Evaluating Participatory Watershed Management:
A Case Study of the Albemarle Pamlico
National Estuary Program

by
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Abstract

Participatory approaches to watershed management have been touted as more effective than traditional command-and-control approaches, yet evaluations of their success have been limited. This master’s project develops a framework for participatory watershed management program evaluation in terms of process and outcomes, with particular attention to social capital outcomes. I then apply the framework in a case study evaluating the Albemarle Pamlico National Estuary Program (APNEP) to discern program strengths, challenges, and lessons learned. APNEP is a participatory watershed management program that spans coastal NC and VA. Since the mid 1980’s members of the public have been involved in a process to develop and implement a Comprehensive Conservation and Management Plan for the region via a Citizen Advisory Committee (CAC). I evaluate APNEP using qualitative and quantitative data collected through interviews and surveys of CAC members.

Members of the Citizen Advisory Committee perceive broad stakeholder involvement, common goals, and dedicated staff as the primary strengths of the APNEP process. Perceived ecological outcomes are related primarily to water quality improvements. Social capital outcomes (such as improved social networks and education) are the impacts of APNEP that CAC members most frequently recognize. Program challenges include insufficient funding and lack of immediate and visible impacts. The study concludes with lessons learned from the APNEP case study evaluation which could inform the design of participatory watershed management programs in other watersheds.

Many of the positive results that APNEP participants reported would not have been captured by traditional evaluations focused only on measuring biophysical outcomes. The evaluative framework developed in this study is therefore a valuable tool to provide a more holistic evaluation of the full impacts of any participatory watershed management program.
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# Table of Contents

Abstract i

Acknowledgements ii

Chapter 1: Introduction 1

*Problem* 3

*Objectives* 3

Chapter 2: Evaluative Framework 4

*Background* 4

*Evaluative Framework Development Methods* 5

*Results: Evaluative Framework* 6

Chapter 3: The Albemarle Pamlico National Estuary Program Case Study 8

*Background* 8

The National Estuary Program 8

Study Area: The Albemarle Pamlico National Estuary Program 8

The APNEP Participatory Process 11

*Case Study Methods* 14

Approach 14

Data Collection 15

Data Analysis 16

*Results: Evaluation of the Albemarle Pamlico National Estuary Program* 17
1. Process Evaluation

1.1 Process Design

1.1.1 Representation

1.1.2 Stages of public involvement

1.1.3 Clearly defined role

1.1.4 Common goals and objectives

1.2 Process Execution

1.2.1 Sustained participation

1.2.2 Value of time dedicated to the process

1.2.3 Convenience

1.2.4 Available Resources

1.3 Program Administration and Funding

1.3.1 Program leadership

1.3.2 Sufficient staff

1.3.3 Program funding

2. Ecological Outcomes Evaluation

2.1 Perceived ecological impacts

2.2 CCMP addresses regional ecological threats

2.3 Impact on original ecological problems

2.3.1 Water quality

2.3.2 Vital Habitats

2.3.3 Fisheries
3. Social Outcomes Evaluation

3.1 Perceived Social Outcomes

3.2 Products: Agreements and Policies

3.3 CCMP addresses socioeconomic issues

3.4 Impact on original management problems
   3.4.1 Interagency cooperation
   3.4.2 Stewardship

3.5 Participant Experiences
   3.5.1 Positive participant experiences
   3.5.2 Improved social networks
   3.5.3 Trust
   3.5.4 Legitimacy

3.6 Observable Behavior

4. Strengths of APNEP

5. Challenges and Weaknesses of APNEP

6. Participant Lessons Learned
   Importance and challenges of public involvement
   National Recognition
   Sustaining Energy
Chapter 4: Discussion and Conclusion

APNEP Evaluation Discussion

Process Design

Process Execution

Program Administration and Funding

Natural Capital Outcomes

Social Capital Outcomes

Lessons Learned from APNEP

Reflections on the Effectiveness of the Evaluative Framework

Conclusion

Works Cited

Appendix 1. APNEP Participant Interview Protocol

Appendix 2: APNEP Public Participant Survey
List of Figures

Figure 1. Investment of human capital through participatory natural resource management processes leads to improved natural and social capital. 2

Figure 2. Map of the Albemarle Pamlico National Estuary Program Region. 10

Figure 3. Current Albemarle Pamlico National Estuary Program governing structure. 12

List of Tables

Table 1. General framework for evaluating participatory watershed management programs. 7

Table 2. Roles of the Citizen Advisory Committee in the Albemarle Pamlico National Estuary Program identified by interviewees. 20

Table 3. Common goals shared among members of the Citizen Advisory Committee identified by survey respondents. 24

Table 4. Ecological impacts of the Albemarle Pamlico National Estuary Program perceived by interviewees. 27

Table 5. Social impacts of the Albemarle Pamlico National Estuary Program perceived by interviewees. 33

Table 6. Strengths of the Albemarle Pamlico National Estuary Program identified by interviewees. 42

Table 7. Challenges and weaknesses of the Albemarle Pamlico National Estuary Program identified by interviewees. 45
Chapter 1: Introduction

Water resource management presents complex challenges because it is a common-pool resource that links multiple ecosystems and user groups. There has been a marked shift towards focusing water resource management on the watershed scale to account for these complexities (Clark et al. 2005). This movement has led to the emergence of watershed conservation groups, and to the increased importance and recognition of participatory management of common-pool resources (Leach and Pelkey 2001).

Participatory natural resource management is a management approach that seeks to engage the public in the decision making process. Public participation can take many forms, from one-time events such as workshops or public hearings to more sustained public input through citizen advisory committees, to collaborative governance structures which actually place citizen representatives in positions of decision-making power (Chess and Purcell 1999). Underlying the rise in popularity of participatory environmental management is a general assumption that increased human capital (time, effort and knowledge devoted to a participatory process- Putnam 2000) will lead to improved natural capital (ecological outcomes – Costanza et al. 1997), as well as increased social capital (such as improved social networks, trust, and coordination among participants – Putnam 2000; Pretty and Ward 2001) (Fig. 1).

As participatory processes become more widespread and as more time and resources are devoted to them, interest in program evaluation is increasing (Conley and Moote 2003). Evaluation of collaborative conservation efforts is important (1) for
participants, to assess whether their personal goals are being met, (2) for managers, to identify which participatory approaches are most appropriate for their particular resource issue, and (3) for policymakers, to develop appropriate regulations to support effective participation (Conley and Moote 2003). Although participatory watershed groups have been touted as a more effective means to watershed management than traditional command-and-control approaches, evaluations of their success have been limited.

Figure 1. Investment of human capital through participatory natural resource management processes leads to improved natural and social capital.

Traditional frameworks for evaluating public participation are process-oriented, outcome-oriented, or interest-oriented (Beierle 1999; Chess and Purcell 1999; Conley and Moote 2003). Process-oriented evaluation measures success in terms of process characteristics, such as representation of participants and agency commitment to the process, with no link to ecological outcomes. Outcome-oriented evaluation typically uses biophysical or economic indicators to measure changes in environmental conditions or economic improvements (d'Estree and Colby 2000; Innes 1999). Lack of baseline data
and the long-term nature of outcomes, however, make measuring multiple outcomes an evaluative approach that is rarely used (Leach and Pelkey 2001; Conley and Moote 2003). Interest-oriented evaluation measures the extent to which the objectives of a particular stakeholder were achieved in the process, linking outcomes to process but from a limited perspective. There are few empirical studies, however, that evaluate public participation in terms of both process and outcomes (Chess and Purcell 1999).

