Public Perceptions of Environmental Quality and Values in the Albemarle-Pamlico Natural Estuary

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Introduction

Many problems facing the Albemarle-Pamlico Estuarine system stem from human activity. As the human population grows and economic development increases, these activities will swell and cause further impact to the water quality in this region. Many solutions are available but implementation is difficult due to lack of resources and public support.

Increased public awareness and optimistic public attitudes will be essential to the enhancement of water quality. This study analyzes public attitudes regarding the natural resources of the Albemarle-Pamlico Estuarine system. The information in this report was collected in a scientific telephone survey of 1,179 people selected at random from across the North Carolina portion of the Albemarle-Pamlico Estuarine system area. This work will help construct support for the goals of this study by identifying educational needs and support for water quality programs.

Project Procedures

Purpose and Objectives

The purpose of this research, as it was in the 1991 study, is to evaluate peoples' knowledge and perceptions about natural resources in the Albemarle-Pamlico Estuarine system and the management alternatives designed to protect these resources. The objectives of the research are to assess public understanding of the causes, severity and consequences of water quality problems in the Albemarle-Pamlico Estuarine system and to analyze the nature and degree of consensus and differences among groups of affecting and affected users of the Albemarle-Pamlico Estuarine system.

Questionnaire Development

The questionnaire in this study was based on the 1991 study of the same area titled "Public Attitudes toward Water Quality and Management Alternatives in the Albemarle-Pamlico Estuarine System". The instrument was updated and revised to appropriately reflect the information needed for the current study.

Sample Design for Telephone Survey

The research design utilized a random sample of households with telephones. The population was defined as the 33 counties in North Carolina making up the watershed of the Albemarle-Pamlico Estuarine system. In order to examine both the subareas and the region as a whole, a total sample size of 1,200 was desirable. The counties making up the entire watershed were divided into three subareas: drainage basin, sound and coast. It was decided that a target sample of 400 would be collected from each subarea. In order to draw conclusions from the entire region, the sample was weighted according to the proportions of the subareas in the population. Please see the table below for the weighting technique.

Location	Population	Sample	Weight (w)	n in sample	w*n	
Basin(1)	0.826	0.361	2.288089	426	974.7258	0.82706
Sound(2)	0.116	0.338	0.343195	398	136.5917	0.115899
Coast(3)	0.057	0.301	0.189369	355	67.22591	0.057042
Total	0.999	1	2.820653	1179	1178.543	1

Phone numbers for the sample were selected using a random-digit dialing technique. This makes certain that all households with a phone had an equal chance to be included in the sample. The sample for each subarea was purchased from Survey Sampling International, Inc. The numbers were screened to remove businesses and those that were not in service. Even with screening, the sample still had business numbers as shown below.

A total of 1,179 interviews were completed: 426 in the drainage basin, 398 in the sound and 355 in the coastal counties. Interviews averaged over 20 minutes in length and a minimum of ten attempts were made before a number was purged from the sample.

Status	Frequency	Percent
Refused	1766	48.5
Terminated	253	6.9
Business	446	12.2
Completed	1179	32.4
Total	3644	100

The interviews were conducted by the Center for Survey Research (CSR) at East Carolina University. CSR employs numerous undergraduate students as interviewers and comprehensively trains them on the research project prior to data collection.

Measurement and Analysis of Telephone Survey Data

A copy of the complete questionnaire can be found in Appendix A. Once the survey was completed, the data were exported to a statistical software package and cleaned. Data in this report were analyzed using descriptive statistical measures.

Telephone Survey Results

Results from this study are broken down into five main sections. First, sample characteristics are given. Second, sources of water quality information are discussed. In the third section, awareness and knowledge related to water quality are presented. Fourth, perceptions of the problems regarding water quality are analyzed. Finally, we present results related to public policies and management. In all cases, the weighted results for the whole sample are presented.

Sample Characteristics

The sample distribution was in line with the subarea distribution. Over 80 percent of the sample was located in the drainage basin, over 10 percent in the sound and just under 6 percent in the coastal counties. The subarea population was determined by 2007 census data for each county. Thirty-six percent of the sample lived in rural areas, 29 percent lived in small towns, 13 percent lived in the suburbs and roughly 21 percent lived in cities. Three-quarters received their water from a central water system. The majority (97 percent) lived at their residence year-round, did not (86 percent) own a second home near the coast and did not presently own or operate a farm (87 percent).

About 65 percent of the sample was female and 35 percent male. Regarding race, 70 percent were Caucasian, 26 percent were African-American and three percent were other races (1 percent refused to answer or didn't know). The largest amount of people were between the ages of 50 and 64 (30 percent) with those over age 65 following (28 percent). Thirty percent of respondents had members less than 18 years of age in their households. Respondents were also asked to indicate the highest level of education completed and their annual household income. In the education category, the largest portion (28 percent) graduated from high school followed by 26 percent who obtained a four-year degree. Almost 16 percent had completed some college and 13 percent held a two-year degree. Approximately 13 percent had completed some graduate work or completed a graduate degree. Around two percent had family incomes of under $5,000 and approximately the same had incomes of over $200,000. Each of the four categories from $30,000 to $80,000 had 15 to 19 percent of the sample.

A large portion considered themselves professionals (23 percent) whereas 13 percent indicated they were currently unemployed. Those describing their political views as conservative made up the largest group (39 percent) with those being "middle of the road" following (31 percent). Over 40 percent surveyed had lived in their county of residence for at least 30 years. Respondents from Wake County made up the largest portion, with 24 percent, followed by Pitt County (10 percent) and Johnston County (8 percent).

Most demographic information can be found in Table 1 on the following pages of the report.

Table 1. Sample Characteristics

	Percent of Respondents
Location of Study Area	
Drainage Basin	83
Sound	11
Coast	6
Residence Location	
Rural Area	36
Small Town	29
Suburb	13
City	21
Water System Type	
Own Well	24
Central System	75
Don't Know	1
Residence Status	
Year-round	97
Part-time	2
Don't Know	1
Second Home Ownership	
Yes	13
No	86
Don't Know	1
Farm Ownership/Operation	
Yes	13
No	86
Don't Know	1

Table 1. Sample Characteristics (continued)

	Percent of Respondents
Employment	
Administrative support	3
Business executive	5
Executive of non-profit organization	1
Homemaker	5
Industrial	5
Professional	23
Public executive	2
Sales	5
Service	8
Technical	2
Not employed	13
Other	28
Political Views	
Conservative	39
Middle of the road	31
Liberal	10
Other	14
Don't Know	5
Refuse to answer	1

Table 1. Sample Characteristics (continued)

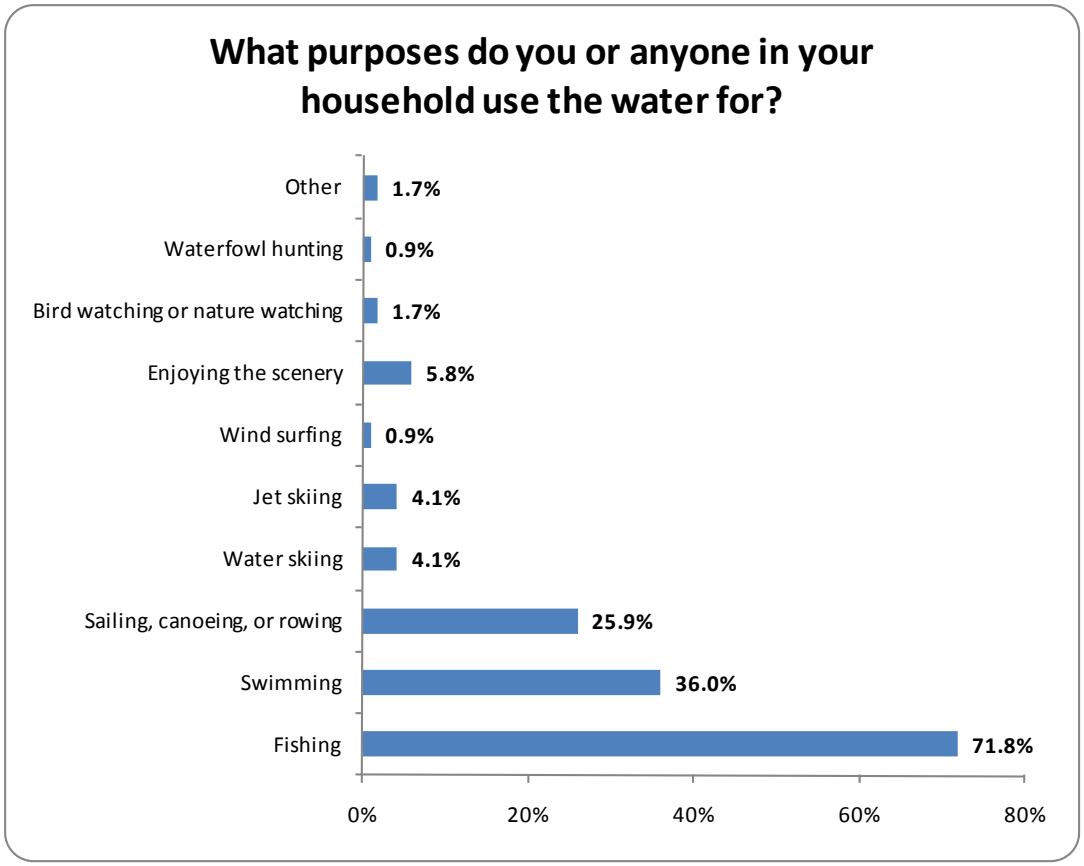
	Percent of Respondents
Gender	
Female	65
Male	35
Race	
Caucasian	70
African-American	26
Other or Don't Know	4
Age	
18 – 35	16
35 – 49	26
50 – 64	30
65 and over	28
Education	
Less than high school	4
High school graduate	28
Some college, no degree	16
2-year college degree	13
4-year college degree	26
Some graduate work	3
Graduate level degree	10

