

CHOWAN RIVER BASIN REGIONAL COUNCIL

Martin County Community College
Bertie Campus
Windsor, NC

December 7, 1999

AGENDA

- | | | |
|------|---|--|
| 4:00 | Welcome & Call to Order | Vice-Chairman Brown |
| 4:05 | Introductions | ALL |
| 4:10 | Acceptance of Minutes from 8/5/99
Meeting in Windsor | Vice-Chairman Brown |
| 4:15 | <u>PRESENTATION:</u>
Southern Watershed Area Management
Management Program (SWAMP) | John Carlock & Eric Walberg
Hampton Roads Planning District
Commission |
| 4:45 | <u>Discussion:</u>
Hurricane Floyd and Aftermath | ALL |
| 5:30 | <u>Old Business:</u>
Demo Project Update
North Carolina/Virginia MOA Update | Guy Stefanski |
| 5:45 | <u>New Business:</u>
Formation of Nominating Committee
for Election of New Officers | Vice-Chairman Brown |
| 5:55 | Public Comment & Plans for Next Meeting | ALL |
| 6:00 | Adjourn | |



CHOWAN RIVER BASIN REGIONAL COUNCIL

Martin County Community College
Bertie Campus
December 7, 1999

MINUTES

The meeting was called to order by Vice-Chairman Brewster Brown. Joan Giordano called the roll. (See Attachment A). She reported that Lee Wynns, Al Howard, Nan Laughton and Victor Liu were excused, and that the quorum requirement for the conduct of business had been satisfied.

Vice-Chairman Brown asked for a motion to approve the minutes from the previous meeting. A motion by Roger Spivey, seconded by G.D. Perry was made, voted upon and carried. The minutes were accepted into record.

The first agenda item was discussion of the damage caused by Hurricane Floyd. Members reported that areas in the Chowan River basin were still feeling the impacts of the hurricane. Flooding was prevalent in many places; loss of livestock, property, crops; and homelessness were cited as serious, and the group felt this underscored the need for more land-use planning in the future. It was noted that the recognition of the need for planning, was the one aspect of the disaster which could be deemed positive. The group also hoped that hurricane centers would predict the amount of rainfall, during future events, because in the instance of Floyd, it was the rain, and not the wind, that caused the most severe damage. The fear of sedimentation deposition, loss of wildlife habitat and oil/petroleum slicks in water bodies, concerned the group as well.

Following the discussion of Hurricane Floyd, John Carlock of the Hampton Roads Planning District Commission (HRPDC) gave a presentation on the Southern Watershed Area Management Program (SWAMP). He described the effort as being part of the Virginia Coastal Zone program. (See enclosure).

Under Old Business, the Memorandum of Agreement between the State of North Carolina and the Commonwealth of Virginia, to better manage the natural resources that are held in commonality, was described by Ernie Brown (Va. DCR) as "being in final form." He reported that Director Brickley looked forward to signing the agreement with Secretary Holman and that a mutually convenient date and location would be determined.

The CRBRC draft demonstration project proposal, Chowan River Basin Subsoiler Demonstration Project was presented by Guy Stefanski and Billy Griffin. Discussion ensued with a motion by Roger Spivey, seconded by Billy Griffin, to approve the draft proposal (at the increased level of funding -\$10K to \$22K) and send it on to the Technical Review Committee of the Coordinating Council. Motion carried with Brewster Brown abstaining.

The next agenda item was the naming of a nominating committee to develop a slate of nominees for the offices of Chairman, Vice-Chairman and Secretary. Vice-Chairman Brown asked Roger Spivey, Marjorie Rayburn and Guy Stefanski to serve in that capacity and report to the Council at the next meeting.

Under New Business, Vice-Chairman Brown asked the members present to look carefully at the newly updated membership roster. He was concerned with the number of vacancies and encouraged the group to consider those persons, whom they felt would be willing to serve on, and benefit the Council, to become involved. Mrs. Giordano agreed to mailing, and mailed, interest-group nomination forms to Vice-Chairman Brown, Marjorie Rayburn, John Stallings, Patricia Piland and Eric Storie, persons who were determined as being interested in Council membership and in recruiting new members. **NOTE:** See enclosed nomination forms for those who were not present at the meeting. Please return them, by April 4th, to:

**Joan Giordano
APNEP
943 Washington Square Mall
Washington, NC 27889**

There being no further business, the meeting was adjourned by motion of Billy Griffin, seconded by Ernie Brown, and passed by acclamation.

The next meeting of the Chowan River Basin Regional Council is April 6, 2000 at the Bertie Co. campus of the Martin Co. Community College on Granville St. in Windsor. The meeting will begin at 3:30pm. Please note this slightly earlier convening time.

Attendance
Chowan RC
12/7/99

Attachment A

NAME

AFFILIATION

Jean Goedard	APNEP Staff
Guy Stefanish	APNEP
ERNIE BROWN	VADOL
Robert J. Carter	Northampton County Commissioner
Karla M. M. M. M.	" " Attorney
Brunstun Dean	Hertford Co.
Roger Spruay	Chowan Forest Owner
Marjorie Rayburn	Chowan-NC Dept. Ext. Agent
Si Spruay	Better Farmer
Billy Griffin	



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Welcome to the North Carolina Department of Environment and Natural Resources Customer Service Center (NCDENR CSC). The Customer Service Center is a single point of contact for all of the Department's programs.

[EPIC](#)

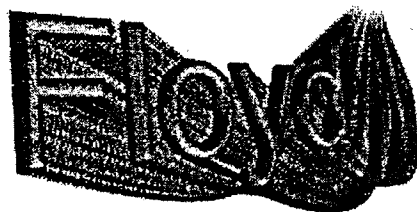
Our Mission

Our mission is to provide prompt, accurate information on the state's environmental and natural resource programs, services, and regulations.

Flood-Disaster Assistance Information

The floods in the eastern part of North Carolina have created environmental and natural resource emergencies in excess of anything previously experienced. The North Carolina Department of Environment and Natural Resources (DENR) has received an increase in customer questions and requests during this recovery and rebuilding period.

Thus, the NCDENR CSC is serving as the Floyd Assistance Information Center. Those in immediate need of environmental and natural resource information should call our toll free number 1-877-623-6748. When necessary, the CSC will refer technical questions to the appropriate DENR offices and non-DENR question to appropriate agencies.



[Information](#)

[To View DENR Hurricane Floyd Relief](#)

As noted at the left side of this webpage, this website is under construction and will continue to improve, so please visit us again in the future.

Contact Information

Telephone:

(877) 623-6748

FAX:

(919) 715-7468

Postal address:

NCDENR Customer Service Center
1640 Mail Service Center
Raleigh, NC 27699-1640

Electronic mail:

General Information:

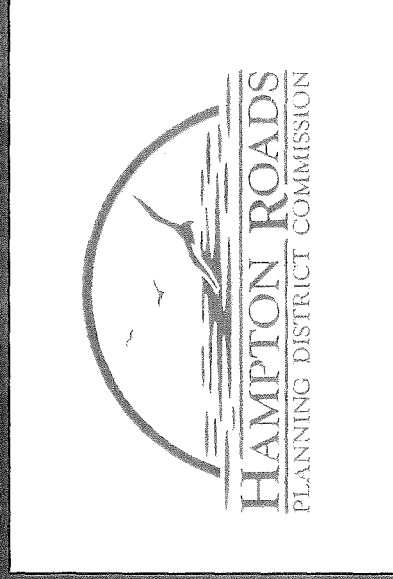
CSC@p2pays.org

Webmaster:

[CSCWebmaster](#)

