining recognition in a capitalist driven society, others argue that the broader goal is to shift social perception and expand the concept of value.

The ongoing story of the CMPA offers us insight into how the nature of a campaign and public involvement shapes its lasting impacts. Contemporary context and unanticipated circumstances now raise concerns about the ability of the CMPA to deliver on its original intent. This raises additional questions about the long term effects of an economic and science led-campaign to pass protective legislation.

A study conducted by Kundell et al. in 1988 concluded that the CMPA has been effective in minimizing and controlling the marshland altering activities it was designed to prevent. However, it also discussed threats that the CMPA was not designed to address and therefore has not been able to protect against. The CMPA does not reduce external influences, like the quality of water draining into the marshland, stormwater flow, and other nonpoint source pollution. In addition, the marshes remain vulnerable to broader threats like sea level rise.[112]

In 1968 the primary threat to the marshes was from large-scale mining operations. Now the development along the coasts is primarily residential or based on the tourism industry. Permits are being sought for the construction of condominiums, marinas, and docks. Between 2006 and 2008, conservationists and developers raised questions about the scope of the Coastal Marshland Protection Committee (CMPC), the committee created under the CMPA to oversee the evaluation and granting of permits for

[112] Kundell et al. (1988).

development activities in Georgia's marshes.[113] Conservationists claimed that permits need to be assessed based on the overall project and its comprehensive impacts on the marshlands. Developers argued that the committee only had the authority to evaluate applications based on specific structures and activities in or above the marsh.[114] The final ruling in 2008 limited the jurisdiction of the CMPC, instructing them to consider only alterations directly in or on the marshes. The committee can only take into account impacts from structures placed in or above the marsh that "remove, fill, dredge, or drain" marshes in "a direct physical manner". This only covers upland development that service or change structures in or over the marsh, for example a bilge pump for a marina.[115] This limits the CMPA's ability to control inland development that may have negative impacts on the marsh, for example the construction of a parking lot that may increase stormwater runoff or sedimentation.

Bob Cohen, a journalist for the Atlanta Constitution during the time of the CMPA campaign, wrote that the CMPA was indicative of a period in which "the entire question of the coastlands came boiling in to the state's consciousness".[116] At the time, the marshlands were just gaining recognition among the general public as a valuable natural resource. The campaign drew on recent scientific findings and argued that such a new and enlightened public consciousness required citizens to take protective action.

The ongoing story of Georgia's marshlands is entering a new phase of struggle between developers and marsh proponents. In Permitting Trouble in the Marsh, Ross Appel notes that "when the legislature drafted the CMPA, scientists and policymakers did

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[113] Center for A Sustainable Coast v. Coastal Marshlands Protection Committee. 248 Ga. 736,736,736,670S.E.2d 429,430 (2008)
[114] Wasser, F. (2011). *Memo: Marshland protection in Georgia*. Athens, GA: unpublished. p.2.
[115] Wasser, F. (2011). p.2.
[116]Cohen, B. (1970, January 18). Marshlands stand gains supporters. *Savannah News.*

not appreciate the significant impact of nonpoint pollution on the marshes".[117] Since that time ongoing research has increased our understanding of the significant and far reaching impacts of nonpoint source pollution on marshlands and coastal habitats. However, Georgia's Supreme Court ruling in 2008 limited the authority of the CMPA to regulate upland development. While Georgians celebrate and remember the passage of the CMPA as a momentous environmental achievement, proponents of marshland protection express concern that the CMPA may not have the authority to effectively fulfill its mandate to protect and preserve the coastal marshlands.

[117]Appel, R. (2007). Permitting trouble in the marsh. *South Carolina Environmental Law Journal*, *16*(1). p.221.

CHAPTER 3

THE COASTAL MARSHLAND PROTECTION ACT IN 2012: CONTEMPORARY CONTEXT

In the Coastal Marshland Protection Act (CMPA), the legislation is identified as a "mechanism for balancing public and private interests in the marshes". In their 1988 review of the act, Kundell et al. found that this goal had been met since the passage of the legislation. They reported that the CMPA had significantly reduced marshland altering activities directly in or on the marshes but allowed for activities that were "not contrary to the public interest". This conclusion was reached based on a review of marsh altering activities[118] since the establishment of the CMPA. The study found that the State Game and Fish rangers reported unregulated marsh altering activities in the two years after the CMPA was passed (although no specific figures are included) but that no court action was taken against perpetrators.[119] However, the study says that after changes were made through the Executive Reorganization Act in 1972, and the Coastal Resources Division was established within GA DNR in 1978, implementation of the CMPA became more effective. They attributed this increase in effectiveness to the "consolidation of activities, the hiring of a professional staff, the reduction in committee composition from seven to

[118] "marsh altering activities" covered by the CMPA include activities that "remove, fill, dredge, drain, or otherwise alter any marshlands or construct or locate any structure on or over marshlands". GA CODE ANN. §§12-5-286

[119] Kundell et al.(1988).

three members, and the provision of enforcement power to GA DNR" that resulted from the actions taken in 1972 and 1978. [120]

The Kundell et al. study was based on the following data. In the first 17 years of the CMPA, the Coastal Marshland Protection Committee received 248 permit applications. The committee issued 202 permits and denied 29. The others were held in abeyance.[121] Of these, 248 permits, 81.5% were granted, 11.7% were denied, and 6.8% were held in abeyance. Between 1972 and 1986 the committee issued an average of 12.6 permits per year.[122] Kundell et al. concluded that in the 17 years since its passage, the CMPA had been an effective tool for controlling and limiting marshland development. However, they recommended that amendments be made to the act to keep it up to date with changes in coastal conditions in the mid to late 1980s.

Kundell et al. identified two specific concerns with the existing act: the effects of climate change and the impacts of activities occurring outside the marsh area. They reported that the act did not protect against downstream impacts from development in the highland areas adjacent to the marshes and these influences were threatening the marshland ecosystem. They identified three specific concerns related to outside impacts.

> 1) the quality of freshwater from rivers that may carry contaminants such as nitrates that can adversely affect the marshes, 2) the lack of state protection measures for freshwater wetlands, that may be intricately connected with the salt marshes, and 3) the lack of any buffer zone around the marshes to prevent nonpoint runoff of contaminated water into the marshes.[123]

They also said that while sea level rise and climate change are not mentioned in the CMPA they must be taken into consideration during coastal and regional planning

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[120] Kundell et al.(1988). p.8.
[121] Abeyance is a state of suspension or temporary inactivity.
[122] Kundell et al.(1988). p.8.
[123] Kundell et al.(1988). p.2.

and will have an impact on the public interest. They identified the CMPA as a potentially useful tool for controlling coastal development and pushing most development pressure further inland. They also recommended that the Coastal Marshland Protection committee think about the predicted impacts of sea level rise on the coast when considering the impacts of proposed developments on the public interest.

The Coastal Marshland Protection Act Today

Since the publication of the Kundell et al. report, only a few changes have been made to the Coastal Marshland Protection Act.[124] The most significant of these took place in 2004 and shaped the Coastal Marshland Protection Committee (CMPC) as it exists today. In 2004, the number of committee members was increased from the three established in 1985 to a total of five. The members include the DNR Commissioner and four members selected by the Board of Natural Resources. Members of the CMPC also serve on the Shore Protection Committee (SPC), which was established through the Shore Protection Act in 1979. Together these committees are referred to as the Marsh and Shore Committee. This committee meets once every two months on average, and handles the business of the Coastal Marshland Protection Act and the Shore Protection Act at the same time. The current committee members include the DNR Commissioner, an engineer and planner, a civilian engineer, the owner of an aviation consulting company and former Bryan County commissioner, and an attorney from St. Simons.[126] All are residents of the coast. Table 1 summarizes the major changes to the CMPA since 1970.

[124] Minor amendments were made in 1992, 2005, 2006 and 2008. GA CODE ANN. §§12-5-280
[126] *GA DNR Coastal Resource Division website*. (2011, December 5). Retrieved from http://coastalGA DNR.org/msp/msc.

Table 1
Amendments to the Coastal Marshland Protection Act 1970-2011

1970 Coastal Marshland Protection Act (CMPA)

1972 Executive Reorganization Act
Reassigned duties among a range of departments, agencies, boards, committees and commissions

•The authority to conduct hearings and prosecute violations of the CMPA is reassigned to the Department of Natural Resources (previously under the State Game and Fish Commission)

• The seven member Marshland Protection Agency is replaced with a three member committee: Commissioner of Natural resources, Director of Environmental Protection, a person selected by the Board of Natural Resources

1978 Establishment of the Coastal Resources Division within DNR
Established to carry out DNR's coastal activities

1985 The Coastal Marshland Protection Committee is Changed
Committee members become the Commissioner of Natural Resources and two people selected by the Board of Natural Resources

2004 Committee composition is changed
• The Coastal Marshland Protection Committee becomes the same as the Shore Protection Committee. The same people serve on both. Two additional members are added to the three established in 1985

• Committee composition: Obligatory seat - DNR Commissioner and four people selected by the Board of Natural Resources. Three of the five members must be from the coast[127]

[127] They must be from one of the six coastal counties- Camden, Glynn, McIntosh, Liberty, Bryan and Chatham. This is not the same as the area designated as Georgia's coastal zone in the Coastal NPS plan. Georgia's coastal zone also includes Effingham, Long, Wayne, Brantley and Charlton Counties.

Figure 1 Dock Permits in Georgia's Coastal Marshlands

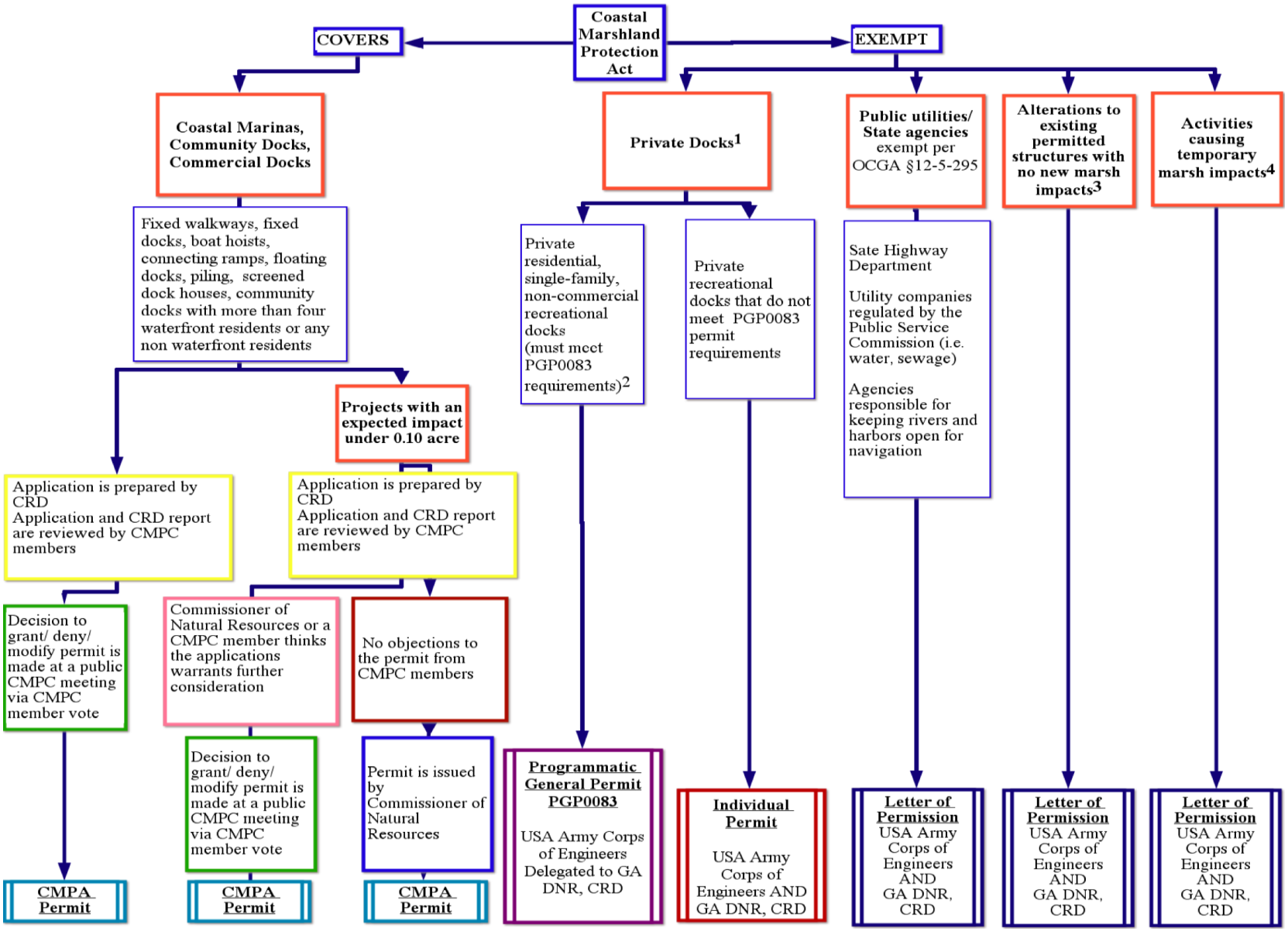

Figure 1 Dock Permits- Georgia's Coastal Marshlands- Continued

1
"Private dock" means a structure built in or over the marsh and submerged lands which is used for recreational fishing and other recreational activities, is not available to the public, does not have enclosures, and does not create a navigation hazard". GA CODE ANN. §§15-5-282(12)

2
PGP0083 Permit Requirements

PGP0083 permits apply to docks with the following *maximum* dimensions
•Fixed walkway may be no wider than 6 feet and be no longer than 3000 sq. feet if using traditional wood decking
•Fixed deck may not exceed 400 sq. feet
•Floating dock may not exceed 576 sq. feet
•Single boat hoist may not exceed 16'x 30'
•The extent of the structure does not exceed 40' past the low water line or ¼ of the channel width at low tide whichever is less

3
"New marsh impacts" do not include impacts from the construction/building process. An existing dock that is replaced by a new dock with the same specifications occupying the same site is not considered to cause "new marsh impacts".

4
i.e adding a barge to an existing marina to secure boats for a boat show.

CMPA Dock Permits

Figure 1 outlines the permitting process for docks along Georgia's coast and compares the dock permitting process under the CMPA with the dock permitting process for exempt projects. All applications for dock construction in the state of Georgia are processed through GA DNR CRD. All applicants work with CRD staff to determine the type of permit required and to prepare the permit application. Any structure that is built over marshland must, as part of any permitting process, obtain a lease from the state for the use of state water bottom. This is primarily done with a Revocable License (RL) granted by the DNR Commissioner. This is required for all projects on publicly owned land lying below the ordinary high water mark. It applies to projects that require a CMPA permit and to projects that are exempt from the CMPA.[128] Applicants can also get a water bottom lease from state legislators or show a valid State Grant or Kings Grant from the Attorney General that shows that the applicant owns the water bottom. However, the majority of the time, applicants seek a Revocable License and apply for this license as a standard part of the application process for a CMPA permit, PGP0083 permit, Individual Permit or Letter of Permission.[129]

CMPA permits are required for coastal marinas, community docks and commercial docks. Each CMPA permit application is processed by two CRD staff members. Staff meet with permit applicants to help them shape projects that comply with requirements, make use of available best management practices, and prepare the application for the CMPC. CRD permitting staff prepare a report for each CMPA permit

[128] Department of Natural Resources, CRD. (2012, April 20). *State revocable license for use of water bottom.* Retrieved from http://www.coastalgadnr.org/msp/ap/lic.; Habitat Management Program Manager, CRD. (2012, April 23). [Personal Communication].
[129] Habitat Management Program Manager, CRD. (2012, April 23).

application. The report includes a description of how each of the CMPA requirements is met. It also includes a set of conditions for the project that staff think the applicant should be required to meet if the committee approves the permit. For example, staff might say that if the permit is approved the applicant should be required to post standard signage about manatees. The application and CRD staff report are both sent to CMPC members.

The CMPC is required to provide a public notice of applications at least seven days prior to a committee meeting.[130] Any individual or organization may join a mailing list to receive these notices. They are also posted on the CRD website under "Marsh& Shore Permits". Comments can be sent to the CRD staff and go to the CMPC with the permit application. Committee meetings are public and anyone is allowed to come and speak for three minutes. A public hearing is not required for each application but the committee can call a public hearing if they believe there is sufficient public interest.[131] This differs from a regular CMPC meeting because CRD staff present information to the public about one specific permit application and the applicant has a chance to address public concerns. Public hearings have only been held for two permit applications in the last ten years. They were held for the Cumberland Harbor and Satilla River Landing Projects that were before the committee in 2004.[132] The committee only makes permitting decisions at CMPC meetings. They can approve, deny, or require modifications of the permit.

Any alteration in the marshlands normally under the authority of the CMPA that impacts an area less than 0.10 acre is considered a "minor alteration".[133] This applies to

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[130] GA CODE ANN. §§12-5-286(e)
[131] GA CODE ANN. §§12-5-286(f)
[132] Habitat Management Program Manager, CRD. (2012, April 23).
[133] GA CODE ANN. §§ 12-5-283(d)

coastal marinas, community docks and commercial docks. Similarly, it applies to restoration projects, bank stabilization projects and other projects that do not involve dock construction but are under purview of the CMPA. It does not apply to power line alterations because Georgia Power is exempt from the CMPA.[134] The size of a structure is considered its area of impact. Impacts that might be caused by the construction or building process are not considered when designating a project a "minor alteration".[135]

Minor alterations are initially treated the same as any other CMPA permit. Applicants work with CRD staff to complete an application and CRD staff review the application and produce a report for the CMPC. The application is sent to the CMPC committee for review. If there are no objections to the permit from CMPC members the Commissioner of Natural Resources may issue the permit without consideration at a public meeting or a committee vote. However, if any member of the CMPC thinks the application warrants further consideration it will be treated like a regular CMPA application and will be considered at a regular CMPC meeting.[136] A permit for a minor alteration may not be discussed at a public CMPC meeting but in all other respects (i.e. requirement of public notification, review of the application by committee members) it is treated like any other CMPA application.[137]

Private Dock Permits

Private docks are exempt from the CMPA and are permitted with either Programmatic General Permits or Individual Permits. GA DNR CRD and the Army Corps of Engineers have jurisdiction over both permits although the process of preparing

[134] For projects that are exempt from the CMPA there is no separate process for projects under 0.10 of an acre. Projects under 0.10 of an acre are not treated differently.
[135] Habitat Management Program Manager, CRD. (2012, January 12).
[136] GA CODE ANN. §§ 12-5-283(d)
[137] Habitat Management Program Manager, CRD. (2012, January 12).

applications and issuing permits has been delegated to CRD. Just as with CMPA permits, applicants work with CRD staff to complete applications, including an application for a Revocable License. Programmatic General Permits are issued directly by CRD. The permit is designed to allow for faster review of projects that meet certain requirements (see Figure 1). Docks that do not meet these requirements must receive an Individual Permit and go through a review by both CRD and the Army Corps of Engineers.

Letters of Permission

Letters of Permission (LOP) are used in three situations. They are use to authorize projects exempt from the CMPA (not including private docks). For example, if Georgia Power needed to install poles in a marsh area to run an electrical line they would need a LOP, a RL, and would need to apply for the appropriate federal permits. LOPs are also used for projects within the CMPA jurisdictional area[138] that will not result in any new marsh impacts. The area covered by a project is considered its area of impact. If a community association wanted to replace an existing community dock with an identical dock in the same location they would be authorized to do so with a LOP and would not need to apply for a new CMPA permit. If any changes were made to the dock or associated structures a new CMPA permit would be required. LOPs also provide authorization for projects within the jurisdictional area of the CMPA that are temporary in nature. This would be granted for structures like a barge added to an existing marina to secure boats for a boat show. It would also be granted for temporary activities. If a researcher wanted to place monitoring stations in the marsh to monitor tidal flow for one year they would be authorized to do so with a LOP.

[138] The CMPA has jurisdiction over "all tidally influenced waters, marshes, and marshlands lying within a tide-elevation range from 5.6 feet above mean tide level and below". GA CODE ANN. §§ 12-5-282

Maintaining a Permitted Structure

CMPA permits and Revocable Licenses authorize construction for up to five years. Applicants can request one five-year extension. PGP0083 permits, Individual Permits and Letters of Permission authorize construction for three years. If construction is not completed within the allowable time the applicant must apply for a new permit. Once a structure is built a permit does not need to be renewed and the structure may be maintained "as long as it does not further alter the natural topography or vegetation at the project site".[139] If structures permitted under the CMPA are not maintained "at a serviceable level", it is the owner's responsibility to repair or remove it. Under the CMPA, whenever anyone not exempt from the act "is altering the marshlands without a permit, altering the marshlands in violation of the terms and conditions of a permit, or violating this part in any other manner the committee may, prior to any hearing, issue a cease and desist order". The committee can request the imposition of civil penalties and if an administrative law judge finds that someone has "failed, neglected, or refused to comply with any provision or order of the committee" they may impose a "civil penalty not to exceed $10,000 for such violation and an additional civil penalty not to exceed $10,000 for each day during which such violation continues." The courts are always an option for those who feel that a project is causing unreasonable harm or if an authorization was granted or conditioned in a manner that someone would like to appeal.

Permitting History

Evaluating the impacts of the CMPA is a challenging and inexact undertaking. The Coastal Resource Division does not have consistent records of permits granted under

[139] GA CODE ANN. §§12-5-286(a)

the CMPA since its passage in 1970, and the state of Georgia does not have a monitoring program that would allow for comparison of marsh areas before and after construction or alteration. Efforts are currently underway to organize and track both CMPA and private dock permits. Any assessment of past impacts based on the existing permitting data must be interpreted with an understanding of the broader permitting context.

Since 1970 the CMPC has issued approximately 657 permits which have covered filling coastal marshlands, building marinas, bridges, and community docks, dredging, and oyster restoration projects. The number of CMPA permits issued each year from 2005 to 2011 is provided in Table 2. The number of permits issued for private docks is provided in Table 3.

Table 2
CMPA permits issued per fiscal year 2005-2011

Federal Fiscal Year	Total Number of Permits Issued	Number of Permits (out of the total) Considered "minor alteration"*
Oct.'05-Sept.'06	28	20
Oct.'06-Sept.'07	27	16
Oct.'07-Sept.'08	25	14
Oct.'08-Sept.'09	37	14
Oct.'09-Sept.'10	15	12
Oct.'10-Sept.'11	16	9

Provided by Coastal Resource Division, GA DNR[142]

* Per §12-5-282- minor alterations means any change in the marshlands which, taken singularly or in combination with other changes, involve less than 0.10 acres. Minor alterations also include renewal of permits previously issued by the committee.

Table 3
Total number of Revocable Licenses[143] granted per federal fiscal year and number of those specifically for private docks (those with PGP00083 permits)

Federal Fiscal Year	Total # of Revocable Licenses Issued	# of Revocable Licenses Granted for Private Docks
Oct.'05-Sept.'06	309	109
Oct.'06-Sept.'07	276	196
Oct.'07-Sept.'08	251	178
Oct.'08-Sept.'09	378*	111
Oct.'09-Sept.'10	166	116
Oct.'10-Sept.'11	138	91

Provided by Coastal Resource Division, GA DNR[144]

* The number of permits issued increased sharply in 08-09 because CRD became more active in bank stabilization projects and many of them were carried out during that year.