**Problem**

Traditional evaluation methods fail to adequately measure the true effect of participatory watershed management programs. In particular, they fail to capture social capital outcomes of participatory processes. This study develops a framework for participatory watershed management program evaluation in terms of process and outcomes, with particular attention to social capital outcomes. I then apply the evaluative framework in a case study of the Albemarle Pamlico National Estuary Program (APNEP) based on the perceptions of participants on APNEP’s Citizen Advisory Committee. I selected APNEP for this case study because it is an example of participatory watershed management that the Environmental Protection Agency (EPA) touts nationally as a successful process.

**Objectives**

This study has two primary objectives:

1. develop a framework for evaluating the success of participatory watershed management programs (from participant perspectives, considering both process and outcomes), and
apply the framework to evaluate a case study, the Albemarle Pamlico National Estuary Program (APNEP).

The overarching research questions that guide this study are:

(1) What characterizes a “successful” participatory watershed management program?

(2) How can indicators of success best be quantified and evaluated?

Then, based on APNEP participant perspectives it seeks to answer:

(3) What are the benefits of public participation in watershed management?

(4) What are the challenges or weaknesses of this management approach?

(5) What lessons can we learn from a “successful” case that might be replicated elsewhere?

Answering these questions will enable communities, program managers and policy makers to understand the strengths and weaknesses of collaborative conservation and will help them design more effective public participation programs in watersheds throughout the United States.

Chapter 2: Evaluative Framework

Background

Evaluation is “comparing reality to a set of criteria” (Conley and Moote 2003). Criteria used to evaluate a particular collaborative effort vary based upon the context and type of effort (for example, consensus-building, community development, or watershed planning) and the goal of the evaluation itself (Conley and Moote 2003). Individual program evaluators and academics have developed lists of criteria and indicators for measuring the success of a particular collaborative natural resource management process. Common criteria include diverse participation, clear goals, relationship building, and
measurable ecological improvements (Conley and Moote 2003). In addition to selecting appropriate criteria, the evaluator must select a standard by which to score a program’s success. For example, a collaborative process could be evaluated with respect to its particular goals, with respect to a theoretical ideal, or in comparison to other programs (Conley and Moote 2003).

**Evaluative Framework Development Methods**

I reviewed the current literature on evaluation of collaborative natural resource management to develop a general framework for evaluating participatory watershed management programs. Based on prior research, I identified common criteria for successful participatory watershed management programs, considering aspects of both process and outcomes. From these criteria, I then developed a set of indicators to measure a program’s progress toward achieving each criterion, using the method for indicator selection set forth by Schueller et al. (2006). According to Schueller et al. (2006), indicators should be relevant to decision-making, easy to interpret, sensitive to change, feasible to obtain, and easily communicated. The framework for program evaluation developed and applied in this study uses methodological pluralism: it evaluates a program based upon program goals (both those in print and those stated by program participants) and based upon comparison to a theoretical ideal (common criteria for success identified in the literature). This methodological pluralism is supported by prior research (Chess and Purcell 1999).
Results: Evaluative Framework

Previous research on participatory natural resource management program evaluation focuses on seven broad criteria of “successful” programs: process design, process execution, program administration and funding, ecological impacts, management impacts, personal experiences, and changes in observable behavior (Conley and Moote 2003; Beierle 1999; Addor et al. 2004; Rowe and Frewer 2000; Leach et al. 2002; Maguire and Lind 2003; Maguire 2006). Table 1 lists the common indicators used in the literature to measure the success of a process at meeting each criterion. The indicators are meant to be adaptable to reflect the specific goals and objectives of a particular program.

The number of measurable indicators within this evaluative framework is lengthy, and a complete scientific and economic analysis would require time and resource intensive data collection. Many watershed management programs, however, lack the staff or funding for a robust monitoring and evaluation program to supply the necessary data. The following case study attempts to streamline the evaluation by basing it on participant perceptions.
Table 1. General framework for evaluating participatory watershed management programs. Measurable indicators correspond to criteria of successful programs taken from a literature review.

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
<th>Indicator (to be adapted based upon program specific goals/objectives)</th>
</tr>
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</table>
| Process                         | Process Design                    | Representation  
Public participation in all stages of watershed management decision-making  
Clearly defined role of public participation  
Common goals and objectives                                                   |
|                                 | Process Execution                 | Sustained participation  
Value of time/effort dedicated to the process  
Convenience  
Available Resources                                                                 |
|                                 | Program Administration and Funding| Strong program leadership  
Sufficient staff  
Amount of program funding  
Diversity of sources of program funding                                         |
| Ecological outcomes             | Impact on original ecological problems | Adequacy of the Management Plan at addressing case specific ecological problems, such as:  
Water quality  
Vital Habitats  
Fisheries                                                                 |
| Social process outcomes         | Participant Experiences            | Positive participant experiences  
Improved stakeholder interactions/creation of social networks  
Trust amongst participants  
Legitimacy                                                                       |
|                                 | Observable Behavior                | Changes in personal behavior related to program goals                                                                                 |
|                                 | Impact on original management problems | Products: agreements and policies  
Adequacy of the Management Plan at addressing case specific management problems, such as:  
Inter-agency cooperation  
Education and Public awareness  
Stewardship                                                                     |

\(^a\) Maguire (2006), \(^b\) Conley and Moote (2003), \(^c\) Rowe and Frewer (2000), \(^d\) Maguire and Lind (2003), \(^e\) Addor et al. (2004), \(^f\) Ferreyra and Beard (2007), \(^g\) Leach et al. (2002)
Chapter 3: The Albemarle Pamlico National Estuary Program Case Study

Background

Prior to evaluating the Albemarle Pamlico National Estuary Program as a case study of participatory watershed management, it is important to understand the context of the program and the role that public participation has played in the program up to this point.

The National Estuary Program

The National Estuary Program is a prominent example of the political shift away from command and control environmental management to a more participatory watershed management approach. Established by Section 320 of the Clean Water Act (1987), the National Estuary Program (NEP) is administered by the Environmental Protection Agency to protect critically threatened estuaries of national significance (US EPA 1989). The NEP called for the establishment of Management Conferences—multi-stakeholder groups to engage in a five-year planning effort to develop a Comprehensive Conservation and Management Plan (CCMP) for each critical estuary. The National Estuary Program uses a participatory watershed management approach to address ecological threats through the application of sound science and public involvement (US EPA 2005).

Study Area: The Albemarle Pamlico National Estuary Program

The Albemarle Pamlico Sounds watershed (hereafter referred to as the AP region) encompasses over 30,000 square miles in northeastern North Carolina and
southeastern Virginia (Fig. 2). The second largest estuarine system in the United States (following only the Chesapeake Bay), the AP region crosses two states, five major river basins, seven sounds, and 52 counties (APES 1994). In addition to crossing geopolitical boundaries, the AP region also crosses ecosystems, including areas of piedmont, coastal plain, and wetlands. Conservationists value the watershed for its diverse fresh and saltwater marshes, pocosins, and bottomland hardwood forest ecosystems. The AP region also contains critical habitat for several state and federally listed species such as the red-cockaded woodpecker and bald eagle (Poulter and Pederson 2006).

In contrast to its rich natural resources, the Albemarle Pamlico Sounds watershed contains some of the most economically depressed counties in the state of North Carolina (US Census Bureau 2000). Counties within the region rely heavily on agriculture, forestry, and fishing for income. These industries, plus a burgeoning coastal tourism industry and residential sprawl, introduce many threats to the ecological integrity of the system (APES 1994). The primary ecological concerns within the Albemarle Pamlico Sounds watershed include water quality impacts of point and non-point sources of pollution, coastal development pressures caused by increased population, negative impacts of commercial fishing (such as by-catch and habitat degradation of trawling), loss of submerged aquatic vegetation, and habitat destruction (APES 1994).