Table 1. Sample Characteristics (continued)

	Percent of Respondents
Household Income	
Less than $5,000	2
$5,001 to $10,000	2
$10,001 to $20,000	4
$20,001 to $30,000	9
$30,001 to $40,000	16
$40,001 to $50,000	19
$50,001 to $60,000	18
$60,001 to $80,000	15
$80,001 to $100,000	5
$100,001 to $200,000	8
More than $200,000	2

Respondents were also asked if they used the Albemarle-Pamlico Estuarine system and other non-ocean coastal waters for recreational purposes. The results indicated that 29 percent of respondents used these waters. For those respondents using these waters for recreation, 72 percent used them for fishing, 36 percent used them for swimming and 26 percent for boating. Less than 10 percent of all respondents reported fishing for commercial purposes. (See Figure 1)

Figure 1. Recreational Use of Sounds and Other Coastal Waters

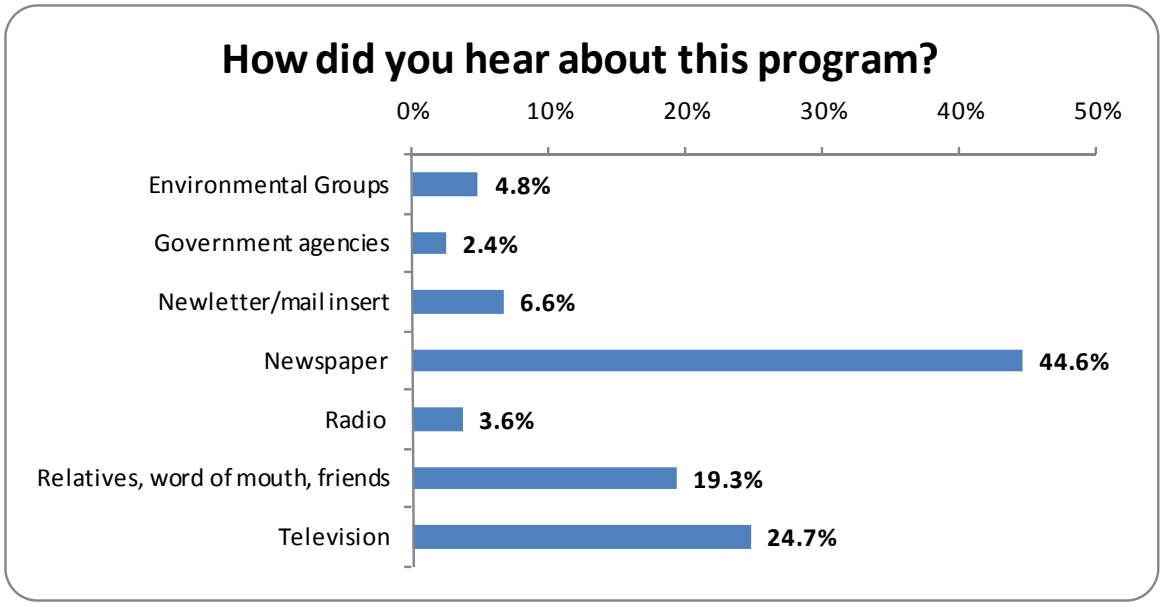


The participants' level of environmental activism was determined by respondents' donations to resource conservation or environmental groups, attendance at a public meeting and membership in environmental groups or organizations. One-fifth of the sample donated money, 11 percent had attended a meeting and almost seven percent were active members of a group.

Sources of Information

Where people get their information about water quality was an important aspect of this study. Most respondents (85 percent) had not heard of the Albemarle-Pamlico National Estuary Program (APNEP or APES). Of those that had heard about APNEP, 44 percent read about the program in the newspaper and almost 25 percent had seen references on television. Nineteen percent had heard about the program through word of mouth, relatives or friends. Six percent received information from a newsletter or a mail insert. Less than five percent each received information from environmental groups, government agencies, and the radio. These results are shown in Figure 2.

Figure 2. Sources of Information about APNEP



Awareness and Knowledge

It is important to measure the awareness and knowledge of issues associated with the estuaries. We asked respondents if they thought certain fishing practices can cause problems for fish habitat. Over three-quarters (77 percent) recognized the impact of fishing practices on fish habitat.

We also wanted to find out if respondents knew the value of wetlands. Wetlands were defined as marshes and swamp land that have water on or near the surface. To determine this, we asked if respondents thought wetlands were important as a habitat for birds and other wildlife. Almost all (92 percent) recognized the value of wetlands as a habitat. We also asked if they thought the wetlands were important for maintaining or improving water quality. Over three-fourths (76 percent) responded favorably.

We were also interested to know if respondents understood the implications of land use and related issues on water quality. When asked if land use has a major effect on water quality in the Albemarle and Pamlico Sounds, most (87 percent) knew that it had a major effect. To decipher if people understood the notion of a watershed, we asked if they thought some of the water quality problems in the Sounds were caused by pollution from inland cities such as Raleigh or Greenville. Over 80 percent answered yes. Only 7 percent said no. As another indicator of knowledge, we asked if people thought that fresh water could create pollution problems for the sound. Less than half (47 percent) answered yes and 30 percent did not know. On the flipside, we also asked if they thought salt water could be a problem for the environmental health of sounds and rivers. A slight majority (57 percent) thought that it could be a problem but 25 percent did not know the answer to the question.

We asked if respondents were aware of the new storm water rules. Almost all were not aware of the rules (92 percent). Of the eight percent who were aware of the rules, 63 percent thought they would improve water quality, and 31 percent thought they would have no impact. We then asked if developers

