

# ALBEMARLE-PAMLICO ADVOCATE

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

Vol. 1, No. 2

November 1988

## From The Public Coordinator

We hope you enjoyed the first issue of our newsletter. If your response in wanting to remain on our mailing list is any indicator, then we believe we're off to a good start! We were particularly pleased that the Advocate was so well received by the many readers in the Piedmont area and western regions of N.C. Since one of the messages of the program is that circumstances occurring in those areas impact greatly the coastal region, their interest is gratifying.

Interest was the key motivator in prompting attendance at the Albemarle-Pamlico Estuarine Study's first Annual Review Meeting, held in Washington, NC on October 14 and 15. The two-day conference was the first time the four management committees of the program (Policy, Technical and both Citizens' Advisory Committees) were able to meet together and engage in meaningful dialogue. Specially invited external evaluators, who were paired with members of the Policy Committee, formed teams whose principal purpose was to provide constructive, general comment on the program. They also specifically evaluated the technical and public participation projects the A/P Study has funded to date. In attendance were many of the program's 20 principal investigators who personally presented their work. It was an opportunity for all to learn of the status and potential value of A/P Study research. Both days also provided ample opportunity for public comment.

For those of you that were unable to attend the conference we have provided, in our Project Highlights column, abstracts of some of the work which was presented. Also included are the comments made by the evaluator teams. This issue carries too, messages from the Program Director and the chairman of the Pamlico Citizens' Advisory Committee; a calendar of upcoming A/P study events; an article on a group closely related to the Albemarle-Pamlico Estuarine Study, the Pamlico Environmental Response Team (PERT); a listing of the 1988-89 technical and public participation projects selected for funding,

and lastly, but certainly with great pride, the announcement of the newest members of the Citizens' Advisory Committees.

### They are, on the Albemarle side:

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### and on the Pamlico side:

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We extend a hearty welcome to our new members and again remind our readers that the Citizens' Advisory Committee members are the persons, along with the Public Participation Coordinator Joan Giordano, (919/946-6481) whom you should contact with questions, criticisms, or comments pertaining to the Albemarle-Pamlico Estuarine Study.

## Director's Message

Almost eight months have passed since I assumed the duties of program director for the Albemarle-Pamlico Estuarine Study. I want to thank all of you for the support and encouragement you have given me during that time.

I have been very impressed with the commitment the four administrative boards have displayed. This is especially true in light of the number of hours involved with planning and carrying out all the tasks associated with the first annual review meeting. I feel the annual review meeting succeeded in fulfilling its three tasks: researcher review sessions, round-table meeting of all administrative board members, and public presentation of the program's status. There now appears to be an even stronger commitment and a new program direction based on the comments I have received from the annual meeting.

Citizens need to become involved with the Albemarle-Pamlico Study because implementation of the Comprehensive Conservation Management Plan can only occur if citizens support its recommendations. Therefore, I look forward to working much closer with citizens, organizations and local governments within the study area this coming year by developing a better communication network among all interested parties.

## Citizens' Advisory Committee Chairman's Message

by Derb Carter, Chair  
Pamlico Citizens' Advisory Committee

"This is just another study in which the researchers are going to redefine the problems we all know exist and nothing is going to get done." As Chair of the Pamlico Citizens' Advisory Committee, this is one of the many comments I hear about the Albemarle-Pamlico Estuarine Study. Perhaps it was a mistake to title the program a "Study" which implies analysis but not action.

While additional analysis of the complex causes of the water quality problems in the Pamlico and Albemarle Sounds will occur, the "study" has committed to a series of objectives which, if accomplished, will create a framework for actions to maintain, and where necessary restore, the water quality and living resources of the sounds.

In six months a comprehensive water quality monitoring program is to be

implemented and the probable causes of major environmental problems identified. Within two years a final report identifying actions to correct these problems is to be published. Within three years specific action plans to address the causes of problems are about to be adopted with schedules for implementation. Within four years a final comprehensive management plan to restore and maintain the water quality and productivity of the sounds is to be adopted and implemented.

