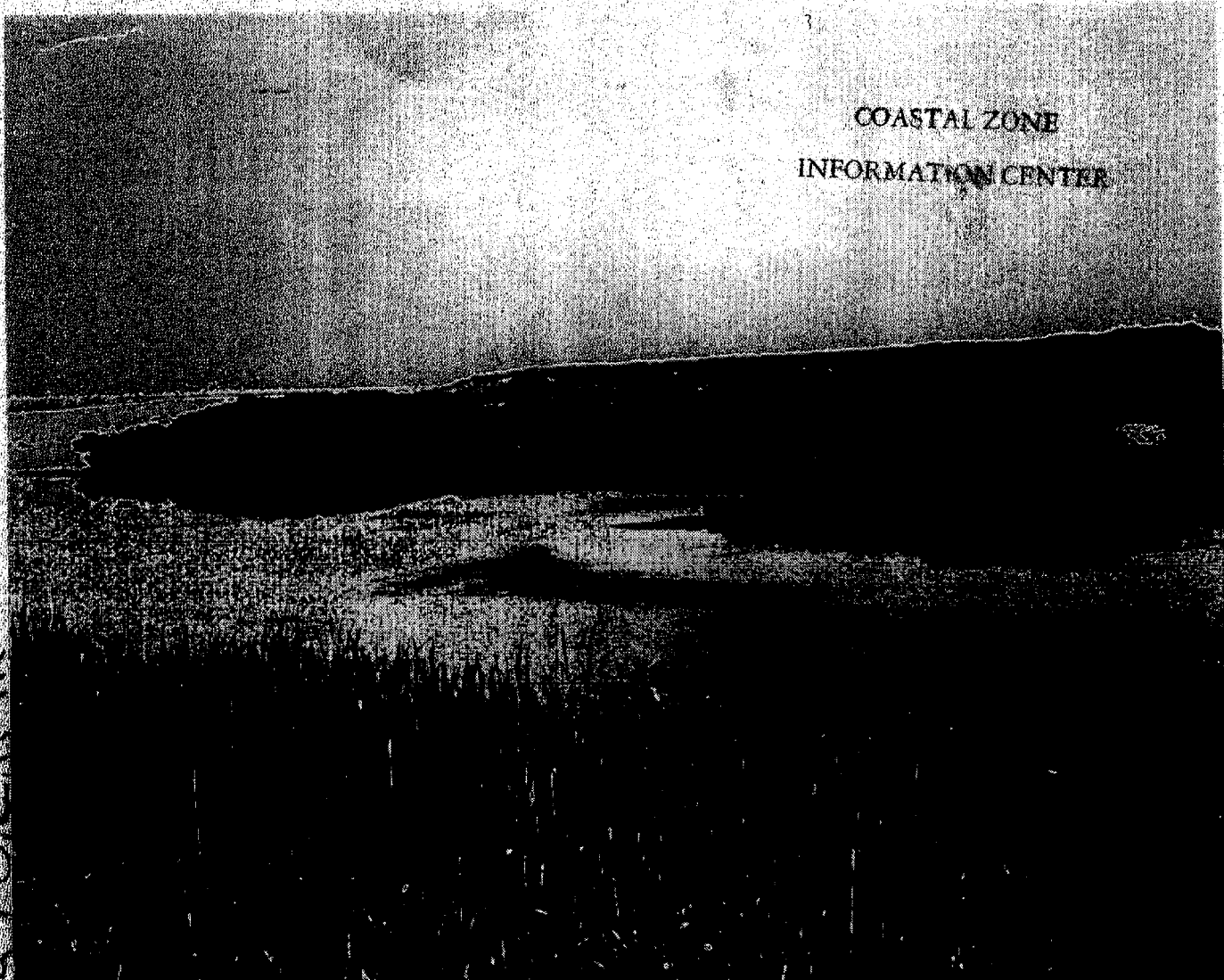




# Coastal Management Solutions To Nonpoint Source Water Pollution

COASTAL ZONE  
INFORMATION CENTER



NOAA / U.S. DEPARTMENT OF COMMERCE

GC1018  
.T43  
no.102  
C.2

Department of Commerce  
National Oceanic and Atmospheric Administration  
Coastal Service  
Ocean and Coastal Resource Management

Technical Assistance Bulletin #102  
April 1990





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
 NATIONAL OCEAN SERVICE  
 OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT  
 Washington, D.C. 20235

April 1990

Nonpoint source pollution control is a major item on the environmental agenda of the Administration and Congress in 1990. The Administration sees an opportunity in the reauthorization of the Coastal Zone Management Act to encourage the coastal states to address this significant source of water pollution. Coastal management programs are in a unique position to deal with the land-based causes of nonpoint source pollution through their existing land management capabilities. Already, we have found that state coastal management programs have developed innovative and successful methods for its control. It is hoped that this document will be of interest and help to states that are faced with similar problems, as well as to individuals interested in the welfare of our Nation's coasts.

The document is organized into five parts. The first part provides a brief overview and summary of nonpoint source pollution and its relation to coastal management. The second part surveys innovative, successful projects undertaken by coastal management programs in eight areas of nonpoint source pollution. The third part provides greater detail on six specific state efforts. The fourth part of this document provides a summary of the Federal coastal management program. This section is primarily intended as background for those individuals unfamiliar with the program. The fifth part contains a list of the state coastal programs.

This Office sincerely thanks the many state program managers who contributed to the information contained in this document.

For further information on activities highlighted in this report, contact the state program manager listed at the end of this document or the Coastal Programs Division, 1825 Connecticut Ave., N.W., Washington, D.C. 20235, Tel. (202) 673-5158.

Sincerely,

*Timothy R. E. Keeney*  
 Timothy R.E. Keeney  
 Director



GC1018 .T43 NO-102  
 25160187

The Cover: This salt pond in Rhode Island is protected by the Coastal Management Program and the Town of South Kingstown using a variety of nonpoint source pollution controls: development setbacks, vegetative buffers, technical assistance on repairing and maintaining septic systems, stormwater management and runoff controls, reduced zoning density and continued monitoring.

## TABLE OF CONTENTS

I.	Introduction: Nonpoint Source Pollution and Coastal Management.....	1
II.	Survey of Coastal Management Solutions to Nonpoint Source Pollution.....	7
	A. Managing Land Use: Watershed Management, Buffers and Setbacks.....	7
	B. Controlling Urban and Suburban Runoff.....	11
	C. Improving Sewage Disposal Systems.....	13
	D. Controlling Marina Impacts.....	15
	E. Siting Landfills and Reducing Plastics and Litter.....	17
	F. Managing Farm Practices.....	19
	G. Monitoring Nonpoint Source Pollution.....	21
	H. Increasing Information About Nonpoint Source Pollution..	23
III.	Detailed Examples of Coastal Management and Nonpoint Source Pollution	
	A. Critical Area Program in Maryland.....	25
	B. Basin Wide Water Quality in Florida.....	29
	C. Marina Siting in South Carolina.....	33
	D. Watershed Management in Washington.....	39
	E. Storm Water Management in New Jersey.....	41
	F. Local Governments Involved in New York.....	45
IV.	An Overview of Coastal Management.....	49
V.	List of Coastal Programs.....	53

## I. INTRODUCTION: NONPOINT SOURCE POLLUTION AND COASTAL MANAGEMENT

### What is nonpoint source pollution?

Nonpoint source pollution is defined as all pollution entering the surface water system other than from pipes. Examples include: soil eroding into streams, agriculture fertilizer seeping into creeks, failing septic systems polluting bays, and runoff from parking lots into adjacent rivers. Discharges from sewage treatment plants and factories, on the other hand, are called "point source" pollution, because they come from a single point--usually a pipe.

### How significant is nonpoint source pollution?

Nonpoint sources contribute more than half of the suspended solids, phosphorus, chromium, copper, lead, iron, zinc and fecal coliform bacteria which pollute our waters.<sup>1</sup> The most common nonpoint pollutant is soil eroded from farms, construction sites, and stream banks. The soil destroys aquatic habitat by increasing turbidity, cutting off sunlight to aquatic plants and other organisms and smothering fish spawning areas. Runoff poisoned with fertilizer, pesticides, toxic metals and oils can have worse affects. Excessive nutrients in the water accelerates vegetation growth which can lead to oxygen depletion. The lower oxygen levels can cause fish kills. As the pace of coastal population growth and development continues to increase, there will be more impervious surfaces, septic systems, litter, chemicals and pesticides applied to lawns and gardens--all of which will increase the pollution of coastal waters.

The results of pollution from nonpoint sources are serious. Public and private drinking water supplies are threatened. Over 40 percent of the shellfish waters in the contiguous U.S. are closed from point and nonpoint source pollution. Since more than 70 percent of commercially important species of fish and shellfish spend some portion of their lifecycle in estuarine waters, pollution significantly affects the \$3 billion a year commercial and recreational fishing industry. Also, beach closings resulting from debris washup not only cause lost recreational opportunities but lost revenue for local economies.

### Why hasn't nonpoint source pollution been stopped?

The severity of the nonpoint source pollution problem only recently has been fully recognized. Nonpoint sources are harder to identify, and may initially appear less serious than discharges from industrial point sources. Public awareness is the most important component of efforts to stop the degradation of coastal waters. The farmer who lets cattle stand in a stream to cool off in the summer may not see how their waste could cause much harm. Neither does the homeowner who puts off fixing

---

<sup>1</sup> See U. S. Congress, Office of Technology Assessment, Wastes in Marine Environments, 1987 Chapter Three.

a faulty septic tank or who dumps used motor oil into a storm sewer. These seemingly small sources of pollution add up to significant adverse impacts when multiplied by the large number of people living adjacent to our coastal waters.

### What are the sources of nonpoint pollution?

Storm water runoff, from rainfall and snowmelt, is the major source of nonpoint pollution. It consists of rainwater that is not absorbed into the land, combined with eroding soil, and litter, oil and heavy metals from roads. Unless properly managed, stormwater runoff increases as the land becomes urbanized. Unlike open land in fields or greenways, asphalt and concrete do not allow rain water to be absorbed into the land and filtered before it enters into waterbodies. Also, until people alter their activities in disposing of household chemical wastes, litter and domestic animal wastes, storm water runoff will be more severe as coastal areas continue to develop.

Boats and marinas are potential sources of untreated human and fish wastes, antifouling paints, boat cleaners, petroleum products, and runoff from parking lots.

Airborne sources, such as toxic chemicals transported by rain and wind, contribute significantly to coastal water pollution. In Long Island Sound, for example, it is estimated that 23 percent of the total nitrogen load is caused by atmospheric pollution. Airborne sources also account for a significant portion of the nitrogen load in the Chesapeake Bay.

Groundwater transport of pollutants into nearby water bodies can result from faulty septic systems and landfills located too close to the water. Rainwater can absorb pollutants as it flows through a landfill with an improper base and then pollute groundwater, which may flow into rivers and streams.

### What is coastal management?

Congress enacted the Coastal Zone Management Act, P.L. 92-583 (CZMA), in 1972, to improve the nation's management of coastal resources, which were being irretrievably damaged or lost due to poorly planned development. Specific concerns included the loss of living marine resources and wildlife habitat, decreasing open space for public use, and shoreline erosion. Congress also recognized the need to resolve conflicts between various competing uses of coastal lands and waters.

Key elements of the CZMA are:

- \* The basic goal of the CZMA is to encourage coastal states to voluntarily develop comprehensive management programs. The CZMA establishes a partnership in which the states take the lead in managing their coastal resources, while the Federal government provides financial and technical assistance and agrees to act in a manner consistent with the federally-approved

management programs. The law also establishes a National Estuarine Reserve Research System to designate and preserve specific estuarine sites.

- \* The CZMA was reauthorized in 1976, 1980 and 1986. It is subject to reauthorization in 1990.
- \* The Office of Ocean and Coastal Resource Management (OCRM), within the National Ocean Service of the National Oceanic and Atmospheric Administration (NOAA) administers the CZMA at the Federal level.

#### Who is responsible for coastal management?

- \* Of the 35 eligible states and territories, 29 participate in the Federal program. At the state level, a lead agency oversees implementation of the CZM program and administers the Federal grant funds. This agency may be solely responsible for all CZM planning, regulation, and management, or it may share implementation authority with other state agencies.
- \* Local governments are involved in the implementation of state CZM programs, either formally or informally. In some states, local governments play a central role by developing local coastal programs and by making land use decisions in accordance with state standards.
- \* Federal agencies are also involved in the development and implementation of state CZM programs. State and Federal agencies must coordinate during the development of state programs. Once NOAA approves a state coastal program, other Federal agencies must ensure that their actions are consistent with the state program. Through coastal management, states and Federal agencies cooperate in planning and permit processes, simplifying the regulatory process.