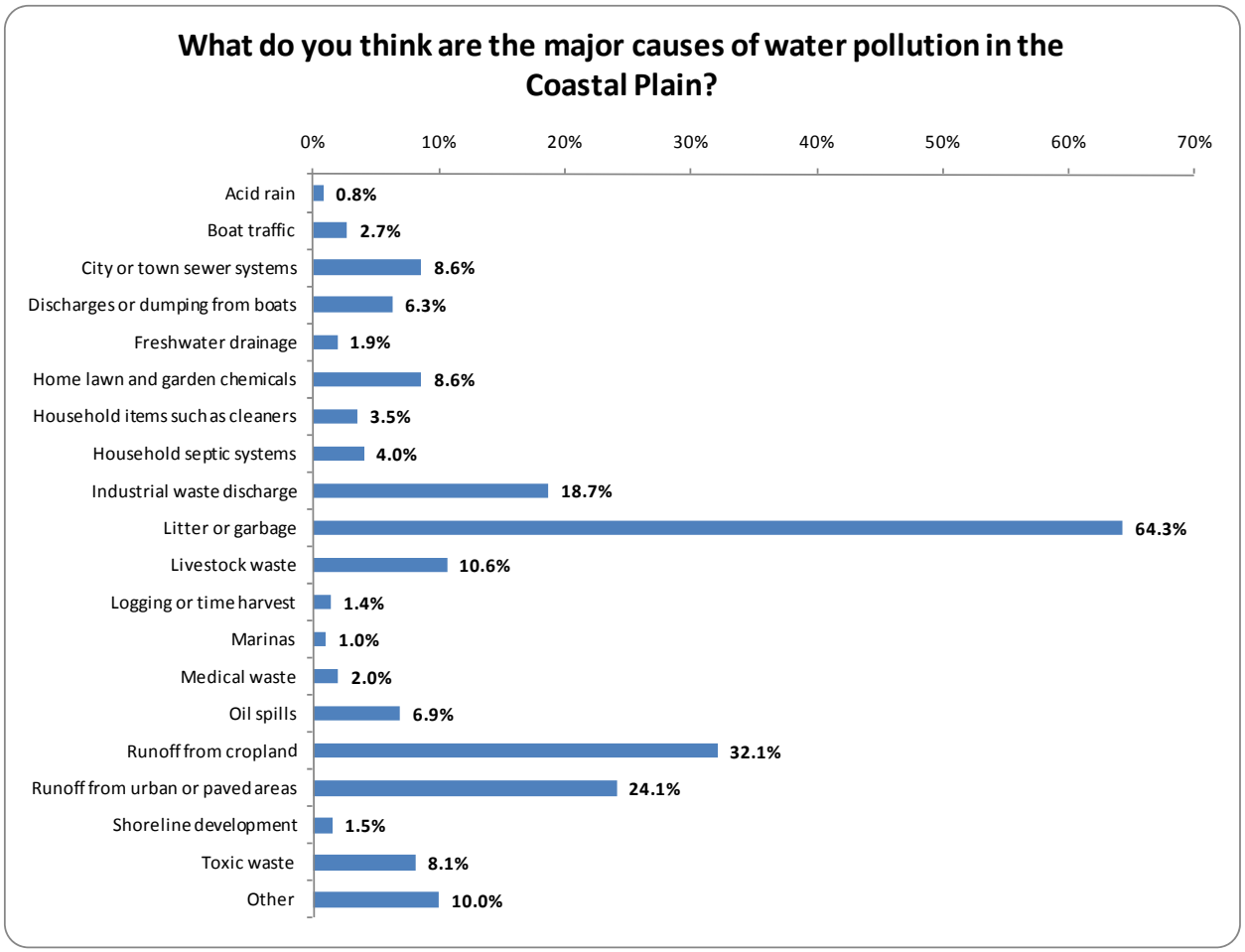
needed to get permits before they can build along the coast. Almost all (94 percent) were of the opinion that developers had to get permits.

Perception of Problems

We were interested in assessing respondents' concerns about water pollution. We asked about different reference points for this concern: the Coastal Plain and their own county. Water pollution in the Coastal Plain was thought to be somewhat of a problem (35 percent) and a serious problem (20 percent). Only 8 percent thought water pollution was not a problem in the Coastal Plain. Respondents were less convinced that water pollution posed a serious problem closer to home. In their own counties, most respondents (39 percent) thought water pollution was somewhat of a problem but a staggering 29 percent thought it was not a problem.

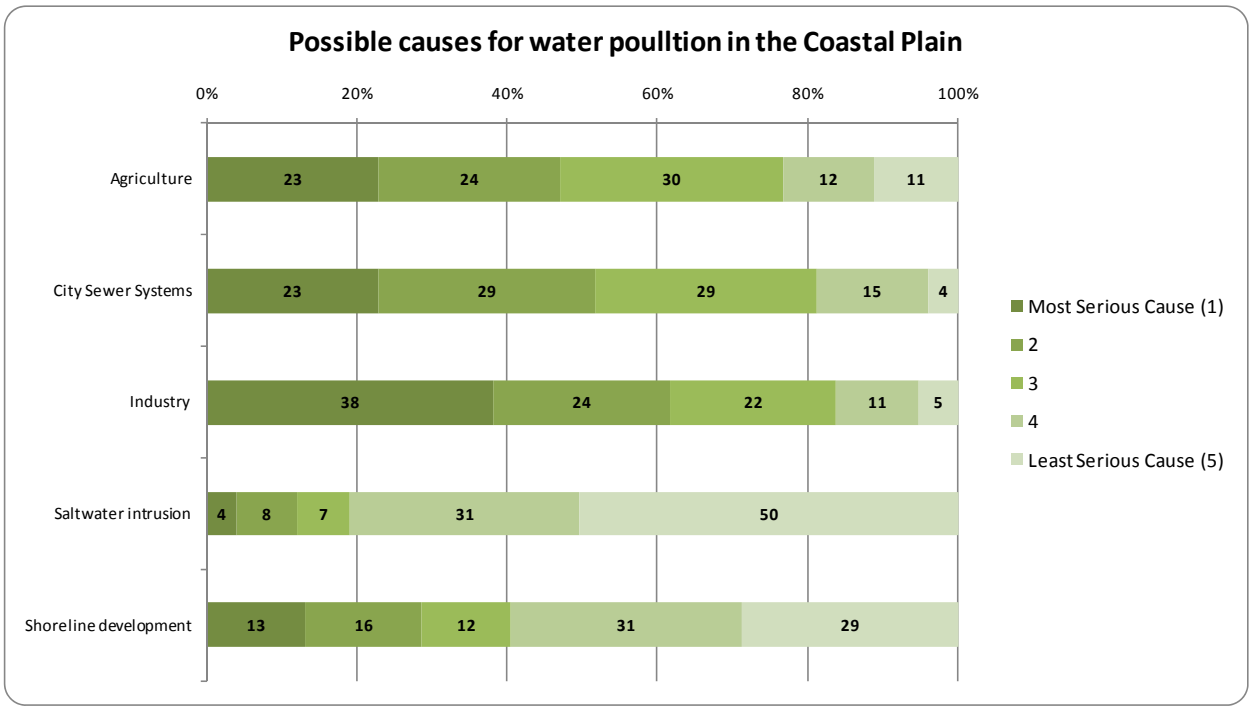
We asked two questions to discover what people thought were the main causes of water pollution. Initially, we asked an open ended question about the major causes of water pollution in the Coastal Plain. Litter was cited the most followed by runoff from cropland and from urban or paved areas. See Figure 3 for details.

Figure 3. Major Causes of Water Pollution in the Coastal Plain



We were next interested in finding out how people actually ranked five specific causes of water pollution: agriculture, city sewer systems, industry, saltwater intrusion and shoreline development. As shown in Figure 4, 38 percent thought industry was the most serious cause of water pollution. Just under a quarter (23 percent each) said that agriculture and city sewer systems were the most serious causes. On the other hand, the least serious causes of water pollution were thought to be saltwater intrusion (50 percent) and shoreline development (29 percent).

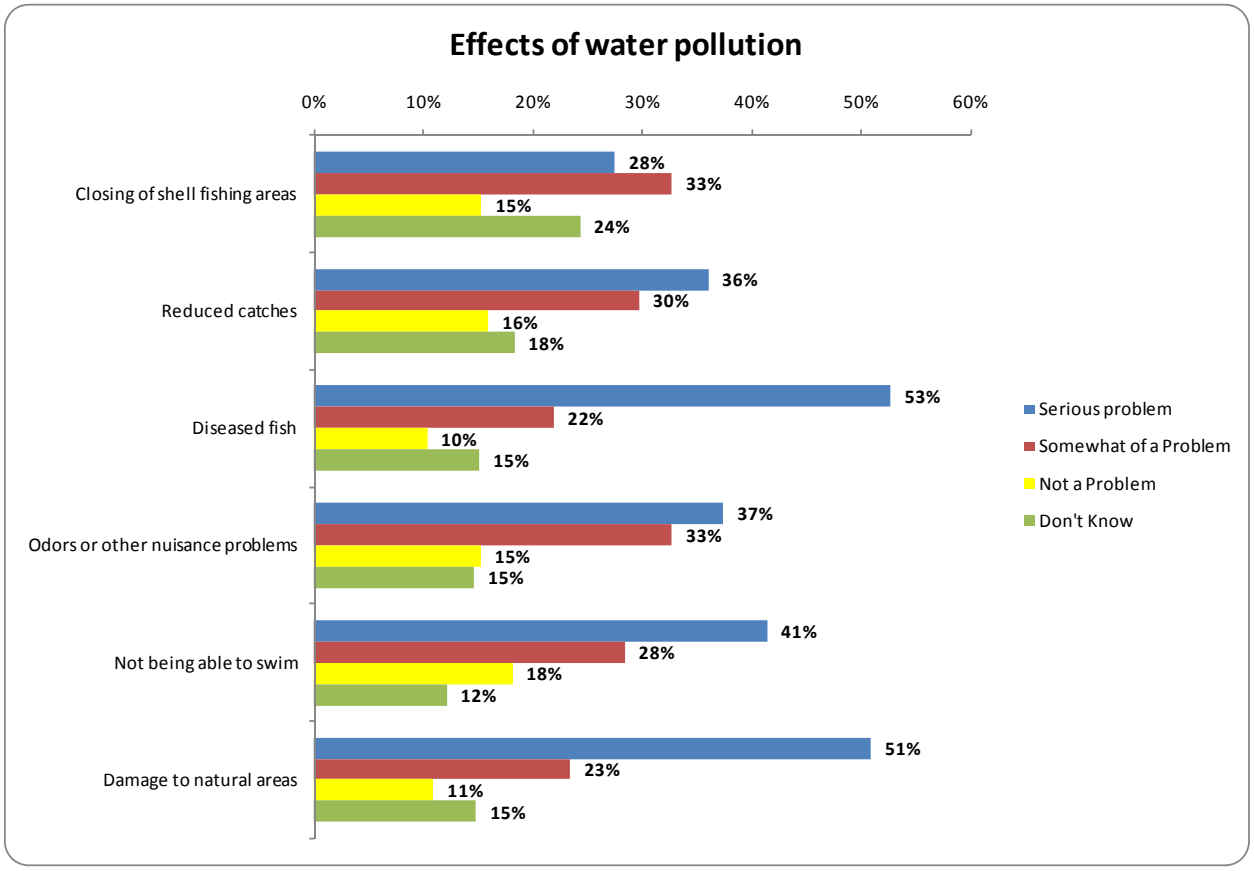
Figure 4. Seriousness of Causes for Water Pollution in the Coastal Plain