This data shows that approximately half as many CMPA permits were issued in FYs '10 and '11 as were issued in the four previous years (Table 3). However, the

[142] Habitat Management Program Manager, CRD. (2012, January 12).
[143] "Total # of Revocable Licenses Issued" includes RLs granted for CMPA permitted projects. "# of Revocable Licenses Granted for Private Docks" includes projects permitted with PGPs, IPs and LOPs.
[144] Habitat Management Program Manager, CRD. (2012, January 12).

number of CMPA or PGP0083 permits issued in a given year is not a direct reflection of the number of structures or changes that have occurred in the marshes. The total number of permits issued includes permits for additions to existing floating or community docks so a portion of the permits granted each year are not for new structures. While additions do impact the marshes, in many cases the impact is different than it would be for the construction of an entirely new structure. In addition, a single permit issued by the CMPC can have multiple components. For example, the permit for Cumberland Harbor which was issued in 2004 authorized two marinas and three community docks. The total number of permits also includes permits for "enhancement" projects, or alterations intended to improve or support ecosystem processes. These might include restoration or bank stabilization projects as well as securing bagged oyster shells to create substrate for oyster spat.[145]

Data on the nature of each permit and the square footage of each built structure is not currently accessible or available. Up until the 1980's the use of state water bottom was permitted by the State Properties Commission, and there are no good tracking mechanisms during this period of time. From the mid 1980's to 1990's the Army Corps delegated this permitting responsibility to individual counties. In 1996 the state took over the process, having acquired the staff and institutional capacity to do so through the establishment of CRD and the Federal CZMP.

CRD staff are currently reviewing historical files and updating the existing permitting database. This is the first step in a larger effort to create a new permitting database that will record and track CMPA and Programmatic General Permits. For each

[145] Habitat Management Program Manager, CRD. (2012, January 12).

permit, the new database, currently called the Coastal Resource Division Regulatory Permitting Database, will include the dimensions for the proposed structure, the structure that is approved, and the structure that is actually built. The database will have GIS and map components. The long term goal is to allow public access, and to allow applicants to track their applications online. The new database will include permits granted under the CMPA, revocable state licenses, private dock permits, and other regulatory permits. The design for the Coastal Resource Division Regulatory Permitting Database is complete and the agency is in the process of working with technical advisors to implement the design. The funding for the first phase of this project ended in March 2012 and CRD staff are looking for additional funding sources.

Data on the number of CMPA and PGP0083 permits granted, the structures or adjustments actually made under each permit, and the size of the marsh area impacted by these structures, are all important sources of information for evaluating the impacts and effectiveness of the CMPA and the current practices of the Coastal Marshland Protection Committee. However, reliable and consistent data of this nature is not currently available in a format conducive to assessment and evaluation. A more complete assessment of the CMPA using permitting data would involve sorting and compiling recent and historical records and developing a system for tracking current projects. Since CRD staff is currently undertaking this task, the most effective action for organizations or researchers seeking to use permitting data to assess marshland impacts is to support the development of CRD's Coastal Resource Division Regulatory Permitting Database either through financial means or technical assistance.

Although a concise and searchable database of permitted structures built in the

marshes is an important asset and tool for evaluating the effects of marshland development and the impact of existing regulatory protection, the CMPA also has impacts that are much more difficult to gage. CRD staff work with Georgia landowners who wish to alter their marshland property to design projects that minimize impacts on the marshland ecosystem. There are currently eight CRD staff members who work on permitting. They conduct site visits and provide technical assistance to potential applicants. The first step of each application process is an evaluation of non-marsh alternatives. CRD staff work with applicants to see if there is a way to accomplish project goals without impacting the marshes, or if there are alternative approaches or best management practices that can be employed to reduce the impact. Some initial requests for assistance from CRD staff do not result in permits because staff are able to work with applicants to figure out alternative approaches. For example, alternative plans can often be found for bank stabilization projects and bridges.[147] Under the CMPA, bridges over marshland will only be permitted if no non-marsh option exists, so considerable effort is put into identifying alternatives before any application for bridge construction over marshlands are submitted to the CMPC.

The new Coastal Resource Division Regulatory Permitting Database plans include information on the dimensions of initial project proposals as well as the dimensions of the final project. Being able to compare proposed dimensions to final dimensions only provides a simplistic assessment of the effects of the process permit applicants go through. It will not capture the more complicated, yet ultimately influential,

[147] Habitat Management Program Manager, CRD. (2012, January 12).

impact of the conversations, planning processes, and innovations that occur when land owners, CRD staff, and hired engineers and contractors work together to meet project goals while reducing the impact on the marshes. One way to try to assess this would be through a series of case studies following particular projects. A study of this nature could select a range of project types, and use either an interview or survey format to collect information about initial project goals and plans, the most influential aspects of the permitting or development process, and reviews of the finished product. This would provide information about attitudes and decisions that cannot be captured through the study of figures alone.

This type of analysis would also provide additional insight into a process that is described very differently by state employees and employees of environmental NGOs. In interviews, representatives from GA DNR and CRD described this part of the permitting process as one of the mechanisms providing protection for the marshes because CRD staff work with permit applicants to reduce the impact of their projects. Employees from environmental NGOs said that the goal of this permitting process is to help applicants create an application that will be approved by the CMPC. They said that CRD permitting staff work with project applicants to merely make sure their projects comply with existing regulations. It is not their job to advocate for measures that otherwise reduce marshland disturbance, and as a result, no one involved in the permitting process is actually "looking out for the marshes". CRD employees suggest that the marshes are protected when projects meet existing regulations. Environmental NGO employees suggest that existing regulations do no provide adequate protection so focusing on compliance is actually a way to approve new construction with little critical review.

Another way to assess the impact of docks and other structures built on or over the marshes pursuant to the CMPA review process is through dock surveys and scientific studies. Scientists at the SKIO and the Applied Coastal Research Laboratory at Georgia Southern University, conducted a study of private docks in 2004. Using aerial photos, they quantified the footprint of docks from 1970 to 2000 on Wilmington Island. They observed a 90% increase in the total dock area and a 73% increase in the number of docks between 1970 and 2000. They also studied the shading impacts of these docks. Impacts were measured through stem density and height of *Spartina alterniflora* in transects directly under docks and in adjacent areas. Average stem density under docks was 56% less than in adjacent plots.[148] Alexander and Robinson identified the need for additional research on the impact of *Spartina* wrack accumulation, which may be greater around docks than elsewhere. They also indentified a need for assessments of the impacts of floating docks that rest on the marsh bottom at low tide. Studies addressing these two needs are currently underway at Georgia Southern University and the University of Georgia.

Scientists, former CMPC members, and representatives from environmental NGOs all identified a need for more information and more scientific data on the impacts of private recreational docks because they are exempt from the CMPA and little is known about their cumulative impacts. Over the last decade scientists and natural resource managers have been researching dock impacts. In addition to the Alexander and Robinson study discussed above, these efforts have included studies on the ecological

[148] Alexander, C., & Robinson, M. (2002). *GIS and field-based analysis of the impacts of recreational docks on the salt marshes of Georgia*. Final Report for The Georgia Coastal Zone Management Program.

impact of dock shading[149], the impact of docks on the spatial distribution of marsh wrack accumulation[150], and a workshop hosted by NOAA's Coastal Ocean Program. The workshop on Environmental and Aesthetic Impacts of Small Docks and Piers was part of an effort to develop a " science-based decision support tool for small dock management".[151] While the need for this research has been recognized by a number of actors, the science is relatively new, and the infrastructure for using the data to influence permitting decisions and dock regulations is still unformed.

Contemporary Context of Georgia's CMPA

Just as Kundell et al. raised concerns about the ability of the CMPA to address changes in coastal conditions between 1970 and 1988, contemporary context and unanticipated circumstances continue to prompt questions about the ability of the CMPA to deliver on the original intent of the bill. Although the size and makeup of the CMPC has been amended, few other changes have been made to the act since it was passed in 1970. The same cannot be said for the coastal region of Georgia. Economic conditions, development trends, and population projections suggest that the context in which the CMPA is now operating is quite different from the economic and social context of the early 1970s.

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[149] Alexander, C., & Robinson, M. (2006). *Quantifying the ecological significance of marsh shading: The impact of private recreational docks in coastal Georgia*. Brunswick, GA: Report for the Coastal Resources Division, Georgia Department of Natural Resources.
[150] Alexander, C. (2008). *Wrack assessment using aerial photography in coastal Georgia*. Savannah, GA: Skidaway Institute of Oceanography.
[151] Kelty, R., & Bliven, S. (2003). *Environmental and aesthetic impacts of small docks and piers, workshop report: developing a science-based decision support tool for small dock management, phase 1: status of the science.* NOAA Coastal Ocean Program Decision Analysis Series No. 22. National Centers for Coastal Ocean Science, Silver Spring, MD. 69 pp. Retrieved from www.nccos.noaa.gov/publications/notables.html#dp.

In the 1960's primary development pressure was from large scale mining whereas development today is skewed towards condominiums, gated communities and tourism. Growth trends in Georgia are also being driven by military bases such as Fort Stewart, which have seen an influx of troops over the past decade. The coastal economy is also shaped by Georgia's major commercial ports in Savannah and Brunswick. In 2009, the Port of Savannah processed over $46 billion worth of cargo which was eight percent of all cargo containers moving to and from the United States. It hosted 300,000 jobs and generated $15.5 million dollars in annual income.[153] The Georgia Port Authority is promoting port expansions as necessary to ensure that Georgia's ports remain accessible and relevant to larger ships that are expected to be in use following the expected expansion of the Panama Canal by 2014.

Coastal Georgia's Comprehensive Plan (2008) notes that Coastal Georgia is the second fastest growing region in the state, second only to Atlanta. In 2006, the Coastal Georgia Regional Development Center (now the Coastal Regional Development Commission) and Georgia Tech conducted a joint population study. Based on population predictions for ten coastal counties, they predicted an overall coastal population of 844,161 people by 2030, a projected 50% increase in population from the estimated 558,000 people living there in 2000.[154] When the study was released, county commissioners and the executive director of the Center for a Sustainable Coast said the

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[153] *Dredgingtoday.com*. (2011, November 11). Retrieved from http://www.dredgingtoday.com/2010/09/03/usa-port-of-savannah-expansion-project-falls-behind/.

[154] (2006). *Georgia coast 2030: Population projections for the 10-county coastal region.* Center for Quality Growth and Regional Development at the Georgia Institute of Technology.

predictions appeared too conservative and predicted an even higher level of growth.[155] Population growth and the associated changes in infrastructure and development that accompany such demographic changes shape the political, economic, and social context in which decisions about coastal policies and regulation are now made.

Economic drivers and development trends make up some of the most dramatic shifts in the context in which the CMPA now operates. However, shifts have also occurred in natural resource management and watershed and city planning. Conservation initiatives and the establishment of protected areas has increased across the nation, and Georgia has seen an expansion in conservation initiatives and acreage of protected public lands. Since 1970 additional lands and sites have come under various forms of protection, including designated historic sites and national monuments[156], the Cumberland Island National Seashore (1972), National Wildlife Refuges[157], and four Georgia sites within the Carolinian-South Atlantic Biosphere Reserve established in 1986[158]. Another major shift in watershed and city planning has been an expansion of focus from the regulation of point source pollution to programs for reducing nonpoint source pollution.

Nonpoint Source Pollution

When the Clean Water Act (CWA) was passed in 1972, two years after the establishment of the CMPA, point source pollution was a major source of pollutants and

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[155] Star, M. (2006, October 14). Get ready to grow. *Brunswick News*; Landers, M. (2006, October 18). Coastal Ga expect 844,000 residents by 2030. *Savannah Morning News;* (2007). *At the tipping point*. Southern Environmental Law Center.

[156] Andersonville National Historic Site (1970, 495 acres); Chattahoochee River National Recreation Area (1978, 9,205.53 acres);Jimmy Carter National Historic Site (1987, 71 acres); Martin Luther King Jr. National Historic Site (1974, 34.47 acres).

[157] Banks Lake NWR (1985, 4049 acres); Bond Swamp NWR (1985, 6,500 acres); Pickney Island NWR (1975, 4,053 acres).

[158] Blackbeard Island NWR, Wolf Island NWR, Grays Reef National Marine Sanctuary and Little St. Simon's Island, also includes Cumberland Island National Seashore.

contaminants in the nation's waterways. Accordingly, the CWA included many provisions focused on eliminating point source pollution. These included stricter regulations on wastewater treatment facilities and more comprehensive permitting programs. Now, four decades after the establishment of the CWA, point source pollution has been significantly reduced, although not eliminated. Point source pollution is still a concern. The political influence of large polluters and a reduction in the resources of regulatory agencies has eroded enforcement and led to an increase in violations of CWA regulations since the 1990's[159]. Although point source pollution is an ongoing problem, the legislation regulating it is considered comprehensive and most criticism focuses on challenges with implementation and enforcement.

Nonpoint source programs were specifically designed to address sources of pollution not covered under the CWA. In describing section 6217 of CZARA, the section creating the Coastal Nonpoint Source Pollution Control program, Georgia's Coastal Resource Division says that "the 6217 management measures address pollution sources that were originally thought to be too insignificant to address by regulations".[160] The EPA now cites nonpoint source pollution as the most pervasive form of pollution for coastal areas.[161]Nonpoint source pollution has emerged as a primary threat because comprehensive point source legislation has reduced the overall impact of point sources, and because ongoing scientific studies have increasingly documented the many adverse impacts of stormwater runoff, and nonpoint source pollution.

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[159] Duhigg, C. (2009, September 13). Toxic waters: Clean water laws are neglected at cost to suffering. *New York Times*.
[160] *GA DNR, nonpoint source program website*. (2012, February 8). Retrieved from http://coastalGA DNR.org/cm/wq/nonpointsrc.
[161] *GA DNR, nonpoint source program website.* (2012, February 8). Retrieved from http://coastalGA DNR.org/cm/wq/nonpointsrc.

Nonpoint source pollution is a form of "diffuse pollution caused by sediment, nutrients, organic and toxic substances originating from land-use activities, which are carried to lakes and streams by surface runoff."[164] Nonpoint source pollution occurs when sedimentation and/or contaminants are picked up by rainwater, snowmelt, or irrigation that washes over agricultural fields, backyards, city streets, or suburban areas. Nonpoint source pollution includes oil from roadways, fertilizers from lawns, golf courses and agricultural facilities, and pathogens from animal waste or damaged sewer and septic systems and soil from sites cleared of vegetation for development. Specific contaminants include sediment, metals, toxins, hydrocarbons, pathogens and nutrients, especially nitrogen and phosphorus.

Studies conducted over the last few decades have shown that nonpoint source pollution damages marsh ecosystems as well as other water bodies both because of the presence of these contaminants and because of the way in which they are delivered to the system. Stormwater runoff is one of the major ways in which the previously mentioned contaminants enter waterways and coastal areas. Stormwater runoff is problematic because a lot of water is delivered to a system at once. A rapid and drastic increase in water volume causes a number of changes in aquatic systems, affecting the rate of water flow, water temperature, erosion and aquatic habitats. The delivery of sediment through runoff can cause high levels of suspended sediment that affects visibility and blocks sunlight from benthic organisms. It has also been shown to clog or scrape the gills of fish and other aquatic organisms and can interfere or cause changes in feeding and

[164] *USGS water science glossary of terms.* (2011, September 26). Retrieved from http://ga.water.usgs.gov/edu/dictionary.html.

reproductive behaviors. Toxic chemicals carried by stormwater runoff can also be fatal to aquatic organisms or affect biological functioning in various ways.

Nonpoint source pollution also leads to increased nutrient loads. While nitrogen and phosphorus are required for plant growth and general ecosystem function, high levels of these nutrients can have negative effects. Nitrogen and phosphorus can cause algal blooms. Some types of algae are harmful to fish and other aquatic organisms. In other instances algal blooms can result in eutrophication, when the consumption and eventual death of large amounts of algae results in the depletion of dissolved oxygen. The loss of oxygen can cause fish kills. The range of impacts from high levels of nitrogen and phosphorus are varied but the combined results of many small impacts and larger eutrophication events can have a significant cumulative effect. In 1999 NOAA's National Estuarine Eutrophication Survey showed that over ninety percent of US estuaries had eutrophic symptoms[166] and sixty-nine percent of assessed estuaries had eutrophic conditions categorized as "moderate to high".[167] In a 2007 update they found that sixty-five percent of assessed systems still had moderate to high eutrophic conditions.[168]

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[166] Symptoms used in this assessment include increased chlorophyll *a*, macroalgae and nuisance/toxic blooms, decreased dissolved oxygen, and submerged aquatic vegetation loss.

[167] High eutrophic conditions: "occur periodically or persistently and/or over an extensive area". Moderate eutrophic conditions: "occur less regularly and/or over a medium to extensive area". Bricker, S., Clement, C., Pirhalla, D., & Orlando, S. National Oceanic and Atmospheric Administration, (1999). *National estuarine eutrophication assessment: Effects of nutrient enrichment in the nation's estuaries.* Silver Spring, MD.

[168] Bricker, S., Longstaff, B., Dennison, A., Jones, A., Boicourt, K., Wicks, C., & Woerner, J. NOAA Coastal Ocean Program Decision Analysis Series No. 26., National Centers for Coastal Ocean Science. (2007). *Effects of nutrient enrichment in the nation's estuaries: A decade of change.*Silver Spring, MD.

The Jurisdiction of the CMPC and Upland Impacts

As scientific studies increasingly show evidence of adverse environmental impacts many miles from the physical location of a development activity or disturbance, conservation groups have asserted that activities outside the designated marsh area fall under the jurisdiction of the Coastal Marshland Protection Committee. Developers however, contend that such consideration was never intended to be part of CMPC decisions. In 2006, the Center for a Sustainable Coast (CSC), brought a case against the Coastal Marshland Protection Committee, challenging a permit granted to the developers of the Cumberland Harbor project in 2004. Located across from the Cumberland National Seashore, the development plans included the largest marina project to be permitted in the state of Georgia.[170] Along with two large marinas, community docks, and private docks, this included plans for 1,200 homes.

The CSC argued that in granting the permit, the CMPC failed to consider the overall impacts of the development on the marshes. They did not consider the expected impacts from the increase in impervious surfaces and storm water runoff, or the impacts on endangered species like the Right whale, manatee, and five species of sea turtle in the area. The case centered on the phrase "otherwise alter" in the directive that "no person shall remove, fill, dredge, drain, or otherwise alter any marshlands in this state within the estuarine area thereof without first obtaining a permit from the committee".[171] The ruling by Administrative Law Judge Michael Malihi, said that the phrase "otherwise alter" meant that the CMPC did need to consider the overall impacts of any proposed

[170] Center for A Sustainable Coast, Press Release, Nov. 17, 2008. "GA Supreme Court Issues Decision in Cumberland Harbor Case that Fails to Fully Protect Coastal Marshlands. Available at: http://www.southernenvironment.org/newsroom/press_releases/11_17_cumberland_harbour_ruling. Accessed on 4/23/2012.
[171] GA CODE ANN. §§ 12-5-286(a)

development. He instructed the committee to consider the impact on the marshes of the houses and roads in the proposed development as well as the impact of the marinas.

The case was appealed and in 2007 the Georgia Court of Appeals ruled unanimously that the term "otherwise alter" could not be interpreted so broadly. In the court's opinion, Presiding Judge Gary Blaylock Andrews wrote that doing so would mean the CMPA would apply to any upland development, "from the coast to inland watersheds", that creates pollution in the marshes.[172] They argued that the CMPA requires all applicants to prove compliance with other environmental regulations and the legislature could not have intended to give the CMPC such broad authority, especially over water quality. Doing so would essentially require the CMPC to consider and evaluate any activity impacting the marshes regardless of how far the activity was from the marshes. They wrote that this would create enforcement impracticalities.[173]

Judge A. Harris Adams, one of the judges ruling on the 2007 case, wrote in a concurring opinion that the "existing patchwork of regulations" may not be sufficient "to address problems with wastewater and runoff" and "may not successfully preserve this delicate and irreplaceable system". He wrote "I write separately to urge the legislature to consider whether broadening the scope of the CMPA to address such issues would better serve the marshland the CMPA is designed to protect".[174] While Judge Adams' supported the more limited interpretation of the phrase "otherwise alter" he felt that with this limitation the CMPA might be unable to fulfill its mandate to protect the marshlands. The case was appealed again and in 2008 the Georgia Supreme Court supported the more

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[172] Landers, M. (2007, July 13). Marshfront mega-developments get go-ahead . *Savannah Morning News*. Retrieved from from http://m.savannahnow.com/news/2007-07- 13/marshfront-mega-developments-get-go-ahead.
[173] Appel, R. (2007).
[174] *Coastal Marshlands Protection Committee.,* 649 S.E. 2d at 628-29

limited interpretation of the act when it ruled in Center for a Sustainable Coast V. Coastal Marshland Protection Committee, that "the permitting power of the Committee did not extend to regulating residential upland portions of development".[175] In the aftermath of this ruling, Judge Adams' original concern that the effectiveness of the CMPA was greatly limited by its inability to regulate storm water, remains pertinent and is shared by many in the conservation community and natural resource management.

The outcome of the 2008 Georgia Supreme Court ruling is that the CMPC is not supposed to consider the indirect or overall impact of development on the marshlands. They are directed to make their permitting decisions based on anticipated impacts of structures or alternations in or over the marshes. Upland impacts can only be considered if it can be shown that they have a direct physical impact on the marshes. The current Rules of Georgia Department of Natural Resources Coastal Resources Division section on Regulation of Upland Component of a Project include the following guidelines and definitions.

"Project" means the proposed construction or maintenance activity identified in an application for a marshlands permit within the contemplation of the Coastal Marshland Protection Act. A project may consist of two components: a marshlands component and an upland component"

The "Marshland component of the project" means the part of the project in an estuarine area or any structure on or over an estuarine area, including but not limited to marinas, community docks, bridges, piers and bulkheads, requiring a permit under the Coastal Marshland Protection Act Pursuant to O.C.G.A Section 12-5-286.

"Upland component of the project" is all those service areas, amenities, and recreational areas located inland of the Coastal Marshlands Protection Act jurisdiction line, that serve or augment the functioning of the marshlands component of the project, such as, but not limited to, dry stack boat storage; dockmaster shop; fuel storage and delivery facilities to serve the marshlands component of the project; and restrooms intended for users of the marshlands component of the project. This term may extend to and cover such facilities adjacent to or in proximity to the marshlands component of the project that are intended to serve exclusively or primarily the users

[175] Center For A Sustainable Coast v. Coastal Marshland Protection Committee. 284 Ga. 736, 736, 670 S.E. 2nd 429, 430 (2008) specifically 737

of the marshlands component of the project if the Committee finds in its sole discretion that such facility is likely to alter the marshlands."

The Coastal Upland Stakeholder Process

In 2006, when the initial suit was filed against the CMPC, developers, environmentalists, and natural resource managers interpreted the act differently, which made it difficult for the committee to make decisions and led to the controversy between conservation organizations and developers. While the Center for a Sustainable Coasts' suit against the CMPC was underway, the Coastal Resources Division of GA DNR took another approach to try to address and reduce this ambiguity. They initiated two stakeholder groups to assist with the development of more specific guidelines for permitting decisions under the Coastal Marshland Protection Act and Shore Protection Act.

The first, the Marinas and Community Docks stakeholders met from May 2005 to October 2006. The second, developed as a follow up to the first, was the Coastal Upland Stakeholder Process which ran from May 2006 to September 2006 and was specifically created to deal with the controversy over upland impacts. The stakeholder process was facilitated by the Fanning Institute at UGA, with technical support from the Georgia Coastal Research Council (GCRC). According to the GCRC, the Marinas and Community Docks Stakeholder Process was created at the request of the Coastal Marshlands Protection Committee who asked for an "independently facilitated stakeholder process to examine the permitting practices for marinas and community

docks" because of the need for "more formalized standards for permitting these types of projects".[178] The goals of the committee were as follows:

> 1) to achieve consistency and predictability for the public, Coastal Marshlands Protection Committee, and Georgia Department of Natural Resources staff, while recognizing and accommodating the uniqueness of each project that comes before the Committee.
>
> 2) to achieve enhanced efficiency in getting a project to the Coastal Marshlands Protection Committee for permitting consideration. [179]

Following the efforts of the Marinas and Community Docks group, the DNR Board wrote a resolution creating the Coastal Upland Stakeholder group and asking them to "create rules for waterfront development under the Coastal Marshland Protection Act" specifically those related to "upland issues". This focused on, but was not limited to, stormwater management, impervious cover, and buffer design and maintenance.[180] They were also asked to come up with definitions for key terms like "upland", "marsh" and "buffer". Their conclusions were not binding but were recommendations for those in GA DNR responsible for drafting rules and guidance measures for the CMPC. The understanding was that any measures that had two or more dissenting votes would not be adopted. The discussion of how to address upland effects primarily became a discussion over stormwater. A technical advisor (and non-voting member) said that group discussions centered on whether or not the CMPA could deny permits based on stormwater effects on the marshes[181].

