

ALBEMARLE-PAMLICO ADVOCATE



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

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From The Public Coordinator

Our newsletter continues to be requested by readers across the state. This is particularly gratifying in light of the projected scheduling of public meetings relative to the Status and Trends Report (S&TR).

Five meetings to gather citizen input from within and outside of the A/P Study area are planned, with Asheville, Greensboro, New Bern, Raleigh, and Elizabeth City being potential sites. If you recall, the Status and Trends Report is one of the milestone documents required by the National Estuary Program (NEP). It is a precursor to the Comprehensive Conservation Management Plan (CCMP) which is the program's final document that will serve as a guide to protecting the environmental integrity of the Albemarle and Pamlico sounds.

The purpose of the S&TR is exactly as its title implies. It is "an attempt to synthesize the existing understanding of the Albemarle-Pamlico system and to assess the status and trends of probable causes apparent in the system." A final version of the preliminary S&TR will be available in mid-January.

You may obtain a "public" version consisting of approximately 40 pages, by contacting Joan Giordano, Public Involvement Coordinator, at (919) 946-6481. Also contact Mrs. Giordano if you are interested in obtaining a copy of the 4th funding cycle Request for Proposals (RFP). Solicitation of proposals have been sought in both the techni-

cal acquisition and public participation areas. The deadline for submitting proposals was January 12, 1990.

Please note too, that the A/P Study program (Raleigh) office has moved from the Archdale Building to the 4th floor of the Cooper Building on the corner of Lane and McDowell Streets. The phone number, 733-0314, remains the same.

In other areas of public involvement, a "Public Forum on Management Needs for Protecting Water Quality and Natural Resources in the Albemarle-Pamlico Estuarine System" was held in Plymouth on November 7 and in New Bern on November 8. The purpose of the meetings was to hear from the public on any problems they perceived with regard to waste disposal, fishing and the monitoring and enforcement of current environmental regulations. Those comments, as well as the responses to a short survey prepared for the forum, will be directed to the Coastal Resources Advisory Council to help promote further action by citizens' groups and government agencies.

Watch also for "Workshops on Important Water Quality Policy Issues and Decisions" to be held in March 1990. There will be a series of four, with emphasis on providing relevant information and practical strategies that the general public can use to further the goals of the A/P Study, and that also can be taken into account when alternative

management strategies are developed. Look for the workshops to be held in New Bern, Edenton, Nashville and Washington.

In addition to the workshops a handbook will be developed for use by citizens which will be non-technical in orientation and will summarize the workshop materials. The project is an effort of the NCSU Ag. Extension Service. More will follow as the time draws near.

Finally, the A/P Study takes pleasure in announcing the distribution of three specially produced educational products for use by the North Carolina school systems in the 33 county A/P Study area. The "gifts" are an environmental education calendar for the year 1990; a copy of "A Guide to Estuaries of the Albemarle-Pamlico Region"; and a copy of "Where The Rivers Meet The Sea" booklet.

All three products were developed in partial fulfillment of one of the objectives of the A/P Study's Public Involvement Plan, namely, "to expand educational programs to inform the public, youth and adult populations, about the values of the Albemarle-Pamlico system and the importance of good management.