The public should expect and insist that these objectives be met. They are the benchmarks by which the success of the program will be judged. Success for the program will be measured not by the number of studies conducted but by improvements in the water quality and resources of the sounds.

Success for the program will also be

measured by public involvement. Public awareness of and concern over the quality of North Carolina's coastal waters, the declines in fishery resources, and the loss of valuable wetlands, is increasing. The Albemarle-Pamlico Estuarine Study provides an opportunity to focus this awareness and concern in the development of public consensus which will support actions to conserve these important resources for this and future generations.

The sounds and estuaries of North Carolina and the fish and wildlife these waters support are public resources. The A/P Study is an opportunity for you to contribute to the management of your resources. I encourage you to take full advantage of this opportunity and ensure that the A/P Study is not "just another study."

## Technical Corner

### PERT

by Cathy Tyndall

The Pamlico Environmental Response Team (PERT) was created in early June of this year to address the increasing environmental problems of the Pamlico River. Over the past ten years, the area has experienced numerous fish kills, chronic low dissolved oxygen levels, fish disease, crab disease, algae blooms, loss of submerged aquatic vegetation and other symptoms of degraded water quality. These events indicate a decline in the overall health of the estuary.

Generally, the Division of Environmental Management (DEM) and the Division of Marine Fisheries (DMF) staff in the Washington Regional Office of NRCO have worked together to respond to events. With the creation of PERT, a full-time four member team is working to respond to problems of the Pamlico River. Jess Hawkins and Raleigh Bland of DMF comprise one-half of the team and Barry Adams and Cathy Tyndall of DEM complete the team.

Since their formation in June, the team has responded to fish kills and algae blooms and has implemented a sampling system utilized by PERT members to gather water quality data and to tie into special studies and routine water sampling on the Pamlico. A main function of PERT has

been to monitor and coordinate studies being conducted by universities, state and federal agencies and local citizen groups. The team is also working with the Albemarle-Pamlico Estuarine Study (A/P Study) to coordinate and offer help or suggestions in Pamlico related projects. PERT members have been involved in studying the Cost Share Program, agricultural practices and animal operations affecting the Tar-Pamlico River Basin.

PERT has actively been involved in a cooperative effort between DMF and the North Carolina State University School of Veterinary Medicine. This effort involves planning and implementing research activities related to the ulcerative mycosis fish disease project. Members of the team have assisted the Vet School's research technicians in capturing and transporting Atlantic menhaden to holding pens and tanks placed at designated study points along the Pamlico River. Research information from the fish tank and pen monitoring project should yield information related to the geographic distribution of the disease and possible associated water quality parameters.

PERT is also cooperating with the N. C. State Vet School and the National Marine Fisheries Service in a study of blue crab

disease. By examining diseased and healthy crab specimens, investigators hope to determine whether biological agents are present which may be important in protecting against bacterial invasion and disease.

A fisherman monitoring network is operating along the river from Washington to South Creek to Belhaven. Currently, thirteen fishermen are recording useful data such as weather details, pounds of fish and crabs caught, and the number of diseased animals captured. The data are incorporated into the PERT data base.

The team is directed by an oversight committee headed by Paul Wilms, the Director of DEM, and Bill Hogarth, Director of DMF. The oversight committee decides how to best utilize the ongoing research and resources of all the agencies involved to identify problems and solutions for the Pamlico River.

The problems that burden the Pamlico are complex and many, and they are not easily identified or solved. Hopefully, with citizen concern, government support and dedicated people working to better our environment, the delicate balance of the Pamlico can be restored.

*Coming together is a beginning;*

## Improvements to Municipal Wastewater Treatment

by: Ted Bisterfeld EPA Region IV

Ever wonder where wastewater treatment grant monies go that the EPA administers? Some of it comes to the Albemarle-Pamlico Estuarine Study area to upgrade or expand sewage treatment and conveyance facilities. The Clean Water Act of 1972 authorized a greatly expanded EPA Construction Grants Program that has been heavily funded and supported by Congress since that time. However, it is currently being phased down until 1990 when the Program changes to a revolving loan program administered solely by the states.