#### What can coastal management programs do about nonpoint source pollution?

State coastal management programs are in a unique position to help control nonpoint source pollution because they address land and water use issues within the coastal zone. Traditionally, addressing the shoreside causes of nonpoint pollution has been a state and local government responsibility through land use decisions. With state permits and support for local governments, coastal management programs can help focus attention on controlling nonpoint source pollution through stormwater regulations, land use planning, and zoning.

- \* States implementing their programs through state permits often require buffers to set development back from the shore, strict erosion and sedimentation control practices for construction projects, and stormwater control systems in new development, to cite a few examples.

- \* States implementing their coastal programs through local governments work with municipalities and counties to improve zoning and subdivision ordinances to control nonpoint source pollution, including reducing the density of development adjacent to shorelines .

Coastal management programs use several non-regulatory mechanisms to address nonpoint source pollution. They provide funds for research, public information and to encourage the voluntary use of best management practices, a term used to include a variety of nonpoint source pollution control techniques. The staff of coastal programs also provide public information and education on effective solutions to nonpoint source problems. Finally, coastal programs initiate purchases of property for wildlife habitat, research and recreation when that appears to be the only method to protect threatened coastal waters.

#### How are nonpoint source efforts being coordinated with other Federal agencies?

The Coastal Zone Management Act requires state coastal programs to incorporate the provisions of the Clean Water Act into their programs. Section 319(h) of the Clean Water Act requires states to submit to the Environmental Protection Agency (EPA) a Nonpoint Source Pollution Assessment Report and a State Management Program. Once the management program has been approved, the state is eligible for implementation grants. For the first time, funding will be available for the Section 319 program in Fiscal Year 1990; \$40 million will be available for all fifty states to implement their nonpoint source programs. (The Fiscal Year 1990 appropriation for coastal management is \$34 million for 29 states).

NOAA and EPA have coordinated their nonpoint source pollution efforts by sharing information with state contacts about each others' programs and encouraging the coastal agencies to participate in preparing Section 319 Assessment Reports and Management Programs. OCRM has reviewed the Section 319 management programs and encourages coastal management programs to give due consideration to the priorities established in these programs.

At the state level coordination has varied among states, often increasing in instances where the water quality agency and the coastal agency are in the same department. Even where this is not the case, as in New York, the coastal agency was a member of the task force that developed the Nonpoint Source Pollution Assessment and Management Program. In Florida and South Carolina, the Section 319 Assessments recognized the importance of the Federal Consistency provisions of the CZMA (see Part IV of this report) as a tool for implementing some of the nonpoint source reduction goals. Nevertheless, all participants recognize that there needs to be much better coordination. OCRM is working to assure that future revisions to Section 319 management plans incorporate state coastal programs efforts and assets, where appropriate.

In states participating in EPA's National Estuary Program, there are several opportunities to closely coordinate solutions to nonpoint source pollution. NOAA and EPA have signed a Memorandum of Understanding(MOU) toward this effort. In partial fulfillment of this MOU, NOAA and EPA held a regional conference in the Northeast to foster coordination and communication. NOAA continues to evaluate coordination through OCRM's formal state evaluation process.

OCRM has established a working relationship with the U. S. Department of Agriculture (USDA) to address agricultural contributions to nonpoint source pollution. The USDA will spend over \$201 million on water quality issues in Fiscal Year 1991. Other parts of NOAA have contributed in the past to USDA research and database committee activities. OCRM and the Soil Conservation Service (SCS) have met to assure the programs compliment each other and do not duplicate efforts. OCRM has participated in various agricultural forums, such as the National Association of Conservation Districts 1990 conference to explain coastal management programs in nonpoint source control and has invited similar participation by the USDA in its activities.

State coastal program staff and SCS extension agents have worked in the field to assure coordinated programs, and have participated on each others advisory boards. In a few instances, CZM has provided partial funding to joint research efforts. Part II F of this report provides more specific examples.

# Wetland area ordered restored

## Seaside Supports Chesapeake Bay Wildlife Protection

By Paul W. Valentine  
*Washington Post Staff Writer*

In a ruling that could put new limits on builders seeking Chesapeake Bay development under Maryland's controversial critical areas law, a state judge has upheld the way local authorities barred construction on a 40-acre Eastern Shore property occupied by endangered wildlife.

Judge Marvin H. Smith rejected claims by a Talbot County developer that he was forced to withdraw his development plans on the 40 acres to meet a deadline that the developer voluntarily agreed not to build on the 40 acres in gain approval for the rest of the development. "This is the first court ruling on the 40 acres," the critical areas protection law," said Maryland Attorney General J. Joseph Curran Jr.

By upholding the law, which is the cornerstone of our intensified efforts to protect the environment, the court has sent a clear signal to developers and local governments throughout Maryland and given them a guide on how they can proceed with development.

The seven-page ruling, which cited the bald eagle and Delmarva fox squirrel as endangered species in the forest habitat, was issued Thursday.

The developer, Clifford E. ... reached for comment.

## CZM gets cheered for 'wise' denial

By VENETIA HARVEY  
 St. Croix Bureau

The denial of a permit for a \$10.3 million development at St. Croix's Southgate Pond has brought applause and praise from local environmentalists who hope it is a move toward tougher scrutiny of development on the island.

"We're very, very pleased," Bruce Wilson of the St. Croix Environmental Association said Friday. "It shows (Coastal Zone Management) will come down hard on development that makes no sense economically and environmentally."

"I would like to commend the CZM Committee for the wisdom in their decision," said SEA president Fred Sladen. "The decision was a clear one: the difference between what is to be reaped in benefits and what is to be lost in value."

CZM voted unanimously Thursday to reject the Dolphin Cove proposal to develop a 69-unit condominium and marina complex on 22 acres of the 43-acre Southgate Pond. The pond is on the north shore east of Christiansted.

CZM does not recommend any development within 50 feet of the edge of the pond, CZM Executive Director Benjamin Nazario said in his report. He suggested that the developer and property owner, Dick

## Island sold, saved from development

Curran from page 1A

of the island because of the storm water runoff and the sewage disposal."

State officials plan to purchase the conservancy's tract and acquire the option on the remaining land within the next few months, said David W. Owens, director of the N.C. Coastal Management Division.

"We have initiated steps to explore that possibility," Owens said in a telephone interview. "We have federal grant funds in hand for just this type of acquisition. We've gotten preliminary approval that they would have no trouble with this kind of acquisition."

Developers have eyed Permuda Island, lying within Stump Sound between Tostan Island and the mainland, as the location for

lands itself to oysters, strimps and crabs."

J. Hal Kinlaw Jr., a Lambertson attorney who sold the land to the Nature Conservancy, was the most recent person to propose developing the island. Kinlaw was out of town Friday and could not be reached for comment about the sale.

Kinlaw had planned to build a 140-unit housing development on the island. He was forced to halt the project in September when the Coastal Management Division denied him construction permits because he had been unable to arrange sewage treatment plans in time to meet his permit application deadline.

Owens, the Coastal Management director, said Kinlaw could have reapplied for and probably qualified for permits once he had arranged sewage treatment for the

## Order Brings Halt to New Building Along Coast

Development Act, which allows for fewer but larger buildings along the coast.

Order Brings Halt to New Building Along Coast

Order Brings Halt to New Building Along Coast

Order Brings Halt to New Building Along Coast

stronger control of development.

Michael Neuburger, a Green Cay resident and chairman of the East End Crisis Committee, also applauded CZM's decision.

"I welcome CZM's position on this project because the impact on the environment would be unfavorable," he said. "Also, there would have been no significant employment benefit here. It would've been an impact only on the infrastructure.

The project would create 100 jobs over the next 10 years, Neuburger said. This denial right does not mean the project is dead.

He reorganized his master plan. In his master plan, Nazario's project was a project with goals and objectives. All effects on the environment are physical. Environmental impacts are physical. Nazario, Sladen, would sit on the habitat, louchd tional a

## STOP SHORE SURVEYS Stop landfills in lagoon says Nu'uuli council

Pala lagoon is now "sacred land" and woe be unto you who dares attempt to fill and reclaim it illegally, so proclaims the village of Nu'uuli.

The chiefs and dignitaries of the village of Nu'uuli have issued a strong letter requesting the Lands and Survey Branch of the Department of Public Works to impose a ban on surveying Pala Lagoon shore areas.

In a letter to the Lands and Survey Branch, the village chiefs state, "It is our wish to request a total ban to be hereby placed on the surveying of the said area in Nu'uuli either for an aiga or for any individual."

At a recent village meeting with ASG representatives, Savusa Tauileva "spoke vehemently on the lack of enforcement. He told the representatives that the government was too lenient with enforcing the regulations and should take people to court if they are found in violation," a press release from the Development Planning Office said.

Lands and Survey Manager Meiko Aiumu said he was aware that the village chiefs

met with ASG representatives last Sunday to discuss the enforcement of the ban on the Pala Lagoon shoreline.

In that meeting the village chiefs expressed their unanimous desire to enforce the ban. Nu'uuli Pulenu'u Sialega felua Lulu said, "In our meeting with the members of government last Sunday, village chiefs agreed to give the government power to police the area and devise ways to improve its natural state."

Local Environmental Protection Agency Director Paiti Faiai explained to the meeting that rules and regulations protecting marine life must be observed because the lagoon is the spawning ground and natural habitat for fish species and wildlife.

The village council will consider meeting out traditional punishment to anyone caught violating the ban if enforcement of the law becomes lax.

Lelei Peau of the Coastal Management Program told Samoa News that another meeting is planned with the chiefs and orators of Leone village on the lagoon there.

The fill at Trail's End Resorts has been blamed for flooding in the Wahanna Road area.

Three wetlands must be created — at least 15.2 acres next to Stanley Lake, one acre north of Trail's End Road, and one acre east of Trail End Road. The latter requires removing some fill dirt, according to Zajonc's order.

Whoever does the work must also rebuild streams, create at least five islands in the wetlands, and plant trees and shrubs, Zajonc ruled.

Division of State Lands representatives will review the project's progress before, during and for five years after completion, according to the order.

The re-created wetlands could provide a place to live for muskrat, beaver, elk and several kinds of birds, Maine said. But more important, they will be home for "little microscopic creatures" that are the heart of many biological systems because they're at the base of the food chain, he said.

ZAJONC'S FINAL ORDER is an improvement over previous versions of the plan, said Maine and attorney Donald Potter, both of whom represented the Northwest Environmental Defense Center of Portland. Irregularly shaped wetlands, more specific wetland-related terms and the five-year evaluation period are among the changes they said.

Still, Potter said NEDC wasn't "entirely happy" with the order. "Products Management" filled in "out a permit and got away with it," he said. "Our group ideally would like to see any development, but the DSL didn't see

Trail's End Resorts "two months, this company said this ... issues ... submit a ... d Leon ... trustee

hoped that didn't happen.

"The trustee is trying real hard to preserve the (Seaside) facility for the benefit of the campground members," Simson said. More than 3,000 of those members have filed claims against the company.

"I don't think it'd do anybody any good if this case were converted to Chapter 7 of the U.S. Bankruptcy Act, which would mean liquidation of the company, Simson said.

If that happened, the Seaside campground would close, and an extensive flood-control and restoration program would not take place, he said.

He has controlled Trail's End Resorts-USA since 1986, when Bankruptcy Court Judge ... named him trustee of the ... more said Trail's End officials had ... aged" the company before Mit-

the cost could be about ... he said ... and Zajonc said they ... how much the work

Neal Maine said ... Zajonc's order ... is long ... no repre ... mental ... the ... time

The law, the ... development ... to all ... rivers

development will review each project ... for any potential damage ... possible ... 1914 Law Extended ... destruction of marshland or sand dunes.

With his two-year campaign for a ... mission to control development along ... coastline stalled in the Legislature ... nor lean cashed for a little-known ... to slow development and put ... legislators.

Inc. ... on in ... March ... A. Inc. ... on creditors while ... products Management ... hat reorganization. ... The companies are ... control of a trustee, according to ... John Mitchell of ... Portlan-

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

development ... to require ... of fewer but ... larger buildings

## II. A SURVEY OF COASTAL MANAGEMENT PROGRAMS SOLUTIONS TO NONPOINT SOURCE WATER POLLUTION PROBLEMS

### A. MANAGING LAND USE: WATERSHED MANAGEMENT, BUFFERS AND SETBACKS

One of the most effective methods to protect water quality is to properly manage development immediately adjacent to waterbodies. Because state and local coastal programs can regulate the use of land, they can require buffers between development and the water. Vegetated, undeveloped land can absorb the nonpoint source pollution impact of development before it gets to the water. For example, a 100-foot buffer in native vegetation between a parking lot and a river can strain the oil and grease from cars before it reaches the water. A buffer can serve the same purpose in providing some protection from poorly functioning septic tanks.