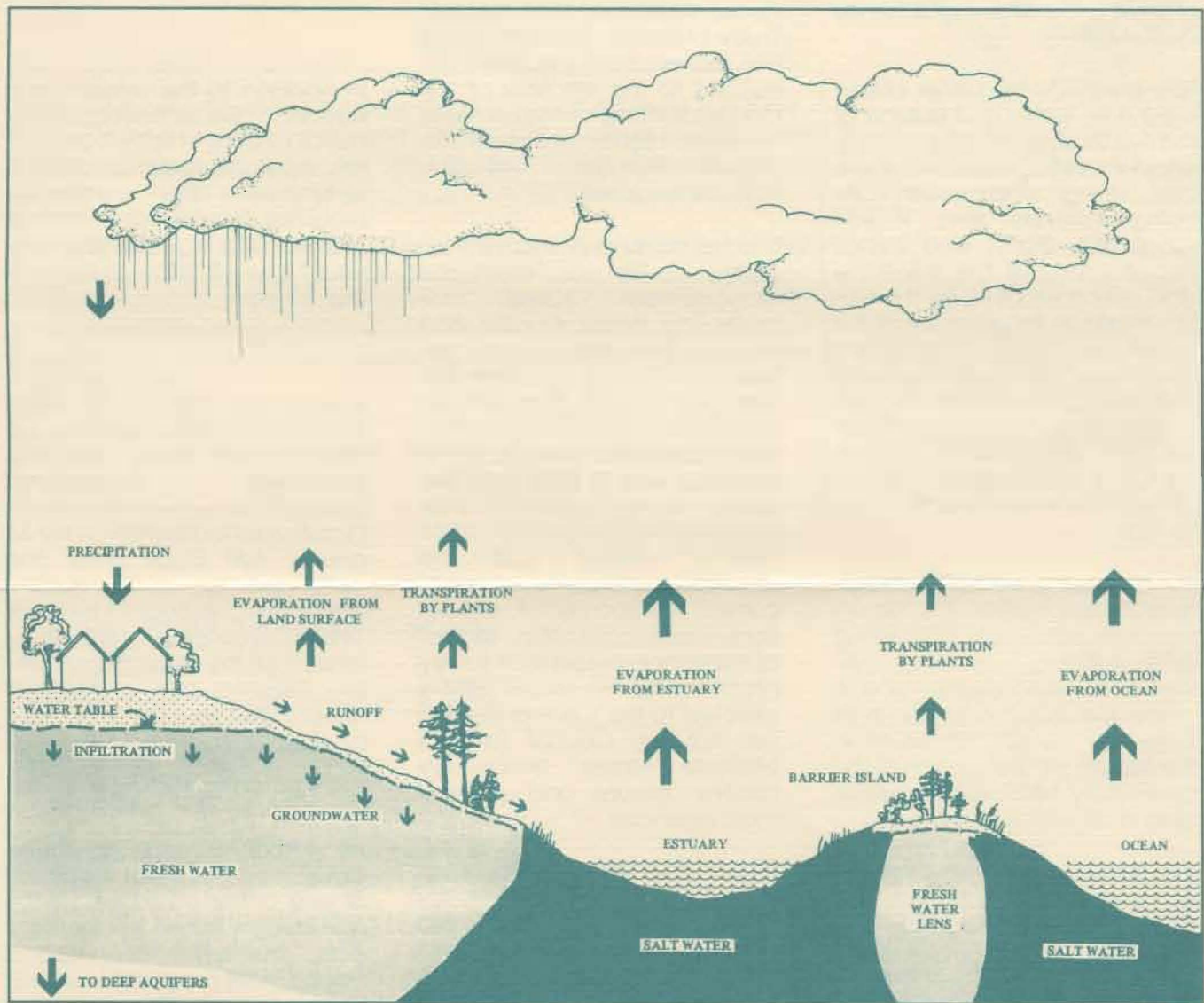
Ask An Expert

So much of the A/P Study deals with water quality. What does "protecting water quality" mean? What exactly needs protecting?

The term "water quality" refers collectively to the physical and chemical characteristics of water systems that enable those systems to support life. Therefore, what must be protected are the basic natural features of estuarine, riverine, and groundwater systems that the various forms of life in the coastal area depend upon to exist.

The estuarine system, for example, is defined by certain characteristics -- salinity, temperature, tides, and the like -- to which the plants and animals that live there are specially adapted. If the characteristics of the estuary that make it habitable for those creatures are changed, then the plants and animals may not be able to reproduce as successfully or they may die.

These conditions -- necessary for the estuarine system to support life -- are what must be maintained if the estuarine system is to continue to be the basis of life in the coastal area. Likewise, protecting groundwater quality requires that aquifers -- underground reservoirs of water that provide the majority of fresh water for human consumption in the coastal area -- must be able to



The Hydrologic Cycle

Coming together is a beginning;

replenish themselves and not be contaminated by chemicals, sewage, and salt water. If groundwater quality is not maintained, the lack of fresh water will severely limit a community's ability to grow and its use of water for drinking, cooking, cleaning, farming, and other routine activities.

The key to protecting water quality, then, is to understand how coastal water systems work. That understanding enables us to recognize the features of natural systems that are essential to the continued health of the coastal area and how these systems are vulnerable to damage. With this knowledge care can be taken to avoid such damage. What follows is an explanation of the basic characteristics of coastal aquatic systems and the pollutants that can affect them.