During the Federal Government's fiscal year 1988 which ended last September, EPA has awarded \$22,586,511 in new grants and \$3,943,659 as increases to existing grants within the A/P Study area of North Carolina. These construction projects are designed to improve the quality of wastewaters eventually reaching the sounds. Grant recipients and funding levels are tabulated below.

### FY '88 Construction Grants Wastewater Treatment Projects

#### Increases to Existing Grants

Hertford	172,817
Ahoskie	197,625
Edenton	186,000
Berhel	144,150
Greenville Utilities Comm.	1,207,612
Belhaven	227,539
Lewiston	35,797
Garner	395,250
Bay River Sewer District	1,339,920
Bailey	36,949
	<hr/>
	3,943,659

#### New Grants

Rocky Mount	1,252,548
Raleigh	7,270,258
Wake County	323,499
New Bern	3,152,986
Greenville	2,370,859
Elizabeth City	436,741
Tarboro	2,146,594
Hyde County	119,550
Weldon	646,230
Kill Devil Hills	597,449
Rolesville	1,235,041
Pink Hill	1,122,362
Jones County	112,893
Chocowinity	1,799,501
	<hr/>
	22,586,511
Grand Total:	26,530,170

## Project Highlights

As mentioned in our last newsletter, a regular feature of the Albemarle-Pamlico Advocate is the column devoted to Project Highlights. This column affords us a good opportunity for directly reporting to our readers the progress and findings of the research being funded by the A/P Study.

The following three abstracts of funded projects were selected for inclusion in this edition because they represent work being done relative to three of the six major categories of information required to facilitate effective management of the program. They are, by no means, intended to be all-inclusive. In subsequent editions of our newsletter we shall include reports on the public participation, human environment and water quality projects for your information.

### Seagrasses in the Albemarle-Pamlico Estuarine System

#### Principal Investigators:

L. Ferguson, Jose A. Rivera and Lisa Wood  
National Marine Fisheries Service, NOAA  
Beaufort, NC 28516

Marine species of submerged aquatic vascular plants (SAV), form underwater nurseries and seagrass meadows, for estuarine-dependent commercially and recreationally harvestable fish and shellfish. In North Carolina about 90% of commercial landings are composed of estuarine-dependent species. Overall, the most productive habitats for marine fish and shellfish in the Albemarle/Pamlico estuarine system study area are the shallow saline waters on the eastern periphery of Pamlico Sound and all of Core Sound. These productive shallow bottoms are inhabited by seagrasses: the temperate species, eelgrass (*Zostera marina*), the subtropical species, shoalgrass (*Halodule wrightii*), and the broadly distributed widegeon grass (*Ruppia maritima*). The occurrence of these three seagrasses is unique to North Carolina and provides critical fishery habitat, food and protective cover, throughout most of the year as deep as 6 ft (MLW). We estimate a total area of marine SAV of approximately 200,000 acres for all of North Carolina, including Bogue and Back Sounds. Of this total, 14% is in Core Sound and 80% is along the eastern periphery of Pamlico Sound.

Under funding from the Albemarle-Pamlico Estuarine Study we conducted an aerial survey (Dec. 1987) of Core Sound and eastern Albemarle and Pamlico Sounds and photographed (April 1988) Core Sound and eastern Pamlico Sound (both color and infrared at scales of 1:24,000 and 1:50,000). We collected seagrass samples (Oct. 1987 and March 1988) in Core, eastern Pamlico, Croaran, Roanoke, eastern Albemarle and Currituck Sounds to provide ground level verification of our photographic interpretation of SAV. As a demonstration product, we

delineated SAV in 1985 photography of southern Core Sound and produced charts of seagrass habitat in Core Sound from Cape Lookout to Drum Inlet. These charts are based on USGS quadrangles and include navigational aids from NOAA nautical charts.

The charts and photographs we are generating form a baseline of location and abundance of this critical fishery habitat for temporal and spatial trend analysis, environmental impact evaluation and research on functional studies of the relationship between habitat and fisheries productivity. They already have provided valuable information to habitat managers in their view of dredge and fill related permit applications and helped achieve the nomination of Core Sound and western Bogue Sound for designation as outstanding resource waters.

