

Albemarle Citizens' Advisory Committee  
College of the Albemarle  
Elizabeth City, N.C.  
April 26, 1990  
7:00 pm

APES  
MAY 21 1990

Minutes

Attendance - See Attachment A

In Chairman Brown's absence Vice Chairman John Stallings called the meeting to order at 7:15 pm and welcomed those present. He called for approval of the minutes from the previous meeting (1/31/90). A motion by Capt. Al Howard, and seconded by Yates Barber to accept the minutes as written was made. Motion carried.

Program Update - Dr. Holman presented his report. See Attachment B. He elaborated on the issuance of county land-use mapping by the center for Geographical Information and Analysis (CGIA) to areas in the Currituck Drainage Basin (Currituck, Camden, Dare, Va. Beach and Chesapeake City). These maps were sent to representatives in each of the 5 counties for review/verification. The maps are based on the U.S. Geological Survey's 1972 LUDA series.

In the next few months a current land use map of each county will be provided for review. This mapping effort will be based on Landsat TM imagery taken in 1987-88. Dr. Holman then directed the groups attention to a sample of the land-use maps. He said the sample was a composite of (8) 1:250,000 scale quads and took eight hours to print. Discussion ensued.

Attention then turned to the Status and Trends Document (S & TD). Dr. Holman explained that the original group of authors was reconvened on April 25th to revise the document and to begin the process of adding conclusions to it. The S & TD Review group then met on May 1 to evaluate the comments made by the S & TD authors. These conclusions and recommendations are presently being circulated to the Technical Committee for comment. Upon completion of the process, including 5 public meetings across the state, specific recommendations for the CCMP outline will be made. Also the comments/conclusions/recommendations will be incorporated into a new public version of the S & TD. CAC input into this process was provided by CAC representation on the original authors' working groups and also in the review group.

Questions arose concerning the timeframe of the S & TD revision. Late July or August were offered as target dates. Direction turned to a question on an update in the Chowan Albemarle Plan. Dr. Holman stated that he did not know but

would talk with Virginia representatives and report back. Finally a question regarding Citizens' Monitoring was asked. Dr. Holman reported that the program needed a new home as PTRF was no longer going to administer the grant. NOAA had been approached as sponsor and showed interest in overseeing the program. No decision has been made as of this date. The creation of an APES foundation would help greatly in dealing with situations such as the Citizens' Monitoring Program.

Public Participation Update - Joan Giordano presented her report. See Attachment C. Mrs. Giordano encouraged the group to participate in the May 4 & 5 CAC Workshops to formulate CCMP recommendations. She then introduced Neil Armigeon from the North Carolina Coastal Federation to elaborate on the May 4 & 5 meetings. Mr. Armigeon explained the workshops purpose and reminded the group that information gathered at the workshops would be synthesized and placed for comment at an interim meeting at Joan's office on May 22 at 10:00 am. After refinement, the final recommendations will be presented at the third of the CAC Workshops on June 5 in Williamston. Watch for more information.

Yates Barber mentioned to the group that Rhode Island's Sea Grant has published a report on Marinas.

Introduction of Dr. William Hogarth - Chairman Brown introduced Dr. William Hogarth, Division Director of Marine Fisheries for the State of N.C. Dr. Hogarth outlined the procedure employed in determining the technical proposals, specifically the fisheries proposals, that were selected for funding (FY '90-'91). In view of the high priority placed on trawling by both CACs and the Policy Committee's ultimate decision to not fund the trawling proposal in question, Dr. Hogarth was invited to attend the April CAC meetings to explain DMF's stance on trawling.

Dr. Hogarth explained that the proposal came through the Technical Committee (TC) with concern about the way it was written. The vote by the T.C. to fund the proposal was not unanimous, but they did put it forward based on the CACs high priority rating.

At the Policy Committee (PC) meeting held in Beaufort on March 7, 1990 the PC examined the proposed FY '90-'91 budget. Because there were no supplemental funds from EPA for early demonstration and a subsequent shortfall would exist if all recommended proposals were funded, a decision had to be made whether to discontinue the 1-2 year old early demonstration projects (i.e. Merchants Millpond and Greenville's Urban BMP) or to continue to fund those projects and look at eliminating newly proposed technical projects. Each of the recommended proposals was looked at. Upon examination of the trawling proposal Dr. Hogarth was

questioned by the PC as to its merit. Dr. Hogarth reported that "in his opinion the questionable proposal was not one that would give much information for management. It was not designed to give those answers. Habitat work is very site specific. Several states have done habitat work predicting the effects of trawls to bottom types and it's so site specific it's difficult to use."

Dr. Hogarth offered to sit down with the CACs and anyone else that might like to be included and assist in writing a proposal for the coming year.

He then went on to explain what the DMF is looking at regarding trawling. "Trawling essentially has two impacts - 1. By-Catch, and 2. Effect on the bottom. Most scientists believe that by-catch is the issue at which we need to look. See Attachment D. By-catch varies depending on the type of trawling that's being done. The ocean trawling winter trawl fishery is entirely different than say, the shrimp trawling inside. Crab trawling is entirely different than either one of those two, and so when talking about impacts of trawling (we) really have to look at the by-catch issue.

In a short report done by DMF based on the last 5 years, winter trawl fishing accounted for 32-52% of all reported scrap fish. Most people ignore this fishery because they don't see it. The perception is that you see the shrimp trawlers close by inside, so you think they've been doing damage, but most scrap fish is landed by the winter trawl offshore. Over the last three years the marketable size catch in trawl fishing offshore is decreasing and the percent of scrap fish is increasing. We looked at each species such as summer flounder, weakfish, Atlantic croaker, bluefish, spot, black sea bass and all of the winter trawl fishes, and we're seeing that the summer flounder fishery is really in bad shape. All of the East Coast is in bad shape. Although for some reason in N.C. it's better than the rest of the East Coast. Summer flounder is growth over fished which means they're being taken too quickly, at too small a size. It's the same thing with weakfish.

In the DMF we're now looking at each fishery trying to find the season, time of year and the location they're trawling in to see what the by-catch is. APES funded a proposal earlier in the program on trawl design. Kenny Pierce a commercial fisherman with DMF and the National Marine Fisheries worked on it and developed some work on a separator trawl. It has potential and DMF is planning on picking that up. DMF is looking at every fishery, every bit of gear, in fact, even at the long-haul. If you really want to talk about by-catch scrap fish and potential impact on the habitat, the long haul may do even more damage than the trawl. One thing about trawls, we can put gear restrictions like a tail bag, (we may put a 5 1/2 " tail bag cod end on

the trawl industry next year) and that will release small fish but in a haul-seine pretty much they can't cull until they get to dock. It (trawling) is extremely variable by location, by water body, by type of fish. In the Pamlico River and Pungo River, we (DMF) have some concern and if you look at the sound itself, the Pamlico Sound operates a lot like the ocean. Albemarle Sound does not have the hydrodynamics the Pamlico has. It operates more like a lake and we have more resident species so the commission banned trawling inside Albemarle Sound. It's been for a number of years and I don't know if we've seen any improvement. We're concerned about trawling. We applied for a S-K Grant through the National Marine Fisheries Service and had the 3rd rated project in the whole region on looking at effects of trawls. We went to the Gulf and South Atlantic Development Foundation a non-profit group working with the National Marine Fisheries. They got audited, and a hold has been put on the money. We should get it by 5/30. Walter Jones' office is working on the release of funds. We'll hire a gear development specialist and a couple of technicians. The project is divided into 3 areas, winter-trawl fishery, inside trawl and developing new type of trawls and escape mechanisms within each type of trawl and other methods of catching shrimp, such as shrimp pots. We have an Advisory Committee that's been set up that is a cross section of the public. We have the Fisheries Association, Atlantic Coast Conservation Association of NC, environmental people and trawlers. Ten Sea Grant people will be working with us and that project will pretty much be done by the Div. of Marine Fisheries and Sea Grant with much direction by the advisory group to make sure it's done properly.

In the meantime Marine Fisheries Commission is going to public hearings in May. I have noticed since I've been Marine Fisheries Director that we don't get much input by the public. We get criticism, but not much input. The general public doesn't come to make statements. We hear from fishermen 'cause we regulate them, but in support for anything we don't get the general public coming. We get a lot of criticism. We NEED public input to make decisions on 20 different items See Attachment D.

Some scrap fish is needed to be used for crab bait. Crabbing is the biggest fishery we have and it takes much bait. We're trying to switch to menhaden and other non-food fish. I've also asked the Dept. of Agriculture to look at a soybean cake with the addition of fish oil to make it comparable in cost and duration to scrap fish bait. They're working on it now. We're trying to get away from using scrap fish for bait. It will take a while. We're also looking at preventing of dredging for oysters in grass beds. You can dredge for oysters in grass beds in the Albemarle area. I don't know if it's done but DMF is attempting to take that out of regulations. We're looking at by-catch in much detail. Sea Grant's also looking at it. They are looking at what a

trawl does to the bottom. They're actually photographing the bottom, putting rollers in and different type things to see what it (trawling) does. They're helping to try to design a trawl that does less to the bottom. Sea Grant is funding a proposal to go talk to fishermen in a non-regulatory environment. Just sitting down and talking to them and asking if they think by-catch is a problem? What do you think can be done? Get ideas on design of new gear.

Fishermen are being honest about problems. The Commission and DMF have held a meeting on February 20th in Kinston and invited 18 recreational and 18 commercial fishermen because we weren't getting public input due to the adversarial-type setting of public hearings. We asked them what they thought the problems were as they saw them. The answers were: #1 water quality, #2 licensing, #3 trawling and by-catch. (Not much discussion on habitat effects but much on by-catch.) And #4 gill nets. On the 21st of April we went back to Kinston and invited the same group and discussed issues. Out of that came the following:

1. Trawl - should be limited entry. Limited number of people allowed to shrimp trawl in the state.

License to sell

Gear Development to control by-catch

Close all grass beds to trawling

Look at other shrimp harvest methods

Larger tail bag mesh sizes

No more Grand Openings

To Close a buffer zone around the mouth of abayments

Limit the head row

#### Habitat

We looked at kick boats, they'll dig 12-19" trench about 5' wide anywhere they go. Dr. Peterson from the UNC Institute of Marine Science, found that in sand it didn't do much impact to the bottom at all. Benthic organisms recolonize very quickly. In grass beds it does a lot of damage to grass and in turn we lose bay scallops, shrimp and crabs. Sand vs. grass beds vs. mucky bottom makes a lot of difference. There has been work done in South Carolina it's very site specific. Habitat work has to be very, very, site specific.