The EPA selected the Albemarle Pamlico Sounds watershed as one of the original National Estuary Programs in 1987 in recognition of its ecological and economic significance as well its threatened status. For the past twenty years the many APNEP stakeholders have been engaged in a participatory process to develop and implement a comprehensive conservation and management plan for the AP region.
Figure 2. Map of the Albemarle Pamlico National Estuary Program Region.  
http://www.epa.gov/owow/estuaries/programs/studies/aps.gif
The APNEP Participatory Process

The role of public participation in the Albemarle Pamlico National Estuary Program has evolved over time. As a first step in the conservation planning process, the North Carolina Department of Environment, Health, and Natural Resources (NC DEHNR) and the EPA initiated a cooperative study in the mid 1980’s to research the causes, status, and potential solutions to degradation of the AP region. This study (referred to as the Albemarle Pamlico Estuarine Study or APES) brought together researchers from relevant federal and state agencies, along with representatives from local universities, interest groups, and organizations. Participants in the APES study formed the original management conference, which was devoted to developing a Comprehensive Conservation and Management Plan (CCMP). Through the lengthy CCMP development stage, public involvement occurred through two Citizen Advisory Committees (one for the Albemarle and one for the Pamlico). The general public was also engaged through public hearings and town meetings at which members of APES discussed drafts of the CCMP and received public input (Korfmacher 1996).

Upon passage of the CCMP in 1994, the objectives of the program shifted from plan development to implementation. The governance structure of APNEP changed such that citizen representation shifted from two Citizen Advisory Committees to five regional councils (one from each major river basin: Chowan, Neuse, Pasquotank, Roanoke, and Tar-Pamlico), and one coordinating council. Executive Order 75 established these councils to foster public input and serve in an advisory capacity on issues pertinent to their respective river basin and to the implementation of CCMP programs (Hunt 1995). Additionally, the regional councils were charged with prioritizing the issues of their
basin, developing and implementing cost-effective strategies for addressing them, and selecting demonstration projects to receive APNEP funds (Hunt 1995). According to CAC members, this structure was problematic because it was difficult to fill the councils with enough dedicated participants.

As a result of recent program evaluations (Addor et al. 2004), the Albemarle Pamlico National Estuary Program has undergone significant restructuring since 2005 (Fig. 3). Executive Order 74, signed in May 2005, established a new governing structure for APNEP (Easley 2005). It created a Policy Board to work collaboratively with the APNEP program office and the North Carolina Department of Environment and Natural Resources (DENR) to “support, evaluate, update, advocate, and guide the implementation of the CCMP and the APNEP mission.” Executive Order 74 established a Science and Technical Advisory Committee (STAC) to advise the policy board on scientific matters relevant to the advancement of the CCMP. Additionally, it called for a Management Advisory Committee (made up environmental management agency representatives) to facilitate and support the implementation of CCMP management actions.

Figure 3. Current Albemarle Pamlico National Estuary Program governing structure. Public participation occurs via the Citizen Advisory Council. Two members of the CAC also serve on the Scientific and Technical Advisory Committee and Policy Board.
The key values of public participation and broad stakeholder involvement are as evident within the new governance structure as in prior formations. Executive Order 74 restructured the mechanism for public participation, merging the former 5 regional councils into a single Citizen Advisory Committee “to advise and support the Policy Board, and to serve as liaisons to local agencies and interested parties regarding environmental and natural resources management concerns and issues relevant to implementation of the CCMP and the APNEP mission.” Two members of the Citizen Advisory Committee also provide public representation on the STAC. Members on the Citizen Advisory Committee, as established by Executive Order 74 (Easley 2005), should represent the broad range in public interests within the entire watershed, including:

- North Carolina soil and water conservation districts,
- Virginia soil and water conservation districts,
- two representatives from non-governmental environmental conservation organizations,
- environmental education,
- K-12 education,
- industry or business,
- agriculture,
- commercial fishing or the seafood industry,
- forestry,
- county government,
- municipal or town government,
- NC league of municipalities,
- NC association of county commissioners,
- VA municipal league,
- VA association of counties,
- NC tribal organizations,
- VA tribal organizations, and
- six at-large positions.

Committee members serve three-year terms, renewable once consecutively.

Initial CAC members were appointed by the director of APNEP, and in the future will be invited by other CAC members.
The duties of the CAC, as stipulated in Executive Order 74 (Easley 2005) are to:

- coordinate CCMP implementation strategies at a local level,
- advise and consult with the Policy Board, other APNEP committees, and interested parties and agencies regarding implementation of CCMP management actions at a local level,
- advocate for the implementation of the CCMP and the APNEP mission at the local level,
- serve only an advisory capacity,
- select two members to serve on the Policy Board, and
- be responsible for determining the protocol of its process.

The Citizen Advisory Committee meets two to three times a year. One primary activity of recent CAC meetings has been allocating APNEP funds for small demonstration projects related to the objectives of the Comprehensive Conservation and Management Plan.

The Citizen Advisory Committee is the primary mechanism for public participation within APNEP today. Interviewing members of the CAC, therefore, is an appropriate means of gauging participant perceptions of the strengths and weaknesses of the program.

**Case Study Methods**

**Approach**

A case study is an “in-depth, multifaceted investigation…of a single social phenomenon” (Feagin et al. 1991, cited in Korfmacher 1996). It is a valuable research technique for studying the impacts of a participatory watershed management process as it unfolds over time for several reasons. According to Feagin et al. (1991), case studies are valuable in that they allow the study of a social phenomenon in its natural context. They are also holistic, providing insight into the larger social complexes involved. Case
studies allow for an analysis of how behaviors change over time. Finally, the case study is useful for discerning lessons learned, which can help develop theories (Feagin et al. 1991). The results of this single case study may not be generalizable, but they can lend insight into the functioning of participatory watershed management regimes, a social phenomenon not well understood by current theory.

In this case study, I apply the evaluative framework presented in Chapter 2 to the Albemarle Pamlico National Estuary Program by measuring Citizen Advisory Committee participant perceptions. I use both quantitative and qualitative data in this case study. Data were collected from several sources: interviews, written surveys, participant observation, and document review.

**Data Collection**

To gather qualitative data, I interviewed members of the APNEP Citizen Advisory Committee (CAC) from January – February 2007. Of the 18 members of the CAC at that time, 13 participated in the interview, representing a 72% response rate. Of the non-participants, four were unreachable and one declined the invitation to participate due to lack of time. The interviews were semi-structured and aimed at eliciting participant perspectives on the strengths and challenges of the program, as well as their reasons for participating and their perceptions of the impacts that the CAC has had on management and environmental issues (see Appendix 1 for interview protocol). Interviews lasted between 30 minutes and an hour and a half. The interviews were digitally recorded and then transcribed. Seven interviews were conducted in person, generally at the interviewee’s office, the remainder occurred via telephone.
Immediately following the interview, 12 of the 13 interviewees completed a written survey (survey questions were read aloud to telephone participants). In the survey, the measurable indicators of program success (Table 1) were converted into statements which participants were then asked to rank on a Likert scale, expressing to what extent they agreed or disagreed with each statement (see Appendix 2 for survey instrument). In this way, qualitative opinions were converted into quantifiable measures of participant perceptions and experiences.

Additionally, I interviewed APNEP staff and other program committee members informally for background information. I conducted participant observation through several site visits and attendance at committee meetings throughout the winter of 2006-2007. Finally, I reviewed program documents such as publications, agreements, prior evaluations, and the Comprehensive Conservation and Management Plan to provide additional information for the case study.