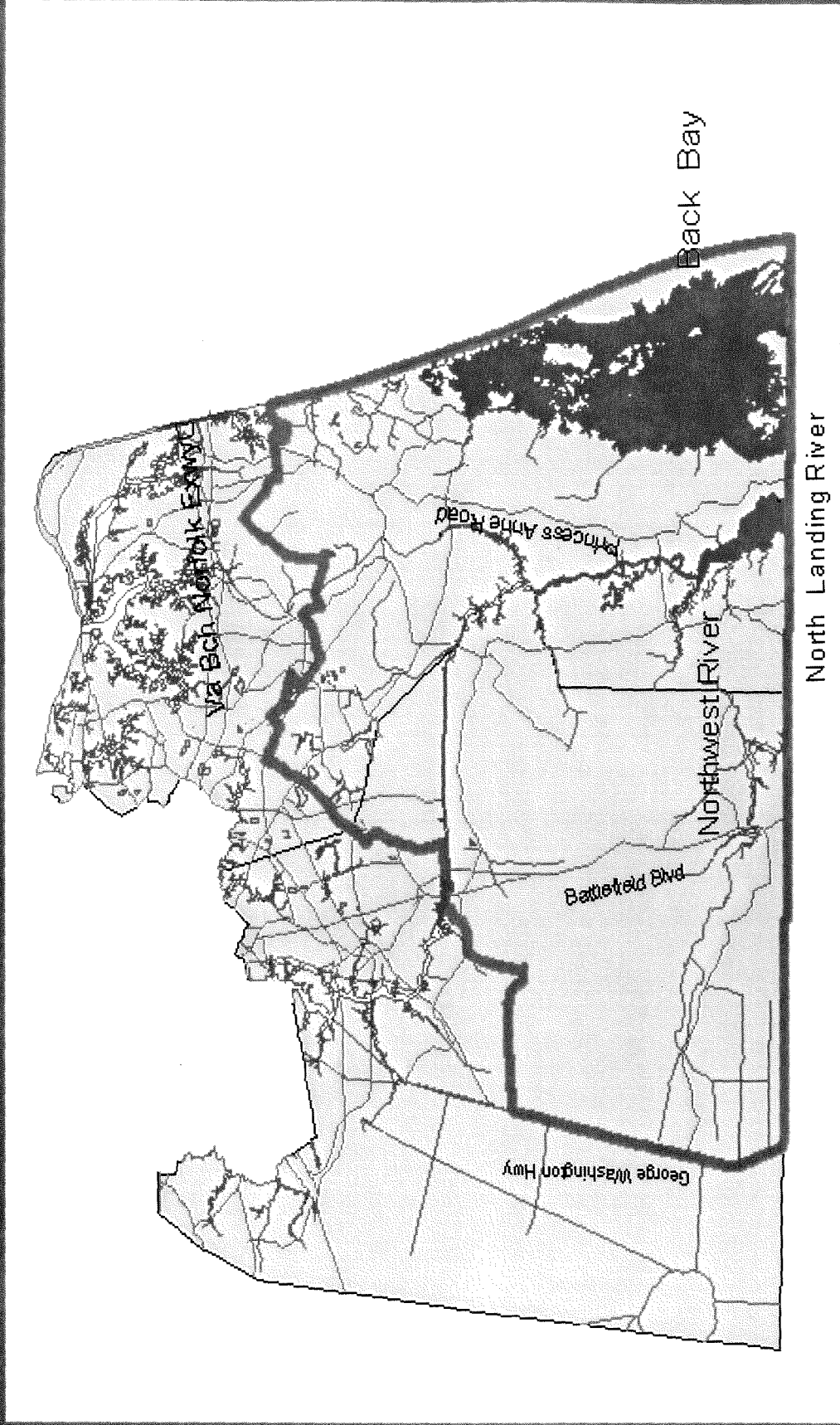
Southern Watershed Area Management Program

Presented by John M. Carlock and Eric Walberg
Hampton Roads Planning District Commission
December 7 & 9, 1999





The Southern Watershed Area



Management Enhancements

- **1) Refine Development Controls to Protect Water Quality and Preserve Critical Habitat:**
 - *Establishment of a Rural Area Preservation Program in the City of Chesapeake*
 - *Establishment of a Mitigation Strategy*
- **2) Improve the Effectiveness of Preservation Districts:**
 - *Modify the Definition and Delineation of the P-1 Preservation District in the Virginia Beach Zoning Ordinance*
 - *Modify the Definition and Delineation of the C1 Conservation District in the Chesapeake Zoning Ordinance*



Management Enhancements

- **3) Habitat Protection:**
 - *Development of a Conservation Easement MOA*
 - *Development of an Information Exchange MOA*
- **4) Improvement of Urban and Agricultural BMPs:**
 - *Development of an MOA on Urban and Agricultural Storm Water BMPs*
- **5) Management of Competing Waterway Uses:**
 - *Development of a Waterway Use Conflict MOA*

Water Quality Data Analysis

- **The Water Quality Data Analysis for the Southern Watershed evaluates current status and long-term trends in water quality.**
- **The Applied Marine Research Laboratory (AMRL) at Old Dominion University analyzed surface water quality data collected by the Virginia Department of Environmental Quality, Chesapeake Public Utilities and Norfolk Utilities.**
- **AMRL has developed a written report summarizing the results of the analysis.**



Project Objectives

- Status of Current Conditions

 - Assess relative condition of each waterbody to historical records and to other waterbodies within the watershed

 - Assess conditions relative to standards for human health

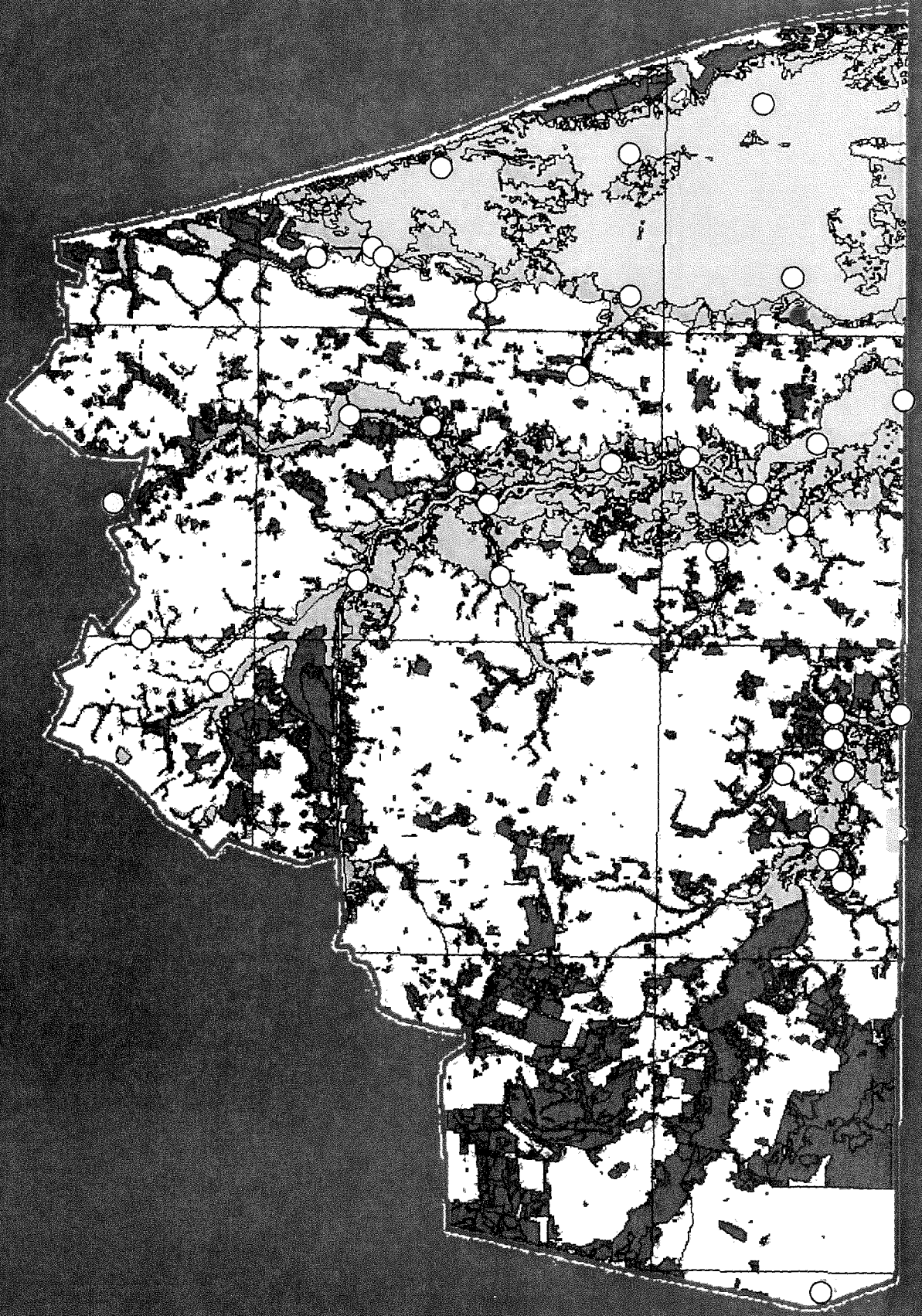
 - Assess conditions relative to standards or goals for ecosystem health

 - Assess conditions to identify potential ecological effects without established standards

- Long-term Trends




 - Identify long-term changes in water quality which indicate improving or degrading conditions