Alaska CZM\* uses buffers to protect rivers rich with salmon.

Nearly 50 percent of the United State's entire sockeye salmon production comes from Bristol Bay, Alaska. The local coastal program wanted to assure protection of the coastal waters for salmon, which is an important commercial and subsistence resource.

The Bristol Bay local coastal program establishes a 100-foot buffer for development which does not need to be adjacent to the water. The buffer thus protects the rivers for salmon migration, spawning and rearing and extends to the tributaries that affect those waters. Program policies place high priority on maintaining subsistence activities by natives and controlling the potential water quality impacts from placer mining.

The California Coastal Commission addresses nonpoint source pollution through its review of permits and local coastal programs.

The California Coastal Act contains policies related to controlling runoff and requiring vegetated buffers, which enables the Commission to review individual permits to require grading plans and erosion control provisions.

The Commission also reviews local coastal programs developed by cities and counties for consistency with the nonpoint source pollution policies.

---

\*Throughout this document CZM refers to the coastal management agency. Refer to Part V for specific agency names and addresses.

For example, the Santa Barbara County Local Coastal Program establishes minimum buffers for wetlands and stream corridors. A minimum 100-foot buffer must be maintained in its natural condition along all wetlands. A minimum buffer for major streams in rural areas is 100 feet and 50 feet in urban areas. The local zoning code incorporates these requirements thus assuring their implementation.

The Rhode Island Coastal Program requires buffers for new development along non-bulkheaded waters.

Under its permit program, the Coastal Resources Management Council reviews all development within 200 feet of the water. It requires a minimum 50 foot setback and requires additional buffers, kept in natural vegetation, of up to 200 feet adjacent to environmentally sensitive waters. In addition, for large residential and commercial projects, other requirements may be imposed such as: 1) conservation easements on buffers, complete with boundary markers; 2) commercial lawn care restrictions built into the condominium articles or individual lot deeds; 3) access and buffer management plans; 4) restrictive covenants on future activities; 5) education programs put together by the developer regarding the site's sensitive areas; and 6) where sewage treatment plant upgrades are a concern, new developments are phased in with the plant upgrades.

New York local governments use CZM funds to address nonpoint source pollution problems.

The Town of East Hampton coastal program has a seven point program to address nonpoint source pollution: (1) setbacks from waters for structures and septic systems and low density zoning; (2) land acquisition and conservation easement programs; (3) redesign of street ends to minimize runoff; (4) fertilizer application and land clearing restrictions; (5) a permit system which requires special review of projects near designated natural features; (6) surface water quality monitoring and testing and (7) improved local law enforcement. All of these practices are incorporated into local zoning and are included in the Local Waterfront Revitalization Program which is binding on State agency actions.

North Carolina requires permits for development projects impacting critical areas.

CZM reviews development in the 575 foot Area of Environmental Concern adjacent to nine waterbodies designated as Outstanding Resource Waters. CZM also reviews all development within 75 feet of tidal wetlands. New development projects cannot add nonpoint source impacts on the critical areas.

Maryland encourages planting buffer zones.

CZM funds have been used to plant trees, shrubs and native ground cover in several areas along the Chesapeake Bay and its tributaries. The state's "Greenshores Program" promotes the planting of forested buffers along the shoreline of the bay. This activity is especially important because these buffers minimize nonpoint pollution, as well as provide wildlife habitat.

In American Samoa, a local village council regulates land use to protect a lagoon.

CZM has supported a significant public education effort which combines the protection of wetlands and other natural resources with the preservation of Samoan culture. Meetings in Nu'uuli Village resulted in support from the local village council for continued regulatory and enforcement efforts to protect Pala lagoon from nonpoint pollution sources. This was a significant resource management landmark in working within the traditional land tenure system in American Samoa.

A mangrove forest adjacent to the Nu'uuli lagoon was threatened by nonpoint pollution and encroachment by filling. Recognizing the significance of the lagoon, the Coastal Program commissioned a resource management study. As a result, the American Samoa Government obtained EPA funds to construct a sewer line around the lagoon to significantly reduce water quality threats from 400 nearby homes.

In Massachusetts, coastal Areas of Critical Environmental Concern (ACEC) along rivers and estuaries are protected.

After an area is designated an ACEC, proposed development projects within it are subject to more intense scrutiny under the Commonwealth's regulatory programs and the Massachusetts Environmental Protection Act. For example, every application for a dock or pier located in an ACEC is reviewed for nonpoint pollution impacts. There are currently 12 ACECs designated, which protect over 145 miles of shoreline.

New Hampshire assists local governments to incorporate water quality issues in land use decisions.

CZM funds were used to prepare the estuarine portion of the water resource plan for the towns of Newfield and Stratham. A comprehensive resource inventory and maps of resources along the river corridor will be

prepared. This information will be used by both towns in making decisions on zoning, subdivision controls, and setbacks.

Maine requires a 75-foot setback for construction along, marine and fresh waters so as to maintain vegetated buffers and reduce non-point source contributions.

The CZM program, through the State Shoreland Zoning Law, requires coastal communities to zone all lands within 250 feet of any waterbody. Within this zone it establishes a 75 foot setback along marine waters (100 feet along fresh water). In 1990, the law was amended to strictly limit the amount of clearing that can occur so as to maintain a vegetated buffer. No development, other than waterdependent uses, can occur within 75 feet of the water, including construction of roads and parking lots. Furthermore, in 1990, the CZM program adopted numerical standards to control sediment and phosphorous contributions to waterbodies.

## **B. CONTROLLING URBAN AND SUBURBAN RUNOFF**

Control of stormwater runoff can significantly control pollutants. Stormwater can contain soil from eroding cliffs and construction sites, as well as lawn chemicals, street litter, oil and grease. State coastal programs issuing permits or having other land use authorities often require stormwater prevention techniques for new developments to assure that stormwater is controlled.

Urban runoff, containing street litter, pet waste, road salt, sand and oil, can be carried by water and winds into adjacent rivers. State coastal programs are beginning to get involved with towns to emphasize the importance of regular street sweeping, catchment basins, and other activities.

North Carolina requires new developments to control stormwater and encourages local coastal plans to include stormwater regulations.

CZM initiated the development of stormwater runoff regulations which now apply to all new development projects adjacent to estuarine waters.

CZM has encouraged local land use plans prepared in coastal counties to include stormwater runoff plans. Nine plans are currently being completed.

New York local coastal plans require no increase in stormwater runoff and redesign streets to control runoff.

The local waterfront plan of the Village of Mamaroneck instituted stormwater runoff retention regulations which require that peak rates of discharge are not increased beyond pre-development or pre-construction levels for all new development. This "zero increase" policy is now a model for other local waterfront plans.

The Village of Patchogue used CZM funds to redesign street ends to reduce stormwater flowing directly into the bays and rivers. Included in the redesign were sediment basins and buffers of native planting.

In Wisconsin, a Priority Watershed Program protects the Milwaukee River.

The coastal program funded a study to control nonpoint source pollution in the Milwaukee River. A model ordinance for construction site erosion control and a development handbook were prepared. Model ordinances for other urban problems are being developed on stormwater, water retention, pet waste and sweeping streets. In agricultural areas, CZM is working with landowners to develop conservation plans.

South Carolina Coastal Council reviews stormwater management plans for new permits.

The Coastal Council adopted stormwater guidelines in 1988, which generally require retention of the first inch of rain and requires the release of runoff in excess of one inch to be at a rate no greater than if was undeveloped based on a five-year, 24 hour storm event.

Rhode Island requires CZM applicants to submit professionally designed sedimentation and erosion control plans and stormwater management plans. They also manage all the poorly flushed estuaries in the state on a watershed basis.

All developments subject to CZM jurisdiction (a minimum of 200 feet from the coastal water) are required to have on-site treatment of a one year storm event and are required to keep runoff at pre-development levels. Discharging of run-off directly into the estuaries is prohibited. Run-off from parking lots and roads must be treated to remove oil and sediments, and all driveway and parking areas must be of a pervious material.

To protect poorly flushed estuaries, the CZM develops Special Area Management Plans which form interagency agreements at the State and local levels. These agreements are the basis for action plans which outline how various nonpoint source pollution problems are to be regulated and corrected. Thresholds for development which trigger CZM jurisdiction within these areas are subdivisions of six units or more and commercial developments which require one acre or more of impervious surfaces.

CZM works with towns and the State Department of Transportation to identify trouble areas in the road drainage systems for retrofit and upgrades.

### C. IMPROVING SEWAGE DISPOSAL SYSTEMS

Poorly located or faulty septic systems are a major source of pollutants in some rural and suburban waters. As a result shellfish bed closures are often necessitated. Coastal programs have been involved in assisting local governments and homeowners in correcting these problems, and in evaluating and monitoring alternative systems.

New York funds promotion of alternative systems.

CZM funded Save the River, a non-profit group operating along the St. Lawrence River, to assist riverfront property owners in correcting faulty individual sewage disposal systems that have polluted the river for years.

Based on the premise that if people knew they were polluting they would take steps to correct problems if they were shown how, homeowners are provided with free, on-site surveys on the effectiveness of their system. Trained volunteers conduct the surveys using tracer dyes and offer information about alternative systems such as aerobic tanks, low flush, composting and incinerating toilets.

Once a homeowner successfully passes the survey, Save the River awards them a hand-crafted Save the River Clean Water Award. Over 120 surveys were conducted in the summer of 1989; there is currently a waiting list of 45.

Rhode Island assists owners to properly maintain or improve septic tanks.

CZM awarded grants to the towns of Charleston and South Kingstown to evaluate septic systems that were suspected of having failed near the ecologically fragile salt ponds. A CZM funded brochure about the "care and feeding" of septic systems was mailed with tax bills to property owners. As a result of this effort, South Kingstown established a tax rebate as an incentive for annual pump-outs.

CZM funds were also used to provide information to owners about low interest loans and a State grant program to make desired improvements. The towns were influential in obtaining State legislation which enabled special management districts to be created for non-sewered areas. Four districts are now operating which have an inspection system requiring mandatory pumping every three years and the authority to make corrections.

CZM permits require upgrading of an inadequate system as a condition for all rehabilitation or enlargement permits of over 150 square feet.

#### D. CONTROLLING MARINA IMPACTS

Wastes from boats can severely degrade shallow estuarine waters. The long-recognized solution for controlling boat wastes has been to require boats to have holding tanks and marinas to have facilities for pumping them out. While there has been some resistance to these approaches in the boating community, CZM programs have often pressed for requirements for pump-out facilities in new marinas. Marinas also cause adverse impacts on waters through their normal operations - i.e., pumping gas, scraping and painting hulls, and engine repairs. CZM permits have been used to control some of these impacts.

Poorly sited marinas can destroy habitat and degrade water quality when located in basins with low flushing rates. Marinas can alter circulation patterns and destroy wetlands during construction and maintenance dredging. CZM programs have played an active role in the siting of new marinas, using regulatory permits to direct marinas away from pristine or valuable shellfish areas. Dredging for marinas is also closely reviewed by coastal programs. Another criterion for siting has been assuring that flushing rates and circulation patterns in proposed project areas are adequate to minimize adverse impacts on water quality and habitat protection.

Connecticut CZM requires pump-out facilities for new marinas and proposes "No Discharge Zones."

The State requires pump-out and other marina sanitation facilities as a condition of approval for all permits for new marinas and significant marina expansions. CZM has proposed legislation which would establish "no discharge zones," requiring marinas and other dock facilities to provide pump-out facilities, and allowing inspection of vessels and docking facilities for compliance with the new regulations.

New Jersey CZM requires pump-out facilities for new marinas and controls siting of marinas in critical areas.

The CZM permit requires pump-out facilities for new or expanding marinas. The permit may require dockside restrooms. CZM has proposed legislation to recover some of the fuel tax from recreational boaters to subsidize pump-out facilities at existing marinas.

CZM has been actively involved in improving water quality along the St. Georges watercourse in Brigantine, Atlantic County. In addition to initiating a Special Area Management Plan to address many coastal issues, CZM has been denying permit applications for the construction of marinas, docks and piers because of the presence of valuable, harvestable shellfish resources. As a result, there has been a continuing improvement of water quality.

CZM has completed a shellfish mapping project which identifies areas of high density shellfish resources. These maps are used by permit review staff in decisions on siting marina development in the coastal zone.

