

# ALBEMARLE-PAMLICO ADVOCATE

... the newsletter of the Albemarle-Pamlico Estuarine Study

Vol.3 No.3

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## From The Public Coordinator

For some time you have been hearing about the Comprehensive Conservation Management Plan (CCMP), the main blueprint for restoring and maintaining the Albemarle-Pamlico Estuary. It identifies the most pressing problems in the estuary and establishes goals, objectives, and new action plans for resolving them. The CCMP will prescribe specific actions to protect and enhance the estuary and its water and sediment quality, living resources, and surrounding land and water resources.

Steps leading to the CCMP include, among others, developing a characterization of the state of the estuary through the Status and Trends Report (STR). The STR describes the present quality of the estuary and evaluates any apparent trends. It defines the problems and links possible causes to these problems. This phase provides the objective basis used to develop action strategies for the CCMP.

Inclusion in the U.S. Environmental Protection Agency's National Estuary Program (there are 12 NEPs around the U.S.) is usually due to the identification of obvious problems in the estuary. Included for example

may be fish kills, extensive algae blooms, or declines in popular commercial or recreational fish species. Identifying the causes or sources of these problems is particularly challenging to each NEP.

The success of the NEPs depends

## Albemarle-Pamlico Estuarine Study

### Findings on the Environment Status and Trends of the Estuary

on public understanding of the problems and public support for enacting the prescribed remedies.

Toward that end, the APES is holding seven public meetings across the State to solicit public comment relative to the Draft Status and Trends Report. We are soliciting final comments on the content of the report to ensure that the problems have been accurately identified and that all pertinent information has been included.

These meetings will be held as follows:

Asheville-Jan. 15, 1991 at UNC-A 7:00-10:00 PM

Owens Conference Center, Room #302

Greensboro-Jan. 16, 1991 at UNC-G 7:00-10:00 PM

Ferguson Auditorium, Room #100  
Raleigh-Jan. 17, 1991 at Archdale Building,

Salisbury Street, 7:00-10:00 PM  
Ground Floor Hearing Room

Elizabeth City-Jan. 22, 1991 at College of the Albemarle 7:00-10:00 PM, Lecture Auditorium, Room #B202

Beaufort-Jan. 23, 1991 at the Duke Marine Lab. 7:00-10:00 PM, Auditorium

Greenville-Jan. 29, 1991 at Regional Development Institute(RDI)

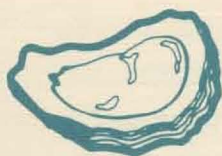
First & Reade Streets, 7:00-10:00 PM, Auditorium

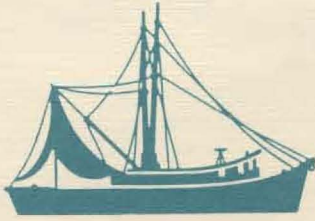
Wilmington-Jan. 31, 1991 at UNC-W, 7:00-10:00 PM

University Union, Room #100

The STR is a public education tool because it describes the estuary's problems objectively which will lead into a range of potential solutions. The executive summary of the findings of the APES STR appears in its entirety here. The STR sets the stage for formulating the CCMP and its action strategies.

continued p.2





This synopsis provides the judgments of the Albemarle-Pamlico Estuarine Study on the health of the estuary, which has been under study since 1987. It is based on the best information and observations available about the estuary.

Two preceding documents were used to develop this synopsis: the "Preliminary Technical Analysis of Status and Trends" and the booklet "A Summary of the Preliminary Status and Trends Report of the Albemarle-Pamlico Estuary." Both documents are available for review.

Consideration of these findings by the citizens of North Carolina and southeastern Virginia is requested. Once these findings have undergone public review, comments will be fully considered by the Policy Committee in developing the statement of final status and trends. The statement will serve as the basis for developing environmental goals, objectives, and action plans in a comprehensive plan to address the environmental problems of the estuary.

As the action plans are developed, it will be important for all interested citizens to be aware of and contribute to their development. Most people who use the estuary or benefit from it will be affected in some degree by the outcome of this effort.

## HUMAN ENVIRONMENT FINDINGS

### 1. PROBLEM:

Increasing population creates increasing and conflicting demands

**Status:** Permanent population in the A/P Region has increased since 1970 and is expected to

reach almost 3 million people by the year 2000. Direct and especially indirect uses of the estuarine area compete with one another and create greater environmental impacts and stresses.

**Trends:** Projections indicate that an additional 320,000 new residents can be expected in the study area during the 1990's. This, along with increased leisure activities, will continue to increase the demand on the resource and the cost of maintaining the quality of the environment.

**Causes:** There is a direct correlation between the growth and development of this region and the stress that is placed on the coastal environment.