### Abundance and Viability of Striped Bass Eggs Spawned in the Roanoke River, N.C. in 1988

#### Principal Investigators:

Roger Rulifson  
Institute of Coastal and Marine Resources  
East Carolina University  
Greenville, NC 27834

Studies on striped bass egg abundance and viability have been conducted in the Roanoke River each year since the mid-1950s by Dr. W.W. Hassler and co-workers from North Carolina State University in Raleigh. The information gathered by these researchers spans nearly 30 years of uninterrupted records and is well-known as the best data base on striped bass spawning activity in North America. These records have been an extremely important source of information for reconstructing the historical spawning record in relation to exploitation, changes in regulations, and man-induced changes in the flow regimen and water quality for the Roanoke River. Upon the retirement of Dr. Hassler in 1987 from actively pursuing these studies, the Albemarle-Pamlico Estuarine Study ensured continuation of the egg production data base by funding the study through ECU in 1988.

The objectives of the study are: 1) to continue the data base established by Dr. Hassler; 2) to develop a means to back-calculate Hassler's data in an egg-density-per-unit-volume format (to compensate for radical changes in the flow regimen); and 3) to correlate the intensity of striped bass spawning (as measured by egg production) with water releases from the reservoir at Roanoke Rapids, North Carolina.

Sampling the waters of the Roanoke River for striped bass eggs was initiated on 10 April 1988 at a site below the historical spawning grounds just downstream of the Caledonia State Prison Farm near Scotland Neck, North Carolina. Samples were taken every four hours for a 60-day period. Eggs were collected in fine-meshed nets sus-

*Keeping together is progress;*

pended in the water column for five minutes. The eggs were returned to the field station on the river bank, enumerated, and examined to determine viability. Diel and seasonal variability in the data remains to be analyzed. Over 80% of the scheduled sampling trips were completed; the remainder were not completed due to inclement weather and equipment problems. A total of 41,719 striped bass eggs were obtained in the 311 trips. Nearly 77% were examined for viability; during peak egg production, subsampling for viability was mandatory. Preliminary results indicate that total egg viability for 1983 was about 89%, the best value since 1972 (excluding values for 1985-87, which were not available). Total egg production for 1988 has not been estimated at this time. This high viability estimate corresponds with good 1988 water quality (determined by another A/P Study), moderate river flows, good larval striped bass abundance in the critical habitats of the lower river, and the best (estimated) juvenile abundance index since 1983.

### Albemarle-Pamlico Estuarine Study Information Management

#### Principal Investigator:

Karen Siderelis  
Div. of Land Resources  
N.C. Dept. of Natural Resources &  
Community Development

Three activities - technical research projects, public participation, and information management - form the basis of the Albemarle-Pamlico Estuarine Study. Good data, in a form that can be readily utilized by source managers, are critical to achieving the goal of developing a viable, long term management strategy for the Albemarle-Pamlico region. The goal of the information management program is to provide this data and management support so that policy and management decisions can be based on the best available information.

A computer system for managing data has been designed to serve the needs of the Albemarle-Pamlico Estuarine Study. A geographic information system or GIS, which provides the capability for compiling, storing, displaying, and analyzing geographic information, is an integral part of the data system.

The information management program utilizes many existing data bases, and a specialized data base for the Study is also being developed. Software and procedures for accessing datasets on computers other than the APES primary system are being developed so that users needing to combine detailed data from different computer systems may do so.

The data base will have three basic components: a catalog of literature and data, column-formatted data, and geographic data. The literature and data catalog will function as an index to all of the known literature and data about the Albemarle-Pamlico. The columnar data are extracted from existing large datasets and from data-

sets developed through on-going research projects.