Station Locations

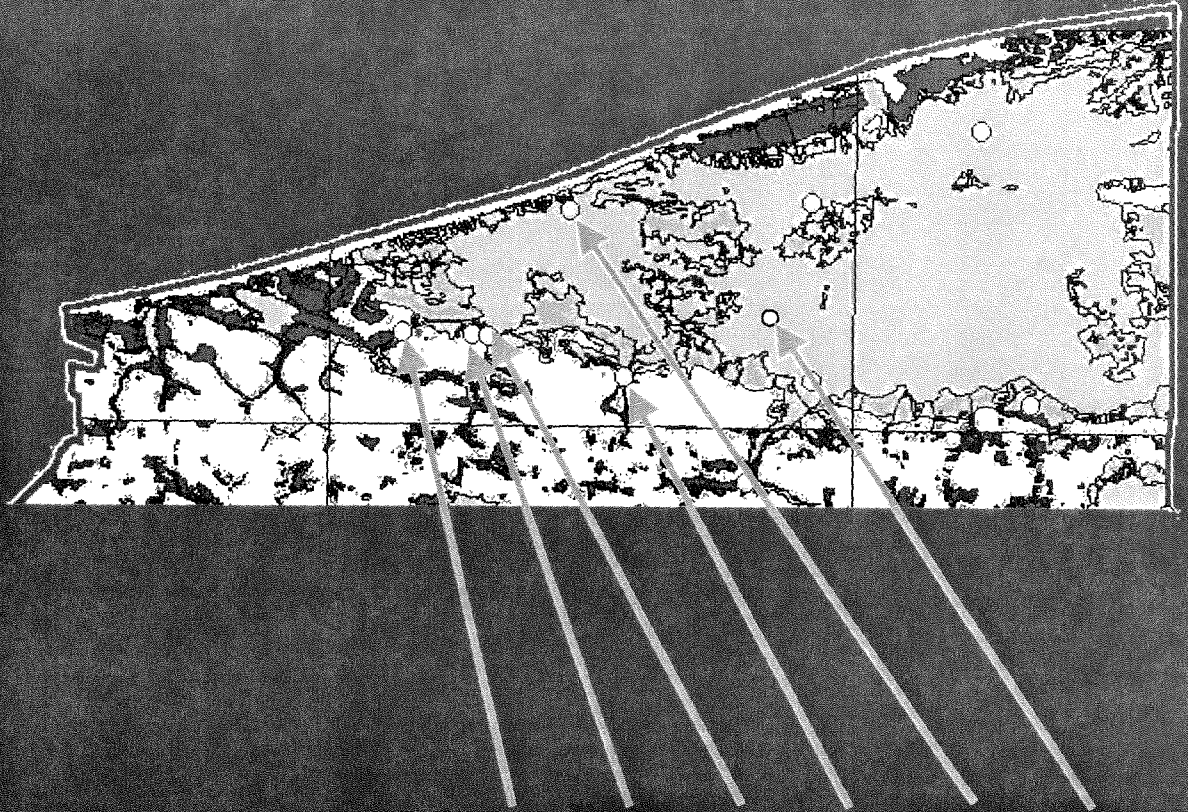




Environmental Goals - Northern Back Bay




-  SUPPORTS STANDARD OR MEETS GOALS
-  PARTIALLY SUPPORTS OR BORDERLINE
-  NOT SUPPORTING OR FAILS GOALS
- ND NO DATA

	pH	DO	TSS-SAV	DIP-SAV
Hells Pt.				ND
Hells Pt. Mouth				
Muddy Creek				ND
Beggars Creek	ND			ND
Shipps Bay				
Redhead Bay				

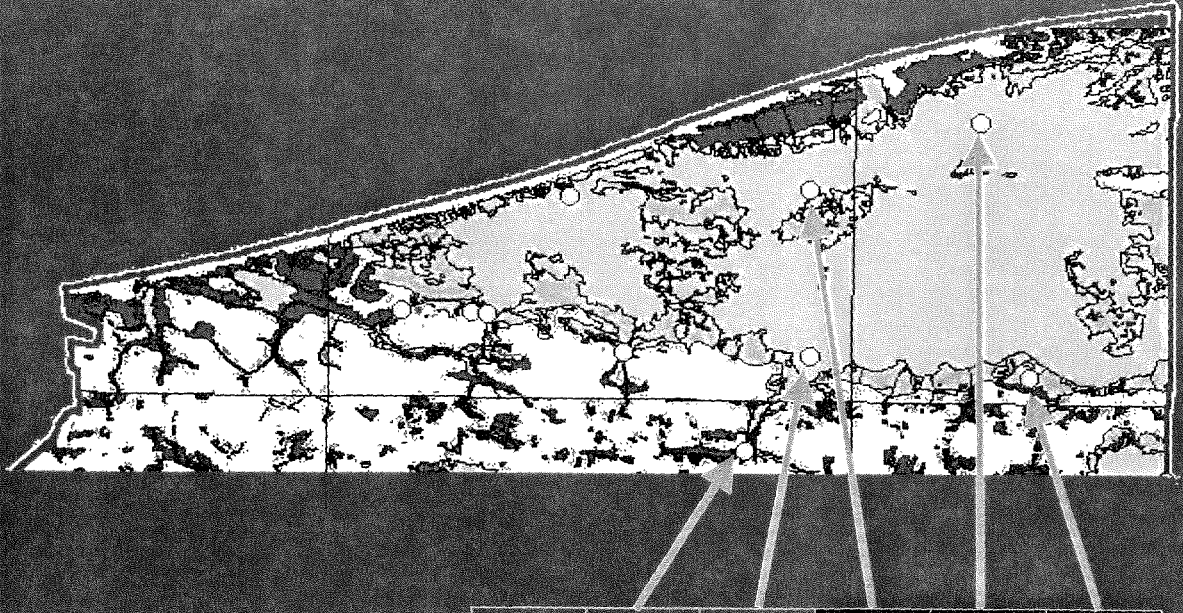




Environmental Goals - Southern Back Bay

-  SUPPORTS STANDARD OR MEETS GOALS
-  PARTIALLY SUPPORTS OR BORDERLINE
-  NOT SUPPORTING OR FAILS GOALS
- ND NO DATA

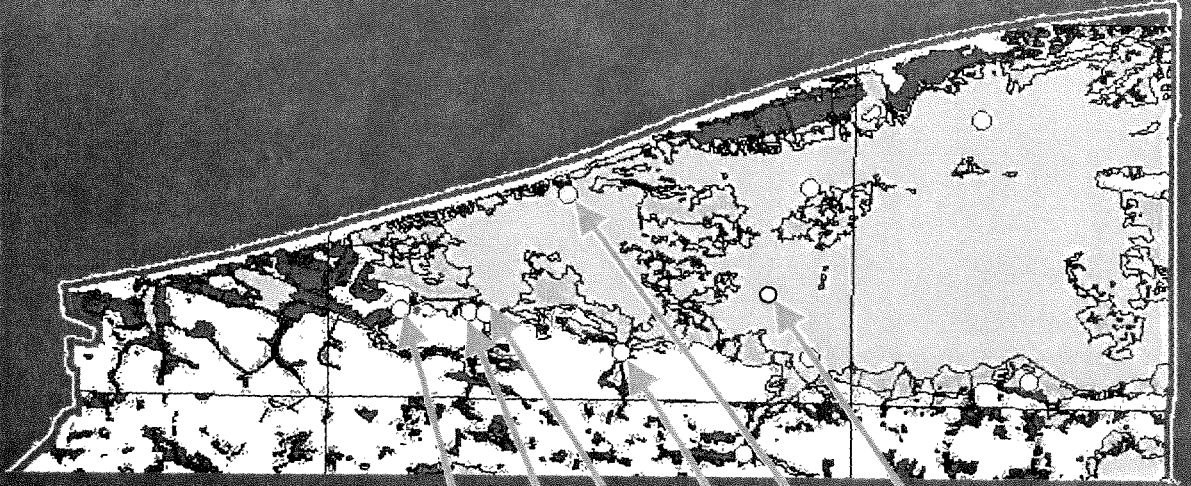
	pH	DO	TSS-SAV	DIP-SAV
Upper Nawney Creek				ND
Nawney Creek Mouth				ND
Near Ragged Is.				
North of Buckle Island				
Pellitory Point				



Relative Status - Northern Back Bay

- GOOD
- FAIR
- POOR
- ND NO DATA

	TN	DIN	TP	TSS	DIP
Hells Pt.					ND
Hells Pt. Mouth					
Muddy Creek					ND
Beggars Creek					ND
Shipp's Bay					
Redhead Bay					