Areas Of Study That Can Be Done 1) What would happen in an area that you have trawled - are you keeping the grass from growing? We could close the area and compare it with an area that was trawled.

2) Oyster dredges - what dredges do to oyster rocks and oyster beds themselves? That is something I think probably affects Pamlico Sound area as much as anything. We're committed to working with the Pamlico CAC.

DMF data is available to anyone and we stand behind all we do, it is not done to protect any group of fishermen. DMF is dedicated to protecting the resource. I'm not opposed to listening to any information that will help us make the best decision on the trawling issue. As regards the trawling proposal in question, we felt there were better proposals and better ways to spend the APES money."

Discussion ensued.

Vacancies - Chairman Brown reinforced to the group that six vacancies exist on the A-CAC. He read the names of several persons proposed to fill the vacancies. They are: Jeanne Meiggs, Clyde Hughes, Chip Hughes, Tom Holland and Shelia Smith. Then he asked for nominations from the floor. Philip Hinton and Melvin Daniels were named as additional nominees. Cpt. Al Howard moved to accept six of the seven nominees (Chip Hughes was not endorsed as he resides out of the Albemarle basin) by acclamation and that the slate of six be presented to the Policy Committee at their next meeting on June 13th in Ahoskie. John Stallings seconded the motion. Motion approved by acclamation.

Questions/Answers/Public Comment - David Watson drew the group's attention to an article appearing in the Coastland Times regarding the discharge of sewage into Shallowback Bay. He urged the group to oppose that happening. It was requested that a person from DEM be invited to speak at the next CAC meeting. Mrs. Giordano agreed to approach Jim Mulligan, Regional Supervisor for DEM, to attend the next CAC meeting.

Yates Barber announced that he read about the establishment of two new offices within the Dept. of EHNR. They are the office of Environmental Education and the office of Waste Reduction.

There being no further business the meeting was adjourned at 9:15 pm.

The next meeting will be held during the week of August 6, 1990 at a time and place to be arranged.

Albemarle Citizens' Advisory Committee  
College of the Albemarle  
Small Business Center  
Elizabeth City, NC  
7:00 pm

April 26, 1990

AGENDA

Welcome	Chairman Brown
Consideration of Minutes	
Program Update	Dr. Holman
Public Participation Update	Joan Giordano
Vacancies on A-CAC	Chairman Brown
Introduction Of Dr. William Hogarth	Chairman Brown
"A Three Year Study on Trawling"	Dr. William Hogarth Div. of Marine Fisheries
Questions/Answers and Public Comment	
Adjourn	

A-CAC

Attendees

4-26-90

COA Eliz. City, NC

Joe Giardano

Bob Holman

John Galloway

Stephen Smith

SHEILA SMITH

DAVID S. WATSON

Joe WRIGHT

L.P. Williams

John Paul Lilly

Caryl Lynn

Manag. S. Neiper Sr.

Marian Neiper

Bill Cohe

Bill Hargrett

Neil Armingeon

Joe Statts  
Art Smith

Brewster Brown

Joe Hollowell

Lynda Hollowell

Bill Richardson

Yates Barber

Vredell Hassell

Tom Burns

Alfred [unclear]

A/P Study

A/P Study

Chesapeake

CHESAPEAKE

KITTY HAWK CAC

ACAC

ACAC - Plymouth

ACAC - Norfolk

AC Edenton NC

ACAC

MSFWS

NCDFE

NC Coastal Federation

ACAC - Muflesboro  
Wanchese, N.C.

ACAC - Winton

ACAC

Guest

ACAC - Currituck

CAC Elizabeth City

ACAC

A-CAC

A-CAC



ALBEMARLE-PAMLICO ESTUARINE STUDY

ACAC  
4/26/90

DIRECTOR'S REPORT

CITIZENS' ADVISORY COMMITTEES

APRIL 24-26, 1990

1) EARLY DEMONSTRATION PROJECTS

a) The program currently has 3 agricultural BMP projects from 1988 funding and 1 urban BMP project from 1989 funding.

(1) Urban BMP project - design complete; process of land acquisition; completion of structure set for October 1990

(2) Agriculture BMP projects

(a) Merchants Millpond Watershed - >72 BMP contracts signed utilizing 10 practices (e.g., waste lagoons, water control structures, sediment control practices, livestock exclusion from streams and solid set).

(b) Solid Set - 3 sites  
--Bertie site 85% in place (Aulander)  
--Currituck site completed (Knotts Island)  
--Washington site - moved to Tidewater (Plymouth) Research Station 90% in place

(c) VA Animal Waste Management  
-- 3 of 5 new waste system designs complete (entire system)  
--15 of 21 nutrient mgmt. plans complete (pump down)  
6 test/demonstration plots (mineral fertilizer/manure application)

2) INFORMATION MANAGEMENT

A) LRIS (now Center for Geographic Information and Analysis [CGIA]) proceeding with land use and land cover classification for entire study area utilizing landsat TM 1987-88 imagery which is due in September, 1990.

B) First pilot area for land use mapping will be the Currituck Drainage Basin. Maps indicating the 1972 land use for Currituck, Camden, Dare, Virginia Beach, and Chesapeake City have been sent out for review to the 5 counties in the drainage basin.

- C) U. S. Geological Survey LUDA data (1970-73) is on line and CGIA is providing county statistics for each county within the study area (The map before you is a composite of eight 1:250,000 scale quads. of study area).
- D) CGIA will take over the data manager position by hiring a software specialist and GIS specialist. However, due to the budget constraints CGIA can only hire temporary positions until July 1, 1990.

3) STATUS AND TREND REPORT (STR)

- A) Public meetings to obtain comments concerning the STR have been delayed by the Policy Committee. This delay is needed to modify the conclusions of the technical version and change the format and add conclusions to the public version.
- B) The original group created by Dr. B.J. Copeland to develop the Preliminary Status and Trend Report will meet on April 25, 1990. This group will review their conclusions and identify trends for each section of the report.
- C) The STR Review Group will have their second meeting on May 1, 1990. This group will review the additional comments provided by Dr. B.J. Copeland's work groups and develop specific recommendations for the CCMP outline.
- D) All of these comments will be incorporated into a new public version of the STR. Once this new version is approved, the public meetings across the state will be rescheduled.

4) MEETINGS

- A) Feb. 20 - Technical Committee Meeting
- B) Feb. 25&27 - Attended a meeting in Williamsburg, VA on reducing pollution from Nonpoint Sources: The Chesapeake Experience
- C) Feb. 6-7 - Roundtable and Polciy Committee Meetings
- D) March 21 - Selected Proposal Review with Technical Acquisition Researchers
- E) March 28 - Selected Proposal Review with Public Participation Investigators
- F) April 19 - VA/NC Interaction Meeting

5) FY 1990-91 PROPOSED PROJECTS

A total of 74 proposed projects were received, and only 29 projects were funded.

Early Demonstration	(2)	Human Environment	(3)
Fisheries	(2)	Resource Crit. Area	(2)
Water Quality	(9)	Public Participation	(11)

(The list provided indicates the 29 projects that were approved for funding)

6) PUBLIC PARTICIPATION

Joan Giordano's Report

29 of 74

ALBEMARLE-PAMLICO ESTUARINE STUDY

Projects Approved For Funding

FY 1990-91

TECHNICAL INFORMATION ACQUISITION

Resource Critical Areas

- 401 Regional Inventory (C) Roe (DPR)
- 416 Delineation of SAV (C) Ferguson (NOAA)

Water Quality

- 417 Citizens' Monitoring (C)
- 453 Nutrient Budgets Dodd (RTI)
- 458 Mgmt. Plan: Currituck Sound (C) Overton/Adams (NCSU)
- 461 Blue Crab-Hemocyanin Concentrations Engel/Brouwer/Noga NMFS/Duke/NCSU
- 465 Open Sound Monitoring (C) Bales (USGS)\*
- 467 Flows/Hydrodynamics in Albemarle Sd. Bales (USGS)\*
- 468 Determine Flows/Flow Patterns (C) Bales (USGS)\*
- 472 Toxicant Inventory Thorpe (DEM)
- 473 Baseline WQ Monitoring (C) Tedder (DEM)

Fisheries

- 434 Blue Crab Fishery (Pamlico) McKenna (DMF)
- 454 Ulcerative Mycosis (Menhanden) (C) Noga (NCSU)

Human Environment

- 415 Public Attitudes Toward WQ/Mgmt. (C) Hoban/Clifford (NCSU)
- 430 Environmental Mgmt. Strategies Bartholomew (CPN)
- 452 Federal Programs (C) Nichols (RTI)

Early Demonstration

- 469/449 Pollutant Removal By A Demonstration Urban BMP (C) Stanley/Bales (ECU/USGS)
- 455 Upper Bennett's Creek Watershed (C) Cummings (DSW)

Others

CCMP Draft Document

TOTAL TECHNICAL INFO. ACQUISITION

(C) Continuation Projects from FY 1989

\* Funding pending further peer review

PUBLIC PARTICIPATION

Newsletter & Postage

403 Water Quality Awards Program	Burns (ARC)
407 Assisting A/P CACs in Organizing an Annual Meeting & Produce 10 Fact Sheets, 5 Educational Pamphlets, & reprint Citizen's Guide	Tursi (NCCF)
408 Radio Outreach Program	Cleary (BF)
409 Public Education Program in the Albemarle Sound Area	Powers (AEA)
411 Five Fact Sheets	Powers (AEA)
412 Precious Waters Display	Conoley (NCAS)
413 Estuarine Resources Center	McNaught (PTRF)
431 Institutional Enhancement for SE VA	Carlock (SEVPD)
439 Yes, In Your Backyard: TV PSA	Willard (WP)
444 Model Education Curriculum	Schultz (EC/PCS)
474 Community Education Outreach III (C)	Stroud (PTRF)

Public Involvement Coordinator's Report  
April 1990

1. Citizens' Advisory Committees (CACs)
  - continue to meet quarterly
  - meeting notices sent to public officials, interested citizens and newspapers in meeting area
  - vacancies exist: P-CAC (1); A-CAC (6)
  - committee members continue to share APES information with community and civic organizations
  
2. Exhibits
  - State Fair Exhibit (Nursery Area Model) was used at WRAL's Coastal Celebration in Raleigh 4/7 & 8 and at Earth Day Celebration in Greenville on 4/22
  - Nursery Area Model is on semi-permanent display at PTRF's resource center in Washington, NC
  - Nursery Area Model being used April 24, 25 & 26 at Environmental Awareness Field Days sponsored by the Assoc. of Soil & Water Conservation Districts
  - Nursery Area Model will be used at W.H. Robinson & So. Greenville Schools in Greenville during May
  - Exhibits are available for use in study area at any time
  