In the end, the group was unable to agree on a set of recommendations for DNR for addressing upland issues under the CMPA. Most of the participating parties had

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[178] *Coastal stakeholder issues, GCRC*. (2012, January 1). Retrieved from http://www.gcrc.uga.edu/FocusAreas/stakeholders.htm.
[179] *Coastal stakeholder issues, GCRC.* (2012, January 1).
[180] *Coastal stakeholder issues, GCRC*. (2012, January 1).
[181] Technical Advisor, Coastal Upland Stakeholder Group. (2011, June 24). [Personal Communication].

vested interests in the outcome of the pending court case. The technical advisor said that throughout the entire process there was "a lot of posturing" by environmental groups, developers and local governments to avoid having anything on record that could be used against their interests in court. Some of the stakeholders determined that the legal case was the most advantageous avenue through which interest groups could try to reach their goals, thus reducing the incentive to compromise. The technical advisor said that a general agreement about upland guidelines was reached, but in the end the environmental groups involved voted against the draft document. If the court had ruled in their favor the environmental groups would not have had to compromise on the issue. While early decisions on the Cumberland Harbor case did favor the environmentalist, the final ruling in 2008 reversed that conclusion.

Although, the Coastal Upland Stakeholder Group did not ultimately provide the desired recommendations to DNR, their efforts precipitated the development of the Coastal Stormwater Supplement to the Georgia Stormwater Management Manual. This has become a central document in current statewide efforts to reduce nonpoint source pollution. The negotiated stakeholder approach should not be disregarded and could still prove useful in addressing remaining ambiguities. However, if there are ongoing legal cases or current campaigns in which stakeholders have a vested interest, the results are likely to be similar.

Environmental NGOs: Concerns about the CMPA

During my interviews representatives from environmental NGOs along the Georgia coast expressed a number of concerns about the way the CMPA is currently implemented. The 2008 Georgia Supreme Court ruling directed the CMPC to consider

upland impacts only if a direct physical impact on the marshes can be demonstrated. This makes it very difficult for anyone making an argument against a certain permit for a number of reasons. Primarily, because it is difficult to prove a direct physical impact before the development takes place. While many scientific studies exist demonstrating the negative impacts on marshlands from stormwater runoff, nonpoint source pollution, and hydrologic alterations, the requirements for what constitutes proof of a "direct physical impact" from a specific structure which has not yet been built remains unclear. Even if drawing on existing scientific studies to demonstrate negative physical impacts of a certain land-use change was considered sufficient grounds for denying a permit, the current permitting process makes it difficult and unlikely that such information will be considered in most of the permitting decisions.

In their interviews, staff from the Southern Environmental Law Center and the Center for a Sustainable Coast said there is not enough science involved in CMPC permitting decisions. Currently the CMPC does not include a scientist and scientific input is not required at any stage of the permitting process. The current procedure and permitting process can make it difficult to bring in scientific or expert opinions before permit hearings. Additionally, in many circumstances the science that would help inform a committee decision doesn't exist or is not easily accessible. The most common example of desired scientific information that either does not exist, or is not readily available, is information about the impacts of private recreational docks (those permitted under PGPs or IPs) and those considered "minor alterations" under the CMPA. This includes issues like the impact of dock shading, the impact of floating docks that rest on the marsh bottom during low tide, and the impact of certain dock materials verses others.

Employees of the Southern Environmental Law Center and Center for a Sustainable Coast have expressed concern about the combined absence of a scientist on the CMPC and the limited window they have to respond to a permit.[182] They said that because DNR does not have experts, like hydrologists, on staff to deal with CMPA issues any expert that comes to the table is often hired by the permit applicant unless an environmental organization or someone else opposing a permit hires a consultant. It is difficult for organizations like the SELC and CSC to do this because of the potential cost and because there is little time for them to get the expertise together to argue against a specific permit. As a result, an attorney for SELC said he is often left feeling like, in the evaluation of these permits, there is no scientific authority that can say "this is not in the public interest". Similarly, the Executive Director of the CSC has expressed concern that because DNR does not have the appropriate staff to do so, they often fail to bring information to the table that is different from that provided by the applicant and their hired consultants.[183]

Center for a Sustainable Coast's Executive Director has been outspoken about his concern over the lack of follow up and monitoring of permits granted through the CMPA. In letters, survey responses, and interviews, he has said that statements about the enforcement of the CMPA can be misleading. He says that when people say the CMPA is "well enforced" they often mean that permit requirements are met. However, this use of the term "enforcement" does not include any assessment of the actual environmental impacts of permitted structures. One of the major faults he finds with the CMPA is an

[182] Senior Attorney, Southern Environmental Law Center. (2011, September 23). [Personal Communication].
[183] Executive Director, Center for a Sustainable Coast. (2011, July 30). [Personal Communication].

overwhelming lack of monitoring of the environmental impacts of development on and in marsh areas, as well as a lack of criteria for evaluating the overall effects of permits after they have been granted. Without monitoring the impacts of new development it is difficult to see how the goal of the CMPA could be fully realized, or how problems with current practices could be identified. Center for a Sustainable Coast's Executive Director has said that without such a monitoring scheme, those on the CMPC "don't even have a baseline of data" on which to base their evaluations of applications. The committee is in danger of making decisions based on assumptions which are in effect, never tested.[184]

An attorney for the Southern Environmental Law Center has also said the lack of guidance for the CMPC is an ongoing problem. He said the lack of structure and guidance can best be grasped in relation to comparable statutes like the Clean Water Act (CWA). Since its passage, regulations added to the CWA through the rule making process has "added flesh to bones". However, with the CMPA, this process has never been comprehensive. The CMPC mandate is centered around the concept of the "public interest". This is a broad and subjective concept and the committee has little guidance about how to define it or how to evaluate impacts.

The DNR rule making process and the 2008 Georgia Supreme Court Case ruling have both added guidance and structure to the CMPA. However, the SELC attorney feels that "the committee is still in the dark about how to apply the act in the wake of the Cumberland decision".[185] While some more overarching structure may have been provided with this ruling, there are still many specific issues that the committee must make decisions about without instruction. For example, DNR recently established a 1000

[184] Executive Director, Center for a Sustainable Coast. (2011, July 30).; Executive Director, Center for a Sustainable Coast. (2010). [Letter to NOAA Review].
[185] Senior Attorney, Southern Environmental Law Center. (2011, September 23).

foot limit for commercial or community docks, a regulation that has the potential to simplify decision making for the CMPC because it creates a clear size limit. However, the rule also says that the committee can grant exceptions to the 1000 foot limit, but does not specify or provide any guidelines for the conditions under which such an exception could be granted. So while the committee now has a general guideline with which to work, (they have essentially been told that anything over 1000 feet is not in the "public interest"), they also have a relatively open scenario if an applicant requests an exception for their project. While the 1000 foot limit had the potential to define and make the "public interest" somewhat more concrete, the exception means that if an applicant requests a waver for this requirement, the committee is again challenged with assessing the impact of the proposed development on the broad and ambiguous concept of the "public interest".

The other concern voiced by representatives from the SELC, CSC, and Altamaha River Keepers is that private residential docks remain outside the jurisdiction of the CMPA. Private docks are not covered under the CMPA and are permitted jointly under the Army Corps of Engineers and CRD. In order to get a permit for a private dock, a project must meet existing requirements outlined in the general permit application. This includes specifications like acceptable materials, maximum square footage, and a requirement that structures remain above the bottom at low tide and do not disturb benthic habitats. As long as a proposed project meets the established list of requirements (see Figure 1), they are given a permit. While part of the concern relating to private docks has to do with this separate permitting process, other concerns fall under larger issues mentioned previously, including a lack of monitoring and dearth of available science

about various impacts. While the existing permitting process appears to be based on the assumption that small private docks will have minimal impact on the surrounding environment, there are concerns about the cumulative impact of many small docks. Studies are currently ongoing concerning the impacts of dock shading and accumulation of marsh wrack but there is little precedent for the incorporation of new scientific information into the CMPC decision making process. The extent to which it influences permitting decisions depends on the efforts of informed individuals who decide to bring it before the committee when contesting a specific permit.

Implications

In the late 1960s, the strategy used to protect the marshes was to pass statewide legislation and grant the state regulatory authority over Georgia's marshes. Although a number of concerns about the jurisdiction and scope of the CMPA currently remain, there are also concerns that any attempt to revise the CMPA would give the opposition an opportunity to weaken the bill. This has led some city planners and conservationists to the conclusion that the best way to address current gaps in marsh protection is through the establishment of strong local ordinances and zoning laws. Given the potential risk for developers and those opposed to the CMPA to weaken the CMPA if attempts were made to revise it, some supporters feel that the existing ambiguity is preferable. Focusing on establishing and strengthening local ordinances as well as promoting zoning and development plans that make use of Low Impact Development schemes and principles can also address these issues effectively.

A CRD employee said she felt this was a promising approach because it also has a local focus. Small changes at the county and city level have the potential to have a lasting

and important regional impact. She felt that people are often more responsive to actions and issues at a local level because the impact on their own lives is most visible. This approach does have its own suite of challenges. Many model ordinances have already been drafted and collected both by state agencies like CRD and NGOs like the Southern Environmental Law Center, but they remain neatly organized in binders, and few have been adopted or implemented. She said that the current challenge is to figure out how to best promote, encourage, and support the establishment of local ordinances and regulations.

Strengthening measures and protections at the local level is also one of the guiding principles of the Coastal Zone Management Program (CZMP). This incentive-based, multi-scale approach is designed to give states and municipalities the flexibility to design programs and regulations tailored to their needs, while providing federal level resources and support for these efforts. The following chapter discusses the Coastal Nonpoint Source program, one aspect of the CZMA. It focuses specifically on the challenges of implementing a program based on this scheme, and on the opportunities it provides for strengthening coastal protection through the establishment of local measures, regulations, and programs.

CHAPTER 4

GEORGIA'S COASTAL NONPOINT SOURCE POLLUTION PROGRAM: CHALLENGES AND OPPORTUNITIES

The previous chapter discussed contemporary context and challenges for the protection of Georgia's coastal marshes. These include limited access to scientific data and knowledge about the impacts of various structures and actions on the marshes, and lack of long term monitoring and evaluation of the effects of permitted structures built on or over the marshes. They also include restrictions on the jurisdiction of the Coastal Marshland Protection Committee that can only consider the impact of structures outside the marshes if they have a demonstrated physical impact on the marshes. Each of these limitations makes it difficult to use the CMPA to address the ongoing impacts of nonpoint source pollution, even though a significant body of scientific evidence has demonstrated nonpoint source pollution's negative impact and degradation of aquatic and marine habitats.

Another program that greatly impacts Georgia's coastal region is the Coastal Zone Management Program. The Coastal Zone Management Program has federal and state components and includes a Coastal Nonpoint Source Management Program (CNSMP), more commonly referred to as a Coastal NPS Program. The Coastal Zone Management Act, which created the national Coastal Zone Management Program, is an incentive-based, multi-scale approach operating on the federal, state, and local levels. It has the potential to contribute greatly to the health of Georgia's marshes precisely by addressing

some of the downstream effects that have been difficult to control under the CMPA. However, this program is also struggling to deal with many of its own challenges and Georgia's Coastal NPS plan has not yet been fully approved by NOAA and the EPA. An examination of the challenges and strengths of this program can inform future efforts to support the development and approval of Georgia's Coastal NPS Program and improve marshland protection.

The Coastal Zone Management Program

The NPS program is administered through the Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). The Coastal NPS Program is one aspect of the federal Coastal Zone Management program, which was established by Congress through the Federal Coastal Zone Management Act in 1972. Two important characteristics define the CZMA and associated programs: the act is designed to be a partnership between federal and state governments and organizations, and it is a non-regulatory program that relies on incentives to encourage planning and implementation.

The official goal of the CZMP is to "preserve, protect, develop, and, where possible, restore or enhance the resources of the nation's coastal zone."[186] It "encourages states and tribes to protect valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats".[187] The CZMA focuses on states that boarder the Atlantic and Pacific coasts as well as the Arctic Ocean, Gulf of Mexico, Long Island Sound, and Great Lakes.

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[186] The Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451-1465 (1994& Supp. IV 1998)
[187] *EPA homepage, CZMA.* (2011, January 5). Retrieved from http://www.epa.gov/agriculture/lzma.html.

The CZMA itself, as well as formal documents and grey literature produced by the agencies involved, stress that the act is intended to foster, strengthen, and benefit from federal and state partnerships. The intent of this approach is to account for state-by-state variability in coastal resources, economics, and demographics while giving states federal-level support and resources. Therefore, states or territories are held responsible for development and implementation of coastal zone management plans, while federal funds, research, and resources are made available to help them. Federal agencies provide technical and legal support and mediation to states in the planning process as well as function as sources of related research and relevant expertise. One of the most important characteristics of the CZMA is that it is non-regulatory, designed to encourage states or tribes to voluntarily participate through financial incentives. However, standards and overall consistency are maintained as each program must be reviewed and approved by NOAA and the EPA.

There are two main incentives for states to develop and implement a coastal zone management plan. States with approved plans receive federal funds to implement them through Section 306 of the CZMA and Section 319 of the Clean Water Act (CWA). States with approved coastal management plans also receive federal consistency authority. This means that a state can challenge federal actions, notably permits, if they do not comply with the state's coastal management program.[188] This has been used in the past to challenge federal decisions about dredge and fill permits and oil and gas leases.

In the original version of section 6217 of the CZMA, a state which failed to submit a coastal nonpoint pollution program by 1996 would not be eligible for, or would

[188] Solomon, A. (2001). Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990: Is there any point?. *Environmental Law , 31*, 151-183. p.153.

lose a percentage of its funding under section 306 of the CZMA and section 319 of the CWA. There was to be a 10 % reduction in funds during the first year of non-compliance. If a plan was still not in place by 1999, there would be an ongoing 30% reduction of 319 funds.[189] In 1995 a number of changes were made in the CZARA program to give states more flexibility. One of the measures taken was the addition of conditional approval stages for state programs. The time frame for implementing management practices was extended from three to five years. States were given up to five years to complete their programs without having federal grants withheld. In 1998, states were given even more flexibility to identify nonpoint sources of pollution. For example, if a state can provide evidence that one of the sources of NPS pollution identified in the EPA guidance document is not a source of NPS pollution in their coastal zone, that state does not have to include management measures to address that category of pollution.[190] States were also required to submit a program strategy, which serves to "schedule implementation of nonpoint pollution management measures and improve water quality within fifteen years of conditional approval".[191]

The Coastal NPS Program became part of the CZMA in 1990 with the passage of the Coastal Zone Act Reauthorization Amendments (CZARA). Consistent with other management efforts at the time, reauthorization of the CZMA focused a great deal on measures to reduce nonpoint source pollution. Nonpoint source pollution was originally

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[189] Copeland, C. Report for Congress RS20232, (1999). *The coastal nonpoint pollution program: Status and legislative issues*. p.3; Solomon, A. (2001). p.153.

[190] Subsequent to program approval, including conditional approval, NOAA and EPA will allow states to further exclude sources either by category, subcategory or management measure or on a geographic basis (e.g., a 6217 management area, watershed, county) where states can provide either existing or newly developed information (e.g., monitoring data) to demonstrate that a source is not, and is not reasonably expected to, become significant, either individually or cumulatively.

[191] Copeland (1999). p.4.; Solomon, A. (2001). p.163.

under the jurisdiction of state and local governments because it is closely tied to land-use and the federal government does not generally regulate land-use. That responsibility has traditionally resided with state and local governments. When they decided to create a federal program to address NPS pollution Congress addressed this issue by adding Section 6217, which requires states with federally approved CZM programs to create and implement Coastal Nonpoint Pollution Control Programs or CNPCPs. Under Section 6217 the federal government does not directly regulate nonpoint source pollution but offers incentives for states to create their own regulatory programs. State and local governments design and implementation their own programs and retain control over land-use management. Most Coastal NPS programs combine voluntary and incentive based programs with county and statewide regulatory measures.

A report released by NOAA in 1998 discussed a variety of approaches states have developed to run their CZM programs. The *State of the Coast Report*, identified five types of CZM programs. A "Direct" program has a single state agency responsible for comprehensive permitting and regulatory oversight. "Direct/Local Coastal Programs" (LCPs) also have a single state agency with regulatory authority but they delegate certain permitting responsibilities to local government agencies that work on local programs. In "Networked" programs a single state agency coordinates the actions of state and local agencies that exercise specific regulatory authority in coastal areas. "Networked/LCPs" also have a single agency coordinating other state and local agencies with certain regulatory authority and permitting responsibilities but they also have enforceable Local Coastal Programs. The fifth category includes the "Networked/ Regulatory" programs

where a primary agency shares regulatory authority with other agencies within the state that are responsible for managing specific activities in the coastal zone.[192]

In 1998 NOAA categorized six states as "Direct", three as "Direct/Local Coastal", twelve were considered "Networked", seven were "Networked/LCP", and four were "Networked/Regulatory". In the Southeast, Georgia and Delaware were categorized as Networked/Regulatory" programs. North and South Carolina were considered "Direct/ LCP" and "Direct" respectively, and Maryland and Virginia were considered "Networked".[193]

It is important to note that *Coastal* Nonpoint Source Programs are separate from state Nonpoint Source Programs. State Nonpoint Source Management Programs (NPSMP) are funded through Section 319 (h) of the Clean Water Act and are under the purview of the EPA. States apply to the EPA for 319 (h) funding for specific projects to address nonpoint source pollution throughout the state. Section 319 funding can be used for Coastal NPS projects. In Georgia, the state Nonpoint Source Program is housed in Georgia's Department of Natural Resources, Environmental Protection Division.

Georgia's *Coastal* Nonpoint Source Program is part of Georgia's Coastal Zone Management Program. It is also housed in GA DNR, EPD, but is the responsibility of the Coastal Resources Division (CRD) and on the federal level is under the joint jurisdiction of NOAA and EPA. There is collaboration between staff working on the state NPSMP and the state Coastal NPS Program, but they are separate programs. GAEPD provides guidance and technical assistance for both programs and they help CRD staff with the

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[192] Millhouser, W., McDonough, J., Tolson, J., & Slade, D. National Oceanic and Atmospheric Administration , National Centers for Coastal Ocean Science. (1998). *Managing coastal resources. NOAA's state of the coast report*. Retrieved from NOAA website: http://state-of-coast.noaa.gov/bulletins/html/crm_13/crm.html.

[193] Millhouser, et al. (1998).

development and implementation of the Coastal NPS Program. For example, on the GAEPD website, GA EPD says they do the following to support and aid CRD staff.

> (1) identification of land uses which may cause or contribute to the degradation of coastal water, including natural, episodic and unpermitted sources, (2) prioritization of critical coastal areas as described in the *Coastal Zone Management Program* and *Coastal Regional Development Plan*, (3) evaluation of USEPA-mandated management measures related to land use impacts required to achieve and maintain water quality standards and designated uses, and (4) coordination of other nonpoint source management efforts.[194]

The Coastal NPS Program is under the dual authority of the EPA and NOAA. These are the federal bodies responsible for creating guidelines for state management plans, facilitating the development process for state management plans, evaluating and approving state plans, and releasing federal funds. Responsibilities are divided between the two organizations. The EPA is responsible for the technical aspects of the program. They have engineers on staff who conduct the technical review. NOAA is responsible for determining boundaries. They review the areas states have decided to include in their coastal zones and the rational behind those decisions.

In 1993 these agencies released the *Coastal Nonpoint Pollution Control Program Development and Approval Guidelines,* which includes requirements for Coastal NPS Programs, an overview of the review process, and various deadlines, penalties, and revisions that are required if a Coastal NPS Program is not fully approved. NOAA and the EPA are responsible for approving state Coastal NPS Programs and enforcing compliance with the guidelines outlined in the report. Since the Coastal Nonpoint Pollution Control Program is part of an incentive-based program (the CZMA),

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[194] Georgia Department of Natural Resources, Environmental Protection Division Water Protection Branch, (2000). *Georgia nonpoint source management program FFY 2000 update*. Atlanta, GA.

enforcement means reducing and withholding Section 306 and Section 319 funds, which are their only means to ensure compliance.

The *Coastal Nonpoint Pollution Control Program Development and Approval Guidelines,* is periodically updated by EPA and the most recent version is on the EPA website.[195] Management measures cover the following topics: Agricultural Sources, Forestry, Urban Areas, Marinas and Recreational Boating, Hydromodification (Channelization and Channel Modification, Dams and Streambank and Shoreline Erosion), Wetlands, Riparian Areas and Vegetated Treatment Systems. The guidance document also includes a chapter on Monitoring and Tracking Techniques to Accompany Management measures. Management measures are defined in CZARA as "economically achievable measures to control the addition of pollutants to our coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, sitting criteria, operating methods, or other alternatives".[196]

Each *management measure* includes *management practices* which are practices "that have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measures." Management measures are provided as examples but are not requirements. Examples of management measures are provided below.

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[195] US EPA, (1993). *Coastal nonpoint pollution control program development and approval guidelines: Polluted runoff (nonpoint source pollution)*. Retrieved from website: http://www.epa.gov/owow/NPS/MMGI/index.html.
[196] US EPA, (1993).

Marina Flushing Management Measure

II. Siting and Design

A. Marina Flushing Management Measure
Site and design marinas such that tides and/or currents will aid in flushing of the site or renew its water regularly.

Management Measures for Urban Areas

A. New Onsite Disposal Systems Management Measures

1) Ensure that new OSDS are "located, designed, installed, operated, inspected and maintained to prevent discharge of pollutants to the surface of the ground and into ground waters closely hydrologically connected to surface waters." This includes implementing inspection schedules for preconstruction, construction and postconstruction.

2) "Direct placement of OSDS away from unsuitable areas". This includes a description of an "unsuitable area" which includes floodplains, and areas overlaying fractured bedrock.

3)"Establish protective setbacks from surface waters, wetlands and floodplains".

4) "Establish protective separation distances between OSDS system components and ground water closely hydrologically connected to surface waters."

5). "Where nitrogen limited surface waters may be adversely affected by excess nitrogen loading, require installation of OSDS that reduce total nitrogen loadings by 50 percent.

The annual funding appropriated to each state in the CZMP varies from year to year depending on the overall budget for the program. Congress appropriates money for each participating state based on the state's proportional coastal population and length of coastline. See Appendix D for a step by step description of the formula used. No state, regardless of geography or population, can receive more than two million dollars in a fiscal year.

Northwest Environmental Advocates v. Locke et al.