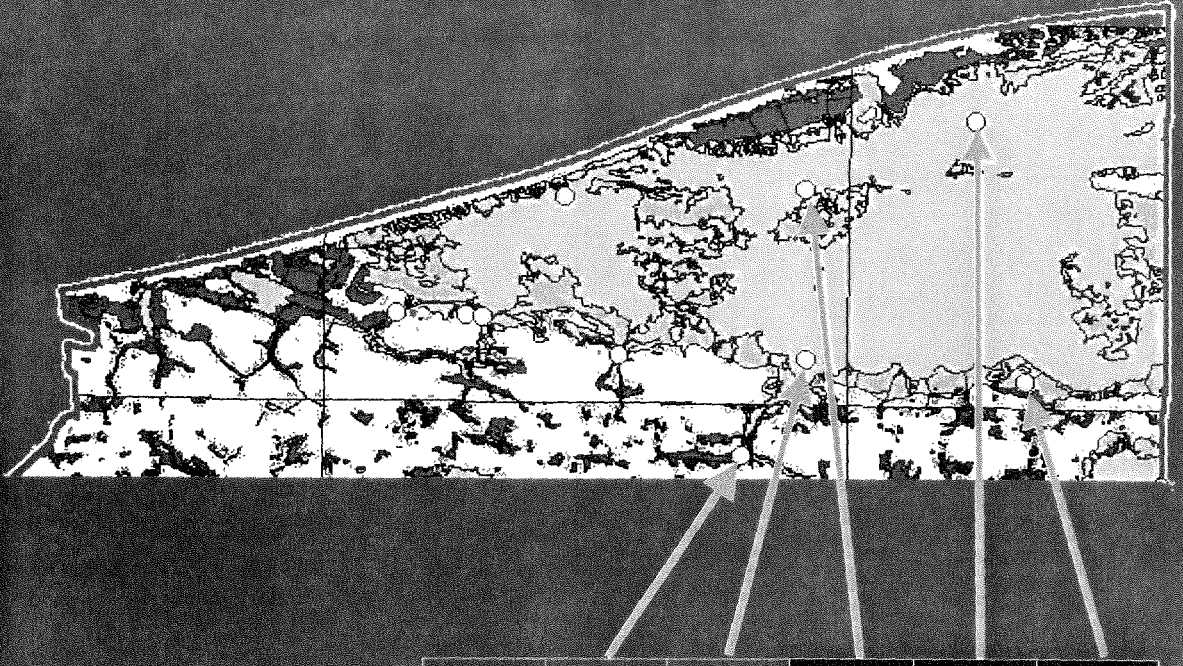




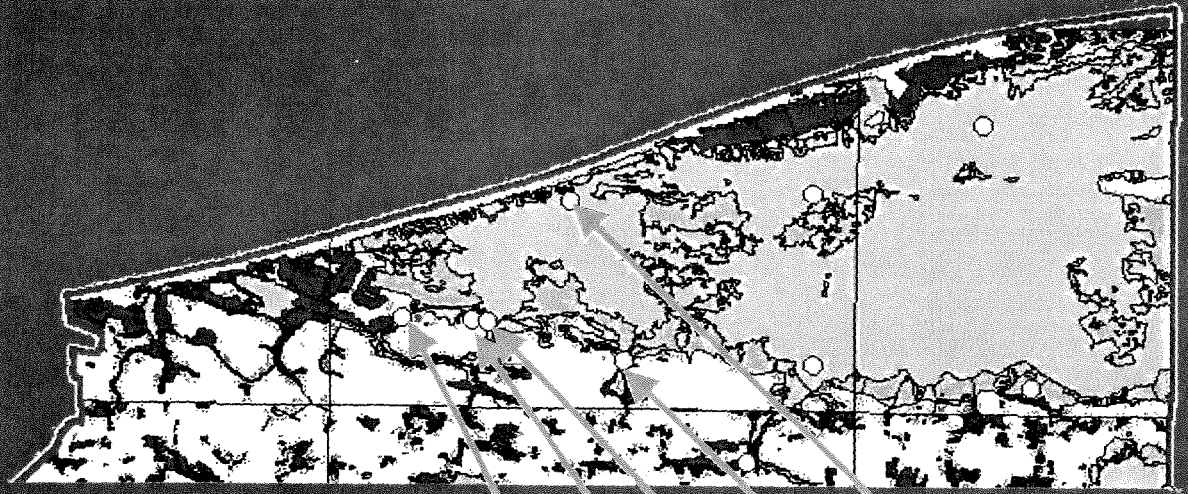
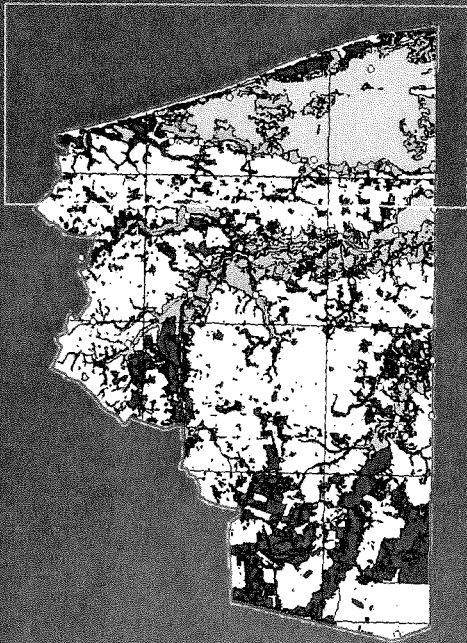
Relative Status - Southern Back Bay



	TN	DIN	TP	TSS	DIP
Upper Nawney Cr.	POOR	POOR	POOR	GOOD	ND
Nawney Cr. Mouth	GOOD	GOOD	GOOD	GOOD	ND
Near Ragged Island	GOOD	GOOD	GOOD	GOOD	POOR
North of Buckle Is.	GOOD	GOOD	GOOD	GOOD	POOR
Pellitory Pt.	GOOD	GOOD	GOOD	GOOD	POOR

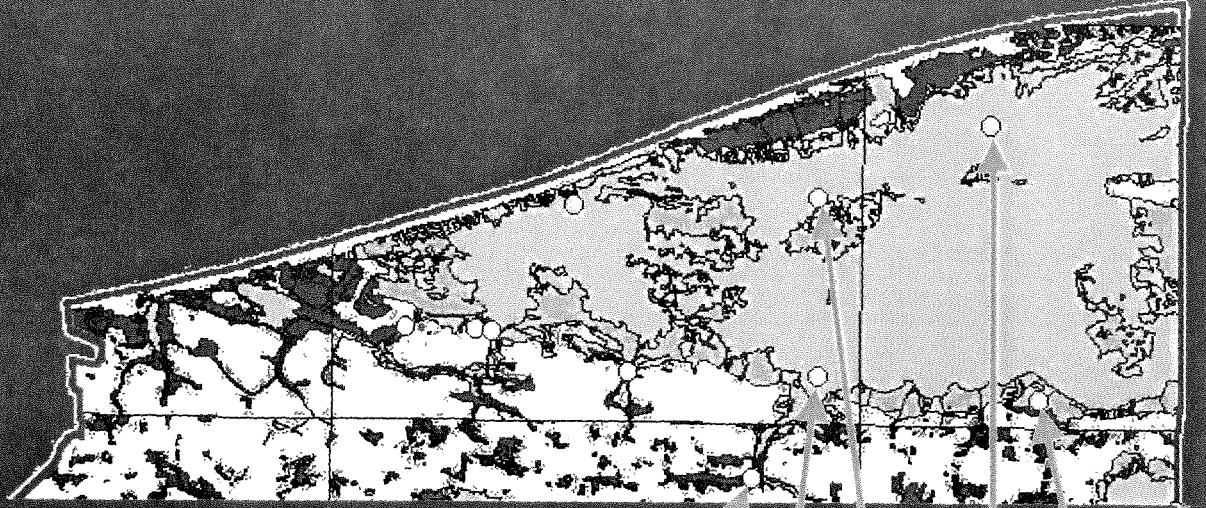
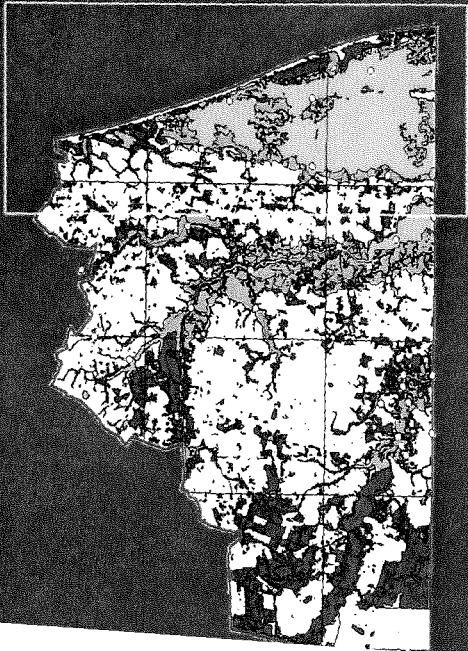


Trends - Northern Back Bay



	NH4	NO3	NO2	TKN	TP	OPO4	TSS	TS	TOC	SO4	DO
Hell's Point Cr.		▲		▲*		▲	▲		▲	▲	▲
Hell's Point Cr. Mouth	▲			▲		▲	▲				
Muddy Cr.				▲	▲	▲	▲				▲
Beggar's Cr.				▲	▲						
Shipps Bay				▲			▲				

Trends - Southern Back Bay



	NH4	NO3	NO2	TKN	TP	OPO4	TSS	TS	TOC	SO4	DO
Upper Nawney Cr.	▲			▲				▲			
Nawney Creek Mouth				▲				▲			
Near Ragged Island				▲			▲				
North of Buckle Is.				▲							
Pellitory Point	▲			▲							