**Data Analysis**

I conducted qualitative analysis of interview transcripts using the computer program NVivo® (QSR International 2002) to discern broad themes that emerged. I then used hand coding for finer scale analysis and tallying of themes. I replicated the hand coding and tallying twice to increase my confidence in the results. I conducted basic statistical analyses (mean and standard deviation) of quantitative survey data using Excel® (Microsoft Corporation 2003).
Results: Evaluation of the Albemarle Pamlico National Estuary Program

The quantitative data collected through survey responses (n=12), taken together with qualitative data drawn from interviews (n=13), make up the program evaluation based on participant perceptions. Survey data are responses to statements measuring indicators of program success reported on a 5-point Likert scale, where 1=strongly agree, 3=neutral, and 5=strongly disagree. Lower scores therefore reflect greater success. The number of survey respondents varied from 6 to 12 because not all respondents answered all questions.

1. Process Evaluation

1.1 Process Design

1.1.1 Representation

Interview participants represented a diversity of stakeholders. Groups that they identified representing were: industry (broadly), the upper Tar river basin, Virginia soil and water conservation districts, agriculture, environmental education, two environmental non-profits, Virginia association of counties, North Carolina soil and water conservation districts, the North Carolina League of Municipalities, and three “at-large” members not representing a given stakeholder interest.

Survey respondents were in strong agreement (mean 1.33, standard deviation 0.49) that the Citizen Advisory Committee represents the range of stakeholders in the Albemarle Pamlico Sounds region. Despite the overwhelming agreement, upon further questioning many participants identified stakeholders unrepresented or underrepresented
on the CAC. Two respondents noted that education and teachers were underrepresented and another two pointed out a lack of participation by representatives of the Native American population (due to failure to respond to invitations to participate). Additionally, the development community (due to their own lack of interest), elected officials, and people of color were identified by respondents as under- or unrepresented stakeholders.

Improving representation is important to APNEP administrators and members of the CAC. This topic arose at a February, 2007, CAC meeting, where meeting participants commented on the absence of representation from particular stakeholders and discussed actions to improve outreach to and participation of unrepresented groups. Participant concerns over a lack of educational representation were perhaps quelled by the appointment of a new CAC member, a school teacher, at the February 2007 CAC meeting (after administration of my survey).

One participant stated, “I think most [stakeholder groups] are represented as members. Showing up and participating – that may be different.” Ensuring that representatives actually participate in the committee is challenging due to several limitations noted by interviewees. Five CAC members identified limited time and work demands as restricting their ability to participate. One stated, “As anyone would say, time [limits my ability to participate in the CAC]. There is only so much you can devote to things outside your own duties or regular occupation.” Three respondents spoke to the challenge of geographic separation and lengthy distance to meetings as limitations to participation. “Maybe some people down there on the coast in Washington are [deeply involved in APNEP], but I’m up here and I’m unable to get that involved in the day in
day out way they do.” One respondent noted that the long travel distance to reach CAC meetings can be a limitation not only in terms of time restraints, but also travel budgetary restraints. “The biggest issue with conservation is budget, and I try to be frugal with how we spend director’s funding for transportation. When the price of gas went up it put a big hit on where we could go and how often we could do it.” This respondent offered a suggestion on how to improve the participation of geographically distant groups: providing video- or tele-conference options for CAC meetings. Additionally, three interviewees stated that scheduling conflicts limited their participation.

Three CAC members noted that their ability to participate in program activities and committee obligations were facilitated by employer support. “It helps since part of my job responsibilities include water quality I don’t have to take vacation time or take time from my job to attend meetings, so that makes it a little bit easier for me to participate.” For some stakeholder groups, however, this may not be the case, and may contribute to their lack of participation in the CAC. “[Participating] is hard because people have jobs. For me, it fits into my job description so it’s easy to attend meetings, but for someone that’s a commercial fisherman it’s hard to take a day to go to a meeting.”

1.1.2 Stages of public involvement

Survey respondents were asked to evaluate the adequacy of APNEP in involving the public in the following stages of the decision-making process: problem identification, research, planning, implementation, monitoring, and evaluation. Respondents mostly agreed that the public was adequately involved in problem identification (mean 2.2, standard deviation 0.79), planning (mean 1.9, standard deviation 0.57), and monitoring (mean 1.89, standard deviation 0.78). There was more variation in responses, however,
with regards to public participation in research (mean 2.2, standard deviation 1.03) and evaluation (mean 2.3, standard deviation 1). Additionally, there was some disagreement over whether or not APNEP adequately involved the public in the implementation stage (mean 2.54, standard deviation 0.93), which is interesting to note since that is the current stage of the APNEP process.

1.1.3 Clearly defined role

There was generally strong agreement among respondents that the role of the Citizen Advisory Committee in the APNEP decision-making process is clearly defined (mean 1.58, standard deviation 0.67). Respondents agree that the role of the CAC is adequate, though with slightly more variation among their responses (mean 1.667, standard deviation 0.99).

Members of the Citizens Advisory Council perceive their committee to play several different roles within APNEP (Table 2).

Table 2. Roles of the Citizen Advisory Committee in the Albemarle Pamlico National Estuary Program identified by interviewees (n=13).

<table>
<thead>
<tr>
<th>Role of the CAC</th>
<th>Frequency of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory (provide input to decision-makers)</td>
<td>8</td>
</tr>
<tr>
<td>Grant allocation for demonstration projects, education</td>
<td>5</td>
</tr>
<tr>
<td>Provide diverse perspectives</td>
<td>5</td>
</tr>
<tr>
<td>Make program visible, public relations</td>
<td>4</td>
</tr>
<tr>
<td>Information exchange</td>
<td>2</td>
</tr>
<tr>
<td>Role will become greater in the future</td>
<td>1</td>
</tr>
<tr>
<td>Improve public involvement</td>
<td>1</td>
</tr>
<tr>
<td>Implement and advance the CCMP</td>
<td>1</td>
</tr>
</tbody>
</table>
Respondents most frequently identified the role of the CAC as an advisory role. Eight respondents perceived the importance of their role providing citizen advice to decision-makers. One stated,

“It’s important to have stakeholders, it’s important to have decision makers, it’s important to have folks that just have an interest in the region and in the resources of the region involved with any of the number of organizations like APNEP to provide input, to also serve as eyes and windows to the community, and also to serve as a conduit of passing information back and forth. I think another thing is individuals like myself and others that serve in advisory roles or other roles, sometimes we see opportunities for the organization that we can pass along suggestions or ideas that become opportunities for the organization to address issues.”

Another added, “As citizens we provide input in what’s going on in our area.” In addition to providing local input to the policy board of APNEP, one citizen also noted their important role as representatives of APNEP, advising state agencies beyond the program about the importance of the region. This respondent perceived the role of the CAC to be “to provide input to other state agencies about concerns with the Albemarle Pamlico Sound area.”

Five committee members perceived their role to be that of small grant allocation for demonstration and educational projects. These projects can have lasting environmental and educational impacts; as one respondent stated, “With some of these projects, we’re impacting people that haven’t even been born yet.” One participant felt that the primary role of the CAC today is grant allocation, but that their role will likely expand in the future. “It seems our major task recently has been small grant allocation, but I think as time goes on, and especially in the last year there seem to be some changes. Once Bill [Crowell, program director] came in, and now he’s had some time to get his
feet wet, I think the three committees will begin working better together and I think our role will become more important as time goes on than just giving out grant money.”