Digitized base map for the region will also be stored in the system. The geographic data include U.S. Geological Survey base map data (transportation, surface water features, and political boundaries), general and detailed soil survey, land use and land cover information, watershed boundaries (drainage basins), and geographic data about the marine fisheries of the state. The fisheries data includes primary and secondary nursery areas, anadromous fish spawning and nursery areas, shellfish areas, biological monitoring sites, submerged aquatic vegetation, etc. Census boundary map data and associated population, housing, income and employment data will be incorporated in the APES data base.

The system and the data base will be used for general data management, geographic data analysis, statistical analysis, and literature and data cataloging. The primary system utilized for the Study is the system operated by the Land Resources Information Service (LRIS) in the N.C. Department of Natural Resources and Community Development.

The following program evaluations were submitted by the moderator/external evaluator teams during our first Annual Review Meeting. By way of information, the teams consisted of six Policy Committee members who were teamed with six external evaluators to correspond to the six major categories of program information. They were:

#### Resource Critical Areas:

Policy Committee — L.K. "Mike" Gantt  
U.S. Fish & Wildlife Service  
External Evaluator — Herb Austin  
College of William & Mary  
Virginia Institute of Marine Science  
Gloucester Pt., Virginia

#### Information Management:

Policy Committee — Dirk Frankenberg  
UNC—Chapel Hill  
External Evaluator — Todd Augenstein  
USGS  
Richmond, Virginia

#### Fisheries:

Policy Committee — Bud Cross  
NOAA S.E. Fisheries Center  
External Evaluator — Paul Sandifer  
S.C. Wildlife & Marine Resources  
Charleston, S.C.

#### Water Quality:

Policy Committee — Paul Wilms for John Costlow  
Duke Marine Lab  
External Evaluator — Doug Rader  
N.C. Environmental Defense Fund  
Raleigh, N.C.

#### Public Participation

Policy Committee — Derb Carrer  
Environmental Attorney  
Parker Chesson  
College of the Albemarle

External Evaluator — Fran Flanigan  
Alliance for the Chesapeake Bay  
Baltimore, Md.

#### Human Environment:

Technical Committee — Dave Owens  
N.C. Division of Coastal Management  
External Evaluator — Ray Burby  
UNC-Chapel Hill  
Chapel Hill, N.C.

#### Resource Critical Areas

By: Herb Austin

Herb Austin indicated he could not provide a technical review from the forum provided, that is, abstracts and five to ten minute presentations. In the future, he suggests that external reviewers be given a copy of the technical proposal along with a progress report. Meanwhile, he could comment on what was provided and on parallels with other programs.

He was pleased to see a GIS being used up front in the study as opposed to later on as the Chesapeake Bay Program (CBP) did. The GIS will be an excellent crossover to put water quality and fisheries data together. This concern needs to be addressed and modified.

There is a need for a good network. A lot of the work parallels the CBP. By making an official appeal to the CBP, they will probably provide a list of their principal investigators PIs who can make their reports available for review. A problem the CBP had was that fisheries had been excluded from the study and at the last minute Chesapeake Bay stock data was generated. The A/P Study should be careful not to make the same error. Draw on the CBP PIs for input. Other studies within the A/P Study area of research could be solicited and used. PIs from other studies could come to talk to A/P Study PIs to get a crossover of information.

He believes the Status and Trends Report (STR) preproposal is a good idea. He suggests doing some sleuthing to look for 10 to 40 years of data. Trends opens up a whole statistical time/series way of looking at data. If the study only looks at biological data, the study will get into trouble.

Citizens were a good source of monitoring for the Chesapeake Bay. Initially, scientists were nervous about using citizens' data, but once the monitoring program got in place it proved very useful. Scientists generally did not have the time nor resources to monitor all areas but the citizens could get to areas they could not.

There must be feedback/communication exchange between researchers and managers.

Austin was very pleased that legislators came into the CBP once the data was found. Once they saw data and what the trends were, they began asking what could be done.

Another good aspect of CBP data were policy statements which were adopted into an official fisheries policy in Virginia.

Mr. Austin said he wants to talk further with the A/P Study PIs to share ideas. He felt

*Working together is success*

there wasn't enough technical information provided or shared and that still needs to happen.