3. Outreach
  - Educational Presentations:
    - \* Bath Ruritan Club
    - \* Windsor Rotary
    - \* Earth Day Elizabeth City & Greenville
    - \* Pasquotank High School - March
    - \* Currituck High School - March
    - \* Bertie High School - Gates - April
    - \* Camden Co. High School - May
    - \* Gatesville Women's Group - May
    - \* Washington Co. Middle School - Roper - May
    - \* Spring Harbor Ext. Group - May
    - \* 4-H group - Arrowhead Beach - May
    - \* Eastern Elementary - Washington
    - \* John Small Elementary - Washington
    - \* P.S. Jones Jr. High - Washington
    - \* 3rd Street School - Pitt County
    - \* Belvoir Elementary - Pitt County
    - \* A G Cox - Pitt County
    - \* Welcome Middle School - Pitt County
    - \* Grifton Elementary - Pitt County
    - \* Sadie Saulter - Pitt County
    - \* Stokes School - Pitt County
    - \* Elm City School - Wilson
    - \* Speight Middle School - Wilson
    - \* Belhaven Elemenatry
    - \* ECU Teaching "Fellows"

Approximately 3000 individuals were reached through presentations in the Pamlico area

- Local Government Liaison
  - \* Belhaven Town Council

4. Projects

- Print
  - \* Poster series/bumper stickers - completed, being distributed
  - \* calendar - completed and distributed
  - \* "Guide to Estuaries" - completed, distributed and going to reprint
  - \* "Where the Rivers Meet the Sea" - distributed to schools as part of December packet; additional copies being printed for public distribution
  - \* Status & Trends (public version) - being revised to include conclusions
- Electronic
  - \* video PSAs - completed; distributed
  - \* video/slide show - completed; shown at Roundtable 3/6 & 7 in Beaufort - video is also being shortened 20 minutes for use at meetings requiring an abbreviated program
  - \* radio talk show - 2nd (Wetlands) of 6 scripts completed and being approved; will begin airing in May
- Public Meetings
  - \* Workshops on Water Quality - done by NCSU Ag. Extension March 6,7,14 & 15 were very well attended - 275 to 300 people
  - \* Forum on Management Needs for Protecting Estuarine Resources in A/P System - all 4 completed - fair to good attendance
  - \* Assisting CACs with Estuarine Management Recommendations - scheduled for May 4 & 5 in Washington - Final workshop - June 5 in Williamston
  - \* Press Tour - scheduled for June 6-8 in Albemarle region

All 3rd cycle projects are completed or nearing completion

5. Other Meetings & Events

- Status & Trends Public Meetings (5) across state rescheduled due to revision of S & T Document (Public Version)
- COG presentations in Va. April 3
- Va. Beach Workshops April 3 & 18 - S. E. Va. Planning District
- Va. Interaction meeting April 19
- State Fair - Oct 12-21, 1990 - Dept. theme is Waste Management and Recycling

6. Newsletters

- next edition in April/early May
- expanded mailing list to 17,000
- responses are very favorable

7. Inquiries to Program

- receive almost daily response to newsletter, T.V. and exhibits from educators, press, students and business
- inquiry log is kept, average response time is 2-3 days
- requests for publications are very popular



# ALBEMARLE ENVIRONMENTAL ASSOCIATION

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(919) 426-9563 (919) 336-4778

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## PUBLIC EDUCATION FOR A/P STUDY IN THE ALBEMARLE

Presentations have been made or are being planned for the following groups:

### Public Schools

- March 23 Northeastern High School, Pasquotank County 2 classes
- April 13 Currituck High School 1 class
- April 26 Bertie County High School 2 classes
- April 27 Gates County High School 1 presentation to several classes
- May Camden County High (date unconfirmed)
- May 9 Weeksville Middle School, Pasquotank County 2 classes
- May 10 Washington County Middle School 3 classes
- May 18 Chowan High School 2 classes

Appointments are in the process of being made for high schools in Dare, Perquimans and Hertford Counties. These schools are receptive to the program but have not set actual dates at this time.

### Civic Organizations

- Feb 10 Bandon Chapel Men's Church Group, Chowan County
- March 8 Albemarle Women's Network
- March 26 E.C. Girls Club
- April 5 Rotarians in Windsor
- April 22 Earth Day at COA (Slide presentation ran continuously, A/P Study literature was displayed and flyers given out)
- May 1 Gatesville Woman's Group
- May 11 Snug Harbor Home Extension Group
- May 19 Arrowhead Beach 4 H
- June E.C. Jaycees (specific date to be set)

# Gulf and Atlantic shrimpers face bycatch issue

By Christopher Cooper

Southern shrimpers, fresh from their recent battle against the required use of turtle excluder devices (TEDs), are about to be confronted by sport fishermen and environmentalists with a new problem. Dubbed by some as the "issue of the 1990s," the amount of finfish bycatch in shrimp trawls is a problem that will not go away quickly and quietly anytime soon.

The problem is also being addressed in the Northeast, where fisheries managers are concerned about the amount of juvenile groundfish caught in shrimp trawls. New England shrimpers are now required to use approved separating techniques at least part of the year (see accompanying story).

Since the 1930s, scientists have documented the presence of finfish bycatch in shrimp trawls, and the numbers can be impressive. Depending on the study — and they vary widely — the ratio of bycatch to shrimp ranges anywhere from 1 lb. to 49 lbs. for every pound of shrimp that's caught.

That bycatch is sometimes just trash fish — silver eels, jellyfish and the like — spilled out in a bruised ball on a sorting table. But some studies suggest that mixed in with the trash is a healthy assortment of juvenile fish — the good stuff — such as Spanish and king mackerel and red snapper.

Sport fishermen, environmentalists and scientists are beginning to wonder what, if any, effect this is having on stocks of desirable fish. And some groups are turning up the volume on their concerns.

The evidence, unfortunately, is confus-

become very critical very shortly."

Several sport-fishing groups have no doubt about what effect bycatch is having on desirable recreational species. Ted Forsgren, executive director of the Florida Conservation Association, blames the collapse of red snapper stocks in the Gulf of Mexico on shrimpers, according to a report in the *Islander News*.

Joe Richard is editor of *The Tide*, the Texas-based newspaper of the Gulf Coast Conservation Association (GCCA). He points out that the largest percentage of bycatch is croaker, according to figures from the National Marine Fisheries Service. He says there used to be thousands of croaker that poured into Galveston Bay every fall during the 1960s. Nowadays, he says, there are very few of the fish left.

"We're importing 70%-80% of our shrimp anyway," says Richard. "It [the domestic shrimp industry] seems to be too much trouble — too much impact on the environment — for only 20% of the shrimp we eat."

The Center for Marine Conservation, which led the fight for TEDs, has hired a marine biologist, in part to study the bycatch question. "We're going to be in the

vich says.

The real story is that the shrimper is constantly trying to reduce his bycatch, he

says. If the fish get bad, a shrimper sews big webbing near the choke strap of the trawl, or he cuts holes in the tail. Or he ties



TED JACKSON

The amount of finfish bycatch in shrimp trawls has come increasingly under fire from fisheries managers, sport fishermen and environmentalists. Some groups are gearing up to make sure the issue is on the public's agenda in the near future.

**"I'm a shrimper; I'm not just out there wanting to kill things. I want to catch the least amount of fish possible and catch the most shrimp."**

ing; nearly every study includes at least a paragraph or two of doubt. "There is very little proof that bycatch damages the stocks," says Mike Street of the North Carolina Division of Marine Fisheries. "Just looking at the bycatch, it seems that way. They may not have the data, but you can be sure that bycatch is an area that will

becatch issue in a big way," promises Marydele Donnelly. "It's the issue of the '90s."

Donnelly is not alone in her assessment. Other groups insist they will be entering the fray soon. "We're just against bycatch; it's not a good conservation act to follow," says Rob Southwick of the Sport Fishing Institute, a group that supported the call for TEDs. "The waste of sport fish [is] totally unacceptable. We're not anti-shrimping; we're anti-bycatch."

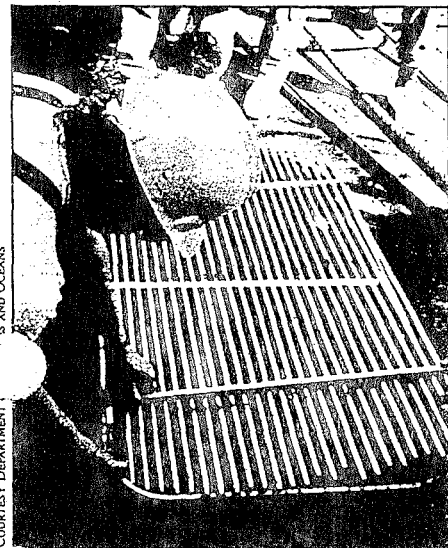
In addition, the environmental group Greenpeace is trying to have the bycatch issue addressed as part of the reauthorization of the Magnuson Act, according to Bo Bricklemeyer of the Seattle office.

#### Shrimpers Respond

Many shrimpers admit that bycatch is a problem, but they argue that it is not an environmental one. For them, too much bycatch in a shrimp trawl means extra work sorting it from the shrimp.

Teo John Mialjevich, president of Concerned Shrimpers of America, says the bycatch studies conducted so far were carried out under unrealistic circumstances: The researchers weren't trying to make a living by shrimping. In a real-life situation, he says, if a shrimper starts taking on a large amount of bycatch, he tries a trick, or he pulls up his nets and goes someplace else.

"They [researchers] go out there and trawl whether there's shrimp or not, and they come back with a snapshot. Then they start wanting to extrapolate, and before you know it, they've got a new study," Mialjevich says.



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va Scotia researchers have been experimenting with the Nordmer grate, which originated in Norway. The unit is sewn into the net at an angle near the cod end. Fish veer away from the grate and out the hole in the net above it. Unfortunately, a large amount of shrimp swim out, too.