## WATER QUALITY FINDINGS

### 1. PROBLEM:

Oxygen-poor waters and fish kills

**Status:** Deoxygenation of water is a recurring problem within this estuary and many other estuaries. It occurs sporadically each year within low salinity reaches of tributary rivers. Fish and bottom dwelling organisms are killed during these events.

**Trends:** There is no consensus about the long term trends in occurrence of oxygen-poor waters, or anoxia as it is called. Reported fish kills attributed to anoxia have been greater during the 1980's than in previous decades.

**Causes:** Natural physical, chemical, and biological interactions lead to the development of anoxia. Human factors such as increased pollutant runoff and modification of freshwater drainage patterns also contribute to the problem.

### 2. PROBLEM:

Algal Blooms and Eutrophication

**Status:** Excessive blooms of blue-green algae and dinoflagellates are problems in portions of the lower tributaries to the sounds. Blue-green algae contribute to losses in commercial fishing and recreational uses and subsequent changes in the food chain and

productivity. Blooms of dinoflagellates in moderate salinities of the estuary can cause toxicity and excessive biological oxygen demand in the water.

**Trends:** Despite some evidence of nutrient loading reductions, the geographical extent of blooms is increasing, primarily further into the estuary.

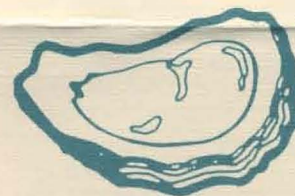
**Causes:** Excessive nutrients continue to enter the system. Nutrients from bottom sediments, ground water, and atmospheric deposition contribute to and can prolong excessive blooms. Primary contributors of nutrients include point source discharges; agriculture; forestry; and urban stormwater runoff; and acid rainfall.

### 3. PROBLEM:

Pollution of Shellfishing Waters

**Status:** Because of the threat to human health, approximately 337,800 acres of surface waters in the Albemarle-Pamlico system are closed to shellfishing due to probable pathogen contamination. About 21,600 of these acres are thought to support shellfish populations.

**Trends:** The total area closed to shellfishing due to pollution has remained the same since about 1980. In recent years there have been more frequent and extensive temporary closures. However, progress in opening areas due to the elimination of point



source discharges has been offset by increased contamination from nonpoint sources.

**Causes:** Pollution of shellfish waters results primarily from domestic waste discharges. Non-point sources include agricultural

*Coming together is a beginning;*

animal wastes, urban stormwater runoff, improperly sited or maintained septic systems, and marinas.

#### 4. PROBLEM:

Maintenance of Nursery Area Function

**Status:** Monitoring of juvenile abundance within nursery areas of the A/P system indicates that these areas are functioning satisfactorily. Designated Primary Nursery Areas are off limits to detrimental fishing activities and are reserved for the propagation of juvenile fish and shellfish. However, unregulated activities in the watersheds impact nursery areas.

**Trends:** Monitoring of juvenile abundance during the past 10 years indicates no significant population trends for any major species except in local, specific areas. Observed water quality changes, such as dissolved oxygen, turbidity and salinity, indicates deterioration of the primary nursery area water quality.

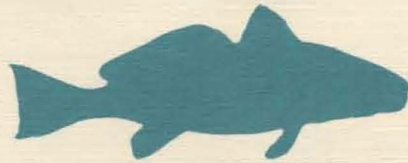
**Causes:** Land use activities associated with nonpoint runoff from agriculture, forestry, animal waste, and urban and marina development has resulted in the deterioration of water quality in primary nursery areas. Fluctuations in juvenile populations, where they have been recorded, have been attributed to variations in environmental conditions including both natural and man-induced land use changes.

### FISHERIES FINDINGS

#### 1. PROBLEM:

Decline In Fisheries Productivity

**Status:** Commercial and recreational fishing catches have declined in the recent past. Catches of most estuarine dependent commercial species have declined from recent highs during 1978-1982. Major anadromous fisheries for striped bass, shad, and river herring collapsed in the mid-1970s. Striped bass and shad have not



recovered. River herring recovered somewhat to a recent peak in 1985, but then declined drastically to the present levels which are the lowest on record. North Carolina is probably unique in the degree to which commercial fishing gears are used recreationally to catch the available fish. Recreational fishermen account for about half of the commercial vessel licenses.

**Trends:** In general, the commercial and recreational catch-per-unit-of-effort is decreasing. Recreational fishing pressure is increasing substantially. Through the 1970's and 1980's, both commercial and recreational fishermen have become much more effective in their ability to harvest desirable species.