Four participants also perceived the role of the CAC as improving public awareness of the Albemarle Pamlico National Estuary Program. One stated, “I think we, as individuals on the council, have a public relations role, letting people know that we serve on the council, educating them about APNEP. Some of those sorts of things aren’t necessarily defined in the roles of the council, but I think most of the members of that committee do some of that PR work as well.” In addition to improving public awareness of the program, one citizen also noted their role of improving public awareness of the broader goal of improved environmental stewardship. “Clearly one of our roles is to get out there and hopefully build some awareness of APNEP and the importance of being good environmental stewards.”

Members of the CAC also perceive the role of the committee to provide diverse perspectives to decision-making within APNEP. An interviewee defined one role of the CAC as “to bring in different elements of the community at large in the APNEP region and keep tied in to education, environmental advocacy, agriculture, or business. Just to have that representation and for a lot of different viewpoints to help push the overall APNEP process forward.” Another added, “It gives a good representation of your more non-technical people. Most people on it work in the field but aren’t overly technical. If APNEP is to have a well-rounded policy, including the different representatives that they do is a good thing to do.” The structure of the CAC and the breadth of representation required by Executive Order 74 (Easley 2005) support this role. As one participant noted, “For me, the CAC is getting different opinions from different types of people that
do different things, and that’s why they have different roles to fill, rather than different names.”

Two interviewees also perceived the CAC as serving a role of information exchange between the public and government agencies. “It’s kind of a two way street between the public and the government, just to make sure that everybody is aware of everything that is going to have an impact on that particular area.” One respondent identified “improve community and public involvement” as a role of the CAC.

Interestingly, only one respondent noted the role of the CAC as pertaining particularly to the Comprehensive Conservation and Management Plan, stating, “I guess the other thing I recall from the information they sent me when they asked me if I would serve, I do have a copy of the CCMP and clearly everything we do is supposed to be focused towards implementing and advancing that plan.”

**1.1.4 Common goals and objectives**

When asked if there were common goals shared among members of the CAC, survey respondents agreed (mean 1.5, standard deviation 0.91). The generally strong agreement of survey participants was skewed by one respondent who disagreed with the statement (response=4). Despite their agreement, respondents identified several different goals of the CAC (Table 3).

Some respondents added that the different backgrounds of CAC committee members can lead to differences of opinions on how to achieve their goals. One participant noted that committee members may differ in how they value particular land uses, while another mentioned the lack of consideration of economic impacts by “pure” scientists as examples of how their goals may differ. One survey respondent wrote, “We
all have similar goals, but not life goals.” Still, differences of opinions and goals are generally not thought to result in conflict amongst committee members. “It’s a very diverse group but they are able to talk out their difference and share opinions. I haven’t seen any conflict.”

Table 3. Common goals shared among members of the Citizen Advisory Committee identified by survey respondents (n=10).

<table>
<thead>
<tr>
<th>Common Goals</th>
<th>Frequency of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase awareness and education</td>
<td>4</td>
</tr>
<tr>
<td>Improve public/student involvement</td>
<td>3</td>
</tr>
<tr>
<td>Improve water quality</td>
<td>3</td>
</tr>
<tr>
<td>Preservation/conservation on the ground in the region</td>
<td>3</td>
</tr>
<tr>
<td>Economic and environmental sustainability</td>
<td>2</td>
</tr>
<tr>
<td>Environmental stewardship</td>
<td>1</td>
</tr>
<tr>
<td>Environmental equity</td>
<td>1</td>
</tr>
<tr>
<td>Reinforce/support APNEP</td>
<td>1</td>
</tr>
<tr>
<td>Program management</td>
<td>1</td>
</tr>
</tbody>
</table>

1.2 Process Execution

1.2.1 Sustained participation

All interviewees have been serving on the Citizen Advisory Committee since the restructuring one year ago; however, many were previously involved in APNEP in other capacities. Two respondents first became involved in APNEP as grant recipients 2-3 years ago. One was first involved as a member of a river basin council 4 years ago, two since the original coordinating councils 10-12 years ago, two held positions in the original APES management conference, and one has been familiar with the program since initial stages due to his employment (though not necessarily involved in an official capacity). All interviewees stated that they plan on continuing to participate in APNEP in the future.
1.2.2 Value of time dedicated to the process

Survey respondents agreed somewhat that the amount of time and effort they put into participating in the CAC is reasonable (mean 1.75, standard deviation 0.75). As far as the reasonableness of the frequency of CAC meetings, respondents tended to either strongly agree or feel neutral on the subject (mean 1.583, standard deviation 0.9). In commenting on what limits their ability to participate in CAC activities and obligations, five noted their limited time to dedicate to activities beyond their primary work demands.

1.2.3 Convenience

The convenience of participating in the CAC was evaluated based upon participant perspectives on the convenience of time of year of CAC meetings. There was general agreement among respondents that the time of year of CAC meetings was convenient, with three respondents feeling neutral about the statement (mean 1.67, standard deviation 0.89). Issues of geographic inconvenience came up during interviews, when three representatives listed geographic separation and the long distance required to travel to CAC meetings as limiting their participation.

1.2.4 Available Resources

Survey respondents agreed that they had access to the information they needed to participate in the CAC (mean 1.5, standard deviation 0.67). One respondent, however, noted his lack of technical background as limiting his ability to participate in the CAC. “When we met in Raleigh there were the ‘scientists’ and they talked about technical things, and I’m not that technical.” This could indicate a lack of technical information made available for non-technical participants.
1.3 Program Administration and Funding

1.3.1 Program leadership

Citizen Advisory Committee members were in strong agreement that leadership within APNEP is strong (mean 1.36, standard deviation 0.51). One respondent stated, “Joan, Bill, Chad [APNEP program staff] are dedicated and hard workers.” Another added, “There are great people in APNEP. They really believe in what they do.” One participant noted that strong leadership within APNEP staff brings greater legitimacy to public participation. “Working with Joan Giordano and the other staff she brings into the process have always made our contribution as citizens more than ‘lip service’.”

1.3.2 Sufficient staff

There is less agreement, however, as to whether there is sufficient staff for APNEP administration and implementation of the CCMP. Respondents only somewhat agreed with the statement, “There is sufficient staff for APNEP administration” (mean 2.13, standard deviation 1.25). Respondents were more neutral or tended to disagree with the statement “There is sufficient staff for CCMP implementation” (mean 3.125, standard deviation 0.835). A member of the committee stated, “More could be done with additional staff.” Another added, “I don’t know how many staff they have, but based on the fact that we only have one staff person in Virginia working on this, I know he gets spread pretty thin.”

1.3.3 Program funding

Survey respondents did not believe that there was sufficient funding for the APNEP program. They generally disagreed with the statement, “There is sufficient funding for implementing the CCMP” (mean 3.875, standard deviation 0.835). One
respondent explained frustration that “the huge APNEP region gets the same EPA funding as tiny estuaries like Charlotte Harbor.” Another added, “The whole program could use more funding.” The issue of limited funds was also discussed at the February, 2007, CAC meeting. APNEP staff explained that EPA funding for National Estuary Programs was initially intended to only support the programs through the CCMP development stage. Upon passage of a CCMP, the burden of financing the implementation of the plan was supposed to shift from federal funds to state funds. Until now, however, the EPA has continued to support the NEPs with about $500,000 per year for implementation. APNEP staff predict that this funding may be cut next year according to the President’s 2007-08 budget. Securing sufficient funding will therefore become an even greater challenge for APNEP in the future.

2. Ecological Outcomes Evaluation

2.1 Perceived ecological impacts

Members of the Citizen Advisory Committee identified the following ecological impacts that the Albemarle Pamlico National Estuary Program has had on the region (Table 4).

Table 4. Ecological impacts of the Albemarle Pamlico National Estuary Program perceived by interviewees (n=13).