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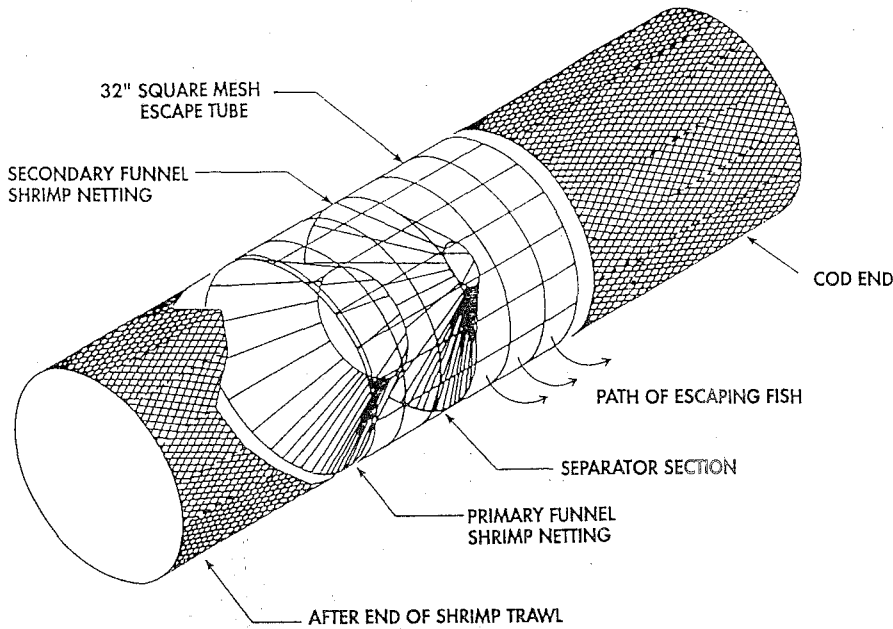
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## SHRIMP/ FISH SEPARATOR



REDRAWN BY RONALD HORVATH

a crab trap rope in front of the cork line to scare the fish before they veer into the net.

"If you've got a problem that needs to be solved, the shrimping industry will solve it," Mialjevich says. "We've got stuff that

reduces bycatch. If you've got something that works better, we'll use it.

"I'm a shrimper, I'm not just out there wanting to kill things. I want to catch the least amount of fish possible and catch the

most shrimp."

The Texas Shrimp Association (TSA) is in the middle of a two-year, federally funded project to develop its own statistics on bycatch. Shrimpers participating in the project keep the day's bycatch they cull instead of throwing it overboard. The content is then documented.

What they're finding, says TSA acting Executive Director Lucy Gibbs, is that most of the catch is trash fish, and even that is not being wasted. When the bycatch is thrown overboard, other fish swarm around the boat to feed.

"Basically, this study is showing what everyone has known all along: if you want to catch fish, hang around a shrimp boat,"

Information on shrimp/finfish separator technology is shared among researchers and fishermen on every coast. This device was developed on the West Coast about 10 years ago and is now used in various parts of the world. It's one of the approved methods being employed by Gulf of Maine shrimpers to satisfy regulations issued by the New England council. The alternative is the use of large mesh behind the footrope.

says Gibbs.

Bob Jones, executive director of the Southeastern Fisheries Association, has a similar argument. Shrimpers just pull fish up from the bottom and recirculate them into the water column when the catch is culled, he says.

He, too, says the available data is unconvincing, especially since it was gathered before the required use of TEDs, which exclude finfish as well as turtles (see accompanying story). He thinks that much of the outcry over bycatch is motivated by a desire to get rid of the shrimping industry.

### Gear Research

With the increased interest in the bycatch issue, more scientists are starting to propose research projects to address the problem. And slowly, the money that wasn't available for such work in the past is starting to trickle in.

One such researcher is Jim Bahen, a gear specialist with the North Carolina Sea Grant program. Bahen recently received a \$39,000 federal grant to do something a little different — talk to shrimpers. He is conducting interviews with a number of targeted shrimpers in his state to help develop gear that will decrease bycatch.

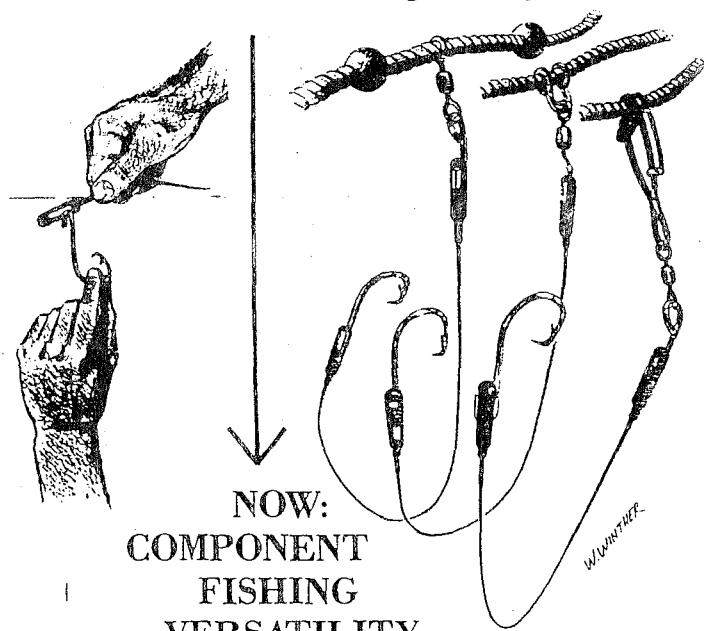
"I'm asking them to show me the kind of gear they use, then I show them the ideas I've got," Bahen says. He plans to build and test several models — all with the help of the industry. Unlike TEDs, which were perceived by many shrimpers to be no real help to them, trawling devices to help eliminate bycatch could be valuable to a shrimper, since such gear would make the shrimp catch cleaner. For this reason, Bahen predicts success.

"For the first time, we're going to the industry, and we're giving shrimpers an opportunity to choose for themselves," Bahen says.

The choice is simple, he says. Either come up with a way to reduce bycatch, or "what you're on — this shrimp boat here — is doomed. The bycatch issue is like a big, black storm out on the horizon — it's coming. And I think most shrimpers realize it."

North Carolina's Mike Street is a member of the Atlantic States Marine Fisheries Commission, and he helped organize a committee to study the bycatch problem.

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## New data needed on bycatch

The bycatch study most widely touted by sport fishermen is one produced in 1987 by the Southeast Fisheries Center of the National Marine Fisheries Service (NMFS). According to Scott Nichols of the NMFS lab in Pascagoula, Miss., his office sometimes gets a couple of requests a day for copies of the report.

That study makes bycatch estimates only for offshore waters of the northern and western Gulf of Mexico, not for waters off south Florida or in the Atlantic. Just how reliable are those estimates? It depends on whom you ask.

Even the authors of the study write: "The opportunistic nature of direct observations of shrimping activity puts a very real limit in our confidence in the accuracy of our estimates, primarily because there is no objective way to evaluate the accuracy under the sampling scheme used. We do believe that the estimates are accurate enough to [show] . . . the directions of any important trends . . . Actually, the absence of major trends is notable in the estimates."

The study then comes up with the following numbers for annual finfish bycatch extrapolated from random sampling over a 14-year period: croaker, 1,500 million fish; sand and silver sea trout, 147 million fish; king mackerel, 0.2 million fish; Spanish mackerel, 1.3 million fish; red snapper, 12 million fish; red drum, 0.13 million fish.

"It's outdated data from pre-TEDs days," says Bob Jones, executive director of the Southeastern Fisheries Association (SFA). He points out that with the required use of turtle excluder devices (TEDs), the total biomass in a shrimp trawl is greatly diminished.

Jones has been aboard several shrimp boats that were comparing the catches of trawls with and without a TED installed. "The net without the TED looked to me to have almost double the biomass as the other net did," he says. "TEDs reduce bycatch. They need new, updated data that show how things really are now."

With that goal in mind, SFA is organizing a conference that will bring together international gear and bycatch experts, shrimpers, and organizations such as Greenpeace and the sport-fishing-oriented Gulf Coast Conservation Association. The idea is to come up with a "core document of the best-available information, which can be used by anyone," according to Jones.

"We don't ever want the government to come back at us like they did on TEDs — with them holding all the data and extrapolating from it," Jones says. "We don't want them to do that to any fishery again."

—Linda Buckmaster

## In the Northeast Shrimpers must use separators

The northern shrimp fishery currently faces strong regulation in the form of mandated catch-separator gear to minimize the destruction of juvenile groundfish. A limited season may also be in the future.

Significant amounts of juvenile fish are dragged up annually in the nets of Northeast shrimp fishermen and discarded over the side. Those small fish are presumed dead, especially by members of the New England Fisheries Management Council, who are charged with protecting the groundfish resource.

Until recently, experts could only guess at how many juvenile haddock, cod, hake and flatfish are destroyed during the annual shrimp fishery in the Gulf of Maine. When results of a two-year, voluntary "sea-sampling" program are tabulated by the National Marine Fisheries Service (NMFS) in New England, solid figures will be available.

Preliminary data, based on 30 trips out of Gloucester, Mass., and Portland, Maine, from January through March of the 1989 season, already indicates that the discard of juvenile groundfish such as cod and haddock equalled the amount of market-size fish landed by the shrimp boats.

However, the discard of juvenile whiting and flatfish was three times as high as that of adult fish of those species landed. (In the Northeast, market-size fish that are not the targeted species are considered "bycatch." Trash or juvenile fish are called "discards.")

"It's a significant problem," says Dr. Stephen Clark, chief of the Population Biology Branch with NMFS' Conservation Utilization Division in Woods Hole, Mass. "The average discard for the whole season on the sea-sampling trips was 33% by weight of shrimp landings. But percentages are not the whole story, the total amount is."

Total tonnages of market-size landed fish by shrimpers are known. Over the past three years, harvests have averaged as high as 90% of total shrimp weight landed during April and May, dropping to 20% in February. The shrimp catch is considered "cleaner" in the winter months, but the totals tell a different story since shrimping effort is heavier then.

During the past three Decembers, the average bycatch landed was 900,000 to 1 million lbs., dwindling to 300,000 or 400,000 lbs. in April and May. As landings increase, the percentages of shrimp to bycatch decreases, says Clark, who is a member of the Northern Shrimp Technical Committee, which advises the Shrimp Section of the Atlantic States Marine Fisheries Commission.

The commission has regulatory jurisdiction over shrimp, but the New England council has regulatory jurisdiction over mesh size. Last year, separator trawls were mandated by the council for use during April and May, "and we saw roughly the same [catch] pattern," Clark says.

Separator trawls are required for this year, too, even though data shows little difference in the catch ratio. In an attempt to solve the discard problem, the council required separator trawls, although they had not been sufficiently tested, says Dan Schick, marine resources scientist with the Maine Department of Marine Resources and another technical committee member.

"When the council mandated separator trawls, it was more a political ploy to show concern — not a solution," says Schick.

Many Maine shrimpers have taken the new regulations in stride and did not even remove the devices from their nets after the required time period. "We take a lot of grief here about separator trawls and juvenile fish," says Tom Jorden, owner of the 65' Rachel Heidi out of Portland, Maine. "We don't want to catch juveniles any

catch them.