In January 2009, Northwest Environmental Advocates (NEWA), an Oregon based environmental advocacy organization, sued NOAA and EPA for violations of the 1990 CZARA. NWEA filed the lawsuit because Oregon has had conditional approval of its Coastal NPS plan since 1998. NOAA and EPA have let this conditional approval stand for thirteen years without withholding funding as required under the CZARA. NWEA's suit claims that NOAA and the EPA have used the "conditional" approval status to "impermissibly avoid withholding CWA and CZMA funds".[197]

The history of Oregon's Coastal NPS plan is not unlike other states that have had conditional approval for close to a decade or more. Oregon first submitted its Coastal NPS plan in July 1995. In January 1998, EPA and NOAA granted them conditional approval, which included requiring a number of conditions to be met by January 13, 2001. NOAA and EPA said that Oregon's "tools are inadequate to ensure that water quality standards are attained and maintained and beneficial uses protected".[198] Oregon is home to a number of aquatic species that are endangered, threatened or considered seriously at risk, including anadromous salmon species reliant on Oregon's coastal and inland waters for critical life stages. The existing plan was deemed insufficient for reaching and maintaining water quality standards to protect these species and to control "cumulative impacts of forestry activities". In December 2000, the deadline for resubmission was extended to January 2003. In April 2004, NOAA and EPA again found that Oregon did not meet the condition for forestry management measures. NOAA and EPA found Oregon's Coastal NPS plan insufficient again in June 2008. At the time the

[197] (2009). Northwest Environmental Advocates vs. NOAA and EPA. Complaint for Declaratory and Injunctive Relief. US District Court, District of Oregon.
[198] (2009). Northwest Environmental Advocates vs. NOAA and EPA.

lawsuit was filed, no additional effort had been made by the state of Oregon to resubmit an improved plan.

In the complaint filed by NWEA, they say that "EPA and NOAA have indefinitely delayed disapproving deficient Coastal Nonpoint Programs and indefinitely delayed withholding CWA and CZMA grant funds from Oregon and other states that fail to submit approvable Programs."[199] They claim that the "agencies' delay [in withholding funds] perpetuates Oregon's Harmful Forest Practices Program".[200] They include as evidence a 2006 e-mail from a state official involved in Oregon's NPS program. In the e-mail, the state official says that no recent attempts had been made to get full approval of their Coastal NPS plan because:

> "we have lost our motivation to pursue full program approval for three reasons: 1) we do not see how our current efforts to develop and implement strategies that address nonpoint pollution would benefit from full program approval; 2) there is no longer any consequence of not having full program approval; and 3) our last efforts to work with the feds on finding workable solutions to meeting management measures were not fruitful."[201]

The lawsuit was intended to force NOAA and EPA to make a final decision on Oregon's Coastal NPS plan and to withdraw funding if the plan was again found to be insufficient. The suit resulted in a settlement. EPA and NOAA will issue a draft decision to fully approve or disprove Oregon's Coastal NPS plan by November 15, 2013 and provide a final decision by May 15th, 2014. If Oregon's Coastal NPS plan is found to be insufficient the two agencies will immediately begin to withhold funding.[202] As a result of this settlement, Oregon has developed new forestry management practices to reach and maintain water quality standards. The state made Total Maximum Daily Loads (TMDLs)

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[199] (2009). Northwest Environmental Advocates vs. NOAA and EPA.
[200] (2009). Northwest Environmental Advocates vs. NOAA and EPA.
[201] (2009). Northwest Environmental Advocates vs. NOAA and EPA.
[202] (2009). Northwest Environmental Advocates vs. NOAA and EPA.

enforceable for nonpoint sources of pollution. This is the first time this has been done nationally and lawsuits have been brought challenging the Oregon Department of Environmental Quality's (ODEQ) legal authority to enforce compliance with TMDLs.

In this circumstance, the lawsuit against NOAA and the EPA was a tool NWEA used to try to force the state to take action on what NWEA described as "inadequate logging practices [that] fail to protect coastal water quality, salmon and steelhead."[203] In a press release from NWEA dated September 28, 2010, the executive director, Nina Bell explained the law suit by saying:

> "For a dozen years the federal government has begged Oregon to improve its logging practices, but failed to cut off its funds as Congress required. Our lawsuit developed a creative way for Oregon to restore water quality essential for coastal salmon while also allowing Oregon to continue to receive federal funds in the meantime."[204]

This is the first time that the courts have been used to force or push NOAA and the EPA to set strict deadlines and withdraw funding if they are not met. The goal was to force action on NPS forestry issues with an impact on the coastal zone and not actually have CWA and CZMA funding withdrawn. The full impact of this settlement on the Coastal Zone Management program is unknown as we still have to see how the settlement agreement is implemented and how the legal challenges to ODEQ's authority over TMDLs is resolved. However, NOAA's Coastal Programs Division Director said that this may force NOAA and the EPA to start holding states to higher standards. The same sentiment was expressed by NOAA's Georgia liaison, who described the case by saying that it may force NOAA and the EPA to hold the state of Oregon to a specific

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[203] Bell, N. (2010, September 28). Federal lawsuit settlement will force changes in Oregon's coastal logging practices. *Press Release.*
[204] Bell, N. (2010, September 28).

schedule, and if the deadline isn't met, they will be forced to penalize the state. If this happens in Oregon, they will probably have to hold other states to the same standards.

I asked Georgia's Coastal NPS coordinator and EPA staff member about impacts of the Oregon case on the Coastal NPS Program nationally, and about potential impacts on the state of Georgia. Neither one mentioned large ramifications or concerns. Georgia's Coastal NPS Program Coordinator said that Washington was the first state to go through a 312 review following the Oregon case. They were given stricter deadlines for the submission of their final plan and for the submission of a work plan and timeline than states reviewed prior to 2010. The same occurred with Louisiana, the second state to have a 312 review after the Oregon case. Georgia's Coastal NPS Coordinator feels that the September 30, 2012 deadline for a work plan and time line is the result of the stricter deadlines NOAA and EPA were required to establish for Oregon. The EPA staff member said that the Oregon case may lead to more lawsuits of a similar nature but she doesn't currently see evidence of that occurring outside the Pacific Northwest.

Georgia's Program

Each state in the CZMP has a unique program structure, and the strengths and challenges are inevitably shaped by this overall framework. Georgia is a home rule state. In a home rule state, local cities or counties have the power to set up their own system of self-governance and their own system of local ordinances without a charter from the state. This means that the majority of responsibility for many issues rests with local governments rather than the state legislature. Counties with home rule charters have the ability to amend their governmental organization and powers. In essence, each county in Georgia has a local constitution. This is important in regards to the CZMP and state and

Coastal NPS pollution programs because policies that help to control NPS pollution (i.e. the regulation of On Site Disposal Systems, and stormwater runoff) have traditionally been enacted on a county-by-county basis.

Georgia's CZMP has a small administrative staff and the majority of the funds from NOAA are redistributed back out to Georgia communities, organizations, or municipal governments in the form of grants. One state employee identified this structure as a "pass-through" program. The term "pass-through" was used when referring to the fact that the majority of federal funding is not used in-house but is distributed to local governments. This was contrasted with states that use the majority of their federal funding for staff salaries, and then conduct their own studies and their own education and outreach programs. In Georgia, the money is used for staff members whose primary job is to facilitate the distribution of the rest of the funds as Coastal Incentive Grants. A staff member from CRD described the program as "a lateral program", that is "small" and "administrative". They find out what local governments need, help them come up with project ideas, help them write and apply for grants and then monitor the projects that are funded. The term "pass-through" is not a formal term used by agencies involved in coastal management. Some interview subjects used that term but many did not. When I asked about states with similar programs I was told by many interview subjects, that each state's program is unique and different, and it is difficult to categorize them by their structural features.

Georgia's CZMP directs the majority of its funding to local governments because when Georgia's Coastal Management Act was being drafted prior to its passage in 1997, many legislators and Georgia residents said they were only going to approve of a

program that was non-regulatory, did not create new levels of bureaucracy and administration, and clearly and directly benefited the coastal zone. Georgia's CZMP is required to use fifty percent of the funds from NOAA as grants for coastal communities. According to a staff member from CRD, this arrangement creates administrative challenges, as CRD staff cannot use funds to create in house projects the way some CZM programs do. It limits what staff is able to accomplish and the type of programs they are able to run. However, it also means that funding goes directly to communities. She felt that this was ultimately beneficial, since working with local governments to identify and write grants for projects helps to create good working relationships and networks.

NOAA's Coastal Program Division Director identified both challenges and strengths in the structure of Georgia's CZMP. When asked to compare Georgia's "pass-through" approach to programs in other states she said that the programs that keep most of the money in house use it to support full time staff and often have a more regulatory structure. She said those more regulatory programs are often more unified and active in their approach. Pass-through programs tend to have less of a focus, but a wider variety of projects. Because pass-through programs have a small staff they have to work more with other agencies and form strong networks with other state programs. They can be very effective because a lot of the work happens at the local level through the development of local ordinances and other measures.

Current Status of Georgia's Coastal Nonpoint Source Program

Georgia joined the Coastal Zone Management Program in 1998, through the passage of the Georgia Coastal Management Act. Georgia's Coastal Zone Management Program is housed in the Environmental Protection Division (EPD) of Georgia's

Department of Natural Resources. Georgia's Coastal NPS Program was given conditional approval by NOAA and the EPA in 2002.

The state of Georgia has been working with staff at EPA headquarters, EPA Region IV office, and NOAA on their Coastal NPS Program. From 2006-2010 the state of Georgia initiated a number of multi-year projects designed to meet the outstanding conditions in the Coastal NPS plan. Based on the progress and development of these efforts state and federal agencies decided to have Georgia submit program components in sections as projects reach completion.

In 2008 NOAA approved the legal opinion from the Georgia Department of Law, which said that Georgia has the necessary statutory and regulatory enforceable authorities established to prevent and control nonpoint source pollution in coastal areas. The opinion said the state has the regulatory enforceable authorities established that can require the implementation of management measures if voluntary approaches are not sufficient in protecting coastal waters.[205]

A draft of Georgia's planned measures to meet the remaining outstanding conditions was submitted in March 2011. The categories included in the latest draft were: Agriculture, Forestry, Urban New Development, Urban Existing Development, Urban Onsite Sewage Disposal System, Urban Highways, Roads and Bridges, Monitoring and Tracking, and the Program's operational boundary. The programs presented to address these categories were: "the Coastal Stormwater Supplement to the Georgia Stormwater Manual; the update of Georgia's Watershed Management Guidance; the GPS inventory, mapping and evaluation of priority septic systems and wells for the coast; the completed green growth model ordinances for coastal local governments and companion projects to

[205] Coastal NPS Program Coordinator. (2012, February 24). [Personal Communication].

create a multi-agency ordinance implementation team; the Better Back Roads Program; and ideas for tracking and monitoring the effectiveness of the Coastal NPS Program" (see Table 4).[206]

Section 312 of the CZMA authorizes the Secretary of Commerce to conduct continuing reviews of state CZM programs to make sure they are enforcing and implementing their programs. This review takes place every three to five years, is carried out by NOAA, and includes state Coastal NPS Programs. EPA does not have a formal role in this process. In May 2011, NOAA conducted a Section 312 review of Georgia's Coastal Zone Management Program.

As a result of a 2010 lawsuit over Oregon's Coastal NPS Program, NOAA began giving states specific deadlines for submitting work plans and timetables as well as completion of their Coastal NPS plans as part of their section 312 reviews. This occurred with Washington and Louisiana, the first two states to go through a 312 review after the 2010 Oregon settlement. Georgia's Coastal NPS Program Coordinator anticipated receiving similar deadlines. In December 2011 they received the draft findings of the review. The draft findings noted that Georgia has made significant progress in their Coastal NPS Program and required the following Necessary Actions: "The GA DNR must work with NOAA OCRM to develop and submit to OCRM by September 30, 2012 a work plan with interim benchmarks and a time line for meeting the outstanding conditions of its conditionally approved coastal nonpoint program."[207] By May 31, 2016 the state of Georgia must submit documentation that the outstanding management measures have been met.

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[206] Coastal NPS Program Coordinator. (2012, February 24).
[207] Coastal NPS Program Coordinator. (2012, February 24).

As of February 2012 the management measures Georgia still needs to address are: agriculture nutrient management planning and wastewater design for confined animal feeding operations, Urban Existing Development, Urban OSDS, Urban Highways Roads and Bridges, and Monitoring and Tracking (see Table 4). The Georgia program is now compiling information about existing or proposed programs that meet the requirements for each of these measures.

Table 4
Georgia's Outstanding Management Measures and Deadlines

Management Measures addressed in the March 2011 federal review	**Management Measures that still need to be addressed**
Agriculture	Agriculture: Nutrient management planning and wastewater design for confined animal feeding operations
Forestry	
Urban: New Development Existing Development Onsite Sewage Disposal System Highways Roads and Bridges	Urban: Existing Development Onsite Sewage Disposal System Highways Roads and Bridges
Monitoring and Tracking	Monitoring and Tracking
Program's operational boundary	

Work plan with benchmarks and a time line for meeting the outstanding conditions	September 30, 2012
Documentation that outstanding conditions have been met	May 31, 2016

Georgia has faced many challenges in the development of their Coastal NPS Program in the nine-year period since they received conditional approval. Some of these are shaped by unique aspects of Georgia's state governance and the structure of Georgia's CZMP, while many of these challenges are seen in other states and appear to

be symptomatic of the structure of the federal CZMP. However, the nine years between submissions raises questions about the why the process of creating the Coastal NPS Program is taking as long as it is and raises concerns about penalties Georgia could face if they do not have a fully approved plan by the newly provided deadlines.

The remainder of this chapter discusses the main interview findings concerning Georgia's Coastal NPS Program. I interviewed ten individuals who work directly with Georgia's Coastal NPS Program. This includes those who oversee Georgia's program from NOAA and EPA, Georgia's Coastal NPS Program director and CRD staff. I also interviewed five staff members from environmental NGO's that work in coastal Georgia. While there were differences in what individuals identified as the biggest challenges of their job or their views on the best way to deal with some of those challenges, there were a number of themes that were repeatedly commented on by interview subjects regardless of their job description. Interview responses have offered insight into the complexity of the NPS planning process, and indicated that Georgia's position is not exceptional. While there is no immediate threat that Georgia will loose its federal CZM funding, the 2010 legal settlement in the state of Oregon appears to have resulted in stricter expectations and timelines for states that have not yet received full approval.

Interview Responses

One of the overall themes expressed by interviewees was that Georgia is not in an unusual position in not having a fully approved Coastal NPS plan. As of July 7th, 2011, twenty-three states had full approval of their Coastal NPS plans, and eleven, including Georgia, had conditional approval (see Table 5). In the Southeast region North Carolina, South Carolina, and Florida have approved Coastal NPS plans while Alabama, Louisiana,

Mississippi, and Texas have received conditional approval. NOAA's Coastal Programs Division Director and NOAA's Georgia liaison both said that Georgia's position is not unusual. When the Coastal Program Division Director was asked if she was concerned about Georgia's progress, she said she was not. She said that Georgia is "inline with many other states" and that "a long drawn out development period was just part of the process of developing this type of plan". Georgia did not stand out to her as an unusual case.[208] This attitude was also apparent in her discussion of neighboring states. When I asked her to compare the efforts and programs in North Carolina, South Carolina and Georgia, she said it was difficult to do, as each state was very different. She said that OSDS was a big struggle for South Carolina just like it was for Georgia. Nothing in her response indicated that Georgia was lagging behind the other states.

[208] Georgia Coastal Program Division Director. (2011, August 26). [Personal Communication].

Table 5
State Approval Status

	State	Received Conditional Approval	Received Full Approval
1	Alabama	6/30/1998	
2	American Samoa	10/3/1997	7/24/2003
3	California	6/30/1998	7/17/2000
4	Connecticut	6/3/1998	11/28/2003
5	Delaware	10/3/1997	2/12/2002
6	Florida	11/18/1997	3/27/2008
7	Georgia	6/4/2002	
8	Guam	10/3/1997	9/26/2007
9	Hawaii	6/30/1998	
10	Indiana	1/15/2008	
11	Louisiana	6/30/1998	
12	Maine	2/23/1998	7/8/2003
13	Maryland	10/3/1997	12/13/1999
14	Massachusetts	9/24/1997	10/3/2001
15	Michigan	9/24/1997	
16	Minnesota	3/11/2003	7/27/2006
17	Mississippi	11/18/1997	
18	New Hampshire	11/18/1997	10/4/2001
19	New Jersey	11/18/1997	1/28/2010
20	New York	11/18/1997	12/5/2006
21	North Carolina	2/23/1998	5/5/2003
22	Northern Mariana Islands	10/3/1997	8/20/2003
23	Ohio	6/4/2002	
24	Oregon	1/13/1998	
25	Pennsylvania	10/3/1997	5/16/2001
26	Puerto Rico	11/18/1997	10/19/2000
27	Rhode Island	9/24/1997	4/20/2000
28	South Carolina	2/23/1998	3/27/2008
29	Texas	3/31/2003	
30	Virgin Islands	11/18/1997	2/12/2002
31	Virginia	2/23/1998	5/16/2001
32	Washington	6/30/1998	
33	Wisconsin	9/24/1997	1/30/2003

Provided by the National Oceanic and Atmospheric Association[209]

[209] (2002). *NOAA coastal nonpoint pollution control program: Program approval findings.* Retrieved from website: http://coastalmanagement.noaa.gov/nonpoint/pro_approve.html.

The Environmental Protection Specialist with NOAA's Office of Ocean and Coastal Resource Management also clearly stated that he was not concerned about the pace of development for Georgia's Coastal NPS program. He continued by explaining that in the early 1990's when the 6217 program was established, all states were supposed to complete their plans by 1995 or 1996. None of the Coastal NPS plans were approved after the first submission. NOAA and EPA, identified areas for improvement in each state. Some state plans were given back with just a few relatively minor conditions while some had significant issues that needed improvement. Georgia is among a group of states with a number of additional conditions to address many of which have been difficult to achieve. He said that while Georgia has struggled to meet all the management measures, they are probably "head and shoulders above many other states" like Alabama, Mississippi, Louisiana and Texas.[210]

When pressed to explain Georgia's progress in relation to other states, the Georgia liaison said that for each of the issues addressed in the Coastal NPS plan, a state's timeline and progress was "dependent on their starting point". He said that for every goal, states have different starting points and most programs are strong in some areas and have to start from scratch with others. For example, in dealing with On Site Disposal Systems (OSDS) Florida already had an inventory of septic systems in the state, so their initial step was to develop a tool for identifying systems that needed repairs. They could then create an effective approach to address needed repairs. Georgia, on the other hand, does not have a complete record of existing septic systems, so their first step is to create an OSDS inventory.

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[210] Environmental Protection Specialist, NOAA's Office of Ocean and Coastal Resource Management. (2011, August 9). [Personal Communication].

The Georgia liaison said that some counties in Georgia are "up to speed" while other places are very behind and in need of basic education on nonpoint source pollution and related topics.

The former director of the Coastal Resources Division said that the process for passing Coastal NPS plans has been long and arduous for every state. She mentioned limited funding as one reason why it is difficult for states to complete their Coastal NPS plans and implement the related programs. Although states were faced with the requirement in 1990, to establish Coastal NPS Programs, they were given minimal monetary support with which to do this. She said they were therefore expected to do new things without additional money. The former director of CRD said that incentive money is necessary to get states to implement Coastal NPS plans. It is also important to remember that the formal status of Georgia's Coastal NPS plan is only one indication of statewide efforts to curb NPS pollution. An independent contractor and owner of a natural resources consulting firm in Georgia said that Georgia has made more progress on their Coastal Stormwater Supplement than both North and South Carolina and that other states have been looking to Georgia for assistance and advice.

While a comparison of how long it has taken different states to create fully approved Coastal NPS plans does provide important context, Georgia's nine years of conditional status is primarily of concern because of the potential penalties the state could face for missing approval deadlines. According to CZARA, Georgia could have its CZM funding withheld because it has not met the deadlines for full approval. Even under the more flexible guidelines and schedules put in place in 1995 and 1998, Georgia remains noncompliant with five of the fifty-six management measures in the EPA guidance

document (see Table 5). The withholding of funding would have a significant impact on Georgia's program and can therefore be perceived as a serious consequence of not having a fully approved Coastal NPS pollution plan. However, it is highly unlikely that NOAA and EPA will actually enact such a penalty, as they have not yet done so, despite the fact that many states have missed deadlines.

Prior to the Oregon settlement, scholarly analysis of the CZMA and Coastal NPS plans argued that NOAA and the EPA had not followed through with any of the disciplinary actions included in section 6217 and were not likely to do so.[211] Instead, since the passage of section 6217, states have been pressuring NOAA and EPA to change various requirements and penalties, which were supposed to function as the primary incentives for state participation and action.

In a 2001 study of section 6217, Andrew Solomon concluded that the EPA and NOAA were finding enforcement difficult because they were trying to prevent the withdrawal of states from the CZMP. During various periods of re-negotiation, states had threatened to leave the program. Solomon argued that the amount of 306 and 319 funding withheld was not enough to clearly outweigh potential savings if a state withdrew from the program and did not have to implement a coastal management plan. The cost of implementing a Coastal NPS Program could be close to, or more than, the amount of money withheld for failure to meet CZMA deadlines. Salomon argued that NOAA and the EPA therefore had to avoid any requirements that created a burden on states that was larger than the benefits of participation, and that this is one reason why the two federal agencies had not followed through with the penalties described in the original document.

[211] Solomon, A. (2001).

Solomon suggested that as of 2001, delaying full approval of a Coastal NPS plan might have given states a strategic advantage because it gave them time (during which they continued receiving funding) to weigh the costs and benefits of full participation. It also increased the chance that Congress would pass additional legislation reducing the requirement for states to implement the programs in existing plans.

In 2002, Douglas Williams made a similar argument in his essay, *When Voluntary, Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution*. Williams wrote, "States continue to receive funding for CZMA or CWA section 319 programs despite the states' failures to submit approvable plans".[212] He argued that the incentive-based approach to nonpoint source pollution in coastal management was not working because NOAA and the EPA were not actually reducing funding for states that failed to meet their requirements. He felt that "when push comes to shove, the federal environmental agencies will not be able to hold their own without the offsetting influence of direct citizen involvement and at least the possibility of litigation."[213]

Interview responses partially support the opinions and analysis put forth by Solomon and Williams. Interview responses indicate that Georgia and other states in similar positions are not in danger of losing their federal funding. NOAA and EPA have never withheld funding from any participating state because of missed deadlines. In my conversations with NOAA and EPA staff I was told that the two organizations do not have any intention of enforcing the penalties. In one instance I was told this directly. In the other instance it was implied. For example I was told that since the budgets for the

[212] Williams, D. (2002). When voluntary, incentive-based controls fail: Structuring a regulatory response to agricultural nonpoint source water pollution . *Wash. U. J. L & Pol'y* , *21*(1).
[213] Williams, D. (2002).p. 95.

agencies involved are being cut it would be especially difficult to withhold money from programs at this point in time. I was told that while deadlines and regulation seem to be a necessary part of the legislation, the general consensus from NOAA and EPA is that withholding funding would "be counter productive in many ways". Not only would it make it more difficult for states to complete the process but in many cases the removal of CZM funds would directly or indirectly undercut other programs since 319 funds support State NSP programs not just Coastal NPS Programs. None of the staff working for state or federal agencies responsible for implementing and running the Coastal NPS Program said they were aware of any efforts either within or outside government agencies to create additional regulation for the Coastal NPS Program.

Even though NOAA and the EPA have never enacted this penalty and staff clearly stated that the organizations did not intend to do so, the issue of how long the process has been for Georgia is an important one. I asked each of my interview subjects if they were concerned about the length of time it has taken Georgia to complete this process. The director of a natural resources consulting firm said that she did have some concerns about the potential loss of 319 funding. She said the loss of that funding would be very problematic and have a large impact on her clients because many of them use 319 funding to initiate projects. She felt that there needs to be a better effort to educate local governments about the NPS program, the benefits of the program, and the funds that come with it.