THE HYDROLOGIC CYCLE

Water is constantly in motion, whether as a gas or a liquid. Its movement may be seen easily in the form of rain or snow, or it may be invisible as it soaks into the ground or evaporates into the atmosphere. This movement of water, from the clouds to the earth and back again, is called the hydrologic cycle.

The cycle begins with the sun's energy warming the earth's exposed waters, causing evaporation. The vapor rises into the atmosphere and condenses to form clouds. The moisture in the clouds then falls to the earth as rain or snow.

When water reaches the ground, it can take three main paths: it can run off the land and collect in the creeks, streams, and rivers that eventually flow to

the ocean; it can infiltrate the soil surface, recharging groundwater reservoirs; and it may be absorbed into the topsoil to be used by plants. (This water is eventually returned to the atmosphere through the process of evapo-transpiration: the evaporation of water from land surfaces plus transpiration, the water given off by the roots and leaves of plants.) Although many factors affect the course water travels on the ground, one of the most important factors -- and the one directly influenced by people -- is the type of surface on which the water lands. If water falls on undisturbed ground, half of it will seep into the ground and the rest will either run off or evaporate. If water falls on a paved surface or on ground that has been thoroughly saturated, a portion will evaporate and the remainder will collect and flow downhill. Water runs off paved, or impervious, surfaces faster than unpaved surfaces, reducing evaporation and infiltration. As water moves across the ground or pavement it can pick up dirt, chemicals, and other pollutants and carry them into streams and sounds.

THE RIVER SYSTEM

The characteristics of water and its effects on daily life can be best understood by studying the river basin where a community is located.

A river basin, or watershed, is the land area drained by a river and its tributaries. A small creek running through a neighborhood may appear to be separate from the stream that crosses another part of town, but they are connected. Creeks join to create larger streams, forming a natural

drainage network that carries rainwater off backyards, fields, and streets and into rivers. Without this drainage system, land would stay wet or flooded.

Rivers are moving water systems, and so are considerably different physically, chemically, and biologically from standing water systems, such as lakes and sounds. Water currents and other physical variations in parts of the same stream or river create different habitats and communities. These physical differences can also influence the amount of oxygen in the water and what type of animals will live there.

As water circulates through a river system it can carry pollutants to other parts of the watershed. This is why coastal residents may be concerned about the activities of people living upstream in the piedmont. Although many miles apart, they all live within the same watershed, and so can affect one another through their various uses of water.

THE ESTUARINE SYSTEM

Estuaries have often been called the "cradle of life" in the coastal area, for they are the bodies of water where fresh inland and salty coastal waters mix, producing a nutrient-rich habitat for plants, animals, and fish alike. North Carolina's estuarine system, the third largest in the United States, encompasses 2.3 million acres of tidal streams, rivers, and sounds.

North Carolina has a wide variety of estuaries -- there are tidal rivers like the Newport and Pamlico, secluded lagoons like Rose Bay and Stumpy Point Bay,

Keeping together is progress;

and shallow basins behind barrier islands like Bogue and Currituck sounds. All of these estuaries have different salinity patterns, tides, sediment types, and shorelines. The conditions within estuaries, especially salinity, change continually, so the organisms that live in them must be adapted to those changes.