"We're willing to do whatever we have to in order to keep fishing and as long as we can catch our shrimp."

NMFS and the University of Rhode Island Sea Grant program are in the process of conducting tests of three types of separator trawls through March. Depending on the tabulated results of the tests, the council may amend its groundfish plan in late summer to mandate a net type.

"If not, they may limit the shrimp season to January, February and March next year until a suitable net is developed," says Schick. "We're looking for a fairly simplistic, low-cost addition to present gear — a design that is easily placed in the shrimp nets used today."

—Nancy Griffin

Made up of about a dozen senior biologists from the Northeast and South, the Conservation Engineering Commission is studying ways to cut down on bycatch ratios and eliminate other forms of unintentional killing from, say, lost traps.

The committee is looking at the use of biodegradable pound nets and quick-dissolving doors for fish traps, as well as catch-sorting devices sewn into shrimp trawls and various kinds of fish-excluders.

"It's wide open," Street says. "so it's interesting. We're not out to write a big paper or anything — this is basically just meant to open up some lines of communication."

Far to the north, Phil Averill, a gear specialist with the Maine Department of Marine Resources, has been working on shrimp/fish separator gear for several years. Currently, his department, along with fisheries scientists from all over New England, are working on a comparative study of various separating devices. The experiments

involve a control boat that fishes without a separator and the test boat, which tries out various devices. The shrimp catch as well as the amount of bycatch from each vessel are then compared.

Basically, he says, all the research on shrimp separators looks at different ways to do the same thing — make a hole in a net that fish can find but shrimp can't. Some of the gear that's being tested is the more traditional horizontal hole with a flap that covers it — a "flapper" separator. An alternative is something like the Florida Fish Excluder, a metal frame that splits vertically opening.

According to Averill, "more funding than we've ever seen" is being made available for research into decreasing shrimp bycatch. A major project in Georgia is in the works, and information is shared among scientists and fishermen on all coasts. "They steal our ideas, and we steal theirs," he says.

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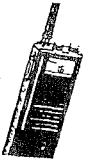


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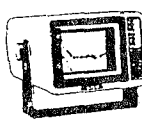
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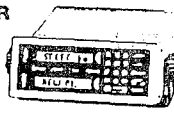


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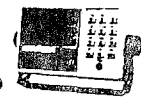
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# Texas oystermen hope cloud has silver lining

By Robert Fritchey

Earning your living from oysters is a lot like riding a rollercoaster — you pay your money, hop aboard and try to hang on through all the ups and downs. Lately, Texas oystermen have experienced more downs than ups.

Four years ago, a red tide forced the closure of Galveston Bay, which normally pro-

duced about 70% of the state's oysters. The bay contains all of the private leases in Texas, as well as many of the most productive public reefs. In 1988, extremely high salinity resulted in an invasion of boring clams and oyster drills, and in the spring of

'89, heavy rains and the resultant influx of fresh water destroyed most of the bay's oysters. Ideally, freshwater inflow from the Trinity and San Jacinto rivers as well as local tributaries dilutes tidal salt water to create the ideal salinity for oyster culture. But the spring of 1989 will be remembered as the

the bay plummeted to lethal levels, killing oysters and rendering Galveston Bay essentially nonproductive.

The ideal salinity for oysters is 10-25 parts per million (ppm). According to Mel Russell, a Galveston County marine advisory agent, surface salinity in middle Galveston Bay, the richest area, reached 0, and in the upper bay salinity reached 0 even on the bottom — and stayed there for 60 days.

As a result, about 75%-90% of the leases and reefs were wiped out, and oystermen are scrambling for financial assistance to hold them over. Smith Point oysterman Joe Nelson holds 100 acres of private bottom in Galveston Bay. "There wasn't one live oyster left," he says. "My cash flow stopped in early June." Nelson needs about \$20,000 a week to operate his four boats and pay 25 employees.

"Many oystermen are several months behind on their bank notes. We've lost our entire seed crop, and the transplant areas have been knocked out completely," he says.

Oystermen without leases, as well as related businesses like shucking plants, applied for emergency disaster loans through the U.S. Small Business Administration (SBA). But many oystermen were denied loans because they didn't show enough income from oystering the year before, since that year had been a poor one as well.

The Farmers Home Administration (FmHA) ruled that leaseholders are farmers and thus eligible for natural disaster loans. The agency will lend Texas oystermen up to \$500,000 at 4.5% interest if they are able to fully collateralize the loan. However, in January, few oystermen had actually been approved to borrow money, according to Sea Grant agent Bob Nailon.

## Silver Lining

With luck, Galveston Bay oystermen may quickly be able to pay off a good portion of their loans because there's a silver lining to excessive fresh water — it kills large numbers of pathogenic parasites and predators such as oyster drills. The stage is now set for record-setting production levels within the next 18 months to two years, the maturation period of Texas oysters, "if the creeks don't run too high or too low," cautions Nelson.

"I've not only heard of record crops after flooding," says leaseholder Clifford Hill-

## Frozen oysters may pay off

"We've had a lot of adverse conditions with the weather, law changes and the political environment," says Clifford Hillman, 39-year-old president of Hillman Shrimp & Oyster Co. in Dickinson, Texas. "If you want to stay in this business, you have to be a little creative."

This third-generation oysterman's idea of being a little creative borders on the unorthodox; he's freezing oysters — individually quick-frozen (IQF), as a matter of fact.

"If you've kept abreast of domestic market developments on oysters as well as other seafoods, you'll know that production levels have gone downhill while demand is still increasing. So I felt it was necessary to take the product that we had and create some other type of value-added activity with it to compensate for the lower production levels," he explains.

Hillman has been freezing oysters for the past two years, cryogenically freezing not only the meats but half-shell oysters as well. "The top half of the shell is gone, and the oyster is still attached by the eye to the bottom of the shell," he says.

Hillman places his oysters on pans and runs them through the freezing tunnel on a conveyor. Along the way, they're blasted with fan-forced cold air. Eight minutes later, the meats come out; it takes about 12 minutes for the half-shells.

The temperature of the product as it emerges from the freezing tunnel is about 0° F and falling. "We spray a real fine mist from the top and bottom to coat that oyster with a clear, potable water," says Hillman. "When this chilled water coming out at 35°-36° hits the product that is zero and less and still falling in temperature, it just automatically glazes it. The glazes seals the freshness in and the environment out."

After a bag is filled with oysters, it's then vacuum-packed. If you have an oxygen-free environment, you'll have a long shelf-life, says Hillman. "We guarantee a six-month shelf-life — compared with the 10 or 12 days you get with a fresh oyster."

Hillman says his product offers restaurant owners other advantages as well. His oysters are frozen with 48 hours of being harvested, whereas many fresh oysters are almost a week old by the time they get to the restaurant, he says. The frozen product has a longer shelf life than the fresh, and oysters can be harvest at their peak season and frozen for late use.

—R.F.



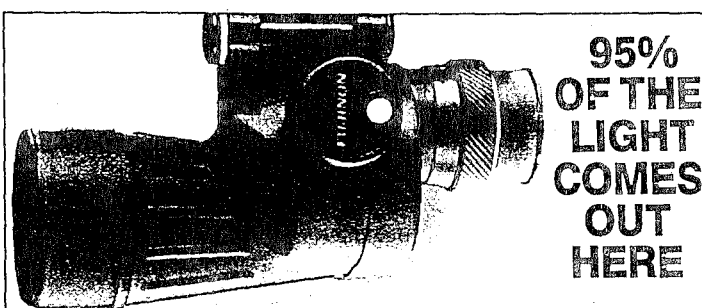
PANELA CASTELL

Galveston Bay oystermen harvested empty shells after heavy rains in the spring of '89 brought normally high levels of fresh water into the bay, killing most of its oysters. The good news is that the fresh water kills many oyster parasites and predators, and the stage is set for record crops when this year's spat matures.

duces about 70% of the state's oysters. The bay contains all of the private leases in Texas, as well as many of the most productive public reefs. In 1988, extremely high salinity resulted in an invasion of boring clams and oyster drills, and in the spring of

year Galveston Bay got too much of a good thing.

Heavy rains in late April and May caused major flooding of the bay's tributaries. Then came Tropical Storm Allison, followed by Hurricane Chantal, which com-



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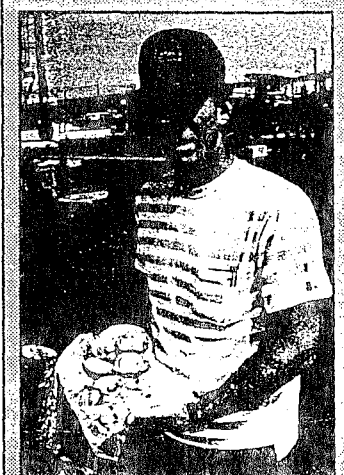
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(2)

man, "I've experienced it. For two to four years after the 1969 and 1979 floods, we had excellent production.

"In October '89, we sampled from the upper portions of Galveston Bay, and we found that there has been a tremendous spawn and spat set. Each shell that I looked at had no less than 12-15 good oysters attached to it. Now, we just have to hold on for the next two years."

Two years is a long time to hold on, but leaseholders do have the public reefs to help fill the gap. The oyster season runs from Nov. 1 to April 30, when oysters on public reefs up and down the coast become fair game for leaseholders and part-time oyster fishermen alike.

Nelson opened the season in Galveston Bay and found it "about like I expected — not worth a damn. After two or three days, we headed 200 miles down the coast to San Antonio, Lavaca and Matagorda bays. We did pretty good the first week, and then it fell off. It took awhile to find the right bay; it turned out to be San Antonio."

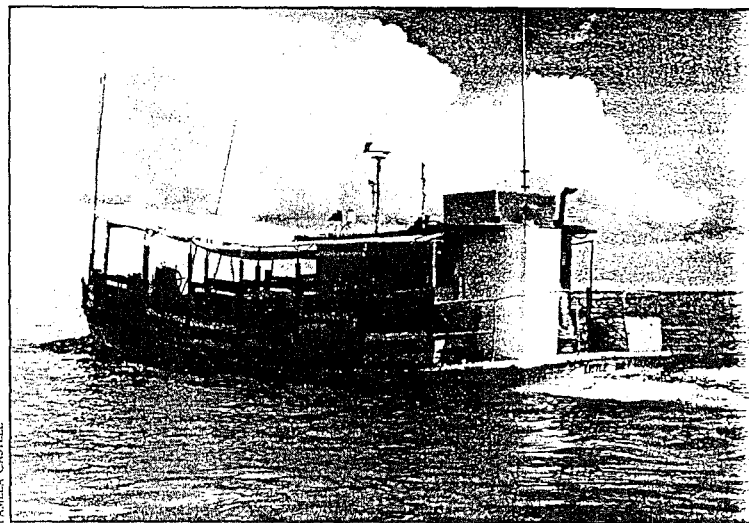
San Antonio Bay follows Galveston Bay in production, yielding about 20% of the Texas harvest. That bay escaped the spring-

time deluge that destroyed Galveston Bay. "Three years ago, all the oysters there died from too much fresh water and they're only now coming back," says Nelson. "Now everything down there is trying to die because it's too salty — up to 26 or 27 ppm. They're losing as high a percentage of oysters from the salt and dermo [an oyster disease] as we're losing from too much fresh water."