She also said she thought it was unlikely that the 319 monies would be withheld. She has not seen any indication from EPA that Georgia is in danger of losing its 319 funding. However, she said that she is concerned that because Georgia is "late in the

game" and trying to get full approval now, they may be held to higher standards than those that were approved a number of years ago. She thought that this might place an unfair burden on Georgia and is problematic because states that are still working on their plans are the ones that have been struggling to get their programs passed. This concern is consistent with comments from NOAA employees about the potential impact of a lawsuit brought against NOAA and the EPA in the state of Oregon. Although NOAA and the EPA do not have any desire or intention to withhold money from Georgia and other states with conditional status, the 2010 lawsuit and settlement in Oregon may force them to be more strict with timelines and penalties, an action that has the potential to affect Georgia.

Federal Level Structural Challenges

Although Georgia has been working on their Coastal NPS plan for nine years, many of the interviewees said this length of time was not unusual and has become expected for this program. One of the reasons why it is so difficult is because states have to meet fifty-six management measures and have them approved by two separate federal agencies. This joint oversight was created because legislators felt that it was necessary to include both the agency that oversees coastal land and land-use (NOAA) and the agency that regulates water quality (EPA). The program manager of CRD's Coastal Management Program, said that the interaction between NOAA and the EPA is challenging because both agencies have to approve state plans, but neither can obligate the other to do anything. Neither has authority over the other which can make it difficult to get anything done.

A manager from NOAA's Coastal Resources Division said that in practice it can feel as though the management and approval processes are actually being carried out

through three separate agencies, since the process involves EPA headquarters and the EPA regional office. All three of these organizations have to meet, discuss applications and run the program, and all three have to approve state management plans. She said the program is difficult to run because in addition to the fifty-six management measures that states must address in their Coastal NPS Programs, and the three management agencies at the federal level, a number of state agencies must also be involved. She said that there are a number of good aspects to the existing program, but her ideal program would "not have fifty-six management measures and three major organizations responsible for oversight". A CRD staff member also said that there may be considerable turnover at the federal level among those in oversight positions at NOAA and the EPA. This has caused complications. In the past Georgia had a complete draft of the Coastal NPS plan reviewed but the individual overseeing the review left and the person that took over wanted a different approach.

On-Site Disposal System

While the majority of themes people spoke about were reflections on the structure of the Coastal Zone Management Act, or the Coastal Nonpoint Source Pollution Program in particular, there was one specific issue that was repeatedly identified as an ongoing challenge. People at all levels of government, in conservation organizations and independent consultants spoke about the difficulties of developing management measures for On-Site Disposal Systems (OSDS).

One of the outstanding conditions found by the NOAA and EPA review of Georgia's Coastal NPS program was that Georgia's plan does not include measures for "1) Inspecting OSDS at a frequency adequate to ascertain whether OSDS are failing and

2) for replacing or upgrading OSDS near nitrogen-limited surface waters". The state was given the following condition:

"Within two years Georgia will include in its program management measures for inspection and maintenance of existing OSDS and protection of nitrogen-limited surface waters in conformity with the 6217(g) guidance. "[214]

In Georgia, the Georgia Department of Human Resources (GADHR) has primary authority to regulate OSDS. County Boards of Health enforce GADHR rules that specify locations for OSDS installation, site requirements, type of facility that can use them, and inspection of new systems before use. However, the NOAA and EPA review says that:

"No information was provided on replacing or upgrading OSDS where conditions indicate that nitrogen-limited surface waters may be adversely affected by significant ground water nitrogen loadings from OSDS."

The local health department, which is usually the agency responsible for inspection and enforcement of Onsite Disposal Systems, is specifically prohibited from post-installation management in Georgia. Post-installation management can be regulated by county commissions and could be mandated at the state level. Although this would be one way to try to address Georgia's outstanding OSDS management measures, the Coastal NPS Program is focusing instead on promoting the adoption of county-level OSDS ordinances.

To fulfill the remaining OSDS condition, Georgia needs to have a plan for on site wastewater treatment system maintenance. However, one of the biggest obstacles is that there is no inventory of existing septic systems, making it difficult to define the problem. Once an inventory is created and the problem can be better defined, it will be easier to

[214] US EPA, (1993). *Coastal nonpoint pollution control program development and approval guidelines: Polluted runoff (nonpoint source pollution)*. Retrieved from website: http://www.epa.gov/owow/NPS/MMGI/index.html.

implement regulations and maintenance plans. Georgia's CNPSP program is in the process of locating and inventorying all existing OSDS. A pilot inventory project was completed in Bryan, Effington, Liberty, and Long counties in 2010. Based on the success of that project, the program is now being conducted in other coastal zone counties. This is being carried out through a partnership between the University of Georgia's Marine Extension Service (MAREX), the Coastal Health District and Local Health Departments, the South Georgia Regional Commission, and EPD's Coastal Nonpoint Source Program.

The OSDS inventory pilot project is just one example of a few county level programs that have proven successful in Georgia or are in the process of being tested and evaluated. Some of these may be expanded or prove useful in informing efforts in other Georgia counties. The following chapter will present information about promising or successful programs in other states and discuss some of the county-level initiatives in Georgia that have the potential to be successful on a larger scale. While a lot of this work is being undertaken and will be carried out by Georgia EPD and CRD staff, the following examples and recommendations include many avenues through which conservation organizations, university-based programs, or environmental NGOs can support and contribute to coastal marshland protection through the strengthening of Georgia's Coastal Nonpoint Source Program.

CHAPTER 5

ACTIONS AND RECOMMENDATIONS

Chapter four summarized the management and conservation challenges identified by interview subjects and reviewed current efforts to address them. New or expanded efforts to contribute to coastal and marshland conservation in Georgia should take account of these challenges and efforts as well as regional trends. Chapter five discusses recommendations for future action based on responses from interviews and my own research. This chapter provides general guiding principles and specific recommendations for university-based institutions and environmental NGOs that want to design effective coastal resource protection programs building on the infrastructure of existing projects. In particular, I was asked by the leadership of the UGA River Basin Center (RBC) to identify how that center could most effectively direct student, staff and faculty assistance. They have been asked by both Georgia DNR and the nongovernmental conservation organizations working on the coast to "have a bigger coastal presence". RBC has responded to particular requests for example to draft a model marshland buffer ordinance, to participate in the drafting of the coastal stormwater plan, and to review the model OSDS ordinance, but they lacked a vision of how they could best assist state and NGO efforts.

Each interview subject was asked to identify remaining gaps or concerns with Georgia's CMPA and Coastal NPS Program, and to describe resources or assistance that could help address them. Participant responses to this question were often vague. They

did not usually name specific projects or well-defined activities, even when asked. For example, many people said drafting model ordinances for nonpoint source pollution measures or Onsite Disposal Systems would be helpful, but there were no requests for model ordinances that met certain requirements or were designed specifically for certain counties or conditions.

The following recommendations cover a range of activities and describe actions at a variety of levels, but all are intended for university-based programs and environmental NGOs initiating a coastal program, expanding their current work on the coast, or working to improve their current contributions to coastal management. Two GA DNR employees, a NOAA staff member, a environmental NGO representative, and two independent consultants, spoke about experiences they had partnering with people from UGA. They all said expanding opportunities for joint projects and partnerships would be beneficial.

The recommendations that received the greatest emphasis in interview responses were the recommendations to strengthen existing partnerships and work on OSDS issues. Assisting with OSDS issues was also mentioned by a variety of professionals. Three state level employees, two from Georgia and one from North Carolina, two federal employees, and one independent consultant spoke about the challenges of implementing regulation and maintenance of On-Site Disposal Systems.

A general theme that many interview subjects touched on was directing assistance at the local government level. A state employee and member of Georgia's Coastal Regional Commission spoke about trying to implement a variety of model ordinances that had been developed. While one spoke primarily about stormwater and OSDS ordinances, and the other focused on ordinances promoting green development, they both

said the challenge was not in drafting the ordinances, but in adapting them to specific counties and successfully promoting their adoption and implementation. An environmental NGO employee spoke about strengthening local ordinances and zoning measures as a general strategy. She said that focusing assistance on the county level, helping counties develop the knowledge and political will to enact strong measures and adopt ordinances promoting Low Impact Development (LID) or other desired approaches to development, would be best. The focus on county level initiatives also emerged during conversations on other issues, for example, one interviewee asked for assistance with social marketing campaigns that could be used to help with county campaigns to pass certain ordinances or measures.

Multiple interview subjects, including one state employee, a federal staff member, and an independent consultant, also mentioned promoting LID. The rest of the recommendations were mentioned by one or two interviewees, each of whom made a strong case in their favor. These include assistance with social marketing campaigns, helping to facilitate interagency and organizational communication, expanding the 319(h) program to include projects not centered on TMDLs, research on dock impacts, permitting schemes and monitoring programs, and research on strengthening guidance measures for the CMPA.

Recommendations

1. On-Site Disposal Systems (OSDS)

Staff at all levels of government, environmental NGOs employees, and independent consultants, spoke about the difficulties of developing management measures for On-Site Disposal Systems (OSDS). To fulfill the remaining OSDS

condition, Georgia needs to have a plan for onsite wastewater treatment maintenance. However, the state does not have a comprehensive inventory of existing septic systems, making it difficult to define and quantify the problem. A pilot project was recently conducted in four coastal Georgia counties and the method developed is now being implemented in an additional four counties. Once an initial inventory is complete, and a tracking system has been established for all counties in the coastal zone, it will be easier to assess the problem and pursue plans to establish regulations for inspection and maintenance.

Georgia's coastal counties have paper data for permits granted before 1995. After 1995, permit data was put in either an "in-house" database or TEC computer database and, since 2008, information has been housed in the Garrison Enterprise database.[215] In a direct attempt to address conditions for the approval of Georgia's Coastal NPS Program, MAREX, the Coastal Health District and local health departments, the South Georgia Regional Commission and EPD's Coastal Nonpoint Source Program partnered on a Section 319(h) grant to create a regulatory program to prevent septic failure and contamination, to establish periodic inspections, and to enforce maintenance policies.

The first step in this process was to locate all existing OSDS and water wells and to have each of these sites visually inspected for signs of damage or failure. This was carried out by local health department personnel in four coastal counties; Bryan, Effingham, Liberty and Long counties. The project also worked with Camden and McIntosh Counties to transfer historical OSDS data into an updated database system. MAREX GIS specialists identified the parcels for this survey by looking at GIS

[215] GA EPD and US EPA, (2010). *Coastal OSDS location, inspection and maintenance: Phase I project analysis.* p.16 & 19.

hydrology and parcel layers. Parcels selected were those within ninety feet of state waters or marshlands. Local health department personnel conducted site visits and visual inspections and collected GPS positions for locations within a ninety-foot proximity to marshlands or other state waters. The data is housed in a database designed by the Southern Georgia Regional Commission and the Middle Georgia Regional Commission for septic tank reference data. This includes map and GIS functions to allow for multi-level analysis and planning.

A total of 2,345 OSDS and 334 well-heads were geo-located and inspected in the four participating counties. A total of eighteen system failures were identified, sixteen in Bryan County and two in Effingham County. The Phase 1 Project Analysis report states that all failing systems were repaired although it does not provide information on how this was accomplished.[216] After the completion of this initial project in 2010, projects were established in Camden, Chatham, Glynn and McIntosh counties.

Phase II includes the development of an OSDS pollution susceptibility index and maps of OSDS systems in areas highly susceptible to OSDS related pollution problems. Phase II also includes conducting an "enforcement program aimed at repairing or replacing dysfunctional systems in all participating counties".

Organizations looking to support existing coastal management and conservation initiatives could have a significant impact on the strength of Georgia's Coastal NPS Program and on the health of Georgia's coastal region by assisting with the data collection phase in counties that have not completed it, and by assisting with the development of regulations and enforcement policies to be implemented in Phase II. The

[216] GA EPD and US EPA, (2010). *Coastal OSDS location, inspection and maintenance: Phase I project analysis.* p.16 & 19.

geo-location survey process seems to be well established. The database and infrastructure exists to store collected data which is compatible with GIS modeling programs. There are three remaining counties that do not have geo-location survey programs and those that do are still running into funding limitations. Assistance in securing additional funding would also be significant. For the counties that are involved in a geo-location program or have completed one, the next step is to establish enforcement procedures and programs.

OSDS- Action/Recommendation A

Offer assistance to ongoing OSDS survey projects in coastal zone counties.

Chatham County is currently running an On Site Sewage Management Systems (OSSMS) Location, Inspection, and Local Code Reform project. This is partially funded through a Coastal Incentive Grant but coordinators are in the process of searching for additional funding to support the effort. Chatham County will also need assistance with Phase II of this project. Objectives include "coordinating the building review processes and codes for all municipal jurisdictions located within Chatham County as it relates to all Health Department purviews". This will involve at least four meetings between June 2012 and September 2013. The Chatham County Health Department will also be hosting a stakeholder workshop. They are seeking to review building codes and processes by Chatham County Health Department Officials and to "update local building codes and review processes within Chatham County for municipal and County jurisdictions." In the Coastal Incentive Grant application, applicants anticipated that the review of building codes and review process would require considerable volunteer time. Participating government agencies and organizations agreed to provide volunteer staff time for this

work. University-based and university-affiliated programs may be well situated to assist with this process and help develop the protocol for other counties.

OSDS- Action/ Recommendation B

Review actions taken by North and South Carolina to meet the OSDS management measures that are still outstanding for the state of Georgia and research their applicability for Georgia.

Tables 7 and 8 provide comparative lists of the actions North and South Carolina took to fulfill these measures. The following section includes examples of North and South Carolina programs that help each state meet the OSDS management measures.

Table 6 South Carolina Actions for Meeting Outstanding OSDS Management Measures

SC original - does not provide for:*	conditions: within 3 years must include measures to provide:	Overview / examples of measures created to meet requirements	notes
(1) adequate separation distances between OSDS system components and groundwater that is closely hydrologically connected to surface waters	(1) adequate separation distances between OSDS system components and groundwater that is closely hydrologically connected to surface waters	-requires a six-inch vertical separation distance to the seasonal high water table	
(2) measures for inspection and maintenance of existing OSDS	2) measures for inspection and maintenance of OSDS systems	Use a combination of voluntary and regulatory approaches to target areas of greatest susceptibility, mostly barrier island communities barrier island communities have -passed ordinances for point-of-sale inspections of OSDS - outreach campaigns that include reminders and confirmation of inspections -educational outreach sent to homes with OSDS - state is developing model ordinances for point-of-sale inspections -an initiative to help local governments fund inspections and maintenance - interactive Onsite Septic System Management Tool Kit for local governments -working to eliminate bacteria contamination "hot spots" identified with infrared thermal imagery -Special Area Management Plans- focus on water quality and OSDS	Special Area Management Plans are used to: collect/examine data, identify development trends, anticipate conflicts between different uses, develop strategies to protect and manage resources to insure goals of various users are compatible.
(3) denitrifying systems where nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from OSDS	(3) denitrifying systems where nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from OSDS.	-encouraging replacement of failing or inadequate onsite disposal systems with alternate systems -assisting local governments to obtain State Revolving Fund (SRF) low interest loans for this purpose	
ENFORCEMENT POLICIES AND MECHANISMS			
South Carolina's program includes enforceable policies and mechanisms to ensure implementation of the measures throughout the 6217 management area**, but still needs policies and mechanisms to ensure implementation of the management measure for operation and maintenance of existing OSDS.**	Within 2 years, South Carolina will include in its program enforceable policies and mechanisms to ensure implementation of the management measure for operation and maintenance of existing OSDS.		

* The order in which the needed management measures are listed is not the same as the order in which they are listed in the official conditional approval findings document. The order was changed to allow for easier comparison with North Carolina and Georgia.

Table 7 North Carolina Actions for Meeting Outstanding OSDS Management Measures

NC original - did not provide for:	conditions: within 2 years must have measures to provide:	Overview / examples of measures created to meet requirements	notes
(1) adequate separation distances between OSDS system components and groundwater that is closely hydrologically connected to surface waters, .	(1) adequate separation distances between OSDS system components and groundwater that is closely hydrologically connected to surface waters,	require a minimum of 18 inches of separation between the trench bottom and any soil wetness condition A 12-inch separation distance for Class I Soils only stringent soil wetness condition criteria mass drain fields (greater than 3000 gpd) require minimum separation of 24 inches advanced wastewater pretreatment systems that include three types of sand filter treatment, aerobic treatment units, and peat bio-filters on sites that are not hydraulically limited. require effluent filters on new systems permitted after January 1, 1999 to enhance effluent quality and pump out of the septic tank. inspectors ascertain site suitability with comprehensive worksheet and perform tests on-site as they fill out the worksheet soil suitability is evaluated at the site by borings or other means of excavation to at least 48 inches or to an unsuitable characteristic	
(2) measures for inspection and maintenance of OSDS serving single family residences	2) measures for inspection and maintenance of OSDS serving single family residences, and	Mandatory requirement for two compartment septic tanks. • Mandatory requirement for all newly installed septic tanks to have an effluent filter. • Mandatory requirement for removal of septage when the contents exceed 1/3 the liquid capacity of the septic tank. • Mandatory inspections of OSDS near or adjacent to shellfishing waters. • Mandatory certified OSDS operator requirement for systems determined to be high risk with local health department surveillance including several systems with advanced pre-treatment or disposal components. • Mandatory failure analysis and repair permits for systems found to be malfunctioning. • Voluntary owner education including: Public Service Announcements, owners folders and brochures, Train the Trainer Programs, and OSDS web site. • The establishment of a toll free line to report systems problems within the State with incentives to self-report. • The continuation of coastal shoreline surveys conducted by the Shellfish Sanitation and Recreational Water Quality Program, including a comprehensive survey of OSDS every three years, updated annually. • Continued efforts to support local entities in providing operation, maintenance, and surveillance of OSDS through agency guidance documents, training and education.	This section is very extensive. NOAA and EPA commended NC for the extensiveness of these measures.
(3) denitrifying systems where nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from OSDS	(3) denitrifying systems where nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from OSDS.	NC showed evidence that additional denitrification for onsite wastewater systems in nutrient sensitive coastal waters is not a significant issue in North Carolina The Neuse and Tar-Pamlico basins have been identified as nitrogen-limited basins classified as "Nutrient Sensitive Waters". A legislatively mandated stakeholder committee passed rules that prohibit new ground absorption OSDS within a 50-foot buffer. This is more restrictive than the standard statewide OSDS sitting criteria.	
ENFORCEMENT POLICIES AND MECHANISMS			
North Carolina's program includes enforceable policies and mechanisms to ensure implementation of the measures throughout the 6217 management area.			

North Carolina WaDE program

The WaDE program is North Carolina's Water Discharge Elimination program. The WaDE program has some components that may be useful in Georgia either as a state program or as one adopted at the local government level to reduce political opposition to OSDS ordinances.

The goal of the program is to "identify and eliminate domestic sewage discharges from straight pipes and failing septic systems into streams proposed to be used or currently used for public water supplies". It was established through House Bill 53 of 1995-1996 and officially began in 1997. It has a regional focus, applying to watersheds in the western part of North Carolina. The WaDE program included an amnesty period that ended December 31, 1997. During the amnesty period, violations of state rules and laws related to domestic sewage and wastewater discharges could be reported without legal consequences. The WaDE program also tries to encourage voluntary reporting of septic failures. It includes a self-reporting policy. Home and business owners that self report septic problems or cooperate with WaDE surveys get more than the standard allowable tirty day period to correct violations as long as they are continually working with the local health department to address the issue. The WaDE program includes grants and deferred forgivable loans[217] for OSDS repairs. Funds for this come from the N.C. Clean

[217] A deferred forgivable loan is forgiven at the end of 5 years after the completion of work. A deferred forgivable loan is proportionally forgiven over an applicable term of recapture. If the home is sold or the recipient no longer occupies the home, the remaining portion of the loan must be recaptured or repaid. *Land-of-sky regional council*. (2012, April 21). Retrieved from http://www.landofsky.org/planning/p_housing.html.

Water Trust Fund. Grants are available for low-income households and deferred forgivable loans are available for medium-income households.

Table 8
NC WaDE Program Funding

Funding Source	Years	Amount
NC Clean Water Management Trust Fund	2002-2006	1.2 million
EPA's 319 NPSP	2003-2006	$494,000
NC Clean Water Management Trust Fund	2006-2009	1.5 million

NC WaDE Program Accomplishments Jan. 2003-Oct. 2008

8,070 home septic system surveys
1,794 violations identified
944 were corrected
154 received financial assistance from the WaDE program
average cost per household- $3,073
total cost- $473,301

OSDS- Action/ Recommendation C

Incorporate the WaDE amnesty policy and funding programs into OSDS county ordinances in Georgia.

Introducing an amnesty period directly after passage of an ordinance or implementing a similar self reporting incentive could assuage concerns about regulations and penalties that are often at the base of political opposition to OSDS ordinances. A self reporting measure and funding programs specifically for repair and replacement of OSDS could also make an OSDS ordinance more appealing by reducing the likelihood that homeowners would face large fines, legal costs, and expensive repairs they would be unable to afford. Each of these measures should be examined further for potential applicability to Georgia programs and county ordinances.

The North Carolina Shellfish Sanitation Section

In North Carolina, door-to-door surveys of homes on septic systems are conducted every three years as part of the Shellfish Sanitation Section program. The North Carolina Shellfish Sanitation Section conducts shoreline surveys in accordance with the United States Food and Drug Administration's Office of Seafood's National Shellfish Sanitation Program Model Ordinance 2. While it appears that Georgia has also adopted the National Shellfish Sanitation Program Model Ordinance 2, it is not clear whether this includes periodic surveys that include door-to-door septic system reviews. During my interviews, I was told that Georgia counties have to be creative in finding ways to implement and carry out periodic reviews of septic systems. The usual approach is to connect septic system surveys to permits for new developments or point of sale permits.

OSDS- Action/Recommendation D

Research the potential for establishing periodic septic system surveys through the Shellfish Sanitation Section program as a way to link OSDS management measures to an existing regulatory program.

North Carolina Rural Community Assistance Project (NCRCAP)

The North Carolina Rural Community Assistance Project (NCRCAP) presents another potential model for education about, and improvement of, failing septic systems. This program is fairly unique and its success has a lot to do with the vision, dedication, and skills of a particular individual, its founder Rich Holder. However, it is an interesting, inspiring, and effective model that is worth examining for potential application in Georgia.

The North Carolina Rural Community Assistance Project was founded in 1987. It is a nonprofit program that helps rural North Carolinians with "water, wastewater and housing issues through a variety of outreach programs". One of those programs is the NC Septic Repair Program that was founded in 2006. High school students in North Carolina are recruited by the program coordinator and volunteer during their summer vacations to provide labor for repairing household wastewater systems. Rich Holder created the program in response to the results of a WaDE survey showing a high number of violations. Holder was a member of the team conducting the WaDE surveys in the late 1990's. This program is one way he has found to follow up on the initial assessment and many of the connections he relies on to run the program were made during the initial survey work. Since Georgia counties are currently conducting comprehensive surveys of OSDS this may be an ideal time to pursue a similar program that can build off the momentum and education created by the survey process itself.

Households in North Carolina are eligible for the NC Septic Repair Program based on financial need and if they have a project that is characterized as a threat to public health. Holder has a background as an environmental health specialist and has certifications to design and permit septic systems in accordance with the North Carolina Department of Environment and Natural Resources (NC DENR). He works in collaboration with the county health department. Materials are donated by material manufactures, local businesses or through watershed protection program funds like the NC Clean Water Management Trust Fund and WaDE.

The program not only helps low income households fix wastewater problems but can become an exceptional educational tool. As projects draw attention from interested

neighbors and friends Holder and his students speak about their projects, the importance of fixing faulty systems, and the resources available to help homeowners with repairs. As a service learning or volunteer activity a program like this could be adapted towards a university service learning model or could be run in conjunction with existing organizations, like Habitat for Humanity, that do similar work. It does require at least one person to have expert knowledge of both the technical and regulatory aspects of repairing and installing OSDS and to have the appropriate certifications.