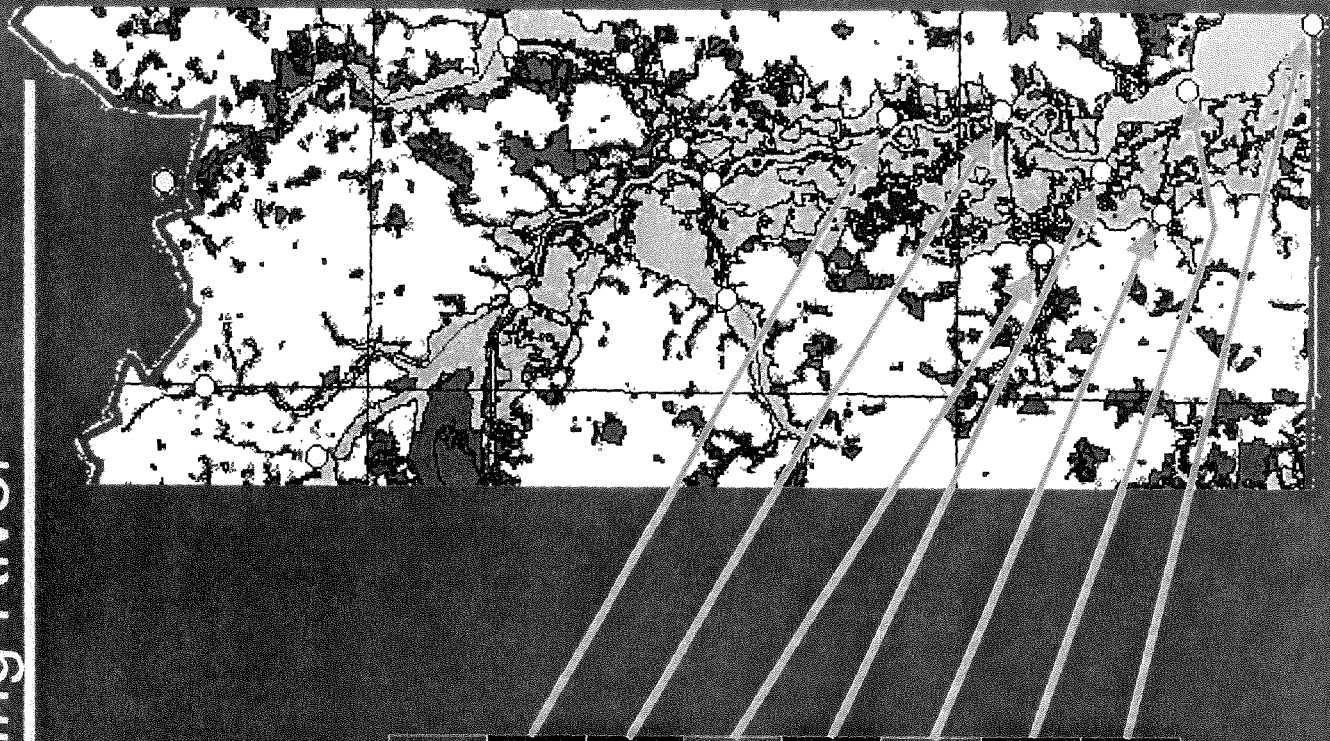


Environmental Goals - North Landing River





- SUPPORTS STANDARD OR MEETS GOALS
- PARTIALLY SUPPORTS OR BORDERLINE
- NOT SUPPORTING OR FAILS GOALS

ND NO DATA

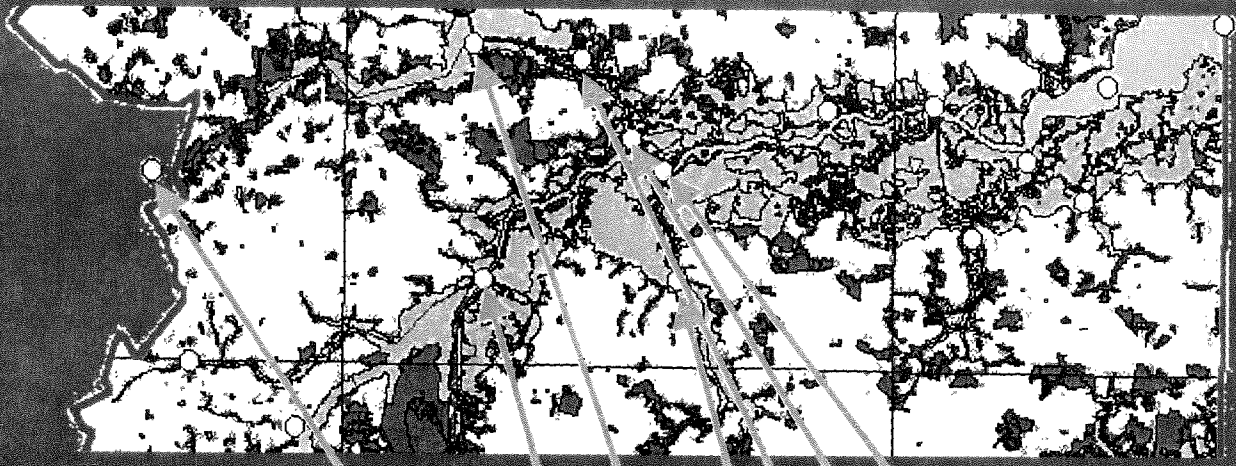
	pH	DO	TSS-SAV	DIP-SAV
Middle North Landing				
Rt. 190 Bridge				
Blackwater Creek				ND
Mouth of Blackwater Cr.				
Mill Dam Creek				ND
Mouth of Mill Dam Creek				
VA-NC Line				



Environmental Goals - North Landing River

-  SUPPORTS STANDARD OR MEETS GOALS
-  PARTIALLY SUPPORTS OR BORDERLINE
-  NOT SUPPORTING OR FAILS GOALS
-  ND NO DATA

	pH	DO	TSS-SAV	DIP-SAV
Upper West Neck				ND
Rt. 165 Bridge				ND
Middle West Neck				ND
Pocaty Creek				ND
Lower West Neck				ND
Mouth of West Neck Creek				
Mouth of Pocaty Creek				

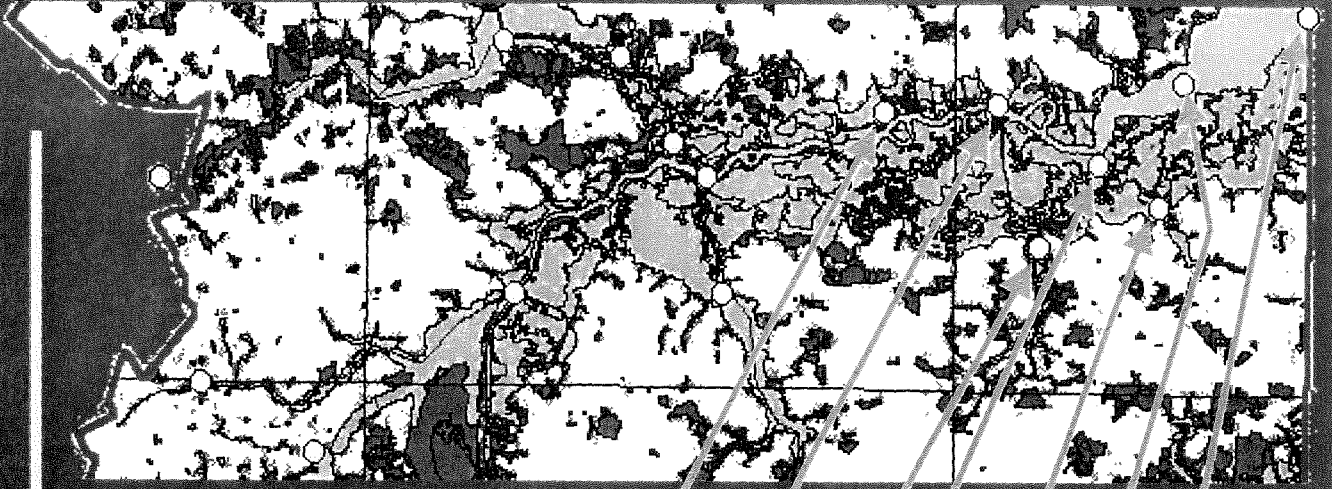


Relative Status - North Landing River



ND NO DATA

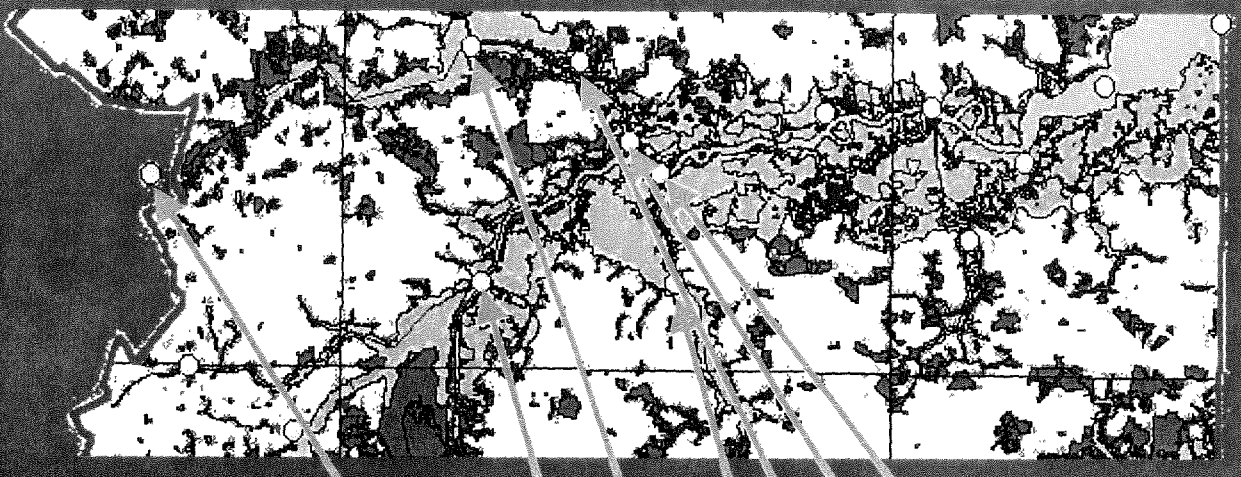
	TN	DIN	TP	TSS	DIP
Middle North Landing					
Rt. 190 Bridge					
Blackwater Creek					ND
Mouth of Blackwater Cr.					
Mill Dam Creek					ND
Mouth of Mill Dam Creek					
VA-NC Line					