James Auzston of Galveston shrimps during the summer months and oysters on public reefs during the winter. He started the season down the coast near San Antonio Bay. "I made 45 sacks the first two days, and the third day I had five."

Auzston ended the season working West Bay, a shallow and normally salty bay, owing to the Texas City Dike that deflects the freshwater inflows from Galveston Bay. "Rain makes West Bay oysters grow real fast," says Auzston. "There are a lot of shallow-water oysters in West Bay."

Auzston dredges from a 23' x 7' flatboat powered by a 115-h.p. Johnson outboard. In October, he was averaging 25-30 sacks on a long day. But, says Auzston, "in three weeks, it'll be real scratchy."



PAMELA CASTELL

Oystermen hope to hold on until the shellfish come back. Some leaseholders are eligible for disaster-recovery loans, and others will make do in other fisheries.

## Moratorium on leases angers oystermen

Texas oystermen covet private leases. With them, they can harvest oysters year-round and, like farmers, they can enhance the productivity of their own acreage. Leaseholders are also entitled to "transplant" mature oysters from "polluted" zones to their own beds for harvest at a later date.

"Some guys have built nice reefs and are getting reproduction," says Richard "Lynn" Benefield, Texas Parks and Wildlife Department (TP&WD) coastal fisheries regional director. "But a lot of our oystering is 'put and take'."

There are 44 private oyster leases in Texas with a combined total of 2,322 acres, all located in Galveston Bay. Thanks to a highly unpopular moratorium on leasing, enacted three years ago, oystermen wishing to add acreage to their existing leases, as well as those fishermen who hoped to acquire their own first beds, are out of luck.

Mel Russel, Galveston County marine extension agent, says, "Before the moratorium, a fisherman requesting an oyster lease had to participate in a public hearing where anyone who had been harvesting oysters in that area could come in and testify. The law said you could not lease bay bottom that had produced oysters within the past eight years. If there were oysters present, they'd deny the request."

"That was to keep a guy from roping off a productive

place and saying, 'This is my lease,'" says Benefield. "TP&WD felt that if there were any oysters at all, it should stay public."

"Once you did lease some bottom, you had to go out and build that bed up," says Clifford Hillman. "You had to build it up from nothing — seed it, plant it, put more shells — and it's quite expensive. In our 300 acres, we've got damn near \$1 million invested in the last five years."

An intensively managed private bed, though expensive to maintain, will yield more oysters than a natural reef. "A private bed, at 100% capacity, will average about 700 bushels per acre per year. A public reef will produce about 350-400 bushels," says Hillman.

Assuring public access to the natural oyster reefs while allowing oystermen to create yet more productive acreage seemed the ideal way to preserve and expand this renewable-resource-based industry. The 1986 freeze on leasing, however, suspended further growth. Speculation among fishermen runs rampant about the motivation behind the moratorium, but it generally follows the line that Texas rates oysters somewhat behind oil and gas in order of importance.

"The General Land Office (GLO) doesn't want to jeopardize the chance for oil and gas development," says one fisherman. "If GLO gives us permission to put up an oyster lease, they can't come along later and give

permission to put in an oil or gas well."

Another fisherman says, "If you have a state land tract, and you have an oyster lease in the middle of it, the oil companies may not bid on it because they're afraid they'll get sued for damaging the oysters. Also, for a 100-acre oyster lease, the state gets \$3 per acre plus, say, \$1,000 for the oysters. Just compare that to the monetary returns they could get from an oil well."

"These are pure rumors," says C.E. Bryan, TP&WD coordinator of shellfish programs. "The reason we did the freeze is that the lease laws were written in the early 1900s, and we had to revise them."

Hal Osburn, project coordinator for TP&WD harvest programs, says "There was concern about the taking of too much public land — water-bottom — and transferring it to the leaseholder forever. As long as they meet the conditions of the lease, they can keep it forever and they can pass it on when they die. There are conflicting interests between the state and the fishermen."

When will leasing resume in Texas? No one knows for sure, but it appears that some progress is being made in that direction. "We're not taking any new applications until we revise the lease laws, and there's no time frame for when we'll finish. It's a long drawn-out process," says Bryan.

"In 1988, we were working on the oyster management plan and couldn't do anything about the leases until that was done. Then, we set up the Oyster Advisory Committee, and we haven't had the time to get to the lease thing," he explains.

—R.F.

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20 FISHING PROPOSALS TO GO BEFORE THE PUBLIC

MOREHEAD CITY -- Twenty changes in marine fishing regulations will be considered in eight public hearings before the Marine Fisheries Commission in May. A business session will be held in Raleigh at the Radisson hotel on June 14 and 15 for final consideration of regulatory items discussed at the following public hearings:

- May 7 Beaufort County Courthouse, Superior Courtroom, Washington, NC
- May 8 Elizabeth City State University, Kermit White Center
- May 9 North Carolina Aquarium, Manteo
- May 10 Civic Center, Hatteras
- May 14 Ground Floor Hearing Room, Archdale Bldg, Raleigh
- May 15 Government Complex Building, Bolivia
- May 16 New Hanover County Courthouse, Room 302, Wilmington
- May 17 Duke Marine Lab, Pivers Island, Beaufort

(All public hearings will begin at 7:30 pm)

The twenty items to be discussed at public hearings include:

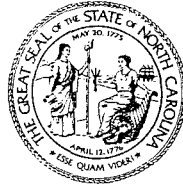
- Item 1. Defining "length of finfish" and "licensee";
- Item 2. Establishing a special permit with related record keeping requirements for certain fishing activities, such as fishing under a quota arrangement;
- Item 3. Expanding regulation which governs mutilated finfish to include all fish and shellfish;
- Item 4. (a) Extending buoy and identification requirements for gill nets in the ocean;
- (b) Regulating drift gill nets in a manner similar to other gill nets; and
- (c) Prohibiting block nets and gill nets in the ocean especially along beaches;
- Item 5. (a) Reducing possession of finfish taken accidentally to crab and shrimp trawling in internal waters to 200 pounds, including flounder;
- (b) Closing Pamlico, Pungo Bay, Neuse, and New River to trawling from November 1 through March 31; and

- (c) Prohibiting possession of oysters on board vessels with trawls;
- Item 6. Initiating a process for approving new pound nets sites prior to setting such gear. If accepted, annual pound net permits would replace registration and/or re-registration;
- Item 7. (a) Reopening closed pot season after five days if area is clear of pots;  
(b) Regulating designation of pot areas in Wysocking Bay and Long Shoal River by proclamation; and  
(c) Establishing a minimum one inch by one-half inch mesh size for eel pots, except that two pots with any mesh size may be used for bait;
- Item 8. Requiring an individual shellfish license for all persons present in a commercial shellfish harvest operation, including individuals who may be present for non-commercial purposes;
- Item 9. Reducing the existing 10% tolerance for undersized oysters to 5%;
- Item 10. Prohibiting possession of more than 100 shrimp per person per day while fishing in a closed area with a cast net;
- Item 11. Closing crab spawning sanctuaries March 1 rather than the existing date of April 1, and at other times by proclamation;
- Item 12. Requiring immediate return to water any illegal finfish;
- Item 13. Reducing allowable scrap fish landings from the existing 10,00 pounds (100 boxes) per day to 5,00 pounds (50 boxes) per day;
- Item 14. Extending the menhaden season six weeks and allowing closing by proclamation;
- Item 15. Granting proclamation authority to the DMF Director to establish size and harvest limits for blue and white marlin, sailfish, cobia, dolphin, bluefish, spotted seatrout, and weakfish;
- Item 16. Extending the period that trawling may be allowed in special secondary nursery areas to August 16 rather than September 1;
- Item 17. Revising non-resident vessel license requirement for landing and off-loading fish taken outside the state by non-residents;
- Item 18. Identifying each seafood container and certifying that each container complies with all applicable rules;
- Item 19. Establishing two new special secondary nursery areas in Turnagain-Bay and Newport River; and
- Item 20. Reducing the size of crab spawning sanctuaries in the Hatteras and Barden's



APES

MAR 21 1990



State of North Carolina  
Department of Natural Resources and Community Development  
Albemarle-Pamlico Estuarine Study  
Public Involvement Office  
1424 Carolina Avenue, Washington, North Carolina 27889

James G. Martin, Governor  
William W. Cobey, Jr., Secretary

Robert E. Holman, Director  
Joan Giordano, Public Involvement Coordinator

March 19, 1990

Memorandum

To: CAC Members  
From: Joan Giordano *JG*  
Subject: P-CAC & A-CAC minutes  
1/29/90 & 1/31/90 respectively

Because I was unable to attend the above dated CAC meetings and because deciphering the meeting tapes proved almost impossible due to my absence, and because the only order of business at each of the meetings was the CAC recommendations for 4th cycle funding of proposals, please accept the attached in place of more formal minutes.

I regret any inconvenience this might cause and I look forward to seeing you at the next round of meetings in April.

JG:ew

Enclosure

25

Public Involvement Coordinator's Report  
January 1990

1. Citizens' Advisory Committees (CACs)
  - continue to meet quarterly
  - meeting notices sent to public officials, interested citizens and newspapers in meeting area
  - 2 CAC representatives attended Citizen Monitoring Conference in New Orleans in December (see attached)
  - vacancies exist: P-CAC (1); A-CAC (6)
  
2. Exhibits
  - portable exhibit used in New Orleans
  - portable exhibit recently returned after use in Atlanta at EPA Region IV
  - State Fair Exhibit (Nursery Area Model) was used at APES Annual Meeting in November in Edenton
  - Nursery Area Model presently on display at PTRF's resource center in Washington, NC
  - Nursery Area Model will be used on April 7 & 8 at WRAL's Coastal Celebration in Raleigh and April 22 at River Park North in Greenville
  - Exhibits are available for use in study area at any time
  
3. Outreach
  - Educational presentations:
    - \* White Oak School PTA - Chowan Co.
    - \* Elizabeth City State University
    - \* Albemarle Womens's Network - Elizabeth City
    - \* Girls' Club - Elizabeth City
    - \* Soil & Water Area 5 Supervisors' meeting
    - \* Press Conference in Raleigh - December 19, 1989
      - with Secretary Cobey and DPI Superintendent Bobby Etheridge
    - \* Distribution of environmental education materials to 459 schools in APES Area, ECU, environmental groups, individuals
  - Local Government Liaison:
    - County Commissions:  
Hyde, Hertford, Camden, Currituck, Gates, Perquimans, Pasquotank, Chowan, Bertie, Craven, Beaufort, Pitt, Pamlico, Martin, Tyrrell, Washington
    - Municipalities:  
Gatesville, Hertford, Winfall, Edenton, Manteo, Kitty Hawk, Bath, Kill Devil Hills, Elizabeth City, Farmville, Greenville, Plymouth, Jamesville

Interest level varied from little to great.