We also wanted to decipher what it was about water pollution that people were concerned about. We listed some effects of water pollution and asked how large of a problem they were to the respondents. Figure 5 displays the feedback. The majority felt that diseased fish (53 percent) and damage to natural areas (51 percent) represented a serious effect of water pollution. Not being able to swim was serious to 41 percent of respondents as were odors or other nuisance problems (37 percent) and reduced catches (36 percent).

Regarding the least serious effect of water pollution, 18 percent cited not being able to swim. Another 15 percent each cited the closing of shell fishing areas and odor/other nuisance problems.

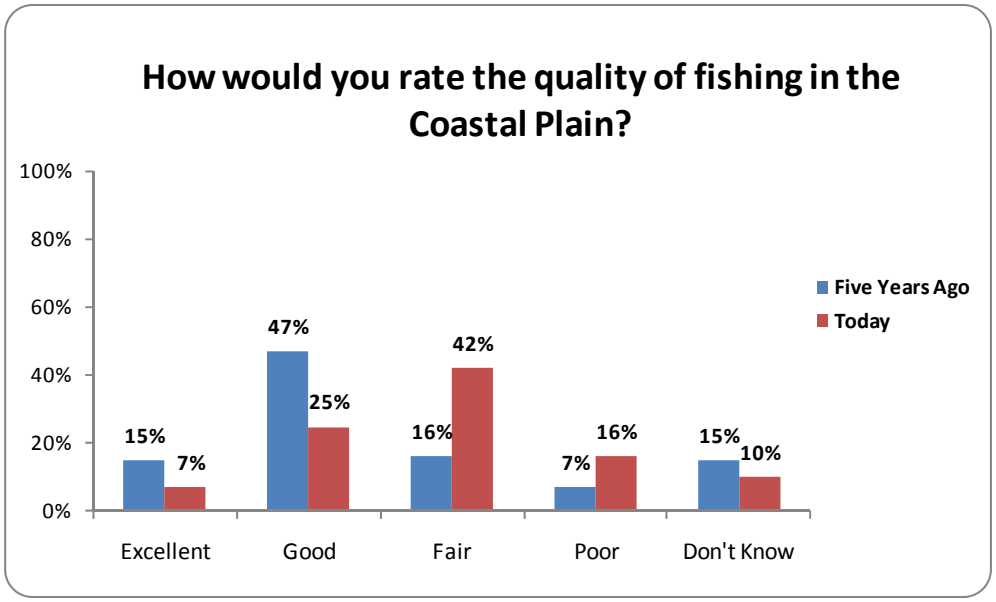
Figure 5. Effects of Water Pollution



We were also interested in finding out how people rate the quality of fishing in the Albemarle and Pamlico Sounds, as well as other coastal water. To determine this, we asked respondents to rate the quality of fishing today in the Coastal Plain of North Carolina. Most thought the fishing was fair (42 percent) and only 33 percent thought it was excellent or good. Sixteen percent thought it was poor.

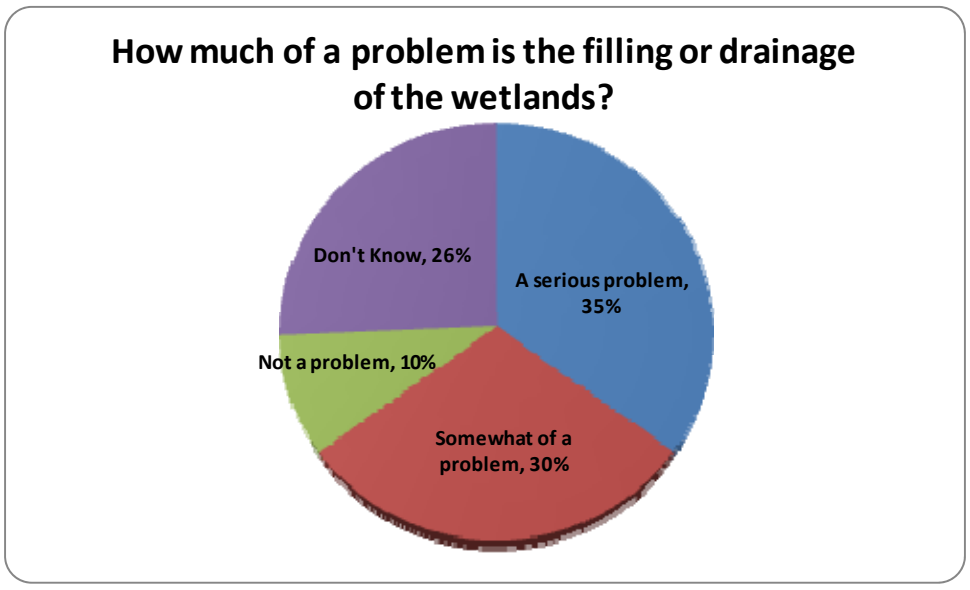
For comparison, we asked about the fishing five years ago. Overall, the respondents were more positive. Almost half (47 percent) thought the fishing was good five years ago. In fact, only seven percent rated fishing as excellent today compared to 15 percent five years ago. This represents almost a complete reversal over a five year period in terms of people's assessment of the quality of fishing. Figure 6 shows the results.

Figure 6. Fishing Quality in NC Coastal Plain



As another indication of people's perception of the problems, we asked about wetland conversion. It was clear that people were concerned about these problems. Many (35 percent) felt that filling and drainage of wetlands was a serious problem and 30 percent felt it was somewhat of a problem. Only 10 percent felt that filling or drainage of wetlands was not a problem. It is important to note that 26 percent did not have a response to this question.