Relative Status - North Landing River

- GOOD
- FAIR
- POOR
- ND NO DATA

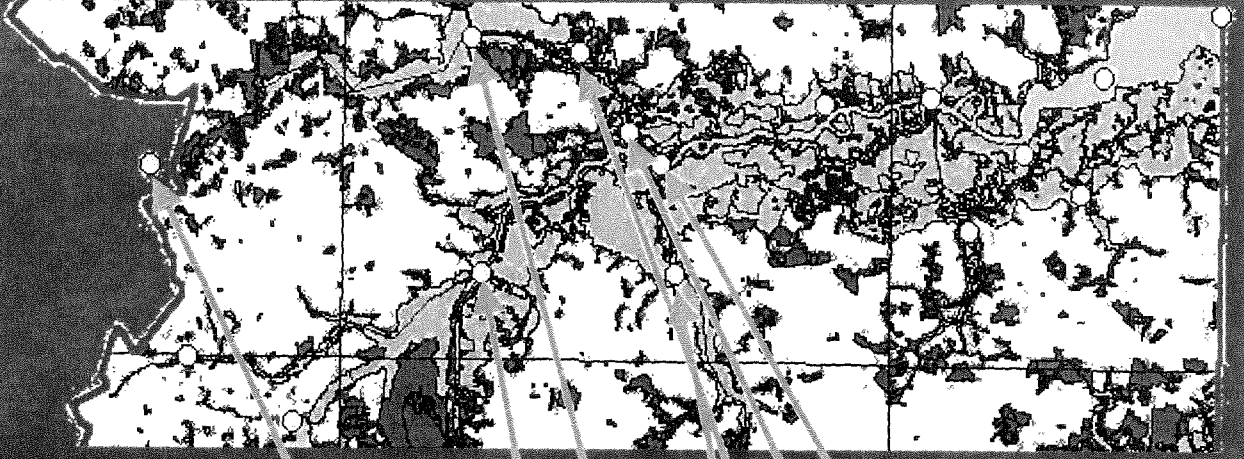
	TN	DIN	TP	TSS	DIP
Upper West Neck					ND
Rt. 165 Bridge					ND
Middle West Neck					ND
Pocaty Creek					ND
Lower West Neck					ND
Mouth of Neck Creek					
Mouth of Pocaty Creek					



Human Health Standards - North Landing River

-  SUPPORTS STANDARD
-  PARTIALLY SUPPORTS STANDARD
-  NOT SUPPORTING STANDARD
-  ND

	Fecal Coliform
Upper West Neck	ND
Rt. 165 Bridge	
Middle West Neck	
Pocaty Creek	
Lower West Neck	
Mouth of West Neck Creek	
Mouth of Pocaty Creek	





Human Health Standards - North Landing River

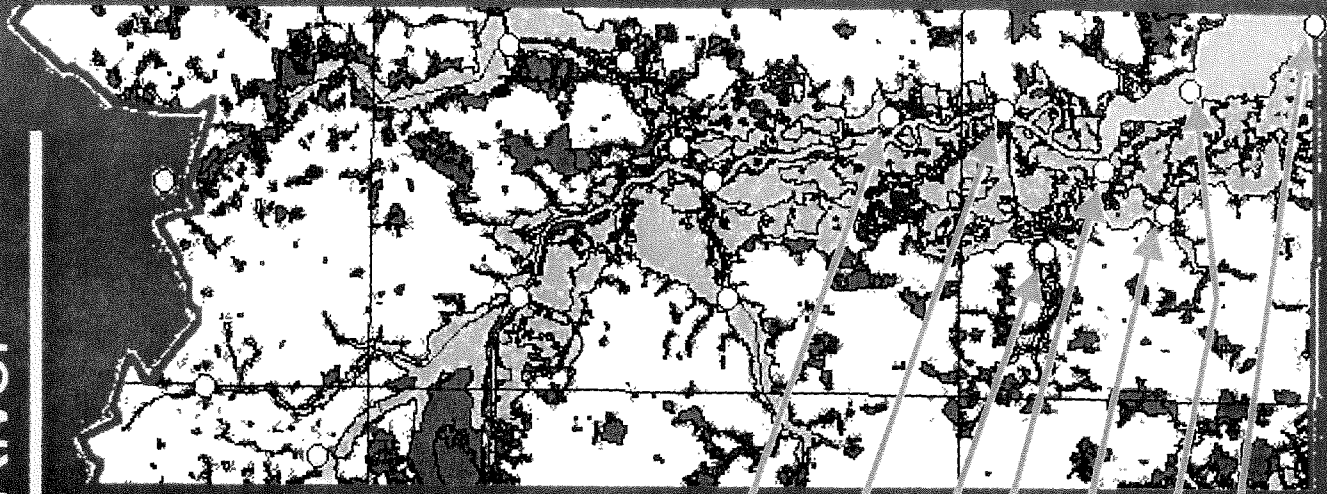
 SUPPORTS STANDARD

 PARTIALLY SUPPORTS STANDARD

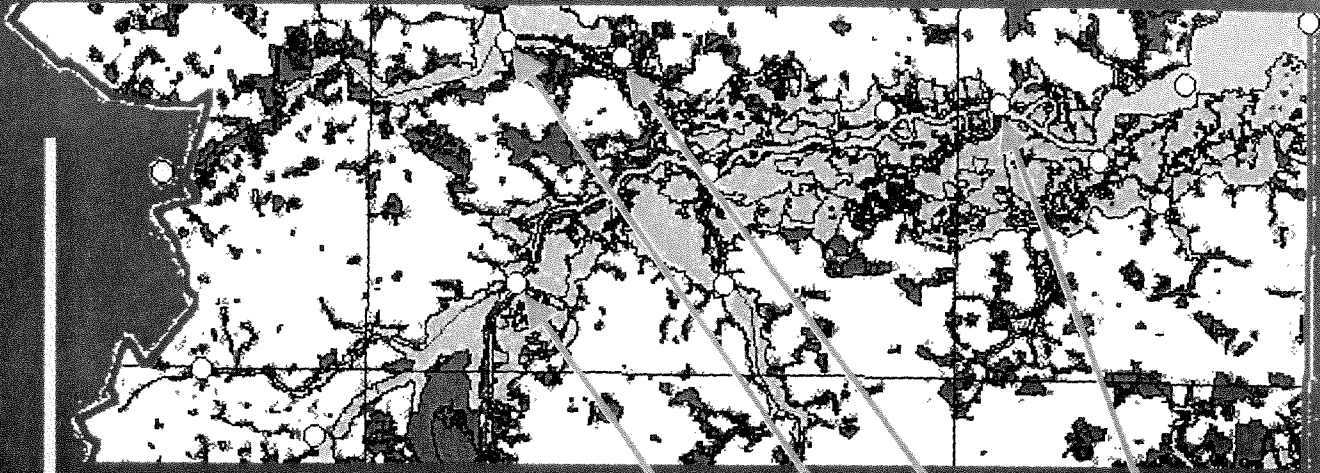
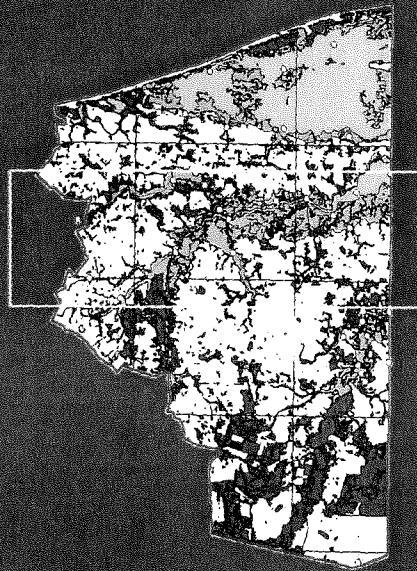
 NOT SUPPORTING STANDARD

 ND NO DATA

	Fecal Coliform
Middle North Landing	
Rt. 190 Bridge	
Blackwater Creek	ND
Mouth of Blackwater Creek	
Mill Dam Creek	
Mouth of Mill Dam Creek	
VA-NC Line	