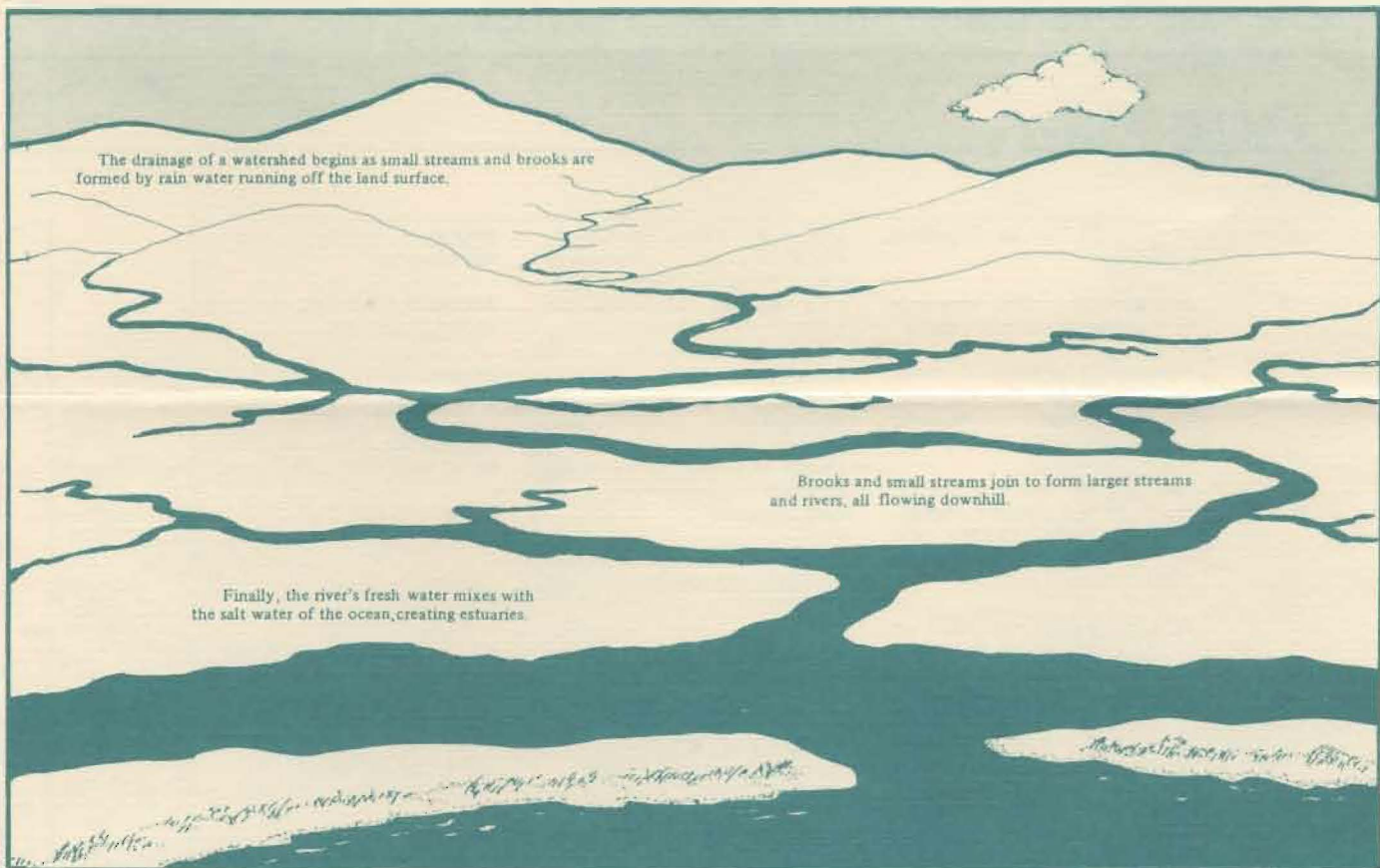
The combination of changing salinity patterns, shallow water, and marsh grasses provides physical protection and abundant food for the juvenile finfish and shellfish that use estuaries as nursery areas. Estuaries are one of the most productive natural systems on earth, accounting for the health and profitability of most commercial fisheries.

The very functions that make estuaries productive also make them vulnerable to pollutants. Just as estuaries efficiently trap and recycle the nutrients that support the estuarine food web, they can also trap and recycle pollutants. Pesticides, or other toxic substances from runoff for example, can be trapped, buried, and re-introduced into the water at a later time. Once in the water these substances can be taken up by marine life and passed up the food chain, sometimes to people.

Comparisons of stream bottom sediments have shown concentrations of lead in urban streams ten times as high as in rural streams. Similar results were found for other pollutants.

Fortunately, estuarine systems can also break down some pollutants by the same mechanisms used to degrade organic matter. Some persistent chemicals like DDT, however, will take decades to break down completely and some, such as metals, can never break down.

Pollutants can affect estuaries in a multitude of ways. Some of the effects are obvious, such as fish kills and algae blooms; other impacts are invisible. The loss of lower organisms in the food web, slowed rates of reproduction, and disease may not immediately kill fish, but they can lead to the decline of a fishery, as well as lower its resistance to other diseases and pollutants. **continued on page 5**



Watershed System

Working together is success.