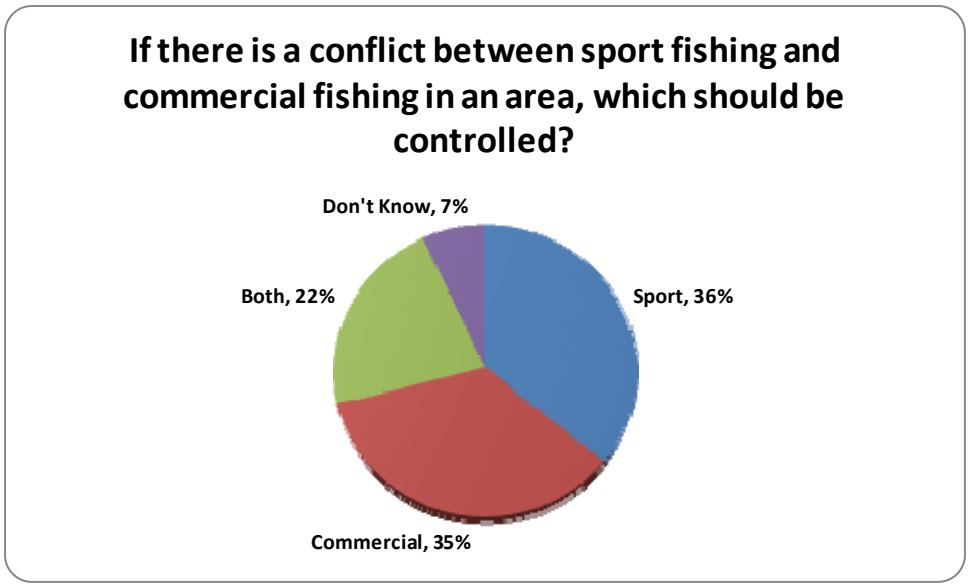
Figure 7. Seriousness of Filling/Drainage of Wetlands



The next set of questions looks at people's attitudes about conflicts that may occur over the use of land and water resources in the coastal area. If there was a conflict between sport fishing and commercial fishing in an area, 36 percent of respondents thought that sport fishing should be controlled and 35

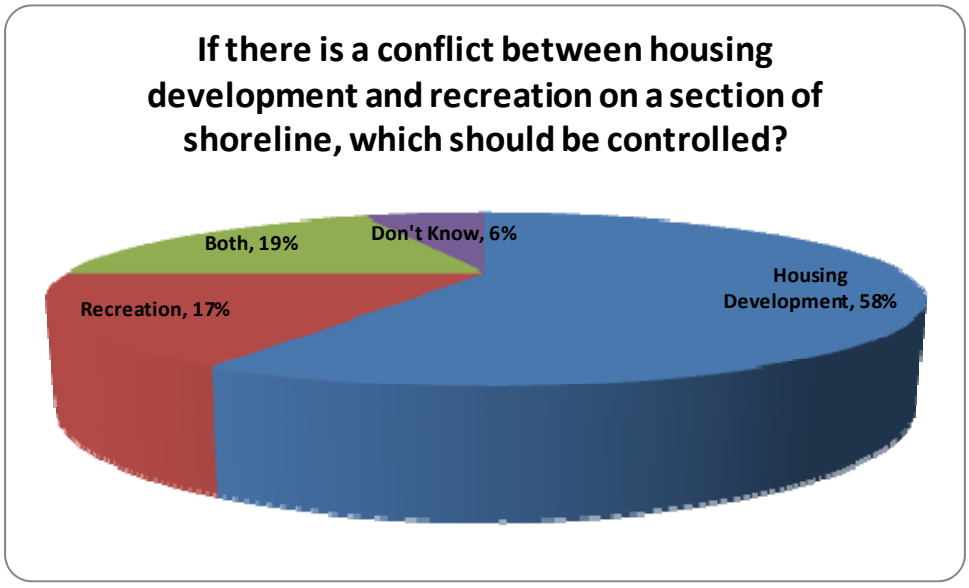
percent thought that commercial fishing should be controlled. The public was rather divided on this particular issue.

Figure 8. Sport Fishing vs. Commercial Fishing



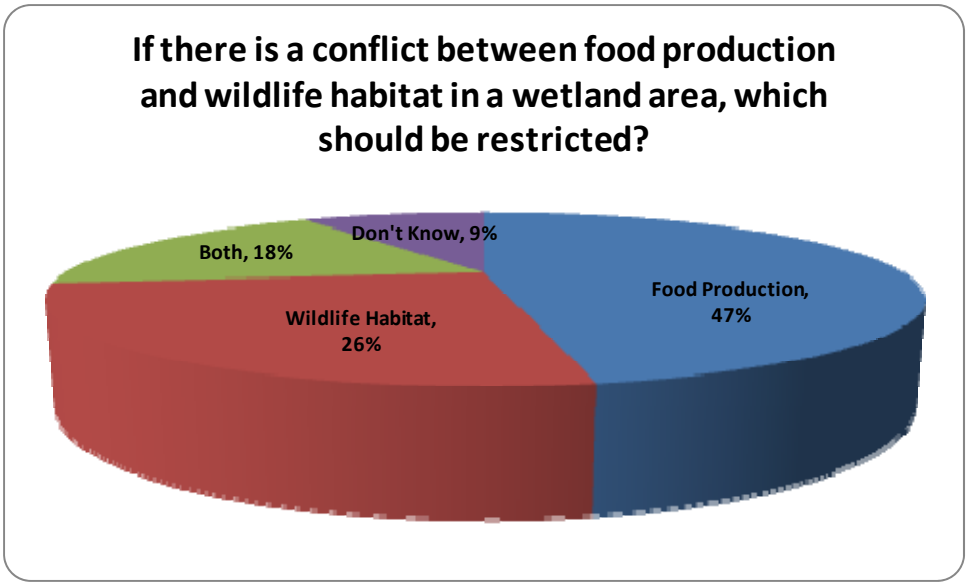
We also asked about another potential conflict that might occur over resources in the coastal area. Between housing development and recreation on a section of shoreline, over half (58 percent) thought that housing development should be controlled.

Figure 9. Housing Development vs. Recreation



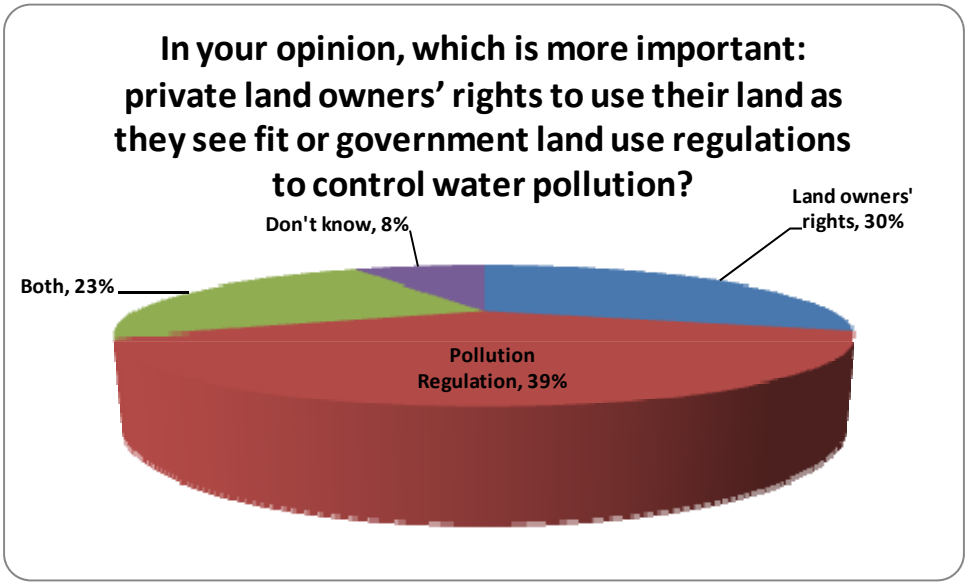
In a conflict between food production and wildlife habitat in a wetland area, 47 percent thought that food production should be restricted whereas 26 percent thought that the habitat should be restricted.

Figure 10. Food Production vs. Wildlife Habitat



As a final question involving resource use conflicts we asked respondents about private landowners' rights to use the land as they see fit versus government land use regulations to control water pollution. Figure 11 shows that pollution regulation is favored (39 percent) over land owners' rights (30 percent). Almost one quarter volunteered that both were important.