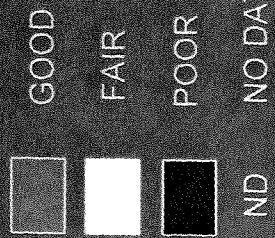


Trends - North Landing River



	NH4	NO3	NO2	TKN	TP	OP04	TSS	TS	TOC	S04	DO
North Landing River Rt. 165 Bridge					▲						
Middle West Neck Cr.		▲		▲			▲	▲	▲		▲
Lower West Neck Cr.	▲	*	▲	▲		▲	▲	▲	▲		
North Landing River Rt. 190 Bridge	▲	▲		▲				▲			

Relative Status - Northwest River



	TN	DIN	TP	TSS	DIP
Below Rt. 168 Bridge					
At Rt. 168 Bridge					ND
Above Rt. 168 Bridge					








Relative Status - Northwest River


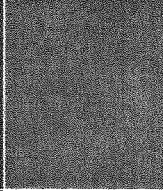
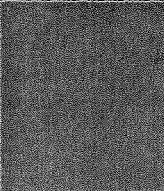






	TN	DIN	TP	TSS	DIP
Indian Creek	FAIR	FAIR	POOR	FAIR	ND
Smith Creek	GOOD	FAIR	FAIR	FAIR	POOR
Chesapeake Water Intake	ND	ND	ND	ND	ND
Indian Creek Mouth	FAIR	FAIR	FAIR	FAIR	POOR
VA-NC Line	FAIR	FAIR	FAIR	FAIR	POOR



Environmental Goals - Northwest River




-  SUPPORTS STANDARD OR MEETS GOALS
-  PARTIALLY SUPPORTS OR BORDERLINE
-  NOT SUPPORTING OR FAILS GOALS
- ND NO DATA

	pH	DO	TSS-SAV	DIP-SAV
Below Rt. 168 Bridge			ND	ND
At Rt. 168 Bridge				ND
Above Rt. 168 Bridge			ND	ND





Environmental Goals - Northwest River




-  SUPPORTS STANDARD OR MEETS GOALS
-  PARTIALLY SUPPORTS OR BORDERLINE
-  NOT SUPPORTING OR FAILS GOALS
- ND NO DATA

	pH	DO	TSS-SAV	DIP-SAV
Indian Creek				ND
Smith Creek			ND	ND
Chesapeake Water Intake	ND	ND	ND	ND
Indian Creek Mouth			ND	ND
VA-NC Line			ND	ND

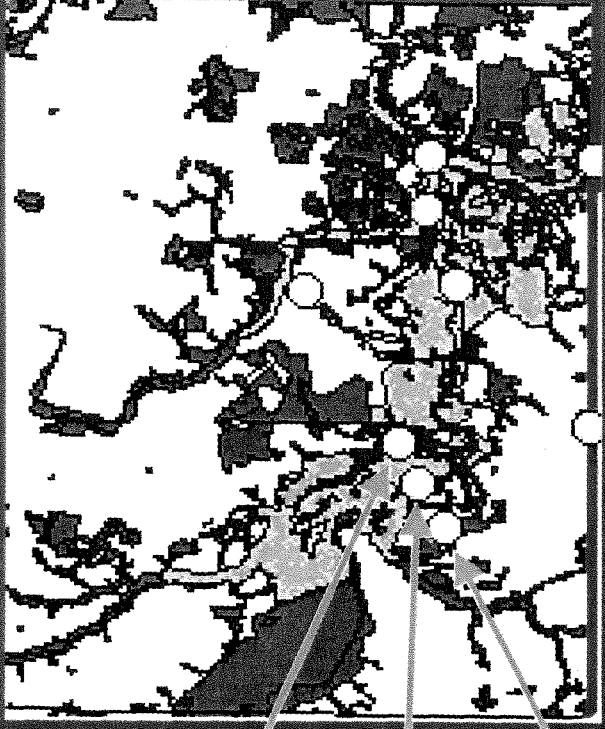




Human Health Standards - Northwest River

-  SUPPORTS STANDARD
-  PARTIALLY SUPPORTS STANDARD
-  NOT SUPPORTING STANDARD
- ND NO DATA

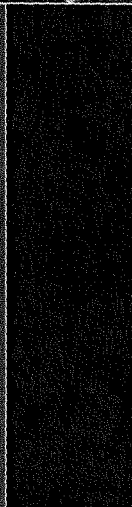

	Fecal Coliform
Below Rt. 168 Bridge	
At Rt. 168 Bridge	
Above Rt. 168 Bridge	





Human Health Standards - Northwest River

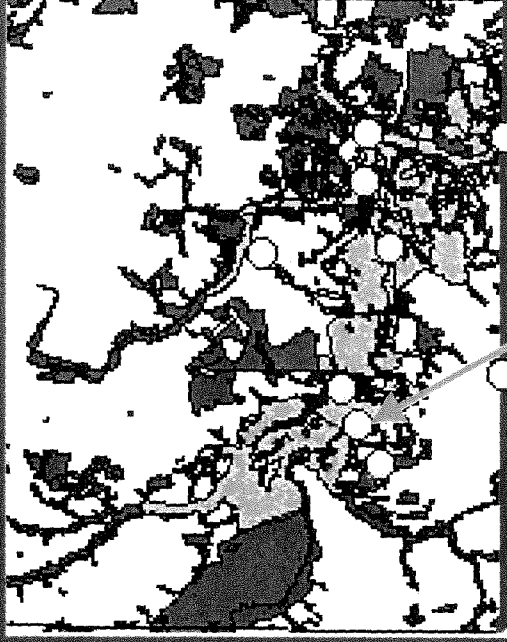
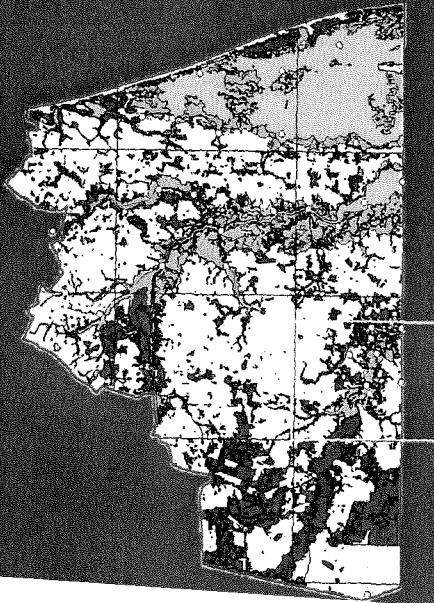
-  SUPPORTS STANDARD
-  PARTIALLY SUPPORTS STANDARD
-  NOT SUPPORTING STANDARD
- ND NO DATA

	Fecal Coliform
Indian Creek	
Smith Creek	
Chesapeake Water Intake	ND
Indian Creek Mouth	
VA-NC Line	





Trends - Northwest River



	NH4	NO3	NO2	TKN	TP	OPO4	TSS	TS	TOC	S04	DO
Northwest River Rt.168 Bridge		▲		▲			▲	▲			



Conclusions

Back Bay - *Concerns*

- Status of DIP poor at all stations with data
- Status of TN and TSS fair
- State DO standard not supported in Upper Nawney
- SAV goals for TSS and DIP not met at most stations
- State coliform standard not supported in Muddy Creek and at Nawney Creek Mouth
- TN, TP, TSS concentrations high relative to similar areas monitored by the CBP
- Degrading trends in TKN, SO_4 and DO in Hells Point Creek
- Degrading trends in NH_4 , TKN and TS in Upper Nawney Creek



Conclusions

Back Bay - *Improvements*

- Improving trends in nutrients and suspended solids at many stations

Conclusions

North Landing River - *Concerns*

- Relative status of TSS and DIP predominantly fair throughout
- State DO standard not supported or partially supported at half of the stations
- SAV goal for TSS not met or borderline for most stations
- SAV goal for DIP not met at all stations with data
- State coliform standard only partially supported in Pocaty and Mill Dam Creeks
- Degrading trends in TKN and TS in Middle and Lower West Neck Creek and at Rt. 190 Bridge
- Degrading trends in NH_4 , NO_3 , OPO_4 and SO_4 in Lower West Neck Creek
- Degrading trend in SO_4 in Middle West Neck Creek



Conclusions

North Landing River - *Improvements*

- Improving trend in TP at Rt. 165 Bridge
- Improving trends in NO_3 , TOC and DO in Middle West Neck Creek
- Improving trends in TSS and TOC in Lower West Neck Creek
- Improving trends in NH_4 and NO_3 at Rt. 190 Bridge



Conclusions

Northwest River - *Concerns*

- Status for DIP poor in the lower portion of Northwest River
- State standard for pH only partially supported at half of stations
- State standard for DO not supported at half of stations
- No TSS or DIP data for most stations
- State coliform standard not supported in Indian Creek
- Degrading trends in TKN and TS at Rt. 168 Bridge station
- Insufficient data to assess trends at most stations