Delaware CZM has supported marina retrofitting legislation.

The CZM agency will promulgate final regulations on marina siting and operations in March 1990. The regulations will include requirements that existing marinas develop operations and maintenance plans. These plans must address the 1988 marina pump-out law, which requires existing and new marinas to provide pump-out facilities for all vessels, and direct slipside pump-outs for liveaboards.

The South Carolina Coastal Council minimizes marina impacts on wetlands and marine resources.

The Council not only regulates siting of marinas but also their operations. See Part III D of this report for details.

## E. SITING LANDFILLS AND REDUCING PLASTICS AND LITTER

Solid waste landfills often have been placed adjacent to rivers with little thought given to their impact on the adjacent waters. Landfills can leach toxics and nutrients into the groundwater and from there into adjacent rivers. Direct contamination can occur during floods.

Litter often is washed directly into waterways with stormwater or through combined sewer outfalls. Coastal programs have been involved in several efforts to control solid waste, including leading a massive, nationwide beach cleanup effort every fall. (See Coastal Management: Solutions to Our Nation's Coastal Problems, December 1988 for details.)\*

Some Alaska local programs prohibit hazardous waste in landfills.

The Juneau local coastal plan prohibits hazardous landfill materials within 100 feet of a floodplain, in order to protect the waters from any leaching from the landfill.

In addition, no new development which will involve the storage of hazardous materials will be permitted in the 100 year floodplain unless there is no feasible and prudent alternative and unless safety measures are provided to prevent accidental discharges.

Alabama requires solid waste sites to control impact on coastal waters.

CZM funds have been used recently to conduct a solid waste monitoring study of unpermitted solid waste sites in the coastal zone. Sites were inventoried using aerial reconnaissance and field inspections. Property ownership was determined. After notification, the State negotiated with owners to clean up the sites and has initiated several administrative and enforcement procedures against owners still not complying.

New Jersey encourages street sweeping and improves solid waste handling.

As part of its coastal development permit, CZM has required regular street sweeping when litter is likely to be a major pollutant. CZM and the U.S. EPA worked together to examine sources, types, and movement of marine debris along the New Jersey coast. A major debris wash-up in August 1987 of medical waste, wood, and glass was investigated. It was found that the

---

\* Copies available from OCRM, see address in Preface.

solid waste handling, transfer, and disposal procedures of New York City were the major source of floating debris. The City and New Jersey have since reached agreement to reduce inadvertent releases of trash as it is moved by barges.

Mississippi CZM enforces strong pollution legislation.

The CZM initiated legislation which made the State the first to adopt the marine pollution provisions of Annex V of the Protocol of 1978 of the International Convention of Pollution. CZM now monitors and enforces this State law and promotes increased public awareness through information programs.

The legislation prohibits the discharge of any litter from land, any size marine vessel, oil rigs, or the air. It regulates the discharge of all types of plastics, garbage, food and human wastes. Boaters will also be held liable for accidental spills, dumping or disposal of materials into State waters.

California Coastal Commission encourages recycling as part of its Adopt-A-Beach program.

A specific goal of the Commission's Adopt-A-Beach program, a year-round coastal clean-up program, is to increase the number of beaches where recycling occurs. Currently, all beaches operated by Los Angeles County have recycling programs for beach debris.

## **F. MANAGING FARM PRACTICES**

Farming practices can be a significant source of nonpoint pollution. Fertilizers, chemicals for weed control, soil tilling in a manner that causes runoff into the waters, and animal waste can all cause pollution. Minor changes to farming operations by farmers can limit these impacts. Coastal programs have worked with local soil conservation officials and rural governments to assist farmers to use best farm management practices on a voluntary basis and occasionally have used the regulatory process to require such practices.

Delaware funds a unique solution to the animal disposal problem.

Numerous large poultry growers operate in Delaware; manure and bird carcasses create a significant nonpoint source pollution problem. Local conservation districts, which operate with CZM funds, have developed a dead bird composting program in cooperation with extension services and state universities. Farmers first add a mixture of manure and water to bird carcasses. The compost pile then "cooks" the carcasses through natural processes until only compost remains. The process is virtually odor-free and produces a quality compost. Although the program is only in the pilot stage, the results are encouraging.

Maryland requires conservation plans and best management practices on agricultural lands.

The Maryland Critical Area Program requires soil conservation and water quality plans to be developed for agricultural lands and best management practices implemented to minimize runoff from agricultural lands. See III A for details about the Critical Area Program.

The Maine CZM program adopted revisions in 1990 to the Shoreland Zoning Law which require more stringent municipal management of agricultural activities along marine waters.

New agricultural activities (e.g., tilling, grazing, and manure storage) along marine waters must be performed consistent with requirements applied to construction activities (e.g., buildings, parking lots, etc.). Furthermore, existing manure storage facilities within 75 feet of the shore must be removed or reconstructed to meet a "no discharge" standard by 1995.

In Washington CZM conducted a study which found farming practices contributed to pollution and developed procedures for improvements.

Better pasture management, including fencing along the creeks, were initiated as a result of a CZM study. The success of this small study led to a larger effort by the State to develop a Basin Water Quality Plan which was partially funded by CZM. See Part III C of this report for more details.

## G. MONITORING NONPOINT SOURCE POLLUTION

The specific relationships between development and nonpoint source pollution are not completely understood nor are the solutions. State CZM programs have initiated unique research and monitoring activities to increase their understanding of these relationships.

Rhode Island CZM monitors septic systems and establishes "Pond Watchers".

CZM, working with the University of Rhode Island (URI), and URI Sea Grant, funded research to monitor and field check an innovative denitrification septic system which CZM had required homeowners to use in an extremely sensitive cove. The ongoing study has found that standard septic systems remove much less nitrogen than scientists previously believed.

The "Pond Watchers Program" has been established with citizens monitoring water quality turbidity and other physical and chemical parameters. Their information is forwarded to CZM for analysis and action. This program has been so successful that the State has expanded it to certain rivers.

New Hampshire CZM monitors the Great Bay.

CZM has identified nonpoint source pollution as a potential problem in the Great Bay area and is funding a project through the Jackson Estuarine Laboratory to study the significance of high volume runoff storm events on bacterial and nutrient loading.

The study results will be used to develop improved criteria for municipal water resources plans which are now required by the Water Protection Assistance Program Act. These plans are a prerequisite for either adopting or amending local zoning ordinances.

In Washington, coastal funds are used to investigate freshwater wetlands for nonpoint pollution control.

Kings County used CZM funds in a multiphased research program to investigate the viability of using freshwater wetlands for urban surface water management and nonpoint source pollution control. The project involves collecting baseline data, sampling, analyzing, and monitoring the wetlands and interpreting the results to devise policy and management guidelines that protect wetlands and downstream waterbodies.

In 1989, CZM funded the design of a monitoring program to diagnose sources of bacterial contamination of shellfish beds. Since its completion, a

number of water resource managers have used the monitoring program in other localities.

South Carolina CZM funded instream monitoring.

CZM funded Section 208 Clean Water Act updates for communities located in the coastal zone. As part of the update for the Charleston area, CZM funded instream monitoring for water pollutants and sources in the Ashley and Waccamaw Rivers.

Northern Mariana Islands provided staff and funds for water quality monitoring activities.

CZM has provided staff and funding to support the Commonwealth's water quality monitoring program, within the Division of Environmental Quality. In addition, special studies have been conducted such as the Suspended Sediment Load Study for Saipan Lagoon and Lau Lau Bay, which was completed in August 1989.

New York CZM scientifically studies two stream corridors.

CZM, with the Long Island Regional Planning Board, is developing recommendations for maintaining and improving fresh and marine water quality in stream/river corridors feeding into the Great South Bay. The study will be conducted using one semi-rural and one urban stream corridor. The purpose of the study is to identify linkages between land and water uses and activities and impaired water quality and, based on those linkages, recommend the most effective action needed to cope with stream corridor pollution.

In Florida, over \$30 million in State funds in 1987 and 1988 were directed to water basin monitoring and planning.

CZM developed the administrative procedures to guide the program and administers the trust fund grants to water management districts. CZM also manages the State review of completed basin plans. See Part III B of this report for more details.

Using CZMA funds, CZM developed guidelines for interpreting metal concentrations in coastal sediments. The guidelines have been used to identify the extent of nonpoint source pollutant metals in several estuaries.

## H. INCREASING INFORMATION ABOUT NONPOINT SOURCE POLLUTION

Because nonpoint source pollution is difficult to control and some of its reduction requires citizens to alter their actions, there is a large role for public education. Coastal programs have been actively involved in information exchange on a broad spectrum of problems by providing newsletters and other publications which have proven useful in increasing public understanding. In addition, coastal programs have worked with special interest groups, such as developers, who have specific technical information needs which can be met through publications and training sessions.

Northern Mariana Islands sponsors Stormwater Control Handbook.

CZM contracted with the SCS to prepare a handbook to assist developers and farmers in minimizing erosion and sedimentation of marine waters. The handbook includes soil and rainfall information specific to the inhabited islands of Saipan, Tinian, and Rota, as well as technical guidance for controlling runoff during construction and farming operations.

Other state CZM programs which have prepared similar handbooks are New Jersey, South Carolina, Virginia, Rhode Island and Maryland.

New York cosponsored three workshops on nonpoint source pollution.

In 1989, the coastal program cosponsored three workshops focusing on the Peconic Bays to address: 1) boater pollution 2) septic systems and 3) nonpoint source pollution. Experts from other states were brought in to describe their experiences, and over 150 people attended. Written summaries of the results of the workshops are available.

Rhode Island distributes an information letter to all permittees on care and maintenance of buffer areas.

The letter describes the property owner's responsibilities and potential legal repercussions for violations.



### III.DETAILED EXAMPLES OF COASTAL MANAGEMENT AND NONPOINT SOURCE POLLUTION

#### A. CRITICAL AREA PROGRAM IN MARYLAND

##### Overview and problem

In passing the Chesapeake Bay Critical Area Protection Act (Critical Area Act) in 1984, the Maryland General Assembly recognized that the cumulative effects of human activity have resulted in deteriorating water quality and productivity of the Bay and its tributaries. The primary purpose of the Critical Area Law is to foster more environmentally sensitive development within Chesapeake Bay's critical areas thereby minimizing damage to water quality and natural habitats.

The bay has experienced three centuries of human use and neglect. Rapidly increasing population and development pressures, and agricultural and urban runoff have caused an increase in bay nutrients which deplete the oxygen supply for fish and aquatic life. Uncontrolled agricultural practices and urban development have increased sedimentation of the Bay, blocking the light needed for submerged aquatic vegetation and filling navigational channels. Finally, toxic laden runoff and dredge material disposal have adversely affected the diversity and health of bay species.

##### The Chesapeake Bay

The Chesapeake Bay is the nation's largest estuary and one of its most valuable natural resources. Located within Maryland and Virginia, its mainstream is over 195 miles long and 3.4 to 35 miles wide. The bay drains 64,000 square miles with over 150 rivers, creeks and streams flowing through portions of six states and the District of Columbia.

The bay provides an abundant fishery and wildlife habitat of national importance. Its extensive finfish and shellfish harvest represents an annual commercial value of approximately one billion dollars. In addition to the riches from its waters, the extensive 7,000 miles of shoreline and over 200,000 acres of wetlands support more than 2,700 species of animals and plants, and are a major stopover for migratory birds along the Atlantic flyway.

##### Development and administration of the Chesapeake Bay Critical Area Program

In 1983, the Governor of Maryland appointed a task force to address the declining health of the Chesapeake Bay. The task force proposed that the State enact a Critical Area Act. During initial discussions, the Maryland Coastal Zone Management Program's (MCZMP) Coastal Resources Advisory Committee

(CRAC) played an important role in the development of the Critical Area Act. The CRAC, with over 100 members from local governments, state agencies, Federal agencies, and private interests, is supported by CZM funds, and advises the Maryland Department of Natural Resources (DNR) on coastal issues.

In June 1984, the Critical Area Act was enacted and the new Critical Area Commission (Commission) began developing the criteria to guide local government development and implementation of local Critical Area Plans. The 26 member Commission is composed of local officials and broadbased interest group members from each coastal county, as well as state officials. After much public input, the Commission promulgated criteria in December 1985, which were then signed into law in May 1986. Local plan development then started and by January 1990, 55 of the 60 local plans were completed and are being implemented. The five remaining plans are nearing completion. Since 1983, approximately \$1.4 million in federal CZM funds have been used by the MCZMP, the Commission, and CRAC in the development and implementation of the Critical Area Law. State funds for the Critical Area Program have totaled more than \$10.4 million.