South Carolina OSDS Management

The framework for South Carolina's Coastal NPS Program is increased communication and coordination between existing agencies and regulatory and educational programs. South Carolina's Coastal NPS Program is run jointly by the South Carolina Department of Health and Environmental Controls (SCDHEC), OCRM, and the Bureau of Water. The Office of Environmental Quality Control (EQC), within SCDHEC, is directly responsible for implementing state and federal environmental laws and regulations, including those related to Coastal NPS pollution.

No new programs or positions were created as part of South Carolina's Coastal NPS Program. However, they have met the OSDS management measures that are still outstanding for Georgia. One of the ways they accomplished this was with a Point of Sale OSDS Ordinance that may serve as a good example for Georgia. The South Carolina Department of Health and Environmental Control drafted the ordinance. It requires permits for new On Site Disposal Systems and requires inspections of OSDS before the property is sold, renovated, or there is any change in occupancy (See Appendix D).

South Carolina also implemented an OSDS outreach campaign, which includes post card reminders for homeowners when inspections are due.

2. Existing Partnerships

There are a number of services the University of Georgia and affiliated programs have provided to government and non-profit conservation organizations in the past that interviewees cited as especially beneficial to their programs. They said that students and UGA-affiliated researchers have made significant contributions by organizing and facilitating stakeholder groups, providing legal and technical consultation, and partnering on research projects that would not otherwise be carried out because of funding shortfalls. They spoke about the contributions these services have provided in the past and said these efforts should be **c**ontinued, supported, and expanded. Interviewees did not provide examples of specific projects they would like assistance with, but indicated that facilitating more of these partnerships would be beneficial. The following section includes measures for facilitating partnerships and creating a programmatic framework to support additional opportunities of this nature in the future.

Almost all of the interviewees mentioned that they had received helpful consultation from someone at the university in the past, whether they worked with someone directly or were part of a project that included a student or student group. The most specific request was for legal expertise. UGA has a very effective program for partnering law students with local and regional projects so I will not offer generic models or sample programs for this here. The River Basin Center at UGA is one of the best examples of a university-affiliated program that provides legal expertise to local projects. Its affiliated graduate course, the Environmental Practicum, is also an outstanding

example of a course that provides students with valuable learning experiences while providing legal expertise to regional projects. Although this program has a strong legal focus, it also provides technical advice and research support.

University staff or staff of affiliated programs like the River Basin Center, the Fanning Institute, and the Vinson Institute for Government Studies, have organized and facilitated stakeholder groups in the past. One interviewee told me this was an especially helpful action as university affiliated faculty and staff are often seen as neutral parties yet have experience and expertise directly related to the issue at hand. For example, staff from the Carl Vinson Institute of Government and the River Basin Center assisted with the Coastal Upland Stakeholder Process in 2004. This stakeholder group was charged with drafting recommendations for the regulation of upland areas under the CMPA. Facilitators from the Vinson Institute helped run the process and a River Basin Center staff member served as one of the technical advisors.

Existing Partnerships- Action/ Recommendation

Create an institutional infrastructure to facilitate partnerships with university affiliates that can provide legal and technical consultation, organize and facilitate stakeholder groups, and partner on research projects.

Existing Partnerships- Action/ Recommendation A

Create a fellowship or apprenticeship in facilitation and alternative dispute resolution in coastal management.

This could be open to any enrolled student or be designed to draw in students whose undergraduate or graduate focus is the coastal region. It would help create facilitators prepared and experienced with coastal resource management and planning. It

could include trainings on facilitation and participation or observation of a facilitation process. It could also be run as a mentorship program in which students would be paired with an experienced facilitator whom they would assist and learn from. Even if participating students do not go on to become facilitators professionally, it would create a cohort of environmental professionals from the University of Georgia with expertise in coastal management and science who also have an understanding of, and experience with, alternative dispute resolution techniques for negotiating and problem solving.

Interest in alternative dispute resolution is growing among professionals and universities. The number of degree granting programs in conflict resolution is expanding. However, the Center for Conflict Resolution based at Salisbury University only lists one degree granting program in the state of Georgia; an MS in Conflict Management at Kennesaw State University. At the University of Georgia, The Fanning Institute and the Center for Continuing Education have leadership, facilitation and dispute resolution trainings, which could be used as the basis for the proposed fellowship program.[220] A certification program consisting of a training course and apprenticeship could be completed in as little as a year and the cost for training of this nature could be similar to the costs of these existing programs ($250 -$750 per student). This would add uniqueness and marketability to graduating students with degrees in environmental studies, and create a cohort of UGA graduates with facilitation skills that compliment their expertise

[220] The Fanning Institute has mediation training courses that fulfill Georgia's requirement for registered mediators. This includes a 28 hour course and either the observation of 5 actual cases or a 12 hour observation course. The fees for these courses are currently $725 for General Civil Mediation and $225 for a Mediation Practicum. UGA's Center for Continuing Education has an Alternative Dispute Resolution (Mediation) course. It is taught in partnership with the Center for Legal Studies and is a 42 hour course taught over 7 weeks. The current fee is posted as $575.

in coastal management and/or science. This would be an asset as facilitated stakeholder processes become a routine part of natural resource management and city planning.

In 2011 Sea Grant's Office of Coastal Resource Management partnered with the South Carolina Council for Conflict Resolution to begin a pilot project employing mediation in permitting disputes. The South Carolina Sea Grant Extension Program (SCSGEP) began by trying to identify scientists who could provide expertise to help resolve conflicts.[221] A student with a degree in coastal ecology, marine science, or a related field that also has experience with alternative dispute resolution would be well suited for this type of program or initiative.

As a fairly unique program a fellowship of this nature would bring attention to the University of Georgia and the institutions that carry out this type of work. It could create advantages for students, participating institutions, and the university while requiring relatively few structural changes and minimal funding. The program can be built on these existing resources, either by having students take one of the training programs offered at the University of Georgia, or by altering the existing models to create a more applicable training program.

Existing Partnership- Action/ Recommendation B

Establish an undergraduate research program for coastal management and governance issues.

As was mentioned above, one of the most useful contributions a university-affiliated program can make is to match student researchers with real life projects that would not otherwise be completed due to a shortage of funding and/or staff. This is often

[221] SCSG Consortium. (2012, April 23). *Coastal communities archive: Dispute resolution*. Retrieved from http://www.scseagrant.org/Content/?cid=519.

the basis for graduate student theses and dissertations as graduate students and their advisors establish connections and relationships with outside organizations. The students gain valuable research and outreach experience and the organizations are provided with a valuable service and/or product. Additionally, graduate students can sometimes bring in outside funding through research or dissertation improvement grants from organizations like the National Science Foundation. This could make their contribution free or very affordable for the partnering organization and add additional visibility and legitimacy to the project. One way to increase these partnerships is to create small grants for students who take on projects in partnership with approved organizations. At the graduate level this could be a fellowship or assistantship sponsored by a UGA department. It would specifically be designed to support graduate students who develop projects in partnership with environmental NGOs or state agencies that focus on coastal management.

Another way to provide students with experience and encourage them to apply their knowledge to real world problems is to establish a program specifically for undergraduate students conducting research in partnership with environmental NGOs or governmental agencies. This idea is based on a unique program run by the University of Rochester, called the Research and Innovation Grant (RIG). This grant provides "research expenses of up to $3,000 for undergraduate students working with a faculty sponsor". The grant was established by the office of admissions at the University of Rochester to give highly motivated incoming freshmen the opportunity to participate in or conduct research during their undergraduate career. Students can use the grant for equipment and materials associated with research, conferences, travel and lodging for interviews for fellowship positions, research experience abroad, and internships and

service learning. The University of Rochester instituted this program because they found that many graduating seniors are underprepared for graduate school. Few of them have experience writing grants, networking with faculty and professionals, or designing research projects. Giving them the chance to do these things lets them decide if pursuing graduate research is a good next step and they are better prepared for graduate school.

The University of Georgia, like the University of Rochester, is well known as a research institution and as a university that promotes undergraduate participation in research. Undergraduate students at UGA have opportunities to become involved in research being conducted by faculty or by graduate students but not in a way that promotes their own leadership on these projects. UGA has the CAES Undergraduate Research Fund, which grants $500 for research supplies to students working with a faculty mentor. A program like the RIG program, specifically designed to support students working with an NGO or government agency would have additional benefits. An undergraduate student with $1,000-$3,000 could accomplish a significant amount on the Georgia coast without incurring major travel expenses. Working with an NGO or government agency would build capacity for the university, coastal programs, and individual students by helping to facilitate partnerships and collaboration and giving each organization some access to the resources of the other institutions. Additionally, the university or sponsoring department would be producing a cohort of highly motivated students well prepared for graduate programs in coastal conservation and management.

This programmatic framework could also be combined with the Odum School of Ecology's Environmental Practicum model. NGOs or government agencies that have a specific project they would like a student to work on could submit a project description to

the program director. Students that have received the grant could then select from these requests the same way students in the environmental practicum choose their projects for the semester. This program might work well in combination with the Environmental Practicum as students that take the practicum course could choose to use their funds to continue working on projects they began as practicum students.

3. Monitoring

As was mentioned in Chapter two, representatives from the Southern Environmental Law Center and the Center for a Sustainable Coast are concerned that there is no set of baseline data to inform CMPA permitting decisions, and no monitoring scheme to assess the impact of permitted structures. The Center for a Sustainable Coast's executive director suggested that a monitoring program for permitted structures would be an important asset, and that university-based institutions could make an important contribution by helping to design a monitoring program and by providing labor for its implementation.

A graduate student or series of graduate students could assist with the development of a monitoring plan as a thesis or dissertation project. A monitoring program could be developed following a citizen science volunteer model or could be carried out by students in related university courses. There are a number of graduate and undergraduate courses at the University of Georgia that monitor nearby water bodies as part of their classroom curriculum[223]. This approach facilitates effective classroom learning while creating consistent longitudinal data sets.

[223] Examples include the Limnology course offered through the Odum School of Ecology, and the Environmental Practicum offered jointly through the Odum School of Ecology and the Law School.

Monitoring- Action/ Recommendation A

Conduct an assessment of existing data, and professional and volunteer based monitoring programs.

Conduct an initial assessment of existing monitoring programs along the Georgia coast. What kind of data is available and what kind of data sets are being collected? Can existing sources be used to compile the necessary data? If existing sources are not sufficient, what else is needed? Does a new monitoring program need to be created or can existing programs provide the necessary information?

The state of Georgia also has volunteer monitoring projects and similar questions should be asked about these programs. Could existing volunteer monitoring programs meet the needs articulated by staff from the Center for a Sustainable Coast? If they do not, how are these programs insufficient? For example, is it the quality and reliability of data collected by existing volunteers, the type of data collected, or the location of the study sites?

Monitoring Program Examples

There are a number of existing scientific and academic programs in Georgia that have monitoring components. Through these programs a range of water quality parameters and species indices are being collected along the Georgia coast. For example, the **Georgia Coastal Research Council** conducts marsh monitoring in collaboration with researchers from Savannah State University, the Sapelo Island NERR, and UGA. This includes annual monitoring of sites in areas of marsh die-off and control areas. Data on vegetation, epifauna, and physiochemical characteristics, is collected along established transects.

The **Georgia Coastal Ecosystem Long Term Ecological Research** (GCE-LTER) project conducts monthly monitoring of nutrient chemistry, chlorophyll concentrations, and vertical profiles of salinity, temperature and photosynthetically-available radiation.[224] All LTER sites, including the GCE, provide online access to their data. Information should be compiled on additional monitoring programs and researchers should determine whether these existing programs can be utilized to compile baseline data or evaluate the impacts of permitted structures.

Monitoring- Action/Recommendation B

Design a long-term program to monitor the effects of permitted structures and alterations on the marshes. Include suggestions for ways to provide the necessary labor to carry out this program.

A common challenge for monitoring programs is the cost of labor. Many existing programs have demonstrated that volunteer monitoring can be effective. A 2008 study by Currin et al. discussed both the scientific findings and volunteer methodology used in the study of a restored marshland. The goal of the study was to "assess the habitat value of living shoreline marsh restorations compared to their natural fringing marsh counterparts along the southern Outer Banks section of North Carolina".[226] An additional goal was also to evaluate the effectiveness of a volunteer monitoring program and identify the marshland indicators and variables that are best suited for a volunteer workforce. Currin et al. evaluated the effectiveness of a volunteer base of over sixty individuals. Volunteers

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[224] Georgia Coastal Ecosystem Long Term Ecological Research Project. (2012, January 5). *Research projects website.*. Retrieved from http://gcelter.marsci.uga.edu/public/research/projects.asp.

[226] Currin, C., Delano, P., & Valdes-Weaver, L. (2008). Ultilization of a citizen monitoring protocol to assess the structure and function of natural and stabilized fringing salt marshes in North Carolina. *Wetlands Ecology and Management*, *16*(2), 97-118.

were supervised by NOAA staff in collecting and processing data on elevation, salinity, sediment characteristics, vegetation and fish utilization. The authors found that vegetation, sediment, and elevation were the best metrics for assessing the success of their marsh restoration projects because they provided valuable data and could effectively be collected by volunteers.[227]

There are many clear and helpful manuals for volunteer-based monitoring programs that can be used as models and provide useful guidelines.[228] I am not aware of volunteer programs that monitor the impacts of docks or similar structures. However, many of the existing manuals and monitoring programs use a comparative study methodology designed to evaluate the effect of a structural change on a specific area of the marsh.[229] While they are usually designed to evaluate the effects of a restoration project, the methodology for selecting appropriate experimental and control sites, the suite of variables used in the assessment process, and the guidelines for each type of data collection, should be adaptable. The following examples can be used as models for designing a monitoring program.

Georgia has state chapters of national citizen science and volunteer water and wetland monitoring programs that can serve as models for the development of a monitoring program for CMPA permitted structures. Georgia has an **Adopt a Wetland** program run out of MAREX and volunteers have "documented invasive species, the salinization of the Upper Floridian Aquifer, incidents of marsh die-back, oil spills, trash

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[227] Currin, et al. (2008). p.116
[228] Currin, et al. (2008). p.118; Zedler, B. (2001). *Handbook for restoring tidal wetlands.*Boca Raton, FL: CRC Press.
[229] Carlisle, B.K., Donovan A.M., A.L. Hicks, A.L., Kooken, V.S., Smith, J.P. and Wilbur, A.R. (2002). *A Volunteer's Handbook for Monitoring New England Salt Marshes*. Massachusetts Office of Coastal Zone Management, Boston, MA.

and pollution, illegal poaching, illegal boat use, and fish kills". The Adopt a Wetland program asks volunteers to create their own group. The data collected is "compiled by the Marine Extension Service and added to the Environmental Protection Division's water quality database maintained at the Atlanta Adopt-A-Stream office." [230] Although the program is designed to collect base-line data, it does not include a comparative framework that would allow for comparison of altered and control sites.

The **Volunteer Water Quality Monitoring National Water Resource Project** is a partnership between the United Sates Department of Agriculture's National Institute of Food and Agriculture (USDA NIFA) and Land Grant Colleges and Universities. It has been successful nationwide although most programs are not coastal. The only one listed for Georgia is the Adopt a Wetland program.[231] New England states, and the New England region in general, have been praised by the Volunteer Water Quality Monitoring National Water Resource Project for having strong volunteer monitoring programs, including those in salt marshes. The National Water Resource Project says that:

> Each of the five New England Extension volunteer water quality monitoring programs (started as early as 1978 and as recently as 1999) has countless success stories of how they have impacted local communities and improved water quality. But perhaps the greatest success story is their history of regional collaboration. New England Extension monitoring programs share tools and learn from the strengths of their sister programs throughout the region.

These examples should be used as models and New England programs and methods for regional coordination should be reviewed.

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[230] *Georgia adopt a stream website*. (2012, November 13). Retrieved from http://aesl.ces.uga.edu/aascd/db/coastal.asp.

[231] *Volunteer water quality monitoring national water resource project website*. (2012, November 13). Retrieved from http://www.usawaterquality.org/volunteer/.

Monitoring- Action/Recommendation C

Research possible mechanisms for raising the funds to support the long term monitoring of structures permitted by the Coastal Marshland Protection Committee.

A volunteer or student-based workforce is one way to facilitate a monitoring program when funding is a significant obstacle. However, there are still financial costs and a volunteer or student-based program may prove ineffective. The executive director of the CSC asked for information about the possibility of establishing a fund to generate money for a monitoring program. He suggested that anyone with a CMPA permit pay an annual user fee which would go into a pool of money used to monitor the permitted structures, or that fees be applied from NPDES permits or part of the NPDES program.

4. Low Impact Development (LID)

Three interview subjects, a North Carolina state employee, a NOAA staff member, and an independent consultant, recommended facilitating the use of Low Impact Development practices at the local government level. They spoke about the need for capacity building and training on Low Impact Development (LID) for local governments. They said that assistance designing and conducting studies on the effectiveness of LID techniques would be valuable because, they felt like many people in city planning in the state of Georgia “don't have a lot of trust in LID initiatives yet”. Compiling evidence demonstrating its impact would help make LID initiatives more acceptable and more desirable.

The Nonpoint Education for Municipal Officials or NEMO program is a national program working to “inform, educate and assist local land use boards and commissioners on how to accommodate growth while protecting their natural resources and community

character." North Carolina has promoted Low Impact Development through their NEMO program. In North Carolina the state Coastal Nonpoint Program Coordinator worked with state agencies and programs to fund a water quality planner position, which included running a North Carolina NEMO program. This focused on offering educational assistance to coastal communities, reviewing land-use plans, holding workshops and helping with grants for community smart growth projects. Low Impact Development strategies were included in North Carolina's 2010-2014 NPS Program update. They created Technical Advisory Committees in Brunswick and New Hanover Counties, where they developed manuals and draft resolutions to encourage the local use of LID. They also developed a spreadsheet modeling tool that helps the Department of Water Quality permit LID techniques to meet state stormwater requirements, and conducted evaluations of LID techniques for stormwater management for the specific hydrology of the northern Outer Banks.

A NEMO program was established in Georgia in October 2000. It was housed within UGA MAREX and funded through Georgia Sea Grant (GSG) with NOAA monies specifically allocated for the NEMO program. This provided a salary for one full-time staff member that was later allocated to two MAREX staff members working on the NEMO program part-time. Georgia's program emphasized the development of BMPs and model ordinances promoting green development practices and stormwater management. Staff acted as technical advisors for the development of Georgia's Coastal Stormwater Supplement (CSS) released in April 2009 and led training sessions for local government officials focused on implementation of the CSS. As of January 2011, NOAA's NEMO mandate was eliminated and Sea Grant is no longer required to allocate funds for the

NEMO program. Because of this Georgia no longer has a traditional NEMO program that focuses on NPS workshops for local officials. Instead staff from the Georgia NEMO program are partnering with staff from Georgia's CoastScapes program (also within MAREX) on a new initiative called EcoScapes.

EcoScapes is expected to launch in September 2012 and combines the CoastScapes program focus on conservation landscaping and use of native plants with NEMO's focus on stormwater management. It will promote sustainable development by educating local officials and the public about the ways landscaping practices can reduce detrimental impacts from stormwater runoff. The program will promote BMPs for stormwater management and provide online tools for local governments. Their website will have a database of native Georgia plants and an online tool to help the public identify plants and landscaping practices that are best for their specific project. It will also have model stormwater and green building ordinances. One of the long-term goals of the EcoScapes program is to encourage Georgia counties and municipalities to adhere to sustainable development guidelines developed by the national Sustainable Sites Initiative (SITES).[232] The EcoScapes program is funded by a two-year GSG grant. They must reapply for funding every two years.

Low Impact Development- Action/Recommendation A

Expand the body of literature and data on the impacts of Low Impact Development and make this information accessible to city planners and municipal

[232] SITES is an "interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanical Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practices". *The sustainable SITES initaitive*. (2012, April 20). Retrieved from http://www.sustainablesites.org/.

officials. Compile existing research on the effectiveness of LID and identify areas in need of further study. Design and conduct research on the effectiveness and impacts of LID measures in Georgia's coastal region or partner with others who are conducting this research.

Low Impact Development- Action/Recommendation B

Conduct ecosystem service assessments of water resources for Georgia's coastal counties that can demonstrate the benefits of sustainable development and water conservation practices at the local level. One of the goals of Georgia's new EcoScapes program is to convince local government officials to implement sustainable development practices. They need to be able to explain the benefits of doing this to local officials and have found that ecosystem service assessments that use national data or data from other regions of the country is not adequately convincing. Officials want to see data and impacts that are projected for their locality.

Compiling LID research as discussed in the previous recommendation is part of this process. However the EcoScapes program specifically wants to provide local officials with data demonstrating the economic benefits to their county of conservation landscaping designed to conserve water and reduce stormwater runoff and nonpoint source pollution. The EcoScapes Program Manager said they would like to work with a team of academics and scientists to design and carry out assessments and studies that would provide them with this information. While graduate students may be able to fulfill this role the Program Manager specifically spoke about working with faculty members. A UGA affiliated program could help greatly with this process by compiling a team of experts and working with EcoScapes staff to identify potential funding and apply for

grants. EcoScapes has not yet pursued this idea because they still need to identify the best avenue for funding this endeavor.

Low Impact Development- Action/Recommendation C

Compile manuals and draft resolutions based on North Carolina's models, altering them to be more compatible with Georgia's existing rules and regulations. Evaluate the compatibility of existing Georgia regulations and LID techniques and evaluate the applicability of North Carolina's spreadsheet modeling tool for addressing incompatibilities between Georgia regulations and LID strategies.

5. Social Marketing

Georgia's Coastal NPS Program Coordinator asked for support and assistance for developing county-level social marketing campaigns designed to change specific resident behaviors. Social marketing was founded as a discipline in the 1970s. Over the past decade many conservation-based organizations have used social marketing to promote conservation and sustainability. One of these organizations, the American Water Works Association, promotes social marketing as an approach that can help reach conservation or sustainability goals by creating a conservation ethic and by changing behavior. This can reduce the need for regulations and create sustainable change. They identify social marketing as the merging of conventional marketing and public policy.[233] In general, it is defined as the "Systematic application of marketing concepts and techniques to achieve specific behavioral goals relevant to a social good".[234]

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[233] Kotler, P., Roberto, N., & LeeqN, (2002). *Social marketing: Improving the quality of life (2nd edition)*. California: Sage Publications.

[234] RCC Web Academy. (2012, March 23). *Social marketing- building a toolkit to motivate environmental action*. Retrieved from http://www.epa.gov/wastes/rcc/web-academy/2010/videos/may/may10_video.htmwebinar.

Georgia's Coastal NPS Program Coordinator said that coastal programs could benefit from research on the use of social marketing campaigns with sustainability or conservation goals. During her interview she said that she would like to see coastal Georgia create campaigns like the Club Chesapeake Fertilizer campaign. This campaign encourages residents to fertilize their lawns in the fall rather than the spring to reduce fertilizer runoff into coastal waters. She said one of reasons the campaign has been so effective is that it has "a very local flavor". The slogan, "get in touch with your inner Chesapeake" reinforces the overall message that people should be proud of living along the Chesapeake Bay. It promotes the idea that enjoying fresh, high quality shellfish is an integral part of the Chesapeake life and residents should act responsibly to ensure seafood and shellfish populations are healthy. She felt that "developers in Georgia have high-end advertising agencies promoting their messages, so why not us too?" She also mentioned the Wild Georgia Shrimp campaign[235] and CoastScapes[236] programs as examples of effective campaigns that she would like to know more about and be able to emulate elsewhere in Georgia.

Social Marketing- Action/Recommendation A

Research successful conservation or sustainability-based social marketing campaigns and compile detailed information on successful examples, like the Chesapeake Club and CoastScapes programs.