It is very important for the researchers/managers/citizens to keep talking to each other. This is key to the process.

### Fisheries

By: Paul Sandifer

In the fisheries area, we reviewed six projects, one of which has been completed, two with no cost extension and three that have just begun. One project is essentially a planning grant for the Division of Marine Fisheries to determine how it should go about acquiring the data necessary for stock assessments. The completed project evaluated the use of four types of TED's to reduce fish by-catch in the Pamlico Sound shrimp fishery. Three projects deal with the early life history of striped bass in the area, and the fiscal project we reviewed deals with determining the value of recreational fishing in the A/P Study area. All of these projects appear to be of high priority and to be making good progress toward their stated goals. Nevertheless, we noted several areas for possible improvement.

1. There is no clear overall goal statement or objective for the fisheries program and no indication of how the component projects pull together. It was also not clear to the external reviewer how initial priorities were set.
2. Fisheries projects are scattered throughout the program and there appears to be little coordination and integration of the various individual project efforts.
3. With the possible exception of the recreational fishery economics study, all of the fishery projects appear to lack a social component. This needs to be rectified. North Carolina is fortunate to have social anthropologists who are familiar with marine fisheries, but such scientists are comparatively few. We recommend that the program bring in a social scientist as a reviewer, or perhaps even a technical committee member, from out-of-state. This would help ensure that the appropriate attitudinal and other social studies were planned, while conserving the state's expertise in this area to actually do

the work. In general, the A/P Study program administration might consider this approach in any discipline where in-state expertise is very limited.

4. A missing element in virtually all the projects is any attempt to realistically estimate recreational harvest of any species. While commercial landings have been declining for some time, recreational efforts have been increasing rapidly. It is essential that this source of mortality be quantified, along with commercial fishing mortality and the effects of environmental degradation. Added together, these estimates could give a good total picture of a fishery population. The Division of Marine Fisheries should develop a plan to acquire recreational catch and effort data and, at the same time, improve its data on commercial effort.
5. The by-catch from the shrimp (and any other trawl fishery) should be quantified and its economic value determined. Included in the economic evaluation should be the potential value of these fish to the recreational fishery or other users.

### Information Management

By: Todd Augenstein

The information management component of the Albemarle-Pamlico Estuarine Study was reviewed and evaluated as part of the program's annual meeting. The overall conclusion of this review is that the information management component of A/P Study is appropriately designed, using state-of-the-art technology, and has made reasonable progress during its first year of activity.

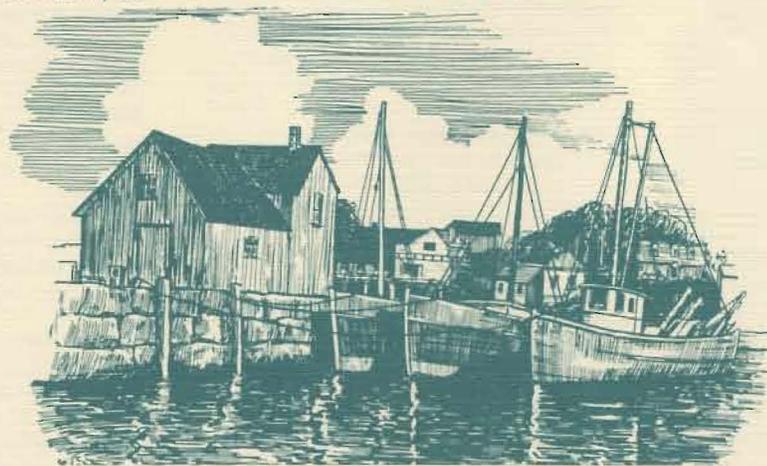
The information management component of A/P Study is utilizing a Geographic Information System (GIS) and a Relational Data Base Management System (RDBMS) as its primary technical tools. AGIS utilizes modern computer techniques to geographically store, analyze, and display information. AGIS systems can be used to produce customized maps showing relationships between environmental factors that might otherwise not be approved, and is capable of displaying the diversity of environmental uses and features of geographic areas. A

RDBMS allows for the easy storage and retrieval of tabular information.