The Critical Area Program includes all Chesapeake Bay tidal waters and tidally submerged lands, the 100-year tidal floodplain and extends 1,000 feet beyond the landward boundaries of state or private wetlands. Local governments may expand the boundaries of their critical area, but they cannot reduce it below the 1,000 foot minimum area. Within the 1,000 foot management boundary, local jurisdictions are required to incorporate the Commission's criteria into their plans and permit process. The criteria contain policies addressing habitat protection, water dependent facilities, agriculture, surface mining, and development.

The primary responsibility for implementing the Critical Area Act lies with the local governments which are required to develop management programs to carry out three protective goals: (1) minimize adverse impacts on water quality; (2) conserve fish, plant and wildlife habitat; and (3) establish land use policies for development in the Critical Area.

#### Criteria for controlling nonpoint pollution through the Critical Area Program

To minimize the impact of growth on water quality, the Commission designated three land use categories: Resource Conservation Areas, Limited Development Areas, and Intensely Developed Areas.

- \* Resource Conservation Areas (RCAs) generally have less than one dwelling unit per five acres, no public water or sewer, and are mostly composed of wetlands, forest, and uncultivated and cultivated fields. Development in RCAs is limited to an overall density of one residential dwelling unit per 20 acres. Local governments are directed to conserve, protect, and enhance

ecological values, biological productivity, and species diversity in the critical area. Development activities in the RCA must also comply with the Limited Development Area criteria.

- \* Limited Development Areas (LDAs) are characterized by one dwelling unit per five acres up to four units per acre. The LDAs have water and/or sewer, and land use is mixed but not dominated by agriculture, wetlands, forest or open space. Nonpoint source pollution controls for LDAs include restricting the removal of forested land to 20% for any one development project, limiting impervious areas to 15% of a site, encouraging clustering of dwelling units, criteria restricting stream alteration, and requirements for replacing cleared forest land elsewhere in the critical area on a one-to-one basis.
- \* Intensely Developed Areas (IDAs) are characterized by dense residential or commercial uses. IDAs have four or more dwelling units per acre and/or have public sewer and water serving three or more units per acre. Reducing nonpoint source pollution in IDAs is accomplished by reducing pollutant loadings by 10% from pre-development loads for redevelopment projects, protecting remaining wooded areas and enhancing vegetation for new developments, and requiring local government water quality assessments and programs that improve water quality and protect remaining natural habitats.

Up to five percent of a county's RCA may be redesignated as IDAs or LDAs, excluding the RCA acreage in tidal wetlands or federally owned property. No more than one-half of this expansion may occur in the RCA.

Specific nonpoint source pollution control policies which apply to the entire Critical Area include: establishing a minimum 100-foot buffer landward from the mean high water line of tidal waters, streams, and wetlands; a minimum 25-foot buffer around non-tidal wetlands; limiting timber harvesting 50 feet from the Bay and perennial tributary streams; developing agricultural soil conservation plans and best management practices; and maintaining a 25-foot filter strip along tidal waters until a soil conservation plan is implemented.

#### Evaluation and future efforts

Local Critical Area Plans are now being implemented. The success of the program depends on adequate enforcement at both the state and local levels. In addition, sufficient funds will be needed by the Commission and the local governments to fulfill their responsibilities. While the Commission is already seeing an increase in forested areas due to the criteria and better development designs, there is growing concern that the program which promises to do much for the health of

---

the Chesapeake Bay may be inadequate by itself. Many believe that increased growth along the entire bay watershed, may, in the long run, overwhelm efforts to improve water quality unless stricter controls and stronger growth management policies are applied. In response to this concern, the Governor of Maryland appointed the 2020 Chesapeake Bay Growth Management Commission to examine this problem. Recommendations from the Commission are expected in the fall of 1990.

## **B. BASINWIDE WATER QUALITY IN FLORIDA**

### **Overview and problem**

The State of Florida is growing at a tremendous pace. Despite the economic benefits of development, rapid growth exerts pressures on the natural systems including wetlands and water quality. Urban development within the state and increased agriculture has increased stormwater and waste water loading in many watersheds in the State. Florida responded to these pressures by setting up a variety of statewide, regional and local initiatives to address water quality issues. Two of these important programs are described below:

### **Development and administration: SWIM program**

The Surface Water Improvement and Management Act (SWIM) was signed into law by Governor Martinez on June 29, 1987. This landmark legislation set up a program and provided initial funding to begin the cleanup and restoration of polluted surface water in Florida, along with the preservation of threatened waterbodies within the State. The State's five water management districts are responsible for implementing the law.

Each water management district is required to address priority waterbodies named by the legislature within its area and prepare a priority list of other waterbodies in need of restoration, conservation and/or preservation.

Funds are provided through a trust fund administered by the state Department of Environmental Regulation (DER). The Coastal Management Program, within the DER, is responsible for reviewing and recommending actions pertaining to SWIM waterbody plans, projects, and funds. The Coastal Zone Management grants have provided significant influence over the direction taken by the water management districts' SWIM activities.

### **Criteria to control nonpoint source pollution: SWIM program**

After they identify priority watersheds, each water management district develops a plan to address the identified water quality problem for each watershed. Besides biological and physical descriptions of the waterbody, the plans contain land use and nonpoint source assessments which will help determine overall impacts of land use within the basin and lead to revised best management practices. The plans identify legal frameworks, needed coordination efforts between state and local entities, and public information programs required for the success of the overall effort. The plans include a timetable for bringing all sources into compliance with state water quality standards and a strategy to restore those water bodies

in need of restoration. Finally, the plans will describe projected cost and revenue capability in order to reach each intended water- body goals.

#### Evaluation and future efforts: SWIM program

The Coastal Zone Section within DER's Bureau of Surface Water Management has played a pivotal role in overseeing the SWIM program. Coastal zone staff produced the administrative procedures used to guide the statewide program and administer the SWIM trust fund grants to the water management districts. The coastal zone staff also directly manages the State's review of proposed SWIM plans including coordination of DER and other State agency comments. These efforts have been essential to the success of the program to date.

As of August 1989, the DER had approved SWIM plans for 18 waterbodies, including, among others, Tampa and Biscayne Bays, Apalachicola River and Bay, and the Suwannee River. Plans for such critical areas as the Everglades Natural Park/Florida Bay, Indian River Lagoon and the lower St. Johns River were either conditionally approved or are under development.

#### Development and administration: Estuarine Initiative

For several years, CZM funds have been a catalyst for interagency investigations to assess the overall health of the several major estuarine areas, to identify priority management problems, and to provide direction and leadership for coordinated intergovernmental management. Major improvements have been made in Florida's ability to cope with present and future problems affecting these areas due to the actions funded through this program. The importance of CZM funding in making these achievements possible is significant.

Little Manatee River Project This project is one of four main estuarine areas being funded through the Estuarine Initiative. The objective of this project is to develop a comprehensive, basin-wide management program for the Little Manatee River watershed, involving Federal, state, regional, and local agencies. The project will also serve as a prototype for similar efforts in other watersheds in the Tampa Bay system, with the long term goal of enhancing the overall health of the bay.

The Tampa Bay area is one of the fastest growing regions in the State. Impacts of this growth on the Tampa Bay estuarine system have been the subject of numerous scientific investigations and have triggered a variety of efforts related to controlling point sources of pollution, habitat destruction and other negative activities. The State recognizes that if they are to be successful, these projects must be better coordinated and must be conducted within a broader, basin-wide management perspective. They must also focus clearly on controlling nonpoint source pollution, maintaining historic freshwater inflows to the estuary, and

integrating consideration of living resource management efforts in local and regional capital improvement programs and comprehensive plans.

The Little Manatee River is a priority tributary of Tampa Bay, providing nursery habitat for many fish species, and is critical to the quality of the state aquatic preserve in the area. This area is the last major river of the Tampa Bay system remaining in relatively natural condition. Although there has been considerable state, regional and local interest in the area, local governments have been unable to develop a comprehensive management plan for the watershed primarily due to a lack of funding and intergovernmental support. The Initiative will foster such a comprehensive plan.

Phases 1 and 2 of the project have been completed. Work elements completed during Phase 1 include the collection of chemical, hydrological, and biological data from the Little Manatee River and identification of sources and acquisition of land use information for incorporation into a geographic information system (GIS). In Phase 2, riverine data was analyzed to develop a hydrological characterization of the watershed, rating curves and fluxes of dissolved and particulate nutrients, and characterization of biological communities. The land use information was entered into the GIS.

#### Evaluation and future efforts: Estuarine Initiative

Phase 3 of the project, now underway, involves a coordinated effort by DER/CZM, Department of Natural Resources, Southwest Florida Water Management District, and Hillsborough County to develop the management plan for the Little Manatee River. As a result of the progress made using CZM support, the Phase 3 effort is being jointly supported by CZM and the Florida SWIM program.

The CZM funds have provided the management tools and leadership focus necessary to leverage State, regional and local funding and provided continuity of effort toward achieving priority goals and objectives. This has influenced State legislation and made possible ongoing State, regional and local programs to help manage the Tampa Bay system.

Project results are intended to improve the overall management of local and State programs affecting the Tampa Bay area and provide the basis for integrating local land use, environmental protection and stormwater management programs with the ongoing effort of State agencies charged with water quality and habitat protection.

## C. MARINA SITING IN SOUTH CAROLINA

### Overview and problem

The South Carolina coastal zone contains more tidal marsh than any other Atlantic coast state. The ecological importance of wetlands and other estuarine aquatic habitats is well established. Population growth, development and recreational demands, however, continue to threaten wetlands, jeopardizing their value as wildlife habitat, nurseries for finfish and shellfish, and as filters for natural and man-made pollutants.

Marina construction can destroy productive estuarine areas through dredging and bulkheading. Shading, maintenance dredging, and various forms of water quality degradation create continuing stresses on wetlands adjacent to marinas. Improper marina siting and design can heighten wetland stress through inadequate tidal flushing, sedimentation control, and stormwater management practices. Marinas often indirectly create adverse effects through increased residential and commercial development, road construction, and related activities.

### Development and administration

Two state agencies play a key role in reviewing marina permits in South Carolina:

- \* The South Carolina Coastal Council (SCCC) is responsible for permitting in tidal areas. The SCCC considers permits in the context of its marina policies and other coastal zone management considerations established in the South Carolina Coastal Management Program; and
- \* The South Carolina Department of Health and Environmental Control (DHEC) issues a water quality certification under §401 of the Clean Water Act. Additionally, marinas must meet DHEC requirements for sanitation, fuel, sewage, and related facilities.

Under the South Carolina Coastal Management Act of 1977, the SCCC has direct permitting authority for activities in the "critical area," which includes estuarine and salt marsh areas, and indirect permitting authority through certification reviews throughout the eight coastal counties. The SCCC has signed agreements with State agencies outlining the consultation process. The SCCC is active in developing a regulatory framework to protect tidal wetlands. Anticipating increased demands for new marina construction and recognizing problems in existing marina operations, the SCCC in 1984 developed comprehensive requirements for new marina siting and operations.

### Marina siting criteria

According to SCCC policies, marinas should be sited and designed to:

- \* Minimize adverse effects on wetlands, wildlife habitat, and marine resources;
- \* Take advantage of physical characteristics so as to minimize dredging and shoreline fill and excavation;
- \* Avoid disrupting currents and ensure that all docking areas, turning basins, and navigation channels flush adequately with the tides;
- \* Build where possible open dockage which leads to deep water instead of boat basins, and where feasible, dry storage instead of wet slips;
- \* Provide for proper handling of petroleum products, sewage, waste and other refuse consistent with DHEC specifications; and
- \* Construct boat maintenance facilities on dry land and provide for residue control.

Finally, marina developers must demonstrate to SCCC satisfaction that public demand for the facility exists.

To assist marina developers, the SCCC published a document detailing step-by-step procedures for engineering and environmental analyses which are required in the permit application. The Council published a marina operations handbook, presenting the policies for managing the primary environmental risks in coastal marinas. The operations manual also recommends management rules and regulations to help protect adjacent waters.

Before filing a permit application, developers must meet with SCCC and DHEC for a pre-application conference to discuss the project, identify major obstacles to constructing the proposed marina, (such as proximity to shellfish beds) and decide on the scope and depth of the Coastal Marina Report (CMR) required by the permit application. The CMR includes engineering evaluations of marina siting and design, environmental assessments of the site, and technical studies of dredging requirements, tidal flushing, and other considerations.