Figure 11. Land Owners' Rights vs. Pollution Regulation

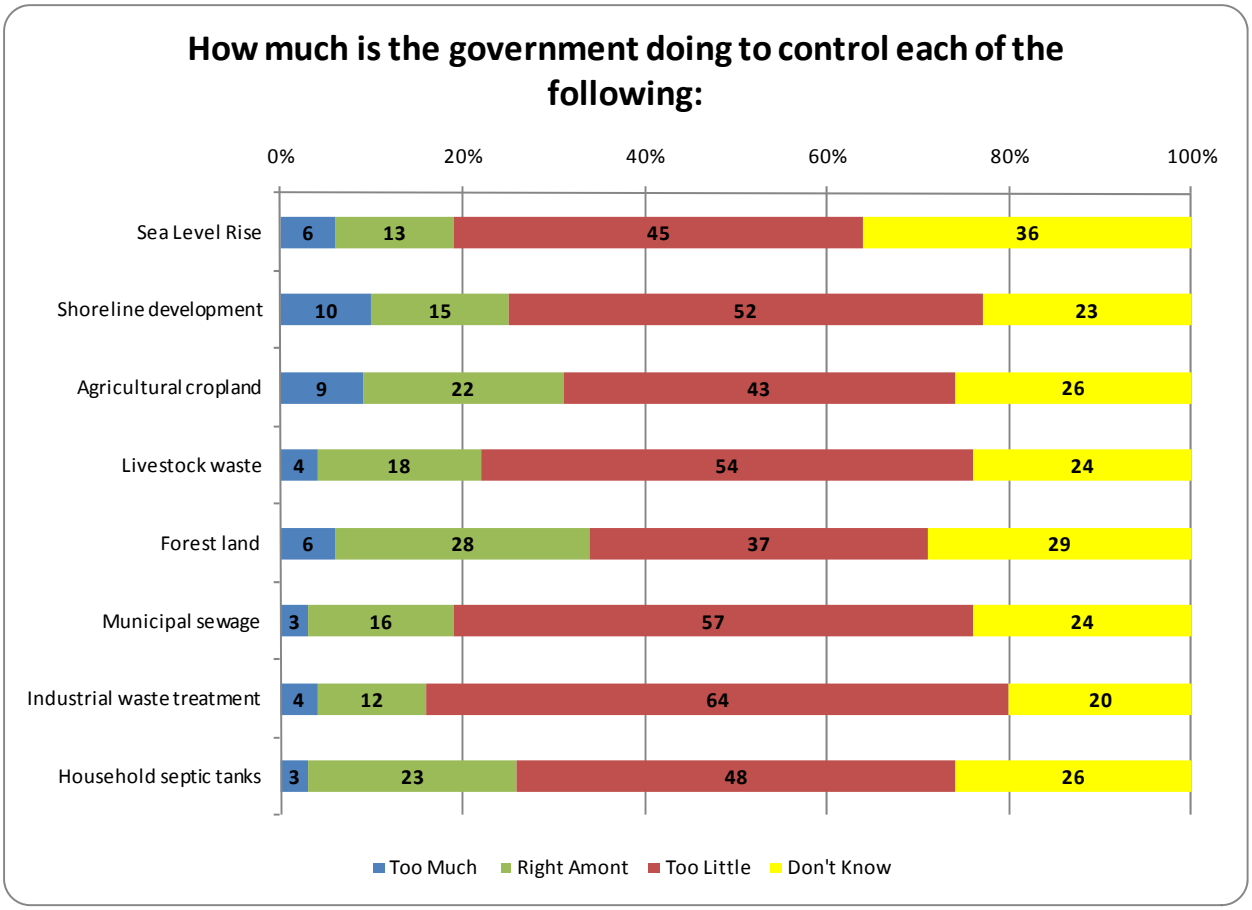


Policies and Management

The final area we wanted to assess with the survey involves public attitudes about government policies to manage natural resources and control water pollution. We asked how much the government was doing to control eight specific potential causes of water pollution, listed in Figure 12. The data was not a

surprise, considering the responses to the questions regarding pollution problems. The majority felt they were doing too little to control water pollution from industrial waste treatment (64 percent), municipal sewage (57 percent), livestock waste (54 percent) and shoreline development (52 percent).

Figure 12. Government Control of Potential Water Pollution Problems



We also wanted to find out how respondents felt about government responses to water pollution problems. We asked about government enforcement of regulations and discovered that most (63 percent) felt the government was doing too little. Seventeen percent thought there was the right amount and only two percent thought there was too much enforcement of the existing water pollution regulations. We also asked if the government was spending too much, too little, or the right amount of money to control water pollution. The majority (60 percent) felt that too little was being spent to control water pollution. Only five percent felt that too much was being spent and 12 percent thought it was the right amount. It is important to note that 22 percent did not know the answer to this question.

It was important to look at respondents ideas about who should pay the costs associated with water pollution control. When the wastewater is produced by industries, the overwhelming majority (88 percent) felt that industries should pay for the cleanup. When asked a similar question where cities produce wastewater, 89 percent felt that the city, rather than the state should pay for the cleanup.

Figure 13. State vs. Industries Regarding Cleanup Costs

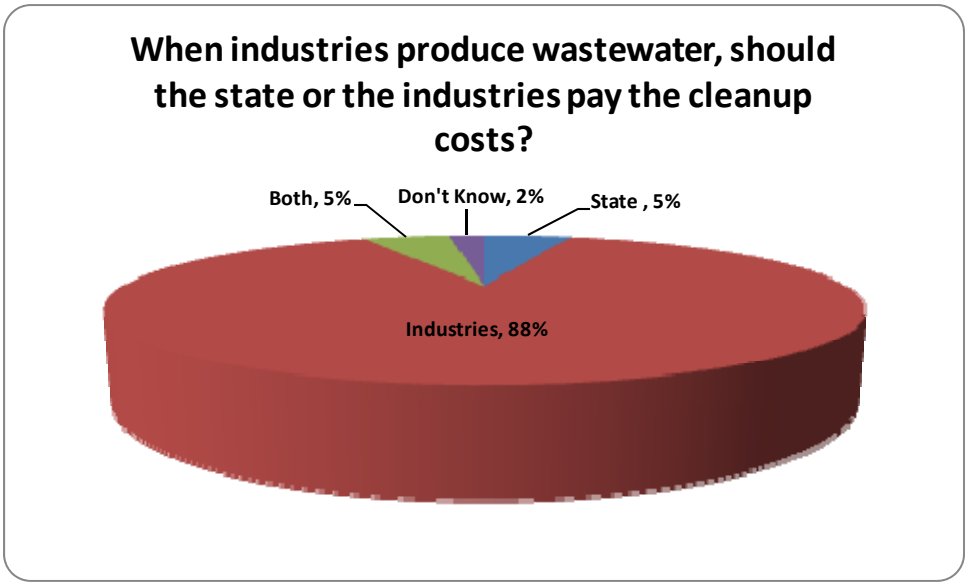
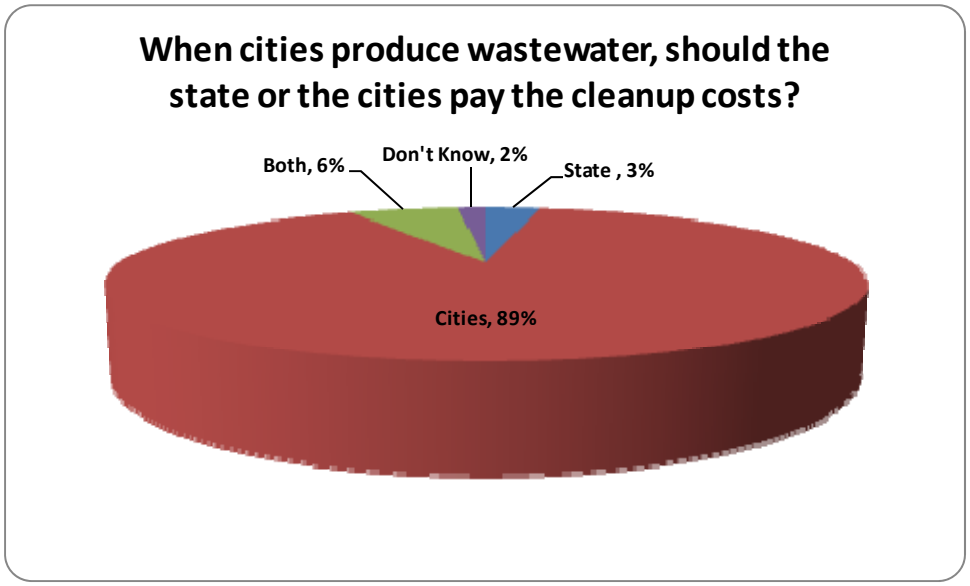


Figure 14. Cities vs. State Regarding Cleanup Costs



An initial assessment was needed to determine how much citizens might be willing to pay for improved water quality. A state program was proposed to control water pollution and would require a $25.00 per year tax increase for each household. The majority (54 percent) would vote no to this on a statewide referendum. Of those that would vote yes, 46 percent would also support a $50.00 per year tax increase. Half of those that would support the $50.00 per year increase would support a $100.00 per year tax increase.

We were also interested in learning how much citizens themselves felt they should be doing to improve and protect environmental quality. When asked if effective long range solutions to environmental

problems depend more upon changing lifestyles to fit nature or developing better technology to make nature fit our lifestyle, most (56 percent) thought it would be better to change our own lifestyles. Almost a quarter (24 percent) volunteered that both would be effective. Respondents seemed unsure whether the necessary technology was available for controlling water pollution (36 percent thought it was and 36 percent thought it was not).