**Causes:** Greatly increased fishing pressure, reduced habitat quality and quantity, and reductions in water quality are having detrimental impacts on the fisheries. Improved fishing techniques, electronics, and vessel construction have enabled all fishermen to become more effective. Highly variable flows during the spring in the Roanoke River resulting from hydroelectric power generation cause reductions in spawning activity and larval survival of striped bass. Illegal mechanical harvesting of shellfish in seagrass beds and oyster beds has resulted in impairment and loss of habitat for shellfish and finfish. Although trawling bycatch mortality may have a negative impact on fish stocks, relevant studies in the South Atlantic Region have not demonstrated an impact. Natural and man-induced salinity changes within Currituck Sound/Back Bay created a

special case in which largemouth bass and other species were severely impacted.

#### 2. PROBLEM:

Fish and Shellfish Disease and Contamination

**Status:** Diseases in fish and shellfish stocks have reached epidemic proportions for some species in certain areas. Some contaminants, found in bottom sediments and surface waters, have entered the estuarine food web. Fish and shellfish are exposed to elevated concentrations of heavy metals in bottom sediments in some tributaries impacted by urban, commercial, and industrial development. Advisories to limit fish consumption due to elevated levels of dioxin, a synthetic hydrocarbon industrial by-product and probable human carcinogen, have recently been issued for large freshwater and saline segments of three rivers in the A/P region.

**Trends:** Yearly outbreaks of ulcerative sore disease since 1984 have been increasing in the lower Pamlico River and to a much lesser extent in other low salinity areas of the system. This disease has been documented in other coastal waters. A blue crab disease, causing eroding of the shell, was first found in the A/P system and has recently also been documented elsewhere. Both diseases have the greatest occurrence in the lower Pamlico River. Two diseases of oysters, Dermo and MSX, are becoming more prevalent within Pamlico Sound waters.



*Keeping together is progress;*

**Causes:** Both the ulcerative sore disease in finfish and the crab shell disease are believed to be related to deteriorating water quality conditions. No link has been proven between any specific pollutant(s) and the diseases. The ulcerative sore disease is contracted in certain areas of the estuary. Most of the elevated metal concentrations have resulted from point source municipal and industrial discharges. Some industrial facilities discharge dioxin to surface waters. Abnormally high salinity from drought conditions in certain years is believed to facilitate the spread of the oyster diseases.

## HABITAT FINDINGS

### 1. PROBLEM:

Declines in Submerged Aquatic Vegetation (SAV)

**Status:** Submerged aquatic vegetation, normally abundant in the lower salinity areas of western Pamlico and Albemarle Sounds, has been lost or greatly reduced. The changes have not been quantified. SAV in backwater areas around eastern Albemarle Sound are generally in good condition based on observation, not quantified analyses. The SAV in Currituck Sound has undergone significant shifts in species assemblage but remains quite prolific while the adjoining Back Bay is now devoid of SAV. The eastern shore SAV areas of the sounds, including Core and Bogue Sounds, are more extensive than previously documented and are believed to be relatively stable in area of coverage.

**Trends:** Observations in the western Sounds and Currituck, areas of high water turbidity, show that SAV is probably undergoing gradual recession over the long term. Little trends data, are available on which to base firm conclusions except of the historical loss from Back Bay.

**Causes:** High water turbidity reducing light availability to the grasses is considered the greatest factor in the losses of SAV in the western sound areas and in Currituck Sound/Back Bay. Excessive nutrients often cause algal blooms which contribute to water turbidity. Excessive nutrients also stimulate over abundance of other algal types that grow upon the SAV plants further limiting light availability. Physical destruction from dredging, boat propellers, and fishing illegally with mechanical gears in seagrass beds are the causes for the losses particularly in certain areas along the eastern side of the sounds.



### 2. PROBLEM:

Loss of Wetlands Acreage and Function

**Status:** Best available assessments estimate that at least one-quarter of the original wetlands in coastal North Carolina have been destroyed. Perhaps as much as another 25 percent are considered to have been altered so that their functions are significantly impaired.

**Trends:** Brackish and salt marsh losses are not now significant.

Freshwater wetlands continue to be converted to other uses. Rates of loss from agricultural activities have decreased in recent years to near zero, while forestry activities are still resulting in losses and alterations.

**Causes:** Minimal salt and brackish marsh losses occur from carefully permitted activities and from natural shoreline erosion. The freshwater wetland losses historically are due mostly to land use conversion activities associated with agriculture, forestry, residential and commercial development, and highway construction.