4. Projects

Print:

- Poster series/bumper stickers - completed, being distributed
- calendar - completed and distributed
- "Guide to Estuaries"- completed, distributed and going to reprint
- "Where Rivers Meet the Sea"- being distributed to schools as part of December packet; additional copies being printed for public distribution
- Status & Trends (public version) - completed; distribution ongoing

Electronic:

- Video PSAs - completed; distributed
- Video/Slide Show - completed; will be shown at Roundtable, 3/6, in Beaufort
- Radio Talk Show - 1st of 6 scripts completed and approved; will begin airing in March
  - March 4 - WRDU - 6:30-7:00 AM
  - March 9 - WELS - 8:00 AM
  - March 12 - WBTB - 8:30 AM
  - WJNC - 9:00 AM
  - March 28 - WELS - 8:00 AM

Public Meetings:

- Workshops on Water Quality - scheduled for March 6, 7, 14 & 15
- Forum on Management Needs for Protecting Estuarine Resources in A/P System:- 2 of 4 completed
- APES Annual Meeting - completed - November 4, 1989 (Edenton)
- Assisting CACs with Estuarine Management Recommendations - planning stage; scheduled for May 4 & 5 in Greenville
- Press Tour - scheduled for late spring

All 3rd cycle projects are completed or nearing completion

5. Meetings & Events

- Citizens' Monitoring Conference - New Orleans - December 5-8, 1989
- ECU Chancellor's Forum on Economics & the Environment - January 3 & 4, 1990
- State Fair
- Roundtable & Policy Committee March 6 & 7 - Beaufort
- Status & Trends Public Meetings (5) across state in late March & early April
- Workshops on Water Quality - March 6, 7, 14 & 15
- Public Forum on Management Needs for Protecting Estuarine Natural Resources in the A/P System - February 21 & 27

6. Newsletters

- January edition is out
- next edition in April
- expanded mailing list to 17,000
- responses are very favorable
- negotiation of the new contract and new layout arrangements caused delay

7. Inquiries to Program

- receive almost daily response to newsletter, T.V. from educators, press, students and business
- inquiry log is kept, average response time is 2-3 days
- requests for publications are very popular

REPORT TO THE A/P STUDY ON THE EPA CITIZEN MONITORING CONFERENCE

NEW ORLEANS, DECEMBER, 1989

The conference gave participants an opportunity to learn what's going on in the world of citizen monitoring across the country. Presenters represented states north, east, south and west and offered two days of panel discussions on their programs. As a result of these discussions, I feel that the Citizen Monitoring effort funded by the A/P Study is one of the most thorough, cost-effective, and safe programs in the country.

Programs in northern states must put away their test tubes in winter as lakes and streams freeze over. Other programs test only one parameter, such as turbidity. Still other programs require monitors to use boats for testing. A/P Citizen Monitoring has the advantage of testing year round because of reasonable weather conditions, the program tests several parameters, and convenience and safety of volunteers are primary considerations. All participants agreed, however, that good quality control and close cooperation with state officials were crucial to the success of all programs.

If we are to continue this valuable data collection and public education program beyond the five-year A/P Study, efforts should begin now to set up a means of sustaining it financially. A non-profit foundation, modeled after the Chesapeake Bay Foundation, partially supported by regional donations and partially supported by federal/state governments, would give volunteer citizen monitoring an identity of its own yet maintain the necessary close ties with state agencies. I would urge that solid groundwork be laid in the next two years for the formation of such an entity.

Respectfully submitted,

Carolyn Hess *CH*

Impressions of the

2nd National Citizens Volunteer Monitoring Conference

"The Role of Citizen Volunteers in Environmental Monitoring"

December 5 - 9, 1989

New Orleans, LA

Sponsored by the EPA Office of Marine & Estuarine Protection, and the Office of Water Regulations & Standards; and the Gulf of Mexico Program.

About 150 Citizen Volunteers, scientists, government officials, representatives of industry and others, all united by a common concern for the environment, met recently in New Orleans. Their mission was to take a hard look at how Citizen Volunteers involved in environmental monitoring are being used, how effective are they, should their use be expanded in the future, and if so, how?

Tudor Davies, of EPA's Office of Marine Estuarine Protection set the up-beat tone of the conference in his opening statement that there are now 20,000 citizen volunteers involved in environmental monitoring, and the number is increasing daily. He admitted that state and other agencies were originally sceptical in respect to the accuracy and acceptability of the data provided by citizen volunteers, but they have now become true believers and are enthusiastically recognizing the large and expanding roles that trained volunteers can fill. This becomes especially important in the current climate of shrinking Federal and State budgets, and our huge national deficit.

Tudor Davies posed the sobering question: "where are we going to obtain the money we'll need to protect our estuaries?" In his answer, he stressed the importance of obtaining a consensus to achieve this and emphasized that citizen volunteers can be the "heroes" in this, by galvanizing action through stirring up grass roots support.

North Carolina's Dr. John Costlow of Duke Marine Laboratory, and TV personality/actor Dennis Weaver of The American Oceans Campaign each delivered stimulating keynote addresses.

Dr. Costlow urged the implementation of estuarine or other water improvement management action based on the reliable knowledge we have already collected. In many situations, we already have sufficient information to allow us to get started, and don't have to collect more data.

He emphasized the extreme importance of communications in our water improvement efforts; communications between all the concerned parties. This includes the property owners, the fishermen, the sportsmen, the concerned organizations, the environmental groups, the beaurocrats; the government, starting with municipal, county and state and including federal.

Dennis Weaver told us that we are now paying the bill for the Industrial Revolution, and claims that ignorance is our most serious problem. However he believes that we are seeing a real change in environmental consciousness today, and that constitutes our greatest hope for the future.

Contrary to what some environmental critics have claimed, he is convinced that we are not over-reacting to our environmental problems; instead, our scientific community tells us that we are under-reacting, badly.

In the three days of conference sessions, we heard from 27 speakers that were on the published program. All of them had something of real interest to contribute. Conferees added many ideas and thought-provoking questions.

Here are some notes on what this conferee learned. Some of these items are, or could be applicable to our citizen volunteer monitoring efforts in the Albemarle-Pamlico estuaries.

1. Before starting new environmental monitoring programs, we must check carefully to be certain that the information being sought isn't being provided by programs already in existence. There is a great risk of re-inventing the wheel; especially when "turf battles" and inter-agency rivalrys are allowed to creep in.
2. An effective data base, and master data collection system available to all users is an essential ingredient of all environmental monitoring programs.
3. A program to guarantee quality assurance and quality control for citizen Volunteer environmental monitoring is another essential ingredient. To date, the volunteer programs now in effect have ranked high in this - - as North Carolina's Paul Wilms stated at the conference, "I haven't had a single problem yet with the accuracy of the data provided by citizen monitors." Other speakers also confirmed the high technical quality of the data being produced by volunteers.
4. A successful citizen environmental monitoring program must include good communications in all directions, such as between monitors, and feed-back of the significance of the data after it has been analysed. The data should be communicated to your federal, state, county and local regulators, to technical institutions, to local politicians. Communications with your media is especially important.
5. If you set up a worthwhile citizen volunteer program to collect data, keep the program going. The value of the data increases with the length of time over which it is collected. And be sure the data is utilized.
6. Be innovative in finding new ways in which citizen volunteers can be utilized in environmental monitoring. The following is a partial list of projects already in operation that were mentioned at the conference:

## 6. (continued)

- Freshwater and Saltwater (by both chemical and biological means)
- Fish
- Sediment
- Shellfish
- Nearshore habitat
- Marine mammals
- Birds
- Conductivity
- Weed census
- Chlorophyll
- Algae
- Acid rain
- Weather
- Marine debris
- Fish tagging

7. Emphasizing again the importance of assuring that monitoring programs once initiated are kept going, their value was stressed as a means of recording observed trends resulting from the effects of additional pollution, as well as verifying the results of management actions to improve water quality.

8. Of special importance to programs built around the use of citizen volunteers who perform their functions on a part time and intermittent basis is the requirement that written procedures, "protocols", or written check lists be developed and used for every function. Such "protocols" can serve as major ingredients for the training programs for citizen volunteers.

9. Training programs for citizen volunteers are viewed as essential. The expressed theme was that no volunteer should be allowed to perform his function without completing a training program and satisfying his coordinator that he can do the job correctly. (He means either "he" or "she", of course!)

10. Several conferees expressed a need for more toxics monitoring, and asked that the practicality of utilizing citizen volunteers for such work be looked at.

11. The need to seek diverse sources of funds for the support of citizen volunteer monitoring received considerable attention. One conferee told of collecting "lay monitoring costs" of the citizen volunteers, (including the theoretical value of time that the volunteers donated), and crediting this into their matching fund applications. While the manpower portion of the cost of environmental monitoring is reduced or eliminated with the use of qualified volunteers, equipment and other costs still have to be faced, and support from organizations, agencies, grants etc. must be found. Innovation in fund raising will be a continuing requirement

12. Environmental monitoring programs must include a rapid response procedure whereby episodic or catastrophic events that are



detected by the citizen volunteers can be immediately channeled to the appropriate agency for further official action, (as in North Carolina Stream Watch, Coastal Management etc. )

13. Several attendees asked what the EPA or other agency could do to satisfy the apparent lack of liability insurance for citizen volunteers involved in accidents while doing environmental monitoring, particularly those doing their work from boats. No satisfactory answer to this potential concern was heard, other than that the organization providing the monitors, (if an organization be involved), might have insurance protection against liability claims arising from an accident.