The CMR is a comprehensive review of the proposed marina and its effects and includes:

- \* A description of the proposed project (siting justification, dredging and spoil disposal plans, construction drawings, and a demonstration that the marina project is needed);
- \* A description of the existing environment (hydrology, water quality studies, soils characterization, a review of the area's terrestrial and aquatic ecosystem, historical and archeological sites, the local economy and land uses, and an evaluation of the available public facilities), and consideration of aesthetic values;
- \* An environmental impact assessment (a review of pollution loadings from stormwater runoff, and direct boat discharges in the context of state water quality standards, impacts on soils, and effects on the aquatic and terrestrial ecosystems);
- \* A review of measures taken to mitigate the effects described in the environmental impact assessment;
- \* A summary of unavoidable adverse and beneficial impacts on water quality, ecosystems, historical sites, local economy, public infrastructure, and aesthetic values; and
- \* A complete marina operations and maintenance plan.

#### Marina operations criteria

As part of the permit application package, the marina developer submits a marina operations and maintenance (O&M) plan acceptable to the SCCC, DHEC, and the U.S. Coast Guard. Should the SCCC issue the permit, the operations and maintenance plan becomes a permit condition. Required components of the O&M plan include:

- \* **Water quality management:** O&M plans must address sewage disposal, fuel pumping precautions, and a complete regime of water quality sampling and testing. Where appropriate, the SCCC consults with DHEC and/or requires DHEC certification of procedures and equipment.
- \* **Maintenance dredging/disposal and shoreline construction operations:** The plan must describe the extent of maintenance dredging anticipated and mitigation measures to be taken. The plan must certify that all spoil will be

disposed of in permanent upland sites and must describe those sites and their preparation. Further, the SCCC must be notified of any maintenance dredging 30 days before it takes place; a report of the activity must be filed with the SCCC upon conclusion of each maintenance dredging activity. Dredging is permitted only from December 1 to March 1.

- \* Shoreline construction approved in the permit must follow accepted practices such as the use of silt screen and/or absorbent material to isolate construction activity from natural waters. The O&M plan must include a description of all techniques used to protect the environment.
- \* Oil pollution management: The O&M plan must contain a comprehensive oil spill response and clean up plan. The O&M plan must also include procedures for transferring and handling fuel and other petroleum products.
- \* Sewage pollution management: Plans must include a comprehensive sewage spill response plan and procedures for transferring and handling sewage. No liveboards are permitted.
- \* Hurricane/severe weather operations: Marina operators must develop a hurricane response plan and have on hand necessary equipment and supplies. The plan must include standard operating procedures for early planning, evacuation, and recovery.

The SCCC issues a three-year renewable marina permit. Should the Council modify its policies and requirements, those modifications may become permit conditions either during the life of a permit or at the renewal stage. During renewal proceedings, the Coastal Council may reduce the size of or change the configuration of the marina to prevent further water quality degradation. The SCCC will also consider the marina's pattern of compliance with permit conditions and the efficacy of monitoring and other required programs already in place.

The SCCC enforcement staff regularly inspects coastal marinas for compliance with permit conditions and terms. The Council may impose administrative fines and penalties.

#### **Evaluation and future efforts**

The policies and guidelines developed by the Coastal Council have helped ensure that coastal marinas minimize estuarine resources loss, including wetlands and other adverse environmental effects, during a time of significant population growth and demand for new marina facilities. However, recognizing that such growth will continue indefinitely, the Council has launched a review of its marina

regulations to evaluate whether existing regulations are adequate to protect wetlands, water quality, and coastal resources.

Among policies under evaluation are:

- \* Zoning waters under SCCC jurisdiction to prohibit or severely restrict marinas and other uses of non-degraded estuarine areas;
- \* Replacing wet slip construction with dry stack or lock basin marinas unless such alternatives are not possible; and
- \* Encouraging local governments to develop comprehensive shoreline use plans and zoning regulations.

At this time, there is no agreement within the SCCC on the appropriate scope of these policies, or whether they should be adopted.

## D. WATERSHED MANAGEMENT IN WASHINGTON

### Overview and problem

Historically, Burley Lagoon and Minter Bay, located within Pierce and Kitsap Counties, have been very productive for clam, oyster, and mussel rearing, spawning, and harvesting. Increasing nonpoint source fecal coliform bacterial contamination of these watersheds has resulted in the partial or complete closure of shellfish beds since 1978.

As a rural area, the nonpoint sources of contamination from the various land uses include agricultural waste from farms, inadequate on-site sewage disposal systems, and construction related impacts. A marked expansion of rural development and population, particularly along small creeks and streams which ultimately discharge to the watersheds, has resulted in an increase of bacterial contamination, and a detrimental impact on water quality in the watersheds.

Since 1984, the Washington State Department of Ecology's (DOE) Shorelands and Coastal Zone Management Program has taken an active role in the effort to correct the bacterial problems in Burley Lagoon and Minter Bay. DOE has conducted an extensive water quality survey the purpose of which was to analyze existing nonpoint pollution sources, reduce the inundation of fecal coliform contamination, and work towards the reopening of commercial and recreational shellfish beds. DOE is lending further support by funding the development of a Basin Water Quality Plan, and providing both technical assistance and regulation enforcement.

### Development and administration

The Washington State Department of Social and Health Services (DSHS) routinely uses fecal coliform levels to determine the viability of commercial shellfish operations. Due to rising fecal coliform levels in the late 1970's, Burley Lagoon was closed for commercial harvesting of oysters in 1981, followed by Minter Bay in 1982. These two areas remain closed.

In March 1984, DOE, through its State Shellfish Protection Strategy, completed a comprehensive study that analyzed the existing water quality conditions within the Burley and Minter watersheds. The objectives for this study were to:

- \* Determine baseline levels of fecal coliform bacteria;
- \* Locate specific sources of bacterial contamination;
- \* Evaluate nonpoint source pollution associated with various land uses;
- \* Estimate the total annual fecal coliform load;

- \* Relate environmental and water quality data to levels of shellfish contamination;
- \* Recommend methods for reducing or controlling existing coliform sources and preventing further pollution; and
- \* Develop a standardized approach for investigating future sanitation problems.

The study concluded that the main contributors to fecal coliform contamination were the nonpoint sources of failing on-site septic systems, and wastes from domestic animals.

#### Evaluation and future efforts

In response to the study, Pierce County adopted new, more stringent requirements related to minimum soil absorption levels, and the installation of septic systems, while Kitsap County adopted larger minimum lot sizes.

Several important projects have been completed, including fencing of creeks, stormwater runoff control, and better pasture management have been completed: thirteen farm plans were adopted; 7,620 feet of fencing was installed; 500 feet of stream bank stabilization measures were instituted; 566 acres of pasture were protected; 2.9 miles of vegetative streamside buffers were created; 950 on-site septic systems were inspected; and 49 septic systems were found failing and corrected.

The study concluded that the most effective long-term solution to the pollution problem in the Burley and Minter watersheds was to implement regulatory measures to manage drainage, animal keeping practices, and on-site septic systems. To this end, Pierce and Kitsap Counties received grants from DOE to develop a Basin Water Quality Plan (plan) which was completed in 1988.

Throughout the plan's development, the counties have worked closely with state agencies, including DOE, which participated in the citizen meetings during which where most of the implementation measures were proposed. As the plan is implemented, the counties and state will continue to coordinate activities to assure that implementation is proceeding effectively. The plan recommends that DOE conduct water quality monitoring in conjunction with, or in addition to, monitoring by the County Health Department, and provide technical assistance for the plan's implementation and future evaluation. The plan further states that continued financial support from Federal programs, such as Section 205j of the Clean Water Act and the Coastal Zone Management Program, for projects directed at improving water quality will be sought.

## E. STORMWATER MANAGEMENT IN NEW JERSEY

### Overview and problem

The New Jersey Coastal Program provides a good example of how a coastal program has served as a catalyst to regulate new development for stormwater impacts improve stormwater standards. The Coastal Program adopted stormwater runoff policies in 1986 and uses them in reviewing all permits in the coastal zone. In 1989, the Coastal Program completed a report entitled Stormwater Management in the New Jersey Coastal Zone, which evaluated existing practices and recommended several innovative techniques for the regulatory program.

Stormwater management is designed to compensate for the added stormwater runoff and pollution caused by development. When land that was formally undeveloped becomes covered with parking lots and buildings, rain water can no longer be absorbed into the ground. Unless properly managed, this excess water can overflow into streams causing erosion and downstream flooding. Most stormwater management ordinances require that peak flows be controlled on site and that the pollutants gathered in the stormwater be cleansed. Ideally, stormwater controls will apply along an entire watershed, not just along the coast, thus capturing the nonpoint pollutants at upstream sources.

### The Atlantic Basin Watershed

The Atlantic Basin, with a drainage area of 2,059 square miles, stretches from just south of Sandy Hook to just north of Cape May. Generally, it encompasses the State's Atlantic coastline. The Atlantic Basin has a population of over 1.2 million and is rapidly growing.

For that portion of the watershed which is not subject to a coastal permit, development projects are subject to town zoning and building codes. New Jersey published a compendium of design guidelines for erosion and sediment control in 1974, which have been incorporated into most municipal ordinances within the Atlantic Basin. Some counties within the basin also have specific design criteria for subdivisions which emphasize groundwater recharge of stormwater.

### Development and administration

The New Jersey Coastal Program, located in the Division of Coastal Resources in the Department of Environmental Protection, issues permits for all development immediately adjacent to the coast and for large scale development up to 24 miles inland. The Coastal Program also passes Federal CZM funds through to localities to encourage better land use decisions at their level.

### Stormwater criteria

The Coastal Program requires that stormwater criteria be met for any development needing a coastal permit. All development immediately adjacent to wetlands and coastal waters also needs such a permit. Only larger scale developments need permits further inland (i.e., housing developments of more than 24 units, commercial areas providing more than 300 parking spaces). A permit is based on a three-step process which takes into consideration the location of the project, the proposed land use and the resource policies.

The regulations addressing stormwater runoff are contained within the resource policies. These policies call for best available technology to minimize off-site runoff, increase on-site infiltration, simulate natural drainage systems and minimize off-site discharge of pollutants to ground or surface water, and encourage natural filtration functions.

Best available technology may include measures such as retention basins, recharge trenches, porous paving and piping, contour terraces, and swales. Eliminating curbs, reducing roadway widths and rooftop recharge basins are strongly encouraged.

The key standard relevant to flood and erosion control is that detention requires that volumes and rates be controlled so that after development, the site will not generate a greater peak runoff than prior to development. The key standard relevant to water quality control is to detain a one year frequency 24-hour storm or a storm of 1.25 inches of rainfall in two hours.

Because of concern for impacts on groundwater infiltration, the State has discouraged detention ponds in areas where there are seasonally high water tables, and has required that detention ponds or swales be sited as far horizontally from surface water and as far vertically from ground water as is practical.

### Evaluating best management practices and future efforts

The Coastal Program has just completed a review of the stormwater practices they have been requiring and have made several findings.

- \* More attention needs to be placed on "Minimum Disturbance/Minimum Maintenance Site Development" which stresses the importance of vegetated buffers. Particular emphasis is placed on using vegetation which does not need chemical fertilizer applications. Given that much of existing and projected development in the Atlantic coastal drainage is seasonal or tourism related, the elimination of costly and

time-consuming maintenance requirements such as lawn mowing, fertilizing and spraying, may be attractive to absentee owners and to the growing retirement oriented population.

- \* More use of porous paving is recommended because it is an effective way of naturally removing pollutants, assuming that necessary soil and other standards are met. Maintenance of paving and monitoring of nearby wells would be required with a permit.
- \* Dual purpose detention basins for impervious or paved area runoff are recommended in nontidal areas. Dual purpose basins will not only detain stormwater but will capture the "first flush" of stormwater which contains the bulk of pollutants--i.e. particulate matter and hydrocarbons. These basins can capture from 40 to 90 percent of pollutants and yet can add little to the construction of a retention basin already needed for flood control purposes.

## F. NEW YORK INVOLVES LOCAL GOVERNMENTS

### Overview and problem

One of the problems in implementing nonpoint source policies and best management practices has been to incorporate them into regular day-to-day land use decisions. With the exception of a few states which require a state permit for development projects, local governments have the primary authority to implement nonpoint pollution policies.

The New York Coastal Program addresses nonpoint source pollution through a number of ways including the Local Waterfront Revitalization Programs (LWRP). Locally developed LWRPs identify nonpoint source pollution problems and develop implementation techniques to prevent and control nonpoint source pollution by developing water quality goals and non-point source prevention and control standards.