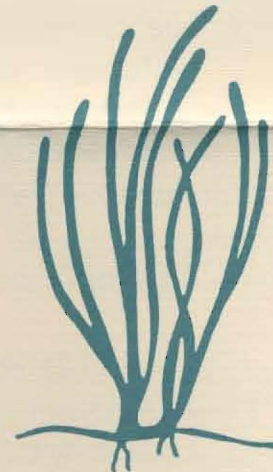
### 3. PROBLEM:

Loss of Unique Barrier Island Habitat

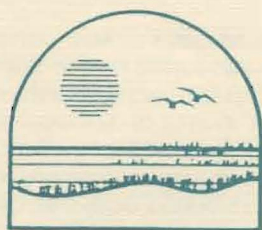
**Status:** Over the past 300 years, human impact has reduced the original extensive coverage of maritime forest, shrub, herbaceous dune growth, sound-side marsh, and brackish wetlands to remnant quantities. About two-thirds of the Outer Banks area is in public ownership.

**Trends:** Losses of habitat, other than salt marsh, continue at a substantial rate on private lands. Acreage in public trust ownership or jurisdiction is increasing the protection of some of these habitats.

**Causes:** Most losses result from development, which includes removal of vegetation, installation of hard surfaces, off-road vehicle traffic, and altering dune slopes and configuration.



*Working together is success.*



North Carolina  
National Estuarine  
Research Reserve

## PROJECT ESTUARY

Facilitator Institute  
June 24-28, 1991  
Bogue Banks, North Carolina

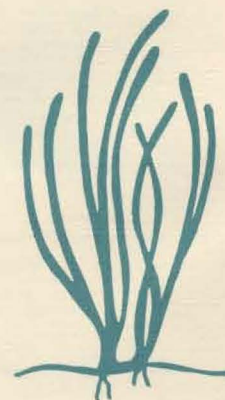
**Interested in coastal ecology? Consider being a Project Estuary Workshop Facilitator.** Approximately 15 elementary, middle or high school science teachers are needed to serve as trainers-facilitators for Project Estuary. The institute will take place on the beautiful grounds of the Trinity Conference Center located on the beach near Emerald Isle. Food and lodging for the selected participants will be provided through a grant from the National Estuarine Research Reserve Program. Each teacher will be asked to coordinate and teach one teacher-training program in her or his system in fall of 1991.

**What is Project Estuary?** This is a curriculum guide for teachers that focuses on issues related to North Carolina Estuaries. It was developed as part of the North Carolina Estuarine Research Reserve Program to encourage teachers to teach about the importance of estuaries. The institute will examine characteristics of estuaries, activities to teach coastal ecology, and field experiences for students. If selected to participate, you will go birdwatching, seining for fish, hiking in maritime forests, and travel aboard the Duke Marine Lab research vessel to Carrot Island and Cape Lookout. Consider spending an exciting week with us exploring the marshes, beaches and forests along North Carolina's coast.

### **For applications write:**

Dr. Gail Jones  
Assistant Professor  
University of North Carolina  
Chapel Hill, North Carolina 27599-3500

or call  
The UNC Mathematics and Science Education Center  
(919) 966-5922 and ask for a Project Estuary Application.



## Upcoming Events

January 11	Review call for proposals (submittal due date)	January 28	CAC Meetings to evaluate specific proposals
		February 19	Technical committee meeting to consider subcommittees proposal recommendations
<b>Status &amp; Trends Public Meetings</b>		March 5	Roundtable meeting of all committees
January 15	Asheville	March 6	Policy meeting to consider technical committees' proposals and annual budget recommendations
January 16	Greensboro	March 18-30	Return selected proposals to authors for revisions
January 17	Raleigh	April 12	Revised proposals to director/subcommittees
January 22	Elizabeth City	April 22/25	CAC Meetings
January 23	Beaufort	May 8	Technical committee meeting
January 29	Greenville	May 17	Final cooperative agreement packages
January 31	Wilmington		

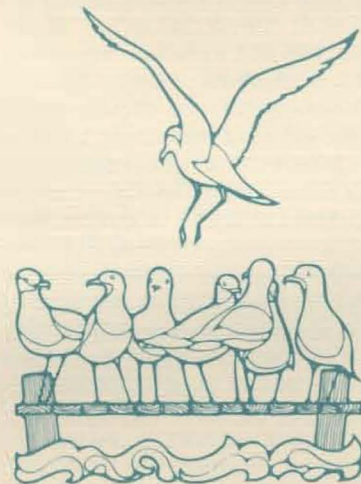
Contact Joan Giordano, Public Involvement Coordinator at (919) 946-6481, for time and location.

The Albemarle-Pamlico Estuarine Study is a joint effort of the state, federal government and local interests, intended to facilitate effective management of the very valuable, productive resources in the major estuaries of northern and central North Carolina.

The Albemarle-Pamlico Advocate is the quarterly newsletter of the APES. For questions or comments, contact Joan Giordano, Editor, 1424 Carolina Avenue, Washington, NC 27889 or call (919)946-6481.

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North Carolina Department of Environment, Health, and Natural Resources  
James G. Martin, Governor William W. Cobey, Jr., Secretary



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