Include a collection of references and resources for the development of similar programs. Once this research has been compiled, work with natural resource managers to

[235] *Wild Georgia Shrimp Website*. (2011, April 23). Retrieved from http://www.wildgeorgiashrimp.com/.
[236] *Coastscapes Website*. (2011, April 21). Retrieved from http://www.coastscapes.org/CoastScapes.html.

identify areas on the Georgia coast where this approach could be useful. Assist with the development of social marketing campaigns focused on specific model ordinances or other local measures.

Assistance with county-level social marketing campaigns promoting the adoption of model ordinances could be a highly effective action. Interviewees identified the adoption of county ordinances as a key action with a potentially large impact. While model ordinances relating to water quality have been drafted by organizations like the Southern Environmental Law Center, they are rarely implemented. Interviewees cited a lack of political will as one of the main reasons why existing model ordinances have not been adopted. In many cases, it appears that counties have many of the necessary tools, like model ordinances and access to legal expertise, but public support is not substantial. Social marketing campaigns can build awareness and increase public demand for the implementation of available tools like model ordinances.

Running a social marketing campaign in support of a county ordinance is most likely to have an impact when it is conducted with the support of someone in a leadership role in the county, or in places where specific water quality issues are already at the forefront of local politics. There will be opportune times when water quality is a "hot button" issue or someone in a leadership position has made it a priority. This approach is most likely to be effective within certain contexts rather than as a generic action.

Social Marketing- Action/Recommendation B

Work with specific counties to assess the applicability of existing models and tools.

Georgia's Coastal NPS Program Coordinator also recommended working with specific counties to assess the applicability of existing model ordinances. Model

ordinances can be found by contacting the Southern Environmental Law Center or Georgia's Coastal Management Program. Georgia's Coastal Management Program has model ordinances for riparian buffers, wetlands, conservation practices, and subdivisions. Relevant model ordinances have been drafted by a variety of other institutions. For example, the Metropolitan North Georgian Water Planning District has drafted model ordinances on Post-Development Stormwater Management for New Development and Redevelopment, Model Floodplain Management and Flood Damage Prevention, Model Stream Buffer Protection, Model Illicit Discharge and Illegal Connection, Model Litter Control, and Model Conservation Subdivision/Open Space Development.[237] Georgia's Coastal Stormwater Supplement includes a Model Post-Construction Stormwater Management Ordinance[238] and the Coastal Georgia Regional Development Center has an ordinance on Model On-Site Disposal System Maintenance.[239]

Model ordinances often have to be altered to be compatible with existing county regulations and physical and institutional infrastructure. University-based institutions and environmental NGOs could assist with the process of adapting model ordinances to specific county circumstances. This is a very specific action that draws on existing resources and has the potential to have a large impact depending on the scope of the ordinance. In addition, there are a number of innovative, comprehensive and accessible guides and toolkits on various education and outreach campaigns that could be used to

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[237] *Metropolitan North Georgia water planning district website*. (2012, March 20). Retrieved from http://www.northgeorgiawater.com/html/86.htm.
[238] Georgia EPD, (2009). *Coastal stormwater supplement to the stormwater management manual*. Retrieved from website: Available at: http://www.GA.
[239] Coastal Georgia Regional Development Center. (2005). *Model on-site disposal system (osds) maintenance ordinance*. Retrieved from website: http://planning/ep/OSDS_Maintenance_Ordinance_Complete.pdf.

help counties evaluate different approaches and programs.[240] As was mentioned in the previous recommendation, this approach will have the largest impact when county leadership or influential local organizations already support the effort. This could be especially effective with model ordinances relating to OSDS inspection and repair, for example, point of sale ordinances that connect an initial inspection with permits for new owners.

6. Social Media

A Coastal Resource Specialist from GA DNR Coastal Management Division identified communication as the biggest contemporary challenge, saying that every federal, state, and local agency has trouble knowing what current projects other people are working on. University-based programs and environmental NGOs could develop strategies to improve the flow of information and facilitate awareness about current projects. Identifying areas of overlap among the programs of different organizations, and state and university programs, would allow for effective collaboration and elimination of redundancies. Social media is increasingly being used to serve government and business needs as well as social functions. Blogs, twitter feeds, facebook, pod casts, and list serves or Google groups are being used in many innovative ways to promote communication.

A world wide annual survey of communication strategies and social media conducted by the consulting firm Watson Wyatt found that the most common uses for social media were for "collaboration and team building, adapting to organizational change, and promoting health and wellness." They also said social media can help

[240] Example: Code and Ordinance Worksheet developed by The Center for Watershed Protection. Designed to be an initial assessment tool. See appendix E.
More information Available at:Worksheet http://www.cwp.org/documents/cat_view/77-better-site-design-publications.html.

employees to, "understand how their job contributes to the success of the overall enterprise". In an earlier press release from 2008, the company said that "A social media-driven intranet allows most, if not all, employees to create information and participate in a companywide dialogue." It is a more collaborative approach and "this provides for relevant and up-to-date content on the internet without dramatically increasing the burden on a company's communications function."[241] Developing an application or interface where agencies could post information and updates about current and ongoing coastal projects could help a wide variety of people stay informed about each other's projects. This could also help facilitate communication between federal, state, and local agencies.

Social Media- Action/Recommendation

Work with federal, state, and local agencies, non-governmental conservation organizations and university-based programs to develop social media applications to facilitate communication between institutions and organizations. Encourage the use of specific social media applications to facilitate communication or develop a social media application or interface where agencies and organizations can post current or upcoming programs and activities in order to keep each other informed.

7. The 319 Program

In our interview, the owner of a Georgia-based natural resources consulting firm, suggested that a 319 grant program that is not directly tied to achieving Total Maximum Daily Load (TMDL) standards on impaired streams would be an asset. She said that there are programs relating to water quality and nonpoint source pollution that are needed but

[241] *Social media: The next frontier in employee communication*. (2008, March). Press Release. Retrieved from http://www.watsonwyatt.com/render.asp?catid=1&id=18787.

are not fundable under the 319 grant program because they are not based on TMDLs. For example, there was a plan to install trash screens in Chatham County in order to keep larger debris out of waterways but "because there is no TMDL for trash, the project was not fundable". Expanding the scope of the 319 grant program to include measures like trash screens would make funding available for useful and needed projects.

The 319 Program- Action/Recommendation

Research possibilities for using 319 program funding for water quality projects that are not based on TMDLs. Research the possibility of adding a non-TMDL category to the 319 program or speak with EPA staff about the possibility of creating a similar funding program for non-TMDL water quality projects.

8. Guidance Measures for the CMPC

One of the problems identified by interviewees is that there has been very little guidance provided by GA DNR through rule making since the CMPA was passed. A staff attorney from the Southern Environmental Law Center said that while a lot of regulations were added to flesh out the Clean Water Act during the rule-making process, this did not happen for the CMPA. The CMP committee is currently making permitting decisions with little scientific information and few clear guidance measures to help guide decisions.

Guidance Measures for the CMPC- Action/ Recommendation

Research the rule making process for the CMP committee. Look into the process used by DNR, the body currently responsible for CMPA rule making. What are the current guidance measures and how can stricter guidance measures be adopted? What are the areas with the least guidance and what information is needed to make useful rules and

guidelines? After conducting background research, draft guidance measures that would address areas that are currently weak.

9. Private Dock Permits

Many people along Georgia's coast are worried that current regulations and permitting processes for coastal development are not sufficient to eliminate threats to the marsh ecosystem. One specific concern is that the regulations and permitting process for private docks do not incorporate findings from recent scientific studies about the effects of docks on waterways (for example the effects of dock shading). Lawyers from the Southern Environmental Law Center would like to understand the permitting process and what opportunities might exist for changing permit requirements. Private recreational docks on lots with at least fifty feet of water frontage and an upland area permitted for a single-family residence are exempt from the Coastal Marshland Protection Act. Docks in this category are regulated with a Programmatic General Permit 0083 (PGP0083) and are under the authority of the U.S. Army Corps of Engineers (USACE) and the Department of Natural Resources, Coastal Resources Division.[242]

Revisions were made to PGP0083 in 2007 and are set to expire in July 2012. The Army Corps will begin reviewing this permitting process in January 2012 and will be finalizing it in July 2012. There will be a mandatory public comment period during this process. Organizations like the Southern Environmental Law Center and Altamaha Riverkeepers would benefit from an inquiry into ways to influence marsh development through changes to private dock permit regulations. To understand this one must

[242] Coastal Resources Division, Georgia Department of Natural Resources. (2012, April 19) *Private dock permits*. Retrieved from avaiable at: http://coastalGA DNR.org.

understand the relationship between the Army Corps and the Coastal Resources Division in relation to the granting of permits.

Private Dock Permits- Action/ Recommendation

Research the process for reviewing permits for private docks in coastal Georgia counties. Find out how jurisdiction is shared between the Army Corps and Georgia DNR's Coastal Resources Division (CRD). What does each organization do? How are duties and authority divided up? What avenues are available for reviewing or changing requirements in the Programmatic General Permit 0083?

Conclusions

Since the 1970s, the state of Georgia has benefited from national and statewide efforts to protect the coast and maintain coastal resources. These efforts have resulted in a collection of nonprofit organizations, national and state agencies, and university-affiliated programs and institutions, with overlapping goals and a significant set of collective resources. While interview subjects have identified weaknesses in existing legislation and management measures, there is great potential to address these weaknesses and strengthen coastal protection by building on existing programs and networks. The primary goal for university-based programs and environmental nonprofit organizations should be to leverage the resources and institutional infrastructure already in place and to shift or adjust existing resources and programs to apply them specifically to the Georgia coast. This process can be aided by creating and maintaining an awareness of regional activities and trends, focusing direct actions and assistance at the county level, promoting the collection and more consistent use of scientific information, and using educational

programs and social marketing to inform the public and promote more sustainable behaviors.

1. A Regional Focus

One of the goals of the CZMA was to allow and encourage counties and municipalities to create programs and management measures tailored to their specific needs. Most of the work done by the national and state agencies responsible for enacting the CZMA is to assist local governing institutions with this process. This is an appropriate and effective way to approach these issues and should remain a key part of addressing coastal management and nonpoint source pollution. However, any organization wishing to assist with, or be part of this work, should cultivate and maintain an awareness of regional trends and networks.

During our interview, a Coastal Resource Specialist from GA DNR Coastal Management Division noted "a growing trend of thinking on a regional scale" and said there has been a shift or "increasing emphasis on regional approaches and coalitions". There is a growing realization that many of the issues her agency deals with would be better addressed regionally, partly because counties and the state, can save money and time by building off of plans and management or educational models from other counties and states. It also allows for broader and more inclusive planning strategies. This shift can be seen in restructured programs within GA DNR and the growth of regional coalitions.

Between 2009 and 2010, the technical program staff of the GA DNR Coastal Resources Division (CRD) restructured their program to promote a more regional framework. There are three Coastal Resource Specialists, and prior to 2009, they divided

work up by counties. Each person was the CRD liaison for three or four coastal counties and approached each issue on the county level. Now, they have retained the same county affiliations, but have added focus areas. Each of them is responsible for leadership on a few of the major coastal issues. For example, one works on low impact development and LEED certification while another focuses on land conservation and public access. This approach lets them think about and plan for each of these issues on a regional rather than county level. One of the Coastal Regional Specialists said that they used to address issues on a county need basis, responding individually to the needs expressed by each county as they arose. Now each Coastal Resource Specialist can develop more in-depth knowledge on a few issues and take a coast-wide approach on projects in their areas of expertise. She felt that the change has helped them to "focus their efforts and be more effective overall".

Recent expansion of regional collaboration includes NOAA's Regional Collaboration Teams, which NOAA developed as a response to "external trends and stakeholder demands" for a regional approach to coastal and ocean management.[243] Teams are composed of NOAA staff and affiliates that work to synthesize and understand regional trends, vulnerabilities and capabilities, create relationships with regional partners and stakeholders, and make recommendations for future actions. In 2002, NOAA launched five Regional Coordination Pilot Programs and in 2006 they established eight regions. The Southeast and Caribbean Region is currently focused on "[i]mproving flood warnings for coastal areas", "assembling and archiving NOAA data", "supporting

[243] Furgione, L. (2009, July 29). *NOAA's Regional Collaboration: NOAA Leadership Seminar*. Power point available at: http://www.wfm.noaa.gov/pdfs/NLS_Jul09/Furgione.pdf.

marine spatial planning efforts", and compiling "indicators for existing Integrated Ecosystem Assessments."[244]

Another example is the Southeast Regional Ocean Council. The South Atlantic Alliance was formed in 2008, and includes Florida, Georgia, South Carolina and North Carolina. It grew out of the Department of Defense SERPPAS Initiative (Southeast Regional Partnership for Planning and Sustainability), and was created so the four states could "coordinate their efforts towards healthy ecosystems, working waterfronts, clean coastal and ocean waters, and disaster resilient communities" and work to "leverage regional funds to promote stewardship of the ecosystem and restore marine habitat."[245]

One of the Coastal Resource Division Specialists said that CRD is continually looking for regional initiatives and groups like these to be part of, because it helps them align their work with federal priorities. Being part of regional groups, sharing information, and planning around key issues is a good way to be aware of and take advantage of opportunities as they arise. Building regional connections and networks also gives CRD more influence in larger issues in a manner similar to the way federal consistency gives states influence they would not otherwise have.

Organizations expanding their work in the Georgia coastal region should be aware of regional trends and seek out and become members of regional organizations and networks. It is beneficial to take advantage of any opportunity to contribute to or be part of collaborative regional efforts even if they do not directly relate to the organization's primary activities. Additional regional organizations to be aware of include the Coastal States Organization, The Coastal Marine Spatial Planning project, the South Atlantic Sea

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[244] Furgione, 2009.
[245] *Governor's South Atlantic Alliance*. (2011, November 9). Retrieved from http://www.southatlanticalliance.org/.

Grant Programs, and the Atlantic States Marine Fisheries Commission, which has been around a bit longer than the other groups, having formed in the early 1940's.

2. Focus on Counties/ Municipalities

It is important to cultivate an awareness of regional efforts and trends and to participate in regional partnerships in order to stay informed, improve access to resources, and expand one's sphere of influence. However, organizations beginning to work on the coast, or those becoming more involved in coastal issues, may be most effective when working and contributing at the county level. Awareness and networking should be regional, while actions should be focused at the county or municipal level. This includes drafting county management plans, BMP manuals and ordinances, and assisting with educational or social marketing campaigns. Working with a county to evaluate their ability to adopt a specific model ordinance, identifying a model ordinance that is most appropriate to their situation, or creating a plan to address a specific water quality issue can have a significant impact.

For example, the county of Albemarle in Virginia developed a plan to reduce pollution from stormwater runoff. A study conducted by Virginia's Department of Environmental Quality examined seven waterways in Albemarle that had been classified as impaired and stormwater runoff was consistently found to be a major contributor to the polluted conditions. In response, the county created a plan with the goal of "minimizing the negative impacts of increased stormwater discharges from new land development." The University of Virginia School of Law's Environmental Law and Conservation Clinic, the Rivanna Conservation Society, and the Southern Environmental Law Center collaborated to create a set of recommendations specifically for Albemarle County based

on expectations of future development. This model, which focuses on a specific issue in a specific place, has benefited Albemarle County and is a good resource for similar efforts. Anther tool that is helpful for county level assessment and action is a Code and Ordinance Worksheet developed by The Center for Watershed Protection. It was designed to be an initial assessment tool and includes "a number of benchmarks that can be used to determine how well a locality's ordinances promote development practices that reduce stormwater runoff."[246]

3. Regulation

One of the cornerstones of the CZMA and Coastal Nonpoint Source Pollution Control Program is its non-regulatory framework. However this examination of Georgia's Coastal NPS Program and Coastal Marshland Protection Act has included discussions of difficulties that have arisen in using this approach to protect Georgia's coastal marshlands. Solomon (2001) makes the argument that we will not see significant improvement in coastal protection as long as NPS prevention programs are voluntary and any existing regulations include exemptions for major sources of NPS pollution.[247] This argument seems particularly apt in Georgia, where voluntary measures have taken time to design and implement. Additionally the Coastal Marshland Protection Act, the state's major regulatory measure, includes exemptions for private docks. and has been criticized for using vague, imprecise, and therefore lenient guidelines.

[246] Code and Ordinance Worksheet. The Center for Watershed Protection's *site planning and model development Principles.* Retrieved from http://www.cwp.org/22_principles.htm.
[247] Solomon, A. (2001).

Since many studies have shown that point source pollution has been significantly reduced since the passage of the CWA,[248] Solomon argues that a NPS pollution prevention program that uses a similar regulatory framework and has similar enforcement measures and funding would have a much larger impact. While the conclusion that the existing non-regulatory approaches are not sufficient is certainly fair, this does not mean that the most effective way to improve protection for Georgia's coast is to pursue an overall regulatory framework. The concerted political effort that would be required to pass additional coastal and marshland regulations in the state of Georgia may not be the most efficient use of the resources and time of organizations that are concerned with strengthen coastal protections.

One of the reasons why the Coastal NPS Program was designed to be an incentive-based, voluntary program is because it is difficult to regulate nonpoint sources the way point sources are currently regulated. While some specific sites and sources of nonpoint source pollution can be identified through visual surveys (erosion) or water quality tests (fecal coliform bacteria) nonpoint source pollution is defined by its diffuse and widespread points of origin. It would be very difficult to apply the same regulatory structure, permitting, and enforcement policies that are currently used for point source regulation. Providing tools and funding for counties and municipalities to design NPS pollution prevention plans that include BMPs for agriculture and construction, stormwater management plans, as well as examples of effective public education campaigns, may be the most effective way to change harmful and widespread normative practices that have small direct impacts but significant damaging cumulative effects.

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[248] Shosteck, D. (2001). Annual review of environmental and natural resource law: Administrative law clean water act. *Ecology Law Quarterly*, *28*, 327- 364.

Additionally, many studies have demonstrated that regulation is only as good as the enforcement behind it. It is not necessarily the structure of the program (regulatory or non-regulatory) or the severity of the fines and punishments that determines the impact of legislation and regulation, but how it is enforced and how it is implemented and received. Although there is clear evidence that the CWA has reduced point source pollution, it is important to recognize that it has not solved the problem completely. In 2009 the New York Times conducted a review of water pollution records and found that in the previous five years, "chemical factories, manufacturing plants and other workplaces have violated water pollution laws more than half a million times".[249] They say environmental groups have reported an increase in CWA violations in the last decade and the New York Times research showed a 16% increase in the number of facilities with CWA violations between 2004 and 2007. They classified 60% of these violations as serious due to the amount or type of pollution. The New York Times study also showed that less than 3% of the violations received fines or punishment. They reported that the head of the EPA and responsible state officials were aware of the problem and attributed it to the political connections of many large polluters and a lack of resources within their own agencies. Over the last decade the number of regulated businesses has grown while budgets that support permitting and inspections have decreased. The article reports that twenty years after the passage of the CWA, studies showed that the nation's waters were far cleaner and healthier. However, both state regulators and environmentalist say that regulation began decreasing in the 90s and today the agencies responsible for holding polluters accountable do not have the capacity, funding, or political support to do so. Regulations

[249]Duhigg, C. (2009, September 13). Toxic waters: Clean water laws are neglected at cost to suffering. *New York Times*.

can only be effective to the extent that they can be implemented and enforced. There are other ways to work on strengthening the existing program for preventing and controlling NPS pollution and for influencing human behavior.

We also need to consider the political resistance that would arise in response to a statewide effort to increase regulation of nonpoint source pollution and coastal development. In times of recession and slow economic growth, it can be especially difficult to gain support for measures that limit development. There is always a strong backlash against regulatory programs when they are first introduced. In addition, there was considerable resistance to the Georgia Coastal Zone Management Act prior to its passage, even though the program was incentive-based and did not include state or federal regulations. Most environmental legislation faces some initial political opposition and only passes due to the concerted efforts and effective campaigning of its supporters. It may be possible for regulations for NPS pollution control and the Coastal Marshland Protection Act to gain the necessary political backing.

While there are significant loopholes and gaps in Georgia's Coastal NPS Program and the CMPA, the basis of both measures is strong. Appropriately and creatively targeting specific weaknesses in these programs could create significant improvement in marshland protection. The recommendations presented here may help guide that process. They may also be useful in building public support for bolder legislative action taken at the state level. While the current state legislature is not very receptive to expanding environmental regulation, the passage of the Coastal Marshland Protection Act in the late 1960s demonstrated that endeavors that initially seem improbable can become celebrated conservation achievements. The recommendations presented here include suggestions

than can help build public support needed for such an undertaking whether that is accomplished through local level educational campaigns or a future statewide effort reminiscent of the campaign to pass the Coastal Marshland Protection Act.

APPENDICIES

Appendix A

Acronyms

BMP- Best Management Practice

CMPA- Coastal Marshland Protection Act

CMPC- Coastal Marshland Protection Committee

CNPCP- Coastal Nonpoint Pollution Control Programs

CNPSMP- Coastal Nonpoint Source Management Programs

These two acronyms are both used to refer to Coastal Nonpoint Source Programs. Rather than use either of the two acronyms above, agencies now refer to them as Coastal NPS Programs.

CSC- Center for a Sustainable Coast

CWA- Clean Water Act

CZMA-Coastal Zone Management Act

CZMP- Coastal Zone Management Program

DNR- Department of Natural Resources

EPA- Environmental Protection Agency

GA DNR- Georgia Department of Natural Resources

GSG- Georgia Sea Grant

MAREX- Marine Extension Service (University of Georgia)

NC DENR- North Carolina Department of Environment and Natural Resources

NCDWQ- North Carolina Department of Water Quality

NOAA- National Oceanic and Atmospheric Administration

NPSMP- Nonpoint Source Management Programs

OCRM- Ocean and Coastal Resource Management (division of NOAA)

ODEQ- Oregon Department of Environmental Quality

OSSMS- On Site Sewage Management System

SCSGEP- South Carolina Sea Grant Extension Program

SCDHEC- South Carolina Department of Health and Environmental Controls

SELC- Southern Environmental Law Center

SITES- Sustainable Sites Initiative

SKIO- Skidaway Institute of Oceanography

TMDL- Total Maximum Daily Load

UGAMI- University of Georgia Marine Institute at Sapelo Island

USDA NIFA- U. S. Department of Agriculture National Institute of Food and Agriculture

WaDE- Water Discharge and Elimination program (North Carolina)

Appendix B

Determination of State Budgets for Coastal Zone Management Grants

Step 1: NOAA Determines Budget

NOAA determines the amount of its fiscal year budget to award in coastal zone management grants. NOAA may also add additional funds to this amount from unspent funds returned by the states from the prior year.

Step 2: NOAA Determines the Minimum and Maximum Amounts

NOAA determines a minimum and maximum amount that each state will receive. Congress dictates that the cap shall not exceed $2 million. In addition, if the funds provided for all CZMA grants (e.g., management and enhancement grants) exceed the funds provided in the previous year, no state may receive more than 5 percent or less than 1 percent of the additional funds.

Step 3: NOAA Determines Each State's Weighting Factor for Calculating Proportional Shares

NOAA determines a weighting factor for each state based on the state's proportional share of shoreline miles and coastal population. NOAA determines a weighting factor for shoreline miles and a weighting factor for coastal population and then adds them together to create one weighting factor.

The weighting factor for coastal mileage is determined by:

60% multiplied by shoreline miles for the state divided by total national shoreline miles.

Example: Delaware has 381 miles of coastline, and there are 95,429 total national shoreline miles. (0.6) x 381 divided by 95,429 = 0.002395

The weighting factor for coastal population is determined by:

40% multiplied by coastal population for the state divided by total coastal population.

Example: Delaware has 783,600 people living in coastal counties, and there are a total of 122,411,728 nationally. (0.4) x 783,600 divided by 122,411,728 = 0.00256

Delaware's combined weighting factor is 0.002395 plus 0.00256 = 0.00496

Step 4: NOAA Calculates Each State's Proportional Share

NOAA multiplies each state's weighting factor by the total amount of funds available for the coastal zone management grants.