<table>
<thead>
<tr>
<th>Ecological Impacts of APNEP</th>
<th>Frequency of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quality improvements from projects</td>
<td>5</td>
</tr>
<tr>
<td>Environmental education/awareness</td>
<td>3</td>
</tr>
<tr>
<td>It’s too early to tell</td>
<td>2</td>
</tr>
<tr>
<td>Improved data, citizen monitoring</td>
<td>2</td>
</tr>
<tr>
<td>Brought research to address problems</td>
<td>1</td>
</tr>
<tr>
<td>Other forces have a greater impact</td>
<td>1</td>
</tr>
<tr>
<td>Indicators currently being developed</td>
<td>1</td>
</tr>
</tbody>
</table>
The ecological impact of APNEP that respondents most frequently identified was water quality improvements resulting from the demonstration projects. When speaking of the ecological impacts of the demonstration projects, one respondent noted, “Definitely with stormwater, putting in retention areas, showing you don’t really think about stormwater, where it goes...So working with kids shows them, and then the kids show their parents. And again, all things are connected. What happens in the upper watershed does affect the estuaries.” Participants believe the individual demonstration projects have had a cumulative impact on improving water quality. “If you look at all those projects together it’s pretty impressive.” In addition to stormwater-related projects, another demonstration project that helped eliminate a water pollution source was the bi-state oil recycling project. “From the first time that I became aware of APNEP and started participating I think that through the oil recycling project we have certainly eliminated a potential pollution problem. That’s an important thing that we’ve worked on as a co-state collaborative effort.”

Three respondents identified improved environmental education and awareness as an ecological impact of the program. One stated, “I don’t think realistically we can do anything to encourage people to do a better job of water quality except through education. I think that is one of the roles where we can have an effect.” APNEP may be influencing environmental stewardship more broadly through its influence on environmental education across the state. An interviewee who has participated since the initial stages of APNEP stated, “I think the state curriculum has a much greater emphasis on environmental education than it did before the Albemarle Pamlico Estuary Study... Twenty years ago if you asked anybody on the street what an estuary was in eastern
North Carolina very few people could have told you, and now many people can, so there are many indirect benefits that have come out of [APNEP].” Participants believe that improved education and awareness leads indirectly to ecological improvements, particularly through improved land use decisions.

Ecological improvements can be long term impacts of a participatory process, and as two respondents stated, it may be too early to tell what the real environmental impacts of APNEP are. One characterized it as a “wait-and-see situation.” Another added, “I don’t think it’s had a significant impact yet.” In fact, the suite of ecological indicators that APNEP will use to measure its ecological and social impacts are currently under development. One CAC member, who is also involved in a subcommittee working on indicator development, stated, “I believe the ongoing indicator suite development process will better help us with [measuring ecological impacts].”

Improved data sharing and data collection through the APNEP citizen’s monitoring program were identified by two respondents as additional ecological impacts that APNEP is having on the region. Through interstate cooperation in APNEP, one participant stated, “I believe there is more data sharing going on than there used to be.” Beyond data collection, the APNEP program has also benefited the region ecologically, as a participant noted, by funding research to address ecological problems.

One respondent suggested, however, that other factors beyond the scope of APNEP are having a more powerful impact on continued environmental degradation in the region. “For example, the New Core plant, there were so many factors in favor of having that plant there that even though the Chowan River Basin Coordinating Council took a vote and decided that the majority of members of the council were not in favor of
locating the plant at that location, it was done. We were really just a tiny step in the whole process. I don’t think realistically we can do anything to stop development.”

2.2 CCMP addresses regional ecological threats

Survey respondents varied widely in their perceptions of whether or not the CCMP adequately addresses the ecological threats to the region (mean 2.09, standard deviation 1.04). Three respondents agreed strongly, six agreed somewhat, and two disagreed somewhat with this statement. One respondent noted that the CCMP fails to address pesticide spills. Another stated, “The CCMP didn't have the ability or political support to directly force movement to achieving its goals. Indirectly yes, it addresses ecological threats, but as it is a public document it couldn't get into the nitty gritty of the regulations.” Additionally, program staff noted that the CCMP is now 13 years old and should be revised to address newly emerging ecological threats to the region such as climate change and invasive species.

2.3 Impact on original ecological problems

The Comprehensive Conservation and Management Plan outlined strategies to address the following specific original ecological problems: water quality, vital habitat protection, and fisheries (APES 1994).

2.3.1 Water quality

Respondents varied widely in their perceptions of the water quality impacts that the CCMP has had. Four survey participants declined to respond to this question. To the statement, “Water quality in the AP region has improved since passage of the CCMP in 1994,” two strongly agreed, four somewhat agreed, one was neutral, and one strongly disagreed (mean 2.25, standard deviation 1.282). Water quality improvements since
passage of the CCMP that respondents identified were reduced algal blooms, stormwater improvements from demonstration projects, and indirect water quality improvements through education, outreach, and projects.

When asked whether water quality improvements were a result of APNEP decisions and actions, again there were a wide variety of responses. Four were unable to comment, three strongly agreed, three somewhat agreed, one somewhat disagreed, and one strongly disagreed (mean 2.25, standard deviation 1.49). Other factors respondents identified as impacting water quality in the region included: development/population growth, education/public awareness, politics/regulations, buffer rules, advocacy work of the Coastal Federation and the Pamlico Tar River Foundation, basin-wide water quality plans, economics, climate, private land use practices, industry, Neuse and Tar-Pam agricultural rules, wastewater treatment plants, pollutant runoff, coalition work, and improved training for agricultural and municipal waste system operations.

2.3.2 Vital Habitats

Again, with regard to estimating the impacts of APNEP on vital habitat protection and restoration in the region, participant responses varied greatly. To the statement, “Vital habitat protection has improved in the AP region since passage of the CCMP in 1994,” four survey participants were unable to comment. Those who did respond agreed somewhat with the statement, though one respondent was neutral and one disagreed somewhat with the statement (mean 2.13, standard deviation 0.99). One example of improvements to vital habitats since passage of the CCMP was protective riparian measures (which stemmed from the Neuse and Tar-Pam River rules). In disagreement
with this statement, one respondent noted, “Our natural heritage areas are not being protected.”

When asked whether vital habitat protections were a result of APNEP decisions and actions, there was much variation in responses. On average, respondents agreed somewhat with this statement (mean 2.22), but with great variation (standard deviation 0.97), and three participants were unable to comment. Other factors that respondents identified as affecting the status of vital habitat protection in the region were federal and state regulations, land use practices, development, fishery rules, the coastal habitat protection plan, farmland protection and federal conservation incentive programs.

2.3.3 Fisheries

Only half of the survey respondents felt qualified or able to speak about the impacts APNEP and the CCMP have had on fisheries management in the region (n=6). Amongst those who responded, there was general agreement that fisheries management in the AP region has improved since passage of the CCMP in 1994 (mean 1.83, standard deviation 0.41). Respondents were slightly less in agreement, however, on whether those improvements were a result of APNEP decisions and actions (mean 2.43, standard deviation 0.54). Other factors they identified as affecting the status of fisheries management in the region included: commercial/recreational fishing practices, coastal development, impacts of farming, urbanization, and tourism.

3. Social Outcomes Evaluation

3.1 Perceived Social Outcomes

Interviewed members of the CAC recognized a variety of social impacts of APNEP (Table 5).
Table 5. Social impacts of APNEP perceived by interviewees (n=13).