The majority (55 percent) thought that sea level rise was a potential problem, but 31 percent did not think it was a problem. A combination of relocation/retreat, shoreline hardening and a living shoreline was thought to be the best solution by 63 percent of respondents. Moreover, 71 percent felt that a combination of local government, state government and federal government as well as property owners should be responsible for providing these solutions.

On a final note, we wanted to learn whether or not respondents felt they had enough opportunity to help shape environmental management decisions. It was revealed that 63 percent of respondents felt average citizens had too little opportunity to influence government decisions about the environment. Almost a quarter (23 percent) felt they had the right amount of opportunity and only two percent thought there was too much citizen influence over environmental decisions.

Conclusions and Implications

In this final section, some of the major findings are summarized from our work. The major conclusions are presented in the same basic order as the results were presented in the previous section. The possible relationships between participants' characteristics and attitudes of interest will also be explored.

Sources of Information

Most respondents had received information about water pollution from a variety of sources. The mass media played the largest role in providing information. Most received information from newspaper and television but few had received information from the government or environmental groups. Due to the nature of mass-media broadcasts and their focus on problems and issues rather than education, targeted education may be needed to increase the knowledge and awareness of water pollution and its causes. These results mirrored the findings in the 1991 study.

Awareness and Knowledge

It is important to assess the awareness and knowledge of issues associated with the estuaries. The results of this survey were encouraging. As in the 1991 study, most respondents were reasonably educated about certain major issues and policies. For example, respondents seemed to understand the concept of a watershed. Many recognized that land use has a major effect on water quality. Participants were also conscious of the functions that wetlands play as wildlife habitat and for improving water quality. Also mirroring the 1991 study, respondents were not as familiar with issues regarding freshwater drainage and the impacts on estuarine water quality. Less than half knew that freshwater could cause pollution problems for the sounds.

Some groups of respondents were more knowledgeable about these issues. Those with higher income levels and education levels had superior knowledge. Men also seemed to have more knowledge as well as white respondents. Recreational users reported more awareness and knowledge as did those living in the coastal counties. These are the same trends found in the previous study.

Perception of Problems

Although people were generally concerned about water pollution in the Coastal Plain, they were less concerned with the pollution in their county. Our current findings indicate that people mainly associated water quality problems with point source pollution like litter, but more people (compared o the 1991 study) were aware of nonpoint sources of pollution such as runoff from cropland and from urban or paved areas. When asked about the seriousness of the causes, most felt that industry was the most serious cause of water pollution. Like the 1991 study, all respondents seemed to think that the quality of fishing has decreased over the last five years, which can be directly attributed to their perceptions of water quality.

Water pollution was cited as more of a problem to women (compared to men in the 1991 study) and those with higher income and educational levels. Respondents with higher education and income were more concerned with wetland conversion and the effects of land use on water quality.

Policies and Management

When respondents were asked about government responses to water pollution problems, most felt that the government was doing too little to enforce regulations and spending too little to control water pollution. A state program was proposed to control water pollution and would require a $25.00 per year tax increase for each household. The majority of all respondents would not support this on a statewide referendum.

Similar to the 1991 study, certain respondents expressed more willingness to support tax increases for water pollution programs. More coastal county residents would support an initial $25.00 per year tax increase. Of those, the coast and the sound county residents were more likely to support a $50.00 tax increase. Those that use the water for recreational purposes, who are white and those with higher income and educational levels, were more likely to support any tax increase. Men were more likely to support the higher levels of increase than women. These results mean that educational programs must be developed and targeted to get to those groups who are less likely to support new proposals.

Appendix A – Telephone Survey Instrument

2009 Albemarle – Pamlico National Estuary Program Survey

Introduction:

Hello, my name is _____ and I am calling from East Carolina University. We are conducting a survey to find out what citizens think about water quality and the environment in North Carolina. Your phone number was selected at random. All information you give will be kept confidential. This survey will take about _____ minutes depending on your answers. Would you be interested in participating?

[*Verify that the person is 18 years or older. If not, ask to speak with someone who is 18 or older and repeat introduction.*]

Survey:

First, I would like to ask you about the Albemarle Sound, Pamlico Sound, and the rivers that flow into these sounds (such as the Neuse and Tar Rivers). These sounds, or estuaries, are the large water bodies in the Eastern part of the state inside the Outer Banks. They stretch from Morehead City, past the Virginia State line. Core Sound and Bogue Sound are also included in this area. For the purposes of this survey, this region will be referred to as the Coastal Plain of North Carolina.

1. Do you or anyone in your household use these sounds, rivers or other non-ocean coastal waters for fishing, swimming, or for other purposes?
   - ☐ Yes
   - ☐ No
   - ☐ Don't know

[*If no to 1, skip to question 6*]
[*If yes to 1, go to question 2*]

2. What purposes do you or anyone in your household use the water for? **[*Do not read. Check all that apply. PROBE: Do you use the area for any other purpose?*]**
   - ☐ Fishing
   - ☐ Swimming
   - ☐ Sailing, canoeing, or rowing
   - ☐ Water skiing
   - ☐ Jet skiing
   - ☐ Wind surfing
   - ☐ Enjoying the scenery
   - ☐ Bird watching or nature watching
   - ☐ Waterfowl hunting
   - ☐ Other: _____

[*If fishing was checked, go to question 3. If not, skip to 6*]

3. Have you ever fished for commercial purposes?
   - ☐ Yes
   - ☐ No

4. How would you rate the quality of fishing today in the Coastal Plain of North Carolina? Would you say fishing is excellent, good, fair, or poor?
   - ☐ Excellent
   - ☐ Good
   - ☐ Fair
   - ☐ Poor
   - ☐ Don't know

5. How would you rate the quality of fishing five years ago in the Coastal Plain? Would you say fishing was excellent, good, fair, or poor?
   - ☐ Excellent
   - ☐ Good
   - ☐ Fair
   - ☐ Poor
   - ☐ Don't know

6. How much of a problem is water pollution in the Coastal Plain? Is it:
   - ☐ A serious problem
   - ☐ Somewhat of a problem
   - ☐ Not a problem
   - ☐ Don't know

7. How much of a problem is water pollution in your county?
   - ☐ A serious problem
   - ☐ Somewhat of a problem
   - ☐ Not a problem
   - ☐ Don't know

8. What do you think are the major causes of water pollution in the Coastal Plain? **[*Do not read, but check all that are mentioned. PROBE: Can you think of any other major causes of water pollution?*]**
   - ☐ City or town sewer systems
   - ☐ Household septic systems
   - ☐ Runoff from cropland
   - ☐ Logging or timber harvest
   - ☐ Livestock waste
   - ☐ Runoff from urban or paved areas
   - ☐ Discharges or dumping from boats
   - ☐ Boat traffic
   - ☐ Shoreline development
   - ☐ Industrial waste discharge
   - ☐ Marinas
   - ☐ Oil spills
   - ☐ Acid rain
   - ☐ Litter or garbage
   - ☐ Home lawn and garden chemicals
   - ☐ Freshwater drainage
   - ☐ Toxic waste
   - ☐ Household items such as cleaners
   - ☐ Medical waste
   - ☐ Other:_____

9. I am going to read you five possible causes of water pollution that may affect the Coastal Plain of North Carolina. Please rank them in order of most serious cause to least serious cause of water pollution. They are:
    - Agriculture ____
    - City sewer systems ____
    - Industry ____
    - Saltwater intrusion ____
    - Shoreline development ____

10. Now I'd like to ask about some effects of water pollution. Please tell me how much of a problem each of the following is in the Coastal Plain. (*serious problem, somewhat of a problem, not a problem, or don't know*)

	Serious Problem	Somewhat of a Problem	Not a Problem	Don't Know
Closing of shell-fishing areas				
Reduced catches				
Diseased fish				
Odors or other nuisance problems				
Not being able to swim				
Damage to natural areas				

11. Are you aware of the new stormwater rules?
    - ☐ Yes **[*go to question 12a*]**
    - ☐ No **[*go to question 13*]**
    - ☐ Don't know **[*go to question 13*]**

11a. Do you think these new stormwater rules will improve water quality, worsen water quality, or have no impact on water quality?
    - ☐ Improve
    - ☐ Have no impact
    - ☐ Worsen
    - ☐ Don't know

Next, I'd like to ask you about wetlands. Wetlands include marshes and swamp lands that have water on or near the surface.