The A/P Study information management is now focusing on a data needs assessment. This phase of the project is designed to determine what types of data will be needed and used by resource managers, scientific researchers, and public citizens. Needs of these groups will be used to design access technology to the A/P Study data base, tabular data sets for management use, and publication lists for access to existing scientific information. In addition the project is entering environmental information on the Albemarle/Pamlico estuary as it becomes available. The project has already entered 30 existing data bases and 3 data bases produced by A/P Study environmental characterization projects. This data is being used to produce maps of environmental relationships by resource managers in the A/P Study project, the Department of Natural Resources and Community Development, and A/P Study researchers. Techniques for entering additional data from A/P Study and other projects are in place.

The present status of the Information Management component of A/P Study is entirely satisfactory. The project is imaginatively designed and progressing effectively toward achieving its objectives.

The Albemarle-Pamlico Estuarine Study (A/P Study) wishes to thank the external evaluators for their constructive comments and their input during the Annual Review. The general consensus among the evaluators is that the A/P Study is off to a strong start and that some mid-course correction may be indicated in certain areas. The process of self-evaluation, aided by concerned and dedicated citizens, is a healthy and beneficial exercise which will yield positive results, particularly when the Comprehensive Conservation Management Plan is being drawn and implemented. We on staff have profited from the meeting process and are delighted to see the program progress to a new level.



## Second Year Technical &amp; Public Participation Projects

TECHNICAL SUBJECT	INVESTIGATOR/ INSTITUTION	PUBLIC PARTICIPATION SUBJECT	INVESTIGATOR/ INSTITUTION
Inventory/Natural Area	Roe-NRCD	Striped Bass	Conley-Office of Marine Affairs DOA
Coupling Study of Sounds	Pierrafesa-NCSU	Guide to Streams	McNaught-PTRF
Managing Multiple Use	Clark-NCSU	Community Outreach	McNaught-PTRF
Shell Disease/Blue Crab	Nogo-NCSU	Calendar	Numberg-PTRF
Water Management vs. Water Quality	Skaggs-NCSU	Teacher Environmental Education	Carson-ECSU
Larval Fish/Roanoke & Albemarle	Rulifson-ECU	State of Estuary-TV	Willard-Lisabeth Willard Productions
Losses of Bay Scallops	Peterson-UNC	Water Quality Monitoring Project	McNaught/PTRF
Total	\$427,934	Total	\$168,698

## Upcoming Events

Date	Event	Date	Event
January 13, 1989	Review of Proposals (submittal due date)	April 24-26, 1989	CAC Meetings
February 7-9, 1989	CAC Meetings to Evaluate Specific Proposals	May 10, 1989	Technical Committee Meeting
February 21, 1989	Technical Committee Meeting to Consider Subcommittees' Proposal Recommendations	July 1, 1989	Projected EPA Award of Funding
February 27, 1989	Roundtable Meeting of all Committees	August 7-9, 1989	CAC Meetings
February 29, 1989	Policy Committee Meeting to Consider Technical Committee Proposals and annual budget recommendations	August 22, 1989	Technical Committee Meeting
March 3, 1989	Return Selected Proposals to Authors for Revisions	August 30, 1989	Roundtable Meeting of all Committees
March 17, 1989	Revised Proposals to Director/Subcommittees	September 1, 1989	Policy Committee Meeting
April 7, 1989	Final Proposals to EPA for Approval	September 14, 1989	Annual Researchers Review Workshop
		September 19, 1989	Technical Review Subcommittee Meeting
		October 6, 1989	Annual Public Meeting
		October 10, 1989	Develop Call for Proposals
		October 25-27, 1989	CAC Meetings
		November 7, 1989	Technical Committee Meeting
		November 21, 1989	Policy Committee Meeting

Note: Dates are tentative and may be subject to change.

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 A/P Study. For questions or comments, contact Joan Giordano, Editor, 1424 Carolina Ave., Washington, N.C. 27889 or call 919/946-6481.



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### ALBEMARLE-PAMLICO ADVOCATE



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