<table>
<thead>
<tr>
<th>Social outcome</th>
<th>Frequency of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education/awareness</td>
<td>7</td>
</tr>
<tr>
<td>Networking</td>
<td>4</td>
</tr>
<tr>
<td>Community collaboration and involvement</td>
<td>2</td>
</tr>
<tr>
<td>Improved connection between economic development and environment</td>
<td>3</td>
</tr>
<tr>
<td>Improved agency involvement</td>
<td>1</td>
</tr>
<tr>
<td>Job creation</td>
<td>1</td>
</tr>
<tr>
<td>Policy products</td>
<td>1</td>
</tr>
<tr>
<td>Increased strength of local environmental groups</td>
<td>1</td>
</tr>
<tr>
<td>Regulatory impacts</td>
<td>1</td>
</tr>
<tr>
<td>None (or only very indirectly)</td>
<td>3</td>
</tr>
</tbody>
</table>

Most frequently, interviewees highlighted the impact of the program on improved environmental education and awareness within the estuary. Respondents spoke of the benefits to child education (through the demonstration projects), as well as adult education and improved awareness among elected officials. Four respondents recognized the importance of APNEP in improving social and professional networking among different groups. “I’ve met people. Anytime you’re involved in something where you have an opportunity to interact with people who are in different businesses and involved in different things you gain insights and learn things that help you do better at your own job. Those kinds of contacts alone are beneficial.” One interviewee stated, “I have tried to be more sensitive to our local constituents and our field people…We’ve found some really good partners and hearing about them through APNEP has really helped…It has helped us build contacts where maybe we didn’t have as many before.” APNEP grants also facilitated increased partnerships by requiring demonstrated collaboration between agencies and organizations as part of the grant allocation process.
Another social impact of APNEP has been improved community involvement and cooperation. One CAC member stated, “[APNEP] is an effective and appropriate tool to involve the community.” Another commented, “It also helped pull communities together that were somewhat distant from each other but that had similar problems but perhaps didn’t realize that a community upstream was grappling with the same kinds of things.”

Other social outcomes of APNEP that members of the CAC perceived included: improved agency involvement through demonstration projects, the creation of a few good jobs, a political agreement in the form of a memorandum of understanding between the two states, preliminary impacts on local regulations, and increased strength and participation in local environmental groups. One respondent, however, felt unaware of any socioeconomic or political impacts that APNEP has had, stating, “I don’t feel that I’m that involved or instrumental in the process.” Another felt that any such impacts APNEP may have were only achieved “very indirectly.” Beyond increasing public awareness, another interviewee felt that the political impact of APNEP was limited. “In terms of being a major player and affecting political or regulatory or advocacy of any sort I think it’s always been a little weak and diluted.”

Despite a few admitted limitations, the Albemarle Pamlico National Estuary Program has helped improve understanding of the link between economic development and environmental conservation in the region, according to two respondents. “I think we’re getting a clearer definition of what is sustainable in our social/economic context.” This improved recognition of the importance of economic well-being as a foundation for achieving conservation objectives is also reflected in the allocation of some APNEP grants to low income communities. “A lot of times their grants go to distressed or rural
areas. We would really like to see more or do more to tie that into local economic development. We are seeing a trend where even your small towns are seeing that sustainability is a way to stay viable.” APNEP grants have also helped ease the economic burden of conservation practices by providing cost-share for agricultural producers to place tanks on their property to collect their oil as part of a bi-state oil recycling project. This creates opportunities that otherwise would not exist in economically stressed communities. As another respondent summarized, “You can’t do the scientific side or try to address the ecological factors without affecting the sociological and historical and even the political.”

3.2 Products: Agreements and Policies

CAC members agree somewhat that there is general public support for the Comprehensive Conservation and Management Plan, the principal product of APNEP (mean 2, standard deviation 0.926). Responses ranged from neutral (n=3) to somewhat agree (n=2) to strongly agree (n=3). Four respondents failed to comment. When asked if they would like to provide additional comments on public opinion of the CCMP, four commented that there is little public awareness of what the CCMP is. One participant stated, “I don’t think most of the public knows or cares about the CCMP to be honest.”

3.3 CCMP addresses socioeconomic issues

In response to the statement, “The CCMP adequately addresses socioeconomic concerns of the region,” participants were somewhat in agreement (mean 2.25, standard deviation 0.54). One respondent commented, “Different backgrounds and communities are not discussed.” Another added, “I don’t know if [the CCMP] can address these issues (such as housing). What influence should it have or could it have?” One participant was
hopeful for improved consideration of socioeconomic issues in the work of APNEP, stating, “I think we are approaching this better with the new Indicator Steering Committee work, bringing the CCMP into the economic context of the region.” The Indicator Steering Committee (ISC) is made up of two representatives from each of the APNEP committees (Policy Board, Scientific and Technical Advisory, Citizen Advisory and Management Advisory). This steering committee is charged with developing a monitoring and evaluation strategy for measuring the progress of APNEP towards meeting the goals and objectives outlined in the CCMP. The draft indicators compiled by members of the ISC at the January 25, 2007, meeting includes several socioeconomic categories.

3.4 Impact on original management problems


3.4.1 Interagency cooperation

Roughly half of survey participants responded to statements regarding the impact of the CCMP on management problems in the region (n=7). Those who did respond agreed that inter-agency cooperation in environmental management in the AP region has improved since passage of the CCMP in 1994 (mean 1.714, standard deviation 0.488). Examples of improved interagency cooperation included the Coastal Management Commission, fisheries working together, joint conferences and involvement of agencies including Department of Water Quality, Fisheries, etc. in APNEP, and cooperation required in grants. They also tended to agree that these improvements were a result of
APNEP decisions and actions, although two respondents were neutral to this statement (mean 2.143, standard deviation 0.69). One neutral respondent commented, “APNEP is one reason for better cooperation, but there are several.” Another member stated, “Turf battles still exist.”

3.4.2 Stewardship

Participants generally agreed that stewardship of the AP region has improved since passage of the CCMP in 1994 (mean 1.857, standard deviation 0.69). Examples of improved stewardship that respondents identified were: watershed improvement projects funded by APNEP grants, education of teachers and students, and generally higher care of the environment in the region. Respondents also generally agreed that improved stewardship was a result of APNEP decisions and actions (mean 1.857, standard deviation 0.9). One participant stated that APNEP has helped improve stewardship in general, but other forces such as a wave of development and change, in addition to socioeconomic, political, and demographic forces are also hindering stewardship. Other respondents identified public education, federal/state regulations, and community involvement as forces affecting stewardship of the region. One commented that a challenge to improving stewardship is that the rate of population growth and development in the region is exceeding the reach of environmental education.

3.5 Participant Experiences

3.5.1 Positive participant experiences

The survey used several statements to measure participant satisfaction with their experiences serving on the Citizen Advisory Committee. Respondents generally agreed that the CAC can make a difference in the overall management of the Albemarle Pamlico
Sounds watershed (mean 1.75, standard deviation 1.138). Respondents also agreed with the statement, “Through my involvement in the CAC I personally believe I can make a contribution to management decisions in the Albemarle Pamlico Sounds watershed” (mean 1.833, standard deviation 1.193). One respondent, however, replied “strongly disagree” to the above two statements.

Participants agreed that they are satisfied with the way the CAC operates (mean 1.75, standard deviation 0.754). The positive nature of participant experiences was also reflected in their very strong agreement with the statement, “My opinions are respected by other members of the CAC,” (mean 1.167, standard deviation 0.389). Another way to gauge a participant’s satisfaction with the experience is to assess their willingness to participate in another such committee. All respondents agreed with this statement, with the exception of one member who strongly disagreed, simply because “I already participate in 3 other committees” (mean 1.667, standard deviation 1.155).