12. In your opinion, how much of a problem is the filling or the drainage of wetlands?
    - ☐ A serious problem
    - ☐ Somewhat of a problem
    - ☐ Not a problem
    - ☐ Don't know

13. Do you think the wetlands are important for maintaining or improving water quality?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

14. Do you think the wetlands are important as a habitat for birds and other wildlife?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

15. Do you think certain fishing practices cause problems for fish habitat?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

16. As far as you know, can freshwater create a pollution problem for the sounds?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

17. As far as you know, can saltwater be a problem for the environmental health of the sounds and rivers?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

18. As far as you know, do developers need to get permits before they can build along the coast?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

19. Do you think land use has a major effect on water quality in the Albemarle and Pamlico Sounds?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

20. Do you think some of the water quality problems in the Albemarle and Pamlico Sounds are caused by pollution from inland cities in NC, such as Raleigh or Greenville?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

21. In your opinion, is Sea Level Rise a potential problem?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

22. Have you seen any impacts you can attribute to sea level rise. If so, what were they?

23. What do you think the best possible solution is?
    - ☐ Relocation/retreat (move or back up from shoreline)
    - ☐ Shoreline hardening(ex: bulkheads, rip rap)
    - ☐ Build a living shoreline (wetland behind rock or rip rap along the shoreline)
    - ☐ Combination
    - ☐ Other

24. Who is responsible for providing these solutions?
    - ☐ Local government
    - ☐ State government
    - ☐ Federal government
    - ☐ Individuals (property owners)
    - ☐ Combination
    - ☐ Other

25. Have you heard about the Albemarle-Pamlico National Estuary Program (APNEP or APES)?
    - ☐ Yes **[*go to question 27*]**
    - ☐ No **[*skip to question 28*]**
    - ☐ Don't know **[*skip to question 28*]**

26. How did you hear about this program? **[*Check all responses that are given*]**
    - ☐ Television
    - ☐ Radio
    - ☐ Newspaper
    - ☐ Relatives, word of mouth, friends
    - ☐ Newsletter/mail insert
    - ☐ Government agencies
    - ☐ Environmental groups
    - ☐ Don't know
    - ☐ Other: _____

27. Have you ever attended a public hearing or meeting on water pollution?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

28. Are you an active member of any environmental groups or organizations?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

29. Please list which ones...29. Have you ever donated money (other than membership dues) to any resource conservation, environmental groups, or other similar causes?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

30. Next, I'm going to read you a list of items for which you will have to rate how much the government is doing to control each one. Your response options are: too much, too little, or the right amount. In your opinion, is the government doing too much, too little, or the right amount to control:

	Too Much	Right Amount	Too Little	Don't Know
Sea level rise				
Shoreline development				
Agricultural cropland				
Livestock waste				
Forest land				
Municipal sewage				
Industrial waste treatment				
Household septic tanks				

31. Does state government spend too much, too little, or the right amount of money to control water pollution?
    - ☐ Too much
    - ☐ Too little
    - ☐ The right amount
    - ☐ Don't know

32. Do you think there is too much, too little, or the right amount of enforcement of existing water pollution regulations?
    - ☐ Too much
    - ☐ Too little
    - ☐ The right amount
    - ☐ Don't know

33. Do average citizens have too much, too little, or the right amount of opportunity to influence government decisions about the environment?
    - ☐ Too much
    - ☐ Too little
    - ☐ The right amount
    - ☐ Don't know

34. As far as you know, is all the technology necessary for controlling water pollution available?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

35. Do you think effective long range solutions to environmental problems depend more upon changing our lifestyles to fit into nature or developing better technology to make nature fit our lifesytles?
    - ☐ Change lifestyle
    - ☐ Better technology
    - ☐ Both **[*If volunteered*]**
    - ☐ Don't know

36. Suppose that the state started a program to control water pollution in coastal areas that would require a tax increase of $25.00 per year per household. If this were placed on a statewide referendum, would you vote yes or no?
    - ☐ Yes
    - ☐ No **[*skip to question 40*]**
    - ☐ Don't know **[*skip to question 40*]**

37. Would you vote yes or no if a tax increase was $50.00 a year per household?
    - ☐ Yes
    - ☐ No **[*skip to question 40*]**
    - ☐ Don't know **[*skip to question 40*]**

38. What if it were $100.00 per year per household?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

39. The Albemarle Sound, Pamlico Sound, and other coastal waters have many uses, some of which may conflict. People have different opinions about how these conflicts should be resolved:

    a) If there is a conflict between sport fishing and commercial fishing in an area, which should be controlled?
        - ☐ Sport
        - ☐ Commercial
        - ☐ Both **[*If volunteered*]**
        - ☐ Don't know

    b) If there is a conflict between housing development and recreation on a section of shoreline, which should be controlled?
        - ☐ Housing development
        - ☐ Recreation
        - ☐ Both **[*If volunteered*]**
        - ☐ Don't know

    c) If there is a conflict between food production and wildlife habitat in a wetland area, which should be restricted?
        - ☐ Food production
        - ☐ Wildlife habitat
        - ☐ Both **[*If volunteered*]**
        - ☐ Don't know

d) When industries produce wastewater, should the state or the industries pay the cleanup costs?
   - ☐ State
   - ☐ Industries
   - ☐ Both **[*If volunteered*]**
   - ☐ Don't know

e) When cities produce wastewater, should the state or the cities pay the cleanup costs?
   - ☐ State
   - ☐ Cities
   - ☐ Both **[*If volunteered*]**
   - ☐ Don't know

40. In your opinion, which is more important: private land owners' rights to use their land as they see fit or government land use regulations to control water pollution?
   - ☐ Land owners' rights
   - ☐ Pollution regulation
   - ☐ Both **[*If volunteered*]**
   - ☐ Don't know

Demographics:

41. What county do you live in? _____ (verify from sheet or do not ask!!)

42. How many years have you lived in this county? _____years **[*If they say "all my life" ask how many years that is*]**

43. Is your home located in a rural area, a small town, a suburb, or a city?
   - ☐ Rural area
   - ☐ Small town
   - ☐ Suburb
   - ☐ City
   - ☐ Don't know

44. Do you receive your water from your own well or a central water system?
   - ☐ Own well
   - ☐ Central system
   - ☐ Don't know

45. Do you live at your current residence year-round or part-time?
   - ☐ Year-round
   - ☐ Part-time
   - ☐ Don't know

46. Do you own, or have part ownership, in any property or a second home near the coast?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

47. What kind of work do you do?
    - ☐ Business executive, administrative or managerial
    - ☐ Public executive, administrative or managerial
    - ☐ Executive of non-profit organization
    - ☐ Professional
    - ☐ Technical
    - ☐ Sales
    - ☐ Administrative support (clerical, secretarial)
    - ☐ Service
    - ☐ Industrial
    - ☐ Homemaker
    - ☐ Not employed
    - ☐ Other, please specify _____

48. Do you or anyone in your household presently own or operate a farm?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

49. Are there any members in your household under 18 years of age?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know

50. What is the highest level of education you've completed?
    - ☐ Less than high school
    - ☐ High school graduate
    - ☐ Some college, no degree
    - ☐ 2-year college degree
    - ☐ 4-year college degree
    - ☐ Some graduate work
    - ☐ Graduate level degree

51. In what year were you born? _____

52. Would you describe your political views as:
    - ☐ Conservative
    - ☐ Middle of the road
    - ☐ Liberal
    - ☐ Other
    - ☐ Don't know
    - ☐ Refuse to answer

53. Which of the following categories best represents your household income? Please include all income sources such as wages, salaries, pension dividends, net farm income, and government payments.

- ☐ Less than $5,000
- ☐ $5,001 to $10,000
- ☐ $10,001 to $20,000
- ☐ $20,001 to $30,000
- ☐ $30,0001 to 40,000
- ☐ $40,001 to $50,000
- ☐ $50,001 to $60,000
- ☐ $60,001 to $80,000
- ☐ $80,001 to $100,000
- ☐ $100,001 to $200,000
- ☐ More than $200,000

54. What category best describes your race?

- ☐ African-American/Black
- ☐ Asian
- ☐ American Indian
- ☐ Caucasian/White
- ☐ Hispanic
- ☐ Other:_____
- ☐ Don't know
- ☐ Refuse to answer

55. What gender do you identify with? (DO NOT ASK, UNLESS UNSURE)

- ☐ Male
- ☐ Female

This completes the interview. Thank you very much for your time and cooperation. Do you have any comments you would like to make?

_____

_____

If you have any questions or concerns about this study, please contact Bill Crowell at 919-715-1327 or email him at bill.crowell@ncdenr.gov