Conclusions

Northwest River - *Improvements*

- Improving trends in NO₃ and TS at Rt. 168 Bridge



Recommendations for Future Monitoring

- Select important “beneficial uses” and “valued attributes” for the SWA
- Develop Watershed Goals for “valued attributes” (i.e. living resources) and “stressors” (i.e. water quality)
- Changes in existing monitoring program should allow direct assessment of progress towards Watershed Goals
- Maintain existing water quality monitoring network in SWA
- Minimum of quarterly monitoring for NH_4 , NO_3 , TKN, OPO_4 , TP, TSS, TS, DO, pH, SALIN, TEMP
- Add some measure of water clarity and living resources at all stations



Strategic Plan for Agriculture

- **An interdisciplinary team from Virginia Tech is developing a Strategic Plan for Agriculture for Chesapeake and Virginia Beach.**
- **Phase I of the project, which involved analysis of the existing economic and policy situation, has been completed.**
- **Preliminary findings show that several factors are placing financial stress on agricultural operations in Chesapeake and Virginia Beach, including low to record-low prices for widely grown crops such as corn, wheat and soybeans.**
- **Phase II of the project will involve modeling of various agricultural enterprises to assess their economic viability.**

Other SWAMP Accomplishments

- **Draft modifications to the C-1 Conservation District in Chesapeake and the P-1 Preservation District have been developed and are currently under review by the two cities.**
- **Virginia Dare Soil and Water Conservation District completed an inventory of Agricultural Best Management Practices in the Southern Watershed Area.**
- **Several Education/Public Involvement events were held including the Second Annual Green Sea Festival and a Storm Water BMP tour.**
- **A newsletter summarizing the accomplishments of the project was developed and distributed.**

Current Activities

- **A team of consultants including Siemon and Larsen, Langley McDonald and Randall Arendt has been hired to assist in the development of a Mitigation Strategy and Rural Area Preservation Program.**
- **The Virginia Department of Conservation and Recreation will assist in the development of a Conservation Plan.**
- **The development of a comprehensive Geographic Information System for the Southern Watershed area is being facilitated by the HRPDC staff.**
- **A Memorandum of Agreement on Management of Water Use Conflicts on the North Landing River is under development.**
- **The Fourth Annual Green Sea Festival will be held in October of 2000 at Munden Point Park in Virginia Beach.**



CHOWAN RIVER BASIN REGIONAL COUNCIL

CHOWAN RIVER BASIN SUBSOILER DEMONSTRATION PROJECT

DRAFT PROPOSAL – December 7, 1999
(Revised from June 15th version)

I. PRIORITY PROBLEM

Waste treatment plants in the Chowan River Basin, that currently land apply their wastewater through irrigation techniques, are experiencing severe compaction problems. Severe soil compaction problems prevent the wastewater (surface-applied at recommended rates) from adequately penetrating the soil surface. Wastewater that can not permeate the surface is washed off the land during rainfall events, potentially ending up in nearby surface waters. It is recommended that these receiving fields be subsoiled at a minimum of twice per year for good water penetration and a reduction in surface run-off. This methodology can also be applied to crop and pasture land in the basin that are experiencing similar soil compaction problems.

This project demonstrates the benefits of using a subsoiler to reduce soil surface compaction. The primary objective of this project is to improve the permeability of soil structure of the wastewater receiving fields to allow greater penetration of the wastewater being applied, and to minimize the amount of run-off created through storm events.

This proposal incorporates the use of a soil compaction tester to determine the extent of soil compaction, a subsoiler to break up soil surface compaction, soil testing, nutrient management and water monitoring to determine the extent of infiltration of wastewater.

II. OPTIONS CONSIDERED

No other options have been successful because the design of this subsoiler makes it possible to subsoil and not destroy the existing vegetative cover. All other options have failed because of loss of vegetative cover.

III. DISCUSSION of SELECTED OPTION/PROJECT ABSTRACT

- **Project Title:** Chowan River Basin Subsoiler Demonstration Project
- **Lead Agency:** The Mid-East Resource Conservation & Development (RC&D)
- **Goal:** To demonstrate the use of a subsoiler to improve the soil permeability of irrigated municipal and livestock wastewater fields.
- **Objectives:**
 - To improve wastewater infiltration
 - To reduce runoff and nutrient loss

- **Likelihood of Success:** This project will successfully demonstrate the use of a subsoiler to reduce soil compaction and the benefits associated with reduced compaction. This method has been tried and proven successful by the Town of Ahoskie, NC Wastewater Treatment Plant. They won a state and national award for the use of a subsoiler on their spray fields.
- **Public Support:** Support for this project is clearly illustrated by the involvement of several local, state and federal resource management agencies, as well as by the participation of over 15 municipalities and landowners in the Chowan River Basin.
- **Time & Resources Required:** Resources required will be the subsoiler, tractor to pull the subsoiler, method to haul equipment to different sites, monitoring equipment to check compaction before and after subsoiling. Time required to run the equipment will be one hour per acre using a 150 horsepower tractor. Scheduling equipment and monitoring the fields will be minimal.
- **Cost-effectiveness:** The use of a subsoiler to fracture compacted soil is highly cost-effective because it involves the purchase of equipment that can be shared by multiple users, and requires little, if any, additional labor costs. A subsoiler can also reduce chemical and nutrient application costs.
- **Deliverables:** Quarterly project reports and final report after completing second year of monitoring will be produced. Use of the subsoiler by municipalities and other land owners will continue beyond the completion of this project time period. The subsoiler will reside at the last user's location until needed by another user. Minor equipment repairs are expected.

IV. DETAILED PROJECT DESCRIPTION/SCOPE of WORK

WHAT: This project will demonstrate to municipalities in the Chowan River Basin of North Carolina the advantage of subsoiling which will result in better water infiltration, less compaction, and less runoff. The project will allow the purchase of the subsoiler to be used mainly by municipalities and irrigated swine waste fields. This equipment is not affordable by small municipalities operating on limited budgets.

WHO: The project will involve agents from the Mid-East Resource Conservation & Development (RC&D) and the NC Cooperative Extension Service.

HOW: Purchase of the equipment will allow municipalities and farmers to use the subsoiler with the only cost being associated with the rental of a large tractor to pull it and the cost of transporting the equipment to their site. The project incorporates the use of a denitrification barrier to study subsurface nutrient movement as well, with an intensive monitoring and analysis component implemented for project evaluation. The denitrification barrier will consist of a saw dust pit approximately 120 m long x 3 m wide x 3 m deep, with some modifications as required according to site conditions. Two sites will be selected that will offer comparisons between soil types, topography, watershed relief, drainage systems and other relevant factors.

Monitoring and analysis will be conducted by Dr. Dave Lindbo, NC Cooperative Extension Service, Vernon James Research and Extension Center, Plymouth, NC.

Monitoring will be for a two-year term, project length may be ongoing for numerous years.

WHERE: Throughout the Chowan River Basin.

WHEN: Upon purchase of the subsoiler, scheduling with municipalities and swine lagoon operators could begin immediately.

PROJECT BUDGET: Proposed Budget

<u>PRACTICE</u>	<u>EXPENSES</u>
Subsoiler Purchase	\$ 4,500.00
Routine Equipment Maintenance (shanks & colters replacement)	1,000.00
Denitrification Barrier Construction (2)	10,000.00
Monitoring (NCSU Soil Science Dept)	4,000.00
Information and Education	1,500.00
Administrative	<u>1,000.00</u>
TOTAL:	\$22,000.00

V. ACTIVITIES to MONITOR SUCCESS

Monitoring and analysis will be conducted by Dr. Dave Lindbo, NC Cooperative Extension Service, Vernon James Research and Extension Center, Plymouth, NC. Monitoring will be for a two-year term, project length may be ongoing for numerous years (see above for use of denitrification barriers).

VI. PROGRESS REPORTS

Progress reports will be completed quarterly with results available to the Chowan River Basin Regional Council at that time. Results will be made available to the general public upon request.

VII. REVIEW, EVALUATION and REDIRECTION

This demonstration project will be reviewed, evaluated and redirected (if necessary) by the Technical Committee of the Coordinating Council for the Albemarle-Pamlico National Estuary Program and the Mid-East RC&D.

VIII. BASINWIDE or REGIONAL APPLICATION

This demonstration project will help approximately 15 municipalities improve conditions for wastewater irrigation, as well as swine farmers who are land-applying waste via spray irrigation in the Chowan River Basin. The methodology and results of this demonstration project can be transferable to other river basins with wide application. In part, the NC Cooperative Extension Service views this project as a "teaching/training demonstration project" to be applied locally and statewide.

IX. EDUCATION and OUTREACH:

Progress reports will be compiled quarterly, field days and workshops will be conducted annually, a mid-term report and final report will be compiled and made available to interested individuals and municipalities upon request. A field day is planned for municipal waste operators to explain benefits of the project and proper techniques of using the subsoiler.

X. ENDORSEMENT by REGIONAL COUNCIL

This demonstration project was officially endorsed by members of the Chowan River Basin Regional Council on December 7, 1999 at a meeting in Windsor, NC.