3.5.2 Improved social networks

There was strong agreement among respondents that their participation on the CAC has led to improved stakeholder interactions and has created social networks. Measured by the statement, “As a result of my participation in the CAC, I interact with parties I otherwise would not interact with,” respondents strongly agreed (mean 1.333, standard deviation 0.651). The importance of social and professional networking through participating in APNEP also came up repeatedly during interviews, as detailed in the above section “perceived social outcomes.”
3.5.3 Trust

Evaluating trust within APNEP was twofold: first, in terms of trust between committees, and second, in terms of trust among members within the CAC. Survey respondents strongly agreed that there is trust between the CAC and other committees in APNEP (mean 1.33, standard deviation 0.68). They also strongly agreed with the statement “I trust other members of the CAC” (mean 1.33, standard deviation 0.49). An example of trust that one respondent provided was the annual meeting in Raleigh with all APNEP committees, which helped build trust amongst them. Another respondent noted, "In every context, members seem to feel completely comfortable expressing views and ideas."

3.5.4 Legitimacy

Legitimacy of the Citizen Advisory Committee was evaluated based on participants’ perceptions of whether the members of the committee were the appropriate public representatives to provide citizen advice to APNEP, and whether they believed advice provided by the CAC was in fact listened to by other APNEP committees. Survey respondents strongly agreed that CAC members were appropriate public representatives (mean 1.42, standard deviation 0.67), and also tended to agree that other APNEP committees listened to their advice, though with more variance of responses (mean 1.82, standard deviation 0.87).

3.6 Observable Behavior

Most notable among changes in personal behavior and attitudes resulting from public participation in APNEP is improved education among participants about the estuary. Respondents agreed strongly with the statement, “Because of my involvement in
the CAC I am better educated about the estuary” (mean 1.333, standard deviation 0.778). One participant eloquently stated, "My family was relatively new to North Carolina when I was asked to participate on [an original basin] CAC, a predecessor to the present APNEP CAC. Through this involvement, I've come to know most of what I know (as well as most of the people I know) about the state and its natural resources, governmental agencies, industries, etc. This is a very important commitment to me."

Some respondents changed their personal actions on their own land as a result of improved awareness of land use impacts. One stated, “I am more conscious of the stewardship decisions I make on my own land. I try to influence land use decisions as a planning board member in our county and as an agricultural advisory board member.” Other respondents have developed workshops and used materials gained through participating in APNEP for educating others in their community of the importance of conserving the estuary. In these ways, personal impacts can spill over into changing behaviors on a more regional level.

Participation in the Albemarle Pamlico National Estuary Program has profoundly affected some members of the CAC. “What I’ve learned, what I’ve done, what I’m doing, what I hope to do all does have a little bit of genesis in the original study and the fact that [the organization] which I had been interested in before APES and a lot of other groups out in this area found ways to grow and to participate and build environmental awareness on a local basis has given me a lot of interest and belief that APES has done a lot of good things.” Another commented,

“In a lot of ways, everything I know or do has in some way or fashion been impacted by APES because that’s how I came into the process at all…A lot of my underlying foundation of knowledge, my underlying understanding of the entire system and how it should function and what
we can do to help it and what’s not good for it, at least the genesis of everything I understand about it pretty much has come from APES…I make tons of personal choices because of what I’ve learned or I know or what I believe in, and a good bit of that relates to APES.”

4. Strengths of APNEP

Interviewees identified several strengths of the Albemarle Pamlico National Estuary program (Table 6). The most frequent response was that the program was strong due to its broad stakeholder representation and subsequent inclusion of diverse perspectives. One participant noted, “One of the things that is wonderful about the CCMP is that it doesn’t just look at one perspective, one element of management. It’s taking all the uses and everybody into consideration. And I think that’s one of the successes and will lead to its future continued success.” Broad representation is important when managing a watershed of this magnitude. As another interviewee stated, “When you are talking about basinwide comprehensive management programs you have to include everyone that is impacted and affected and has input to that, and they’ve really tried to do that.” The composition of the Citizen Advisory Committee is a testament to the APNEP commitment to diversity of participants, particularly in that the committee chair is a hog farmer, a nontraditional stakeholder in environmental decision-making processes. One participant pointed out, “They are not scared to get anyone to participate, hog farmers, whatever. They aren’t trying to find an esoteric group, just a small group of interested people. I know the composition of this council, they don’t hold back and they try to bring a diversity to the table.” Increased diversity at the table, however, can also bring a diversity of values and perspectives on how goals should be met which can slow a
process. As a committee member stated, “The diversity of people involved is a strength as well as a weakness.”

Table 6. Strengths of the Albemarle Pamlico National Estuary Program identified by interviewees (n=13).

<table>
<thead>
<tr>
<th>Program Strength</th>
<th>Frequency of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad stakeholder representation</td>
<td>7</td>
</tr>
<tr>
<td>Program staff</td>
<td>6</td>
</tr>
<tr>
<td>Bi-state, estuary wide effort</td>
<td>6</td>
</tr>
<tr>
<td>Non-technical community involvement</td>
<td>6</td>
</tr>
<tr>
<td>Education</td>
<td>4</td>
</tr>
<tr>
<td>Well established program</td>
<td>2</td>
</tr>
<tr>
<td>Demonstration project success</td>
<td>2</td>
</tr>
<tr>
<td>Communications/web site</td>
<td>2</td>
</tr>
<tr>
<td>Bridges science and policy</td>
<td>1</td>
</tr>
<tr>
<td>Availability of resources</td>
<td>1</td>
</tr>
<tr>
<td>Loyal volunteers</td>
<td>1</td>
</tr>
</tbody>
</table>

Six participants identified the dedicated APNEP staff as program strengths. “Joan [Giordano] is incredible. They are wonderful about the resources and information and continual education, keeping us in the loop. She’s a great coordinator. And Bill Crowell, I have a lot of respect for him.” One interviewee noted how the staff can serve to advocate for their stakeholder group. “Bill Crowell has advocated us [environmental education] to the entire department.” Participant trust of APNEP staff was strengthened by their interactions facilitated by the program. “It’s been nice to work more closely with the APNEP people in charge, to work with and meet them, because when you know someone it’s a little bit better. You can kind of see that they are working to do the right thing.”

Another strength frequently noted is the geographical extent of the program, that it is a bi-state, estuary-wide management effort. “It addresses a fairly large area, rather than focusing on a small area like the Neuse River or Roanoke River. It attempts to deal
with the bigger picture.” Participants recognize how the geographic extent of the APNEP management area matches the geographic extent of the environmental issues, rather than being limited by political boundaries. “It’s nice to work on the estuary level, rather than have it broken up by state or basin. APNEP has no state line, so you are thinking more like a bay…There are no drawn lines because water moves.” The uniqueness of this approach is valued by citizen participants. One stated, “I don’t know that there’s an equivalent single region emphasis on environmental protection anywhere else in North Carolina…I’m really glad it’s there and it gives a little extra spotlight on the importance of protecting this region.”

Additionally, six participants highlighted the strength of non-technical community participation in APNEP. “The Citizen Advisory Committee is good because it is citizens, normal people, not scientists so much. There are people from all over that do different things.” A self-identified non-technical participant and former APNEP grant recipient stated, “They have built those layers. You have to have the scientific community but then you also need people like me who are in the field who can talk to people and get things going on the ground…We know where to put the projects.” APNEP has succeeded at involving the non-scientific community in collaborative research through a well-established citizen’s monitoring program. The strengths of this program are twofold: one “in the information that is gathered, but [also] in the way that it involves the people in the monitoring of water quality issues and in APNEP is another great thing about the program.”

Educational impacts of APNEP were a strength recognized by four interviewees. “I believe that in its limited role it can be very effective in terms of providing input for
basinwide management plans and in