This approach to addressing nonpoint source pollution has several advantages. It takes advantage of existing land use regulatory processes and hence does not require new legislation. Cities, towns and villages implement their nonpoint policies by revising zoning, subdivision and other ordinances. The other advantage is that standards may differ depending upon local circumstances. Intensely developed communities tend to rely more upon structural controls and techniques, such as requiring the collection, treatment, and disposal of runoff prior to release into ground or surface waters, while less developed communities tend to rely upon development-limiting, non-structural controls, including the adoption of restrictive zoning standards which limit the type and intensity of land use in coastal areas.

### Criteria for best management practices by local governments

The most common approaches taken by coastal communities include developing nonpoint source runoff standards in local zoning ordinances or other local laws. Typical standards or best management practices include the following:

- \* Deleting from calculations of minimum lot size, lot yield, density, building and coverage, those "environmentally sensitive lands" such as steep slopes, freshwater and tidal wetlands, areas of shallow groundwater, highly erodible soils and bluffs. This would result in less land being developed and more left in open space.
- \* Adopting a "Zero Additional Runoff" standard which prohibits runoff from sites during and after construction that is greater than predevelopment conditions. In some cases, a "zero runoff" standard may be applied, requiring that all runoff be contained and recharged on-site using such techniques

as leaching catch basins, sediments basins, detention ponds, recharge basins, biofiltration basins and wetlands.

- \* Requiring the retention of natural drainage swales, land contours and native vegetation, and minimizing grading operations on construction sites.
- \* Prohibiting the installation of street curbs in selected areas in order to allow runoff to infiltrate soils adjacent to roadways, rather than being channeled to a body of water, and by restricting the width of roadways in new subdivisions to reduce runoff by reducing impermeable paved areas.
- \* Requiring buffer areas adjacent to wetlands and surface waters, and prohibiting the removal or disturbance of native vegetation in buffer areas to allow settling of particulates and biological uptake of nutrients and pollutants by vegetation.
- \* Limiting impermeable paved surfaces near surface waters and in drainage basins by limiting the amount of land that may be covered by buildings and impermeable surfaces, and by requiring the use of permeable materials in parking areas near surface waters.
- \* Prohibiting land uses and activities in coastal areas which contribute to substandard water quality or which have the potential to pollute.
- \* Requiring during the site plan review process, that roadways, pathways, driveways and structures be located as far from surface waters as possible, and requiring that certain natural features such as drainage swales are retained.
- \* Authorizing the "Transfer of Development Rights" in order to move activities and uses which contribute to nonpoint source pollution out of sensitive coastal areas.
- \* Rezoning wetlands and floodplain areas as "conservation and open space" zones, and rezoning underwater lands and lands below mean high water as "estuarine" zones. Conservation and open space zones serve primarily as buffer and treatment areas, while estuarine zones restrict uses and activities to those uses and activities which are less likely to result in contributions to substandard water quality.
- \* Authorizing cluster zoning to preserve open space and to reduce impermeable surfaces.

- \* Establishing local vessel waste no-discharge zones, requiring the installation of vessel waste pump-out facilities at new and expanded marinas, and requiring public restroom facilities at all marinas.
- \* In those communities which regulate dredging and dredge spoil disposal, requiring dredging "windows" which restrict dredging activities to the late fall and winter months, and prohibiting reintroduction of polluted sediments into surface waters, on underwater lands, or in proximity to surface waters, and requiring the use of sediment control techniques including sediment curtains, hay bales and berms to prevent pollutants and sediments from re-entering surface waters.
- \* Restricting motorized vessel operation in shallow nearshore areas and wetlands to reduce erosion, sedimentation, and sediment and pollution suspension due to vessel wakes and propeller wash.

#### Evaluation and future efforts

Local governments use different techniques to implement these practices. Some may be applying the policies only to new developments, while others may be requiring that existing development meet new runoff standards or implement nonpoint source best management practices by "phasing in" standards over time or within five years of adoption of the standards.

During local waterfront plan development there has been recognition of the need for more data and more specific techniques to address nonpoint sources. CZM and participating communities are undertaking specific studies, such as the stream corridor study described on page 22 to, in part, determine if techniques to address specific nonpoint source pollution problems can be identified now, and if not, to determine what information and/or research is needed to do so.

There are 250 coastal municipalities in the New York coastal zone. Participation in the coastal program is voluntary. Over 115 municipalities are now participating in developing local waterfront revitalization plans. This represents 70 percent of the coastline and 90 percent of the coastal population. To date, 22 municipalities have completed their plans, all of which incorporate nonpoint source pollution policies.

# LOCALITIES AND STATE UNITS GET FUNDS FOR 41 COASTAL RESOURCE PROJECTS

**T**wenty-one local governments and eight planning districts in Virginia's Tidewater region—from Northern Virginia to Hampton Roads and the Eastern Shore—are benefiting from a federal grant to carry out coastal resource management projects. This is the third year Virginia has participated in the federal-state-local program.

Half of Virginia's 1988-89 fiscal year grant of \$1,786,000 is devoted to assisting local projects. The other half is being used by eight state agencies for 20 projects. The money is provided by the National Oceanic and Atmospheric Administration, a branch of the U.S. Department of Commerce.

Reservation of half of the funds for local activities is a long-standing commitment the Commonwealth made with the NOAA in establishing the Virginia Coastal Resources Management Program.

Fifteen counties and six cities and towns are sharing the funds to conduct projects ranging from \$10,000 to \$25,000. Almost half of the efforts are related to development or revision of local comprehensive plans in order to protect the jurisdictions' sensitive coastal zone resources.

Local matching money totals \$2,787,887. Added to the federal funds, the local projects will cost about \$125 million. Localities are contributing almost \$3.3 million.

Overall \$3.3 million from the Mobile Register Press Register, Thursday, May 11, 1989

model and an interface with the Geographical Information System for the region, including evaluation and a nonpoint source pollution control project review. A groundwater protection handbook and suggested ordinances for water management are being developed. Southeastern Virginia PDC. Both are doing work with \$25,000 grants. This is in addition to basic grants given to each Tidewater planning commission for technical coastal management assistance to localities within their districts.

Ten local governments are working on comprehensive plans, conducting projects as creating coastal and natural resource elements; developing regulations to implement land use plan and an environmental revisiting plan to set standards for urban and management to ensure coastal protection; adding a shoreline management section in dated comprehensive plan; emphasizing and water quality; establishing guidelines for development; and revising county ordinances to enable handling of mental pressures.

Other projects to protect include addition of a position for land-use planning and management of stormwater runoff line and King George Wight County's relationship with the state for protection of environment of a County; and a project to improve the relationship between the state and localities.

## Nature group buys island

Purchase ends plans to develop Permuda

By TOM MATHER

**CHAPEL HILL** — A private conservation group Friday purchased half of Permuda Island with an option to buy the remaining half — apparently bringing an end to the long-standing controversial plans to develop the small coastal island.

Conservation groups in the area were negotiating to buy the island for the sanctuary system for research.



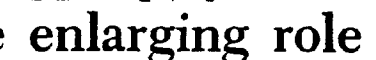
island is now safeguarded, and the threat of development is diminished. Ms. Shimmer said in an interview at the group's office in Chapel Hill. "There was a real concern over the development of the island."

page 10A

## Cleaning Bronx River Making Bronx River Fishery

By SAM HOWE VERHOVEK

Cleaning up the Bronx River is not an easy proposition. In just one sweep of the waterway, in the West Farms section, 30 refrigerators, 200 tires, 100 pairs of upright pianos, 3 sofas and most of the rest are people who are committed to the task and many of them are from the Bronx several years ago. The Bronx River Restoration Project, now in its 13th year, is a joint effort of the Bronx River Restoration Authority and the Westchester County Department of Planning and Economic Development. The project is a joint effort of the Bronx River Restoration Authority and the Westchester County Department of Planning and Economic Development. The project is a joint effort of the Bronx River Restoration Authority and the Westchester County Department of Planning and Economic Development.



## State enlarging role in preserving sites

WAILUKU — The state will take a more active role in providing prehistoric and historic sites, the deputy director of the Department of Land and Natural Resources said yesterday.

Libert Landgraf said the department will make its historic sites office a separate division within the department with greater authority to deal with historic preservation issues. The move was mandated in the last legislative session.

At the same time, land department Director William Paty is setting up advisory councils to review and make recommendations on historic sites on each island, Landgraf said.

Landgraf offered the comments during a ceremony to sign an agreement to restore the Honokahua burial site at the Kapalua Resort.

The Office of Hawaiian Affairs, representatives of a Hawaiian site. The reburial agreement provides for the remains taken out last year to be returned to approximately the same place from which they were removed. Kapalua will be responsible for the restoration and maintenance of the burial ground. There would be public access across the site to the beach and the site itself would be open to the public. It would be nominated for listing on the state and national registers of historic sites. The excavation controversy also fueled legislative interest in protection of other ancient Hawaiian burial sites and archaeological sites. Tavares and Landgraf said yesterday they expect the Legislature to develop new laws on historic preservation. The upgraded historic sites division may well have greater authority.

## Oyster beds saved by compromise

By EARL SWEATT

Press Register, Thursday, May 11, 1989

**BAYOU LA PLANTÉ** — Oyster beds in the bayou were saved by a compromise between the state and localities. The compromise was reached between the state and localities. The compromise was reached between the state and localities.

The state and localities reached a compromise. The compromise was reached between the state and localities. The compromise was reached between the state and localities.

The compromise was reached between the state and localities. The compromise was reached between the state and localities. The compromise was reached between the state and localities.

## Court affirms development curbs for some farmland, coastal zones

By SALLY BARRETT CURTIS

The state's highest court affirmed development curbs for some farmland and coastal zones. The court affirmed development curbs for some farmland and coastal zones.

The court affirmed development curbs for some farmland and coastal zones. The court affirmed development curbs for some farmland and coastal zones.

The court affirmed development curbs for some farmland and coastal zones. The court affirmed development curbs for some farmland and coastal zones.

## State enlarging role in preserving sites

WAILUKU — The state will take a more active role in providing prehistoric and historic sites, the deputy director of the Department of Land and Natural Resources said yesterday.

Libert Landgraf said the department will make its historic sites office a separate division within the department with greater authority to deal with historic preservation issues. The move was mandated in the last legislative session.

At the same time, land department Director William Paty is setting up advisory councils to review and make recommendations on historic sites on each island, Landgraf said.

Landgraf offered the comments during a ceremony to sign an agreement to restore the Honokahua burial site at the Kapalua Resort.

The Office of Hawaiian Affairs, representatives of a Hawaiian site. The reburial agreement provides for the remains taken out last year to be returned to approximately the same place from which they were removed. Kapalua will be responsible for the restoration and maintenance of the burial ground. There would be public access across the site to the beach and the site itself would be open to the public. It would be nominated for listing on the state and national registers of historic sites. The excavation controversy also fueled legislative interest in protection of other ancient Hawaiian burial sites and archaeological sites. Tavares and Landgraf said yesterday they expect the Legislature to develop new laws on historic preservation. The upgraded historic sites division may well have greater authority.

# Joint effort backed on watershed regulation

By SEAN M. BAILEY

Staff writer

In a move to bring uniformity to inconsistent rules governing development in the Falls Lake watershed, a City Council panel recommended Monday that a joint city-county committee be appointed to draft consistent watershed regulations.

The recommendation by the council's Public Works Committee

**Raleigh N+C**  
long debated whose watershed restrictions are the toughest. The regulations are important because they control the degree of development allowed in the watershed, which drains into Raleigh's primary source of drinking water, Falls Lake.

"This is an attempt to resolve that and get it straightened out all at once," committee chairman Charles C. Meeker said in an interview. "Our hope is that we can agree on a standard that will

toward arriving at a regional watershed standard.

Wake commissioner Larry B. Zieverink said in an interview that he welcomed the Raleigh proposal and agreed that it would boost the effort to arrive at regional watershed controls.

"Everybody lives in someone's watershed, and we need to get the state to take a more active role in this," Zieverink said.

While both governments limit residential development to about

total lot size. Wake allows up to 10 percent hard surfaces on its residential lots in the primary watershed.

During a rain, water runs off rapidly off hard surfaces, picks up impurities as it runs through the watershed, thus contributing to pollution.

While no suggestions were made about specific regulations, Louis A. Jones, a Raleigh resident who often appears before the

#### IV. AN OVERVIEW OF COASTAL MANAGEMENT

##### What is the coastal zone?

- \* The coastal zone is the dynamic area where the land meets the sea. It includes coastal waters and the adjacent shorelands; areas which strongly influence one another. It is composed of open waters, estuaries, bays, inlets, lagoons, marshes, swamps, mangroves, beaches, dunes, bluffs, and coastal uplands.
- \* The United States has over 95,000 miles of shoreline, including the Great Lakes. The shoreline ranges from the rocky cliffs of Maine to the broad Louisiana wetlands to the rich Hawaiian coral reefs. The wide climatic range is seen in the frozen coastal plain of Alaska and the mangrove swamps of Florida.
- \* The uses of the coastal zone are as diverse as its physical forms, including: housing, recreation, wildlife habitat, resource extraction, fishing, aquaculture, transportation, energy generation, commercial development, and waste disposal.