14. Several organization represented at the conference, and many attendees announced their firm conviction that we have plenty of good environmental legislation on the books, but that not nearly enough is being done to assure compliance and enforcement. Two major groups said that they are concentrating their efforts this year on urging improved enforcement of environmental laws on the local - "grass roots" level instead of lobbying for new laws at their state capitol or in Washington.

15. "Emphasize the positive" was the theme of several speakers. Few if any estuarine homeowners, developers, or marina operators will fail to say yes when we ask if they are in favor of improving the quality of our waters. So right at the start we have an area of agreement from which we can start working out acceptable programs to make our waters better. Then, it takes communication, education and facts. These facts are something that we can expect reliable monitoring to provide.

16. Raising public awareness of environmental problems is one of the key benefits of citizen volunteer monitoring. But to take full advantage of this, good communications must exist. A further factor is that the citizen volunteers who are aware of the problem generally become involved in its solution.

17. To be truly effective, estuarine water monitoring programs must extend into the entire watershed area and not be restricted to the estuary. This point was stressed particularly by scientists of the Chesapeake Bay and other major programs.

*Cal Yaggy*

Calvin D. Yaggy  
1/28/90

## ALBEMARLE-PAMLICO ESTUARINE STUDY

## DIRECTOR'S REPORT

## CITIZENS' ADVISORY COMMITTEES

JANUARY 29-31, 1990

1) EARLY DEMONSTRATION PROJECTS

a) The program currently has 3 agricultural BMP projects from 1988 funding and 1 urban BMP project from 1989 funding.

(1) Urban BMP project - design almost complete with construction to start this spring and completion set for October 1990

(2) Agriculture BMP projects

(a) Merchants Millpond Watershed - 40 BMP contracts signed (e.g., lagoons, broiler storage, filters, solid set)

(b) Solid Set - 3 sites  
 --Bertie site 95% in place  
 --Currituck site 90% in place  
 --Washington site - moved to Tidewater Research Station 90% in place

(c) VA Animal Waste Mgmt.  
 -- 1 of 6 new waste system designs complete (entire system)  
 -- 12 of 19 nutrient mgmt. plans complete (pump down)

2) INFORMATION MANAGEMENT

A) LRIS (now Center for Geographic Information and Analysis [CGIA]) proceeding with land use and land cover classification for entire study area due in July 1990

B) First pilot area for land use mapping will be the Currituck Drainage Basin

C) CGIA will take over the data manager position by hiring a software specialist and GIS specialist

3) TECHNICAL COMMITTEE

Technical Review and Citizens' Affairs Subcommittees have been busy reviewing the FY 1990-91 proposals. The meetings to finalize their recommendations to the Technical Committee will be February 14-15 and February 9, respectively.

4) MEETINGS

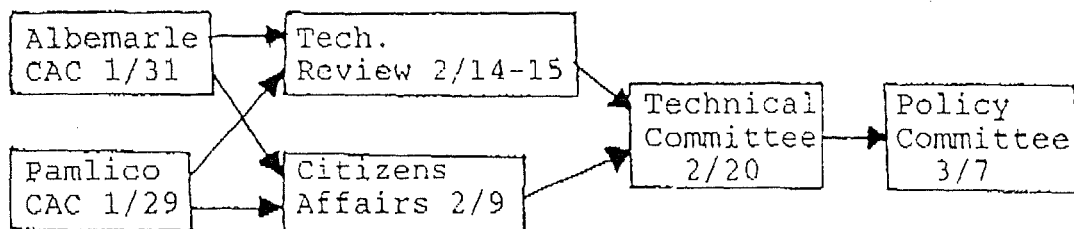
- A) Nov. 4 - Annual Public Meeting (Edenton)
- B) Nov. 14 - OMEP annual audit of files - 93% complete (Raleigh)
- C) Nov. 22 - Fourth year call for proposals sent out (Raleigh)
- D) Dec. 1 & Jan. 12 - First two meetings of the Legislative Water Quality Committee (Raleigh)
- E) Dec. 4-8 - OMEP second annual technology transfer meeting (New Orleans)
- F) Dec. 19 - Educational Press Conference (Raleigh)
- G) Jan. 18 - VA/NC interaction meeting (Chesapeake, VA)

5) STATUS AND TRENDS REPORT

- A) Both Preliminary reports (public and technical versions) delivered to project office on January 16, 1990
- B) Public meeting scheduled at 5 locations throughout the state (March - April)
- C) Status/Trends Review Group - resource managers organizational meeting January 30, to develop recommendations and conclusions to report
- D) Technical version sent out for peer reviewer comments
- E) Final version due to OMEP October 1990

6) FY 1990-91 PROPOSED PROJECTS

- A) Total 74 projects consisting of:
  - Early Demonstration (8)
  - Fisheries (5)
  - Water Quality (20)
  - Human Environment (7)
  - Resource Crit. Area (5)
  - Public Particip. (29)
- B) Review Procedure



7) PUBLIC PARTICIPATION

- A) Outreach - both investigators made presentations to all local governments in their area; they will follow up with two other presentations with study staff.
- B) Educational materials - 3 pieces to school systems in the study area

c) Newsletter - should be out next week; experiencing problems with new contract and preparing layout preparations.

Pamlico CAC Meeting

Washington, NC

January 29, 1990

Review of Recommended Proposals for FY 1990-91

Early Demonstration Projects

Highest Priority 1) #471  
2) #455  
3) #457  
4) #442  
5) #445  
6) #441  
7) #464  
Lowest Priority 8) #418

CODE

1) = highest priority  
8) = lowest priority

Technical Projects

Fisheries 1) #447  
2) #448

Human Envir 1) #415  
2) #452  
3) #430

Resource Critical 1) #416  
2) #401

Water Quality 1) #467, #468,  
#453  
2) #429, (449 &  
469)  
3) #417, #466  
4) (451 or 472)  
#465, #473  
5) #458

Public Participation Projects

1) #407, #413, #446  
2) #412  
3) #411  
4) #427  
5) #456, #470  
6) #474  
7) #408

The PCAC recommends that the program fund an awards program to be administered by program staff and the CACs. Funds would cover costs of administering the awards program, producing or printing awards, presentation event, etc.

The PCAC also recommends that staff negotiate down all indirect costs which the Committee felt were excessive. In particular, the Committee does not support funding proposal 427 with the level of indirect costs.

Albemarle CAC Meeting

Elizabeth City, NC

January 31, 1990

Review of Recommended Proposals for FY 1990-91

Early Demonstration Project

- 1) #455
- 2) #445
- 3) #457
- 4) #441
- 5) #471

Technical Projects

Fisheries 1) #447  
2) #454

Human Envir 1) #430  
2) #452  
3) #462  
4) #415

Water Quality  
1) #429 6) #472  
2) #458 7) #417  
3) #467 8) #453  
4) #449 9) #465  
5) #469 10) #473

Resource Critical 1) #401  
2) #416

Public Participation

- 1) #446
- \*2) #409
- 3) #411
- \*\*4) #439
- \*\*\*5) #407
- \*\*\*\*6) #474
- 7) #463
- 8) #470
- \*\*\*\*\*9) #444
- 10) #403

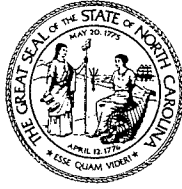
\* - Add \$7,165 from #404 and hire 3/4 or full-time person.

\*\* - Make sure distribution includes channels 2(NCPBS), 7, 12, & 9, so viewing in Albemarle area is possible.

\*\*\* - Reduce to \$9,000 and include parts 3 & 4 only.

\*\*\*\* - Reduce funding to \$25,000.

\*\*\*\*\* - Doesn't meet criteria for broad base; suggest approval by N.E. Regional Ed. Center in Williamston and a distribution plan for 1991.



State of North Carolina  
Department of Natural Resources and Community Development


Albemarle-Pamlico Estuarine Study  
Public Involvement Office  
1424 Carolina Avenue, Washington, North Carolina 27889

James G. Martin, Governor  
William W. Cobey, Jr., Secretary

Robert E. Holman, Director  
Joan Giordano, Public Involvement Coordinator

November 13, 1989

TO: Policy Committee Members  
Technical Committee Members  
Albemarle Citizens' Advisory Committee Members

FROM: Joan Giordano 

RE: Attachment to A-CAC Minutes of October 26, 1989

Enclosed is Attachment D which was inadvertently left out of the minutes recently sent to you. Please insert it in the minutes of the A-CAC meeting held on October 26, 1989 as sent.

I regret any inconvenience this omission may have caused.

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ACACT  
1/31/90

DRAFT

CALL FOR PROPOSALS FOR 1990-91 APES PUBLIC PARTICIPATION PROJECTS

The activities funded under the category of Public Participation are intended to accomplish two purposes: 1) to create effective avenues for disseminating information about the need for planning, conservation and management of the Albemarle-Pamlico Sounds and watershed; and 2) to obtain advice and input from the public concerning APES activities. The projects funded in 1990-91 will build on the projects funded in the earlier years of the program. For 1990-91, proposals will be entertained on the following specific topics, in addition to any proposals that facilitate public participation in the APES program.

1) The development of citation, or award program that recognize the involvement of constituent groups such as agriculture, forestry, fisheries, industry, municipalities and private citizens in effective conservation and environmental protection in the APES study area. Such programs should emphasize broad participation rather than single "winners", and should include specific provisions for citations or awards to be recognized in public forums.

2) Public Service Announcements (PSAs) targeted to specific audiences. Such PSAs could be in any media, and should direct their message concerning the need for and solutions to environmental planning and conservation to specific audiences such as farmers, fishermen, homeowners, and other groups. The PSAs should emphasize what each particular group can do to help.

3) Public Education Displays. There is a need for broader display of educational and interpretive material concerning the APES estuaries and watershed in either permanent or travelling formats. Locations such as waterfronts, public libraries, municipal buildings, parks and major tourist destinations should be considered in display siting.

4) Fact Sheets. A series of concise, readable, attractive and informative fact sheets should be developed to provide the general public with accurate information concerning the sounds and watershed. These fact sheets should be produced in a format and quality suitable for durability in outdoor displays and outdoor activities.

5) The development of public outreach programs, specifically including increased interaction between the APES program and local governments in the APES study area.



6) Model Estuarine Education Curricula for Public Schools. Proposals must demonstrate the involvement of, and support from appropriate components of the public school system as a prerequisite for funding.

7) Interactive Media Projects. Proposals should provide direct opportunities for the public to interact through electronics or print media with technical experts, public officials and resource managers.

8) Family-oriented Estuarine Educational Camps. Proposals on this area should emphasize opportunities to provide education about the estuaries in the APES area in a family setting. Programs that focus on direct, "hands on" activities of more than a single day duration in outdoor environments are preferred.