Ask An Expert

continued from page 4

THE GROUNDWATER SYSTEM

When water seeps into the ground it is either absorbed by the soil or it passes through the soil to become part to the groundwater supply. The sand, gravel, and rocks that allow water to collect and move through them are called aquifers. The water level in an unconfined or "water table" aquifer will rise and fall depending upon the amount of water stored in the ground. The recharge of this aquifer occurs through porous soils when it rains. Although this type of aquifer will recharge relatively easily, pollutants can seep into it just as easily.

The second type of aquifer is called confined or "artesian" aquifer. This is a complex water

system formed by layers of various types of rock and clay.

The water in this aquifer moves through the earth under pressure rather than simply by gravity. Recharge to the confined aquifer takes place only in certain areas and depends on the difference in pressures between the water table aquifers, so it is less likely to get polluted, unless pollution sources are located in recharge areas. Artesian aquifers provide a more constant water supply in terms of volume and quality than water table aquifers.

The dynamics of groundwater movement are extremely complicated. In essence, groundwater moves downward following the slope of the water table (not the land surface) from

its highest level to its lowest. The water slowly filters between the rocks or soil that compose the aquifer, usually at a rate of a few inches a day.

This slow movement keeps any pollutants from being quickly diluted. Therefore, a well located down-slope from a source of pollution could be contaminated by the groundwater flow that still contained concentrated pollutants.

This article appears through the cooperation of the Department of Environment, Health and Natural Resources, Division of Coastal Management and is part of that division's publication "A Guide to Protecting Coastal Waters through Local Planning."

Upcoming Events

January 12 Call for Proposals (Due Date)	March 7 Policy Meeting to Consider Technical Committees' Proposals and Annual Budget Recommendations	August 21 Technical Committee Meeting
February 5/9 CAC Meetings to Evaluate Specific Proposals	March 8 Return Selected Proposals to Authors for Revisions	August 29 Roundtable Meeting of All Committees
February 20 Technical Committee Meeting to Consider Subcommittees' Proposal Recommendations	March 14 Workshop on Important Water Quality Policy Issues and Decisions.	August 30 Policy Committee Meeting
February 20 Public Forum on Management Needs for Protection of Water Quality and Natural Resources in the A/P Estuarine Study	March 15 Workshop on Important Water Quality Policy Issues and Decisions.	September 13 Annual Researchers' Review Workshop
February 21 Public Forum on Management Needs for Protection of Water Quality and Natural Resources in the A/P Estuarine Study	March 23 Revised Proposals to Director/Subcommittees	September 18 Technical Review Subcommittee Meeting
March 6 Roundtable Meeting of All Committees	April 13 Final Cooperative Agreement Packages	October 5 Annual Public Meeting
March 6 Workshop on Important Water Quality Policy Issues and Decisions	April 23/27 CAC Meetings	November 5/9 CAC Meetings
March 7 Workshop on Important Water Quality Policy Issues and Decisions	May 9 Technical Committee Meeting	November 20 Technical Committee Meeting
	August 1 Projected EPA Award of Funding	November 27 Policy Committee Meeting
	August 6/10 CAC Meetings	November 28 Call For Proposals to be Sent Out (5th cycle)

contact Joan Giordano, Public Involvement Coordinator at (919) 946-6481, for time and locations

Citizens' Advisory Committee Chairman's Message

by Brewster Brown, Chairman of the Albemarle Citizens' Advisory Committee

As I assumed the Chairmanship of the Albemarle Citizens' Advisory Committee it was with the understanding that the committee members and the people of the Albemarle area would actively participate in this project. During the first years of the study much was done on the collection and coordination of information concerning our estuarine system. These studies will continue and allow for more

informal discussions on how to prevent human need and use from destroying the estuaries. The final outcome of this project will be a Comprehensive Conservation Management Plan. It is my hope that through the use of the information gathered, all user groups in the Albemarle and Pamlico Estuarine system will find common ground. I would encourage each of you to

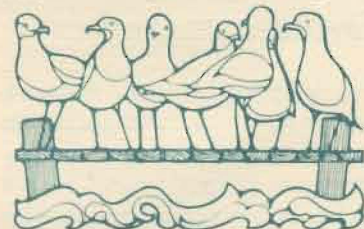
become more involved in this effort. That involvement can take many forms, you could test water quality, attend public meetings, or advocate better management of our water resources by contacting your local, county or state governmental officials. In any case we all have a personal interest in the improvement of our estuarine resources and we all need to find ways to cause this improvement.

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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