Step 5: NOAA Adjusts Funds Based on Minimum and Maximum Allocation Levels

NOAA determines whether each state's proportional share places them below the minimum amount or above the maximum amount. For states below the minimum, NOAA increases the funds to reach the minimum amount. For states above the maximum amount, NOAA reduces the funds to the maximum amount.

For fiscal year 2008, NOAA determined that the minimum amount would be $672,000. For states whose proportional share was lower than this amount, NOAA raises the state's grant to $672,000. NOAA determined that the maximum cap will be $1,967,000. For states whose proportional share exceeds this cap, NOAA reduced the state's grant to $1,967,000.

Step 6: NOAA Redistributes Funds in Excess of the Cap

The excess funds from states whose proportional share exceeded the maximum are redistributed to the states below the maximum using each state's coastal miles and population weighting factor, relative to the other states below the maximum. This process may have to be repeated several times because after each redistribution additional states may have grant amounts in excess of the cap and then NOAA will have to readjust their amounts as well resulting in another round of redistributed funds.

Step 7: NOAA Calculates the Total Grant Award

Once all excess funds have been allocated, NOAA finalizes the state's grant amount.

Appendix C

Georgia's Outstanding Management Measures:

Coastal NPS Management Measures	Findings: NOAA/EPA 2002 Review of Georgia Program	Outstanding Condition: Condition Georgia Must Meet to be in Compliance with the Management Measure	Met after 2012 Review
Boundaries	Georgia's proposed 6217 management area excludes existing land and water uses that reasonably can be expected to have a significant impact on the coastal waters of the State.	The Georgia Department of Natural Resources, U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration and other relevant State, local, and Federal agencies will participate in a cooperative process to determine an appropriate 6217 management area boundary to protect the State's coastal waters from nonpoint source pollution.	Yes
Agricultural Sources	Georgia's program does not include facility wastewater and runoff from confined animal facilities management measures (large and small units), or nutrient management measures. The State should provide a legal opinion that clearly states that the back-up authorities can be used to prevent nonpoint pollution and require management measure implementation. The State should strengthen its description of the voluntary or incentive based programs to implement the management measures, the description of the mechanism or process linking the implementing agency with the enforcement agency and its commitment to use the enforcement authority where necessary.	Georgia needs management measures for facility wastewater and runoff from confined animal facilities management measures (large and small units) and nutrient management measures in conformity with the 6217(g) guidance. Georgia will submit a legal opinion and supporting documentation to demonstrate that back-up authorities can be used as enforceable policies and mechanisms to implement the agriculture management measures throughout the 6217 management area, as described in the *Final Administrative Changes* (see Section XIV.)	
Forestry	Georgia has not provided sufficient justification to support a categorical exclusion of forestry from its coastal nonpoint program. The State should provide a legal opinion that clearly states that the back-up authorities can be used to prevent nonpoint pollution and require management measure implementation.	Georgia needs to submit a legal opinion and supporting documentation to demonstrate that back-up authorities can be used as enforceable policies and mechanisms to implement the forestry management measures throughout the 6217 management area, as described in the *Final Administrative Changes* (see Section XIV.)	Yes

Urban Areas			
A. New Development	**A.** The State does not include management measures to reduce total suspended solids (TSS) by 80% after the construction site is permanently stabilized, or to maintain post-development peak runoff rates at pre-development levels in conformity with the 6217 guidance. The State should provide a legal opinion that clearly states that the back-up authorities can be used to prevent nonpoint pollution and require management measure implementation. The State should strengthen its description of the voluntary or incentive based programs to implement the management measures, the description of the mechanism or process linking the implementing agency with the enforcement agency and its commitment to use the enforcement authority where necessary.	**A.** Georgia needs to include in its program management measures in conformity with the 6217(g) guidance. Georgia will develop a strategy to implement the management measure throughout the 6217 management area. Georgia will submit a legal opinion and supporting documentation to demonstrate that back-up authorities can be used as enforceable policies and mechanisms to implement the forestry management measures throughout the 6217 management area, as described in the *Final Administrative Changes* (see Section XIV). For activities exempted by the Erosion and Sedimentation Act, the State needs to strengthen its description of the voluntary or incentive based programs to implement the new development management measure, the description of the mechanism or process linking the implementing agency with the enforcement agency and its commitment to use the enforcement authority where necessary.	**A.** Yes
B. Watershed Protection and Existing Development	**B.** The Georgia program does not include management measures for existing development in conformity with the 6217(g) guidance. The program includes enforceable policies and mechanisms to ensure implementation in portions of the 6217 management area, but not throughout the entire area.	**B.** Georgia will include management measures in conformity with the 6217 (g) guidance and within one year, will include in its five-year program implementation strategy a plan to implement the management measures throughout the 6217 management area.	
C. Site Development	**C**. Compliant	**C.** Compliant	

D. Construction Site Erosion & Sedimentation Control	**D.** Compliant	**D.** Compliant	
E. Construction Site Chemical Control	**E**. The Georgia program does not include management measures in conformity with the 6217(g) guidance for construction site chemical control. The State needs to provide a description of the voluntary or incentive based programs to implement this management measure, the description of the mechanism or process linking the implementing agency with the enforcement agency and its commitment to use the enforcement authority where necessary.	**E.** Georgia will include in its program management measures in conformity with the 6217(g) guidance. Georgia will develop a strategy (as part of the 5-Year Implementation Strategy) to implement the management measures throughout the 6217 management area.	
F. New and Operating Onsite Disposal Systems	**F.** Georgia's program includes management measures for new and operating onsite disposal systems (OSDS) in conformity with the 6217(g) guidance except it does not include measures for: (1) inspecting OSDS at a frequency adequate to ascertain whether OSDS are failing and (2) replacing or upgrading OSDS near nitrogen-limited surface waters. The State's program includes enforceable policies and mechanisms to ensure implementation throughout the management area.	**F.** Georgia will include in its program management measures for inspection and maintenance of existing OSDS and protection of nitrogen-limited surface waters in conformity with the 6217(g) guidance.	
G. Pollution Prevention	**G.** Compliant	**G.** Compliant	
H. Roads, Highways and Bridges	**H.** The Georgia program does not include management measures for roads, highways and bridges in conformity with the	**H.** Georgia will include in its program management measures inconformity with the 6217(g) guidance. Georgia will develop a strategy to implement the management measures throughout the 6217 management area. Georgia will submit a legal opinion and supporting documentation to demonstrate that back-up	

	6217(g) guidance. The State needs to strengthen its description of the voluntary or incentive based programs to implement the roads, highways, and bridges management measures, particularly for local and county projects, and the description of the mechanism or process linking the implementing agency with the enforcement agency and its commitment to use the enforcement authority where necessary.	authorities can be used as enforceable policies and mechanisms to implement the roads, highways and bridges management measures throughout the 6217 management area, as described in the *Final Administrative Changes* (see Section XIV.)	
Marinas and Recreational Boating	Compliant	Compliant	
Hydromodification **A. Physical and Chemical Characteristics of Surface Waters and and Riparian Habitat**	**A.** The Georgia does not include development of an operation and maintenance plan for existing modified channels to improve physical and chemical characteristics of surface waters and identify opportunities to restore habitat in those channels. The program includes enforceable policies and mechanisms that ensure implementation of the measures throughout the 6217 management area, except for activities exempted by the Coastal Marshlands Protection Act.	**A.** Georgia will include in its program measures that are in conformity with the 6217 (g) guidance for hydromodification. Georgia will develop a strategy to implement the management measures throughout the 6217 management area. Georgia will submit a legal opinion and supporting documentation to demonstrate that back-up authorities can be used as enforceable policies and mechanisms to implement the agriculture management measures for those activities exempted by the Coastal Marshlands Protection Act, as described in the *Final Administrative Changes* (see Section XIV.)	
B. Dams	**B.** Georgia's program does not include management measures to apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters or management measures for protection of surface water quality and instream and riparian habitat.	**B.** Georgia will include in its program measures that are in conformity with the 6217 (g) guidance.	

C. Stream bank and Shoreline Erosion	**C.** Georgia's program does not include management measures for stream bank and shoreline erosion in conformity with the 6217(g) guidance. Georgia's program does not include management measures for stream bank and shoreline erosion in conformity with the 6217(g) guidance.	**C.** Georgia will include in its program measures that are in conformity with the 6217 (g) guidance. Georgia will develop a strategy to implement the management measures throughout the 6217 management area.	
Wetlands Riparian Areas and Vegetated Treatment Systems	Compliant		
Admin. Coordination	Compliant		
Public Participation	Compliant		
XIII. Monitoring	Georgia's program does not include a plan to assess over time the success of the management measures in reducing pollution loads and improving water quality.	Georgia will develop a plan that enables the State to assess over time the extent to which implementation of management measures is reducing pollution loads and improving water quality, particularly with regard to urban management measures.	
XIV. Enforceable Policies and Mechanisms	Georgia must identify enforceable policies and mechanisms that provide for the "implementation, at a minimum, of management measures in conformity with the ...[§6217(g) measures] to protect coastal waters generally..." (CZARA §6217(b)) Enforceable policies and mechanisms may provide specific authority to implement selected measures, or serve as back-up authorities, providing general authority to prevent water pollution.		

Appendix D

South Carolina Department of Health and Environmental Control

http://www.scdhec.gov/environment/envhealth/septic/ordinance-template-point-of-sale.htm

Ordinance Template: Point of Sale, Renovation, and Change in Occupancy

Note:

CAPITALIZED words or phrases in the text are included in the 'Definitions' section at end.

Where you see text that is *italicized*, customize with your local information.

The numbering system we used is arbitrary, so feel free to change numbering to suit your local preferences.

XX.01 INTENT
The purpose of this ordinance is to promote the health and safety of the residents, visitors, and other community members by preventing the spread of diseases associated with failing ONSITE SEWAGE DISPOSAL SYSTEMS (OSDS), or SEPTIC SYSTEMS; to educate the public about proper SEPTIC SYSTEM operation and MAINTENANCE; and to promote a quality environment in the marshes, wetlands, rivers, and beaches by reducing contaminated runoff from FAILED or poorly maintained SEPTIC SYSTEMS and by ensuring that OSDS are properly operated, inspected, and routinely maintained.

XX.02 APPLICABILITY
This ordinance shall be applicable to every OWNER of premises that has an OSDS or is proposing to install an OSDS. In no way do the provisions of this ordinance abrogate the powers and duties of the South Carolina Department of Health and Environmental Control (DHEC) to their responsibilities for the permitting and enforcement of WASTEWATER systems.

XX.03 CITY/TOWN/COUNTY RESPONSIBILITY
The enforcement and management of this ordinance shall be the responsibility of the *City/Town/County* of *(insert name)*, Department of *(insert department name that will manage program, such as Public Works, if applicable)*.

XX.04 CONSTRUCTION OF NEW STRUCTURES
Whenever an applicant proposes to construct a new structure from which SEWAGE will be disposed of by means of an OSDS the following conditions related to the OSDS must be met (other building or zoning requirements pertinent to new structures are not

included):

(A) Permit Application and Permit to Construct.

The number of BEDROOMS on the DHEC permit application must be determined as defined by this ordinance so the system will not be undersized.

(a) Permit to Construct (the OSDS) must be issued by DHEC before construction on the structure or the SEPTIC SYSTEM can begin.

(b) Setback. The setback requirement to tidal waters shall be a minimum of 50 feet from the OCRM critical line. A site that does not meet the critical line setback criteria may apply for a variance.

(c) Septic tank. Any new OSDS installed shall be required to include a two-compartment SEPTIC TANK and at-grade access manholes built into the lid over the inlet and outlet ends of each SEPTIC TANK. An appropriate mechanism shall be provided to make the access manholes vandal-, tamper-, and child-resistant.

(d) Certificate of Final Approval. The OWNER must receive a DHEC Certificate of Final Approval before the *City/Town/County* can issue a Certificate of Occupancy.

XX.05 SALE OF OWNERSHIP INTEREST IN PROPERTY, BUILDING RENOVATIONS, AND CHANGE IN OCCUPANCY TO EXISTING STRUCTURES

BASELINE INSPECTION required. Prior to the sale of any ownership interest in, RENOVATION of, or CHANGE IN OCCUPANCY of existing structures an INSPECTOR shall make a BASELINE INSPECTION of the OSDS in accordance with Section XX.07 of this ordinance.

Sale of Ownership Interest in Property. A Baseline Inspection is not required more than once every five years, provided the property has not been renovated or changed occupancy and the OSDS has not failed.

Permit required. A DHEC permit, similar to that for new construction as listed in XX.04 (A), must be submitted to the *City/Town/County* for BUILDING RENOVATIONS and CHANGE IN OCCUPANCY to ensure that the OSDS will function properly after the RENOVATION or CHANGE IN OCCUPANCY. The BASELINE INSPECTION report and BUILDING RENOVATION site plans must be included in the DHEC permit review. The number of BEDROOMS on the DHEC permit application must be determined as defined by this ordinance so the system will not be undersized.

XX.06 OSDS OPERATION AND MAINTENANCE

City/Town/County responsibility.

The *City/Town/County* will maintain a list of approved INSPECTORS.

The City/Town/County (and/or DHEC) will conduct random site visits during inspections, pumping, REPAIRS, or ALTERATIONS to evaluate the

quality of such work. The *City/Town/County* (and/or DHEC) will also respond to citizen complaints with regard to OSDS services and/or inspections.

Property OWNER responsibility.

It shall be the responsibility of the property OWNER to ensure that the OSDS is operated and maintained according to its designed use and capacity.

Property OWNERS shall provide all requested and known information about the OSDS to the *City/Town/County* and the INSPECTOR to facilitate locating and assessing the condition of the system.

The property OWNER shall maintain the OSDS so that it is accessible for inspection and MAINTENANCE, and so that it is protected from vehicular traffic and parking.

XX.07 OSDS INSPECTIONS AND REPAIRS

BASELINE INSPECTION. As per Section XX.05 of this ordinance prior to the sale of any ownership interest in, RENOVATION of, or CHANGE IN OCCUPANCY of, properties will be required to have a BASELINE INSPECTION using *City/Town/County*-approved INSPECTORS and *City/Town/County* inspection forms. Properties with a FAILED SYSTEM shall also be required to have a BASELINE INSPECTION done as per this section.

A pump-out of the SEPTIC TANK is required. This is necessary to properly examine the interior of the tank and to check for leaks from the house or saturated conditions in the DRAINFIELD. Property OWNERS must arrange with the INSPECTOR to have a LICENSED PUMPER present during the inspection.

The inspection shall take place no earlier than sixty (60) days prior to the sale of any ownership interest in property. In the event that the inspection does not occur as specified prior to the sale, an inspection must be completed within thirty (30) days of the water transfer.

It is preferable to have the inspection done while the property is occupied.

Inspection reports. The INSPECTOR shall give a copy of the completed inspection report to the occupant, to the property OWNER, and to the *City/Town/County*. A copy of the inspection report and the receipt from the pumper, must be submitted to the *City/Town/County* within ten (10) business days of the inspection. For sale of property, a copy of the report also shall be provided to the prospective buyer.

Minor REPAIRS and ALTERATIONS. If during a BASELINE INSPECTION, the INSPECTOR determines that minor REPAIRS or ALTERATIONS are needed to bring the OSDS into good operating condition (such as replacing cracked lids and missing or broken tees and baffles), such work must be made within ninety (90) days of the inspection. Evidence of said work must be submitted to the *City/Town/County*.

Failure evaluation and REPAIRS. If during a BASELINE INSPECTION the OSDS is determined to be a FAILED SYSTEM, as defined by this ordinance, the

City/Town/County will notify DHEC of the failure within five (5) business days of receiving the inspection report. The property OWNER shall:

Contact DHEC within fifteen (15) business days of the inspection to request a failure evaluation and/or to determine the proper recommended repair;

Apply for a DHEC permit to REPAIR or replace the system, if determined necessary by DHEC.

Apply for an easement permit, if needed, from the *City/Town/County* in accordance with Section (E) below.

Submit evidence of REPAIRS to the *City/Town/County* within sixty (60) days of the inspection. The *City/Town/County* may grant the OWNER an extension of the time limit to complete any needed REPAIRS on a case-by-case basis.

Easements. The *City/Town/County* may permit the use of an easement for repairing or upgrading an OSDS provided the easement meets DHEC requirements.

XX.08 INSPECTION RECORDS

The *City/Town/County* shall maintain a record of each OSDS installed, inspected, pumped, repaired, and altered.

XX.09 EDUCATION

It shall be the responsibility of the *City/Town/County* to establish an ongoing public education program to make OSDS OWNERS and occupants aware of the proper operation and MAINTENANCE of these systems.

XX.10 FINANCING

(A) Fee structure. A nominal management program fee, as established by a *City/Town/County* Council resolution, may be assessed to each OWNER of an OSDS based on the number of these systems owned in the *City/Town/County*.

(B) Funding. The *City/Town/County* will investigate grants or loan programs that may be available to the *City/Town/County* or to qualified property OWNERS for the improvement, correction, or replacement of FAILED OSDS.

XX.11 ENFORCEMENT; PENALTIES FOR OFFENSES

Failure to comply with the inspection and REPAIR provisions of this ordinance will be deemed a violation of *(insert applicable code)*. Penalties will be administered as per (insert applicable code).

XX.12 DEFINITIONS

As used in these rules and regulations, the following terms shall, where the context permits, be construed as follows:

ALTERATION – Any modernization, modification or change in the size, type, or flow of an existing ONSITE SEWAGE DISPOSAL SYSTEM, including but not limited to any work performed in connection with a BUILDING RENOVATION

and/or CHANGE IN OCCUPANCY of that building.

BASELINE INSPECTION – A thorough evaluation of an operating ONSITE SEWAGE DISPOSAL SYSTEM conducted by an INSPECTOR, as defined by this ordinance, to determine whether the system is functioning as designed, is not exhibiting signs of failure, and is being operated properly. A pump-out of the SEPTIC TANK is necessary to conduct a baseline inspection.

BEDROOM – Any room in a residential structure which is greater than seventy (70) square feet in area, which is susceptible to present or future use as a private sleeping area and which has at least:

One (1) egress window or door per fire code; and

One (1) interior method of entry and egress, excluding closets and bathrooms, allowing the room to be closed off from the remainder of the RESIDENCE for privacy. In determining the number of bedrooms contained in any RESIDENCE, it shall be presumed that all RESIDENCES contain a living room, kitchen, bathroom and at least one (1) bedroom.

(D) CHANGE IN OCCUPANCY – Refers to any single family or duplex residential property for which the OWNER should apply for a business license to change the occupancy of the dwelling (e.g., converting to multiple family or to short-term rental) and that is likely to result in an increase in SEWAGE flow into the system; conversely, switching from commercial property to residential property.

DRAINFIELD – A system of trenches or beds, or other such seepage systems approved by DHEC, designed to disperse SEPTIC TANK effluent into the soil for treatment.

FAILED SYSTEM – Any SEWAGE disposal system that does not adequately treat and dispose of SEWAGE that consequently creates a public or private nuisance or threat to public health and/or environmental quality, as evidenced by, but not limited to, one or more of the following conditions:

Failure to accept SANITARY SEWAGE into the building sewer.

Discharge of SANITARY SEWAGE to a basement, subsurface drain, surface drain or surface water unless expressly permitted by DHEC.

SANITARY SEWAGE rising to the surface of the ground over or near any part of an ONSITE SEWAGE DISPOSAL SYSTEM or seeping down-gradient from the DRAINFIELD at any change in grade, bank or road cut.

Any deterioration or damage to any ONSITE SEWAGE DISPOSAL SYSTEM that would preclude adequate treatment and disposal of WASTEWATER (For example, damage from a vehicle driven over the DRAINFIELD or SEPTIC TANK.).

A SEPTIC TANK that is not constructed to be watertight (e.g., bottomless tank) as required to hold WASTEWATER for primary treatment prior to discharging to a DRAINFIELD.

The presence of a GREASE TRAP to which kitchen waste is discharged and

which is not connected to the SEPTIC TANK or DRAINFIELD.

GOOD OPERATING CONDITION – An OSDS that upon inspection is determined to function in a sanitary manner, prohibits the discharge of untreated or partially treated WASTEWATER onto the ground surface, into surface water, or into groundwater, and allows building plumbing to discharge properly.

GREASE TRAP – An interceptor tank used to trap grease and oils from kitchen waste. If the tank is not plumbed so that the remaining liquid enters the septic tank or a drainfield, it is in violation of this ordinance.

INSPECTOR – An individual who has successfully completed a Septic System Inspector Training Workshop and who has been approved by the *City/Town/County* to inspect SEPTIC SYSTEMS.

LICENSED INSTALLER – Any individual who holds a valid DHEC license for the installation and REPAIR of OSDS. Licensed installers may hold a dual license for installation/REPAIR and cleaning of OSDS; installers with a dual license are also classified as LICENSED PUMPERS.

LICENSED PUMPER – Any individual who holds a valid DHEC license to clean SEPTIC TANKS and self-contained toilets.

MAINTENANCE – The clearing of stoppages in pipes and the regular cleaning of any SEPTIC TANK, GREASE TRAP, building sewer, distribution lines or any other component of an OSDS for the purpose of removing any accumulated liquid, scum and/or sludge without removing, replacing, or rearranging of pipes or surrounding soils. The term "maintenance" shall also be held to include any regularly required servicing or replacement of related mechanical, electrical or other equipment.

ONSITE SEWAGE DISPOSAL SYSTEM (or OSDS) – Any system of piping, tanks, DRAINFIELDS, alternative toilets or other facilities designed to function as a unit to convey, store, treat and/or dispose of SANITARY SEWAGE by means other than discharge into a public sewer system.

OWNER – Any person who alone or jointly or severally with others holds legal title to any real property or has possession or control of any real property through any agent, executor, administrator trustee, or guardian of the estate of a holder of a legal title or has possession or control through any lease or purchase and sale agreement. Each such person is bound to comply with the provisions of these rules and regulations.

REGULATION 61-56 (R.61-56) INDIVIDUAL WASTE DISPOSAL SYSTEMS – Statewide regulation that governs the permitting, design, and installation of OSDS.

RENOVATION – Any addition (including structural and plumbing fixtures with waste lines), replacement, demolition and reconstruction, or modification of an existing structure on the subject property that:

Results in an increase in SEWAGE flow into the system*; or

Adds BEDROOM(s) and/or significant water-using fixtures to the house

(bathroom, hot tub, etc.). *NOTE: All SEWAGE flows shall be determined in conformance with S.C. Regulation 61-56.

REPAIR – Work performed on an OSDS in order to mend or remedy a specific defect or deficiency after the failure, injury, deterioration, or partial destruction of a previously existing OSDS or component thereof. A repair shall not include any ALTERATION work performed on an existing OSDS that increases the flow capacity of the system.

RESIDENCE – Any structure used for housing purposes, including but not limited to single- or multiple-family dwellings, duplexes, tenements, apartment buildings, condominiums, mobile homes, recreational vehicles or trailers.

SANITARY SEWAGE OR WASTEWATER – Any human or animal excremental liquid or substance, any perishable (capable of decaying) animal or vegetable matter and/or any garbage and filth, including but not limited to any black water discharged from toilets, or grey water discharged from laundry tubs, washing machines, sinks and dishwashers, as well as the content of SEPTIC TANKS or privies.

SEPTIC SYSTEM – For the purpose of this ordinance, a septic system is analogous to an ONSITE SEWAGE DISPOSAL SYSTEM (OSDS).

SEPTIC TANK – A watertight receptacle that receives the discharge of SEWAGE from a building sewer and is designed and constructed to permit the deposition of settled solids, the digestion of the matter deposited and the discharge of the liquid portion into a leaching system (e.g., DRAINFIELD).

For additional information, contact: (803) 896-0641 Fax (803) 896-0645