##### Why is it important?

- \* More than half of the U.S. population resides in the coastal counties, on less than 10 percent of the nation's land. The coastal counties are five times denser in population than non-coastal counties, 10 times denser along the Atlantic coast. This population continues to grow dramatically.
- \* The 189 commercial ports in the U.S. coastal zone moved 1.3 billion tons of cargo in 1986 alone.
- \* Almost 40% of the industrial facilities in the U.S. are within the drainage basin of the Great Lakes. Over half of Canada's industry is within the Great Lakes drainage basin.
- \* Wetlands currently number about 11 million acres within the coastal zone. Wetlands serve as spawning, nursery, and feeding grounds for over 60 percent of the saltwater fish and shellfish harvested annually in the U.S. This harvest is valued at over \$30 billion. The commercial and recreational fishing industries contribute \$17 billion and \$13.5 billion, respectively, to the U.S. economy annually.

- \* Marine aquaculture is a growing industry. In 1986, the culture of Pacific salmon, shrimp, mussels, clams and oysters totaled 52,000 tons, valued at \$89 million.
- \* Development pressure is three to four times greater in coastal areas than in the rest of the country. Peoples' desire to be near the coast has resulted in the development of areas vulnerable to coastal storms. The Federal Flood Insurance Program, which insures structures in flood prone areas, represents the Federal government's second greatest liability, second only to Social Security. As of August 1987, there were 64,000 policies under the Flood Insurance Program in coastal high hazard areas or v-zones; coverage valued at \$5.2 billion.
- \* Coastal recreational facilities and water dependent uses, such as energy development and ports, must be sited in limited shoreline areas. Accommodation of such competing uses is important and extremely challenging.
- \* Coastal areas provide habitat for millions of waterfowl and other wildlife, including 100 threatened and endangered species.

**What must state CZM programs address?**

- \* The requirements for state coastal programs, set forth in Federal regulations, emphasize the need for comprehensive, predictable, and enforceable policies to guide coastal regulatory, planning, and public investment programs. The requirements identify the range of issues that states must consider in developing their programs (e.g., wetlands protection, erosion control, public access, water-dependent facility siting), yet provide flexibility for criteria that allow states to design programs that meet their particular needs. Broad public review of the programs by state agencies, Federal agencies, and interest groups is achieved through public hearings in the states and National Environmental Policy Act review prior to OCRM approval of the state CZM programs.

**What kind of funding does the CZMA provide?**

- \* States have an incentive to participate in the Federal program because of the availability of Federal funds. Section 305 program development funds, awarded from 1972-1979, have been phased out. Section 306 program implementation funds continue to be available and are allocated to states with approved programs based on a formula set by state coastal population and shoreline mileage. In Fiscal Year 1990, 29 states and territories will receive Section 306 grants totalling \$35.3 million. Eight states receive the

maximum award of \$2 million and five states received a minimum award of less than \$500,000.

- \* The average award was \$1.15 million. States are required to match the Federal funds, dollar for dollar. Over the last decade, increases in the number of states with approved programs and inflation have drastically reduced Federal implementation funds available to states. Funding has remained relatively constant at \$33 million per year.

What are the other important aspects of the CZMA?

- \* The Federal consistency provisions under Section 307 of the CZMA provide another important incentive for state participation. Federal activities, permits, or funding, which significantly affect a state's coastal zone, must be consistent with the enforceable elements of the state's federally-approved CZM program. The intent of the Federal consistency process is to ensure that Federal agencies adhere to the state comprehensive plans and to foster consultation and coordination between Federal and state agencies in order to resolve conflicts at the earliest stages of project/program development.

What is the future of coastal management?

- \* Coastal management programs are dynamic. They are changing to address emerging coastal issues such as sea level rise, coastal pollution, marine debris, and wetlands protection. States respond by developing new program policies or regulations, often with Federal funds. OCRM encourages states to improve their management programs through recommendations resulting from the periodic evaluation of state programs.

## V. LIST OF STATE COASTAL PROGRAMS

### Alabama

Coastal Resources Div.  
Dept. of Economic and Community Affairs  
P.O. Box 2939  
Montgomery, AL 36105  
(205) 284-8778

### Alaska

Division of Governmental Coordination  
431 North Franklin  
Juneau, AK 99811-0165  
(907) 465-3562

### American Samoa

Development Planning Office  
Government of American Samoa  
Pago Pago, AS 96799  
(684) 633-5155

### California

California Coastal Commission  
631 Howard Street, 4th floor  
San Francisco, CA 94105  
(415) 543-8555

### Connecticut

Dept. of Environmental Protection  
18-20 Trinity Street  
Hartford, CT 06106  
(203) 566-7404

### Delaware

Dept. of Natural Resources  
and Environmental Control  
89 Kings Highway  
Dover, DE 19903  
(302) 736-4403

### Florida

Dept. of Environmental Regulation  
Twin Towers Office Bldg.  
2600 Blair Stone Road  
Tallahassee, FL 32301  
(904) 488-6221

### Guam

Bureau of Planning  
P.O. Box 2950  
Agana, GU 96910  
(671) 472-4201

### Hawaii

Office of State Planning  
State Capitol, Room 700  
Honolulu, HI 96813  
(808) 548-3026

### Louisiana

Coastal Mgmt. Div.  
Dept. of Natural Resources  
P.O. Box 44487  
Baton Rouge, LA 70804  
(504) 342-7591

### Maine

State Planning Office  
State House Station #38  
Augusta, ME 04333  
(207) 289-3261

### Maryland

Coastal Resources Div.  
Dept. of Natural Resources  
Tawes State Office Bldg.  
Annapolis, MD 21401  
(301) 974-2784

### Massachusetts

Office of Environmental Affairs  
100 Cambridge Street  
Boston, MA 02202  
(617) 727-9530

### Michigan

Land & Water Mgmt. Div.  
Dept. of Natural Resources  
P.O. Box 30028  
Lansing, MI 48909  
(517) 373-1950

### Mississippi

Coastal Programs  
Bureau of Marine Resources  
2620 West Beach Blvd.  
Biloxi, MS 39531  
(601) 385-5860

### New Hampshire

Office of State Planning  
2 1/2 Beacon Street  
Concord, NH 03301  
(603) 271-2155

New Jersey

Dept. of Environmental  
Protection, CN 401  
Trenton, NJ 08625  
(609) 292-2795

New York

Department of State  
162 Washington Street  
Albany, NY 12231  
(518) 474-3643

North Carolina

Div. of Coastal Mgmt.  
Dept. of Environment, Health, and Natural  
Resources  
512 N. Salisbury Street  
Raleigh, NC 27611  
(919) 733-2293

Northern Mariana Islands

Coastal Resources Mgmt. Office  
Nauru Building  
Saipan, MP 96950  
(670) 234-6623

Ohio

Dept. of Natural Resources  
Fountain Square  
1930 Belcher Drive  
Columbus, OH 43224  
(614) 265-6877

Oregon

Dept. of Land Conservation  
and Development  
1175 Court Street, N.E.  
Salem, OR 97310  
(503) 378-4017

Pennsylvania

Div. of Coastal Zone Mgmt.  
Dept. of Env. Resources  
P.O. Box 1467  
Harrisburg, PA 17120  
(717) 541-7808

Puerto Rico

Dept. of Natural Resources  
P.O. Box 5887  
Puerta de Tierra, PR 00906  
(809) 724-5516

Rhode Island

Coastal Resource Mgmt. Council  
Stedman Office Bldg.  
Tower Hill Road  
Wakefield, RI 02879  
(401) 277-2476

San Francisco Bay Conservation  
& Development Commission

30 Van Ness Avenue, Room 2011  
San Francisco, CA 94102  
(415) 557-3686

South Carolina

S.C. Coastal Council  
AT&T Capitol Center  
1201 Main Street, Suite 1520  
Columbia, SC 29201  
(803) 737-0880

U.S. Virgin Islands

Dept. of Planning and Natural Resources  
Nisky Center, Suite 231  
No.45A Estate Nisky  
St. Thomas, VI 00802  
(809) 774-3320

Virginia

VA Council on the Environment  
903 Ninth St. Office Bldg.  
Richmond, VA 23219  
(804) 786-4500

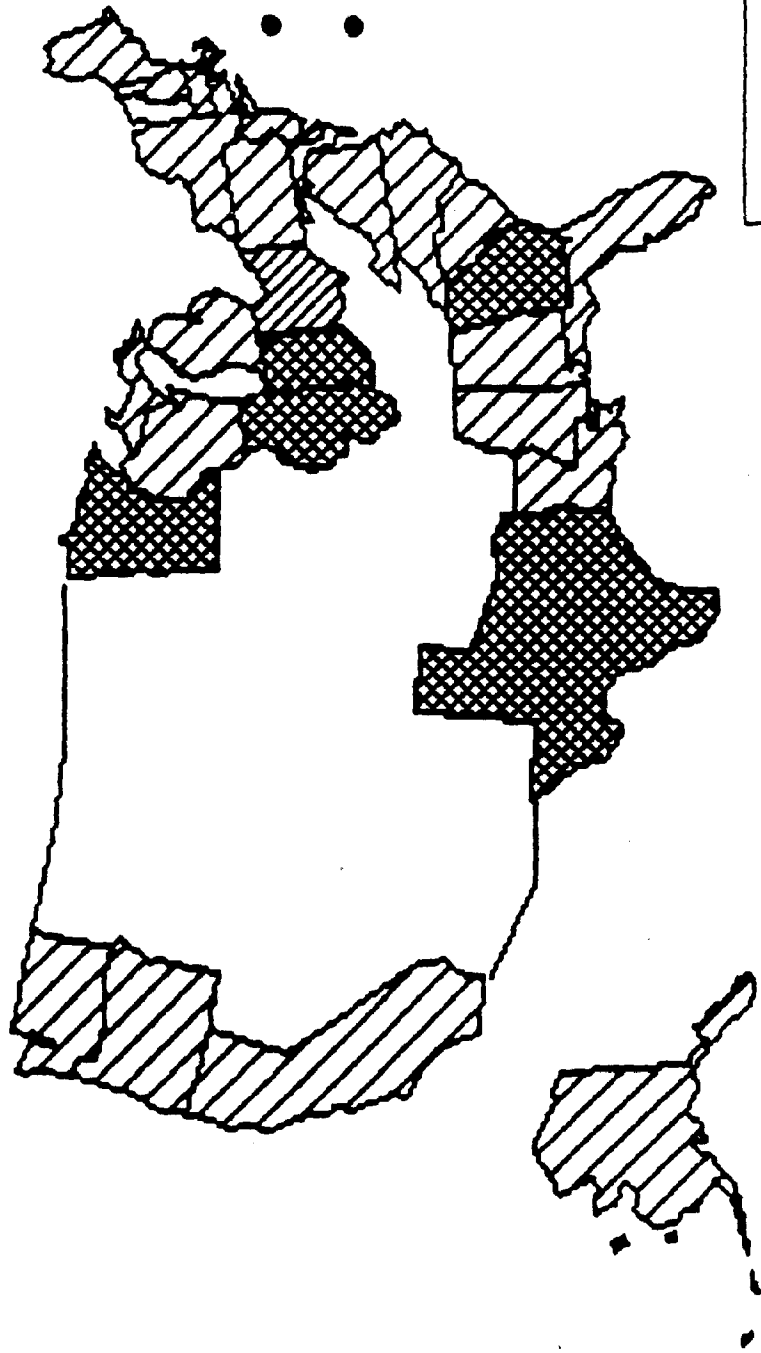
Washington

Department of Ecology  
State of Washington (PV-11)  
Olympia, WA 98504  
(206) 459-6777

Wisconsin

Coastal Mgmt. Program  
Dept. of Administration  
101 South Webster, 6th floor  
Madison, WI 53707  
(608) 266-3687

# State Coastal Management Programs



- 29 Approved Programs
- Cover 94% of the Nation's shoreline (89,117 mi.)

## Not Pictured

Northern Mariana Islands  
Guam, U.S. Virgin Islands  
American Samoa, Puerto Rico

- Approved
- Developing Program
- Non-Participant

NOAA COASTAL SERVICES CENTER LIBRARY



3 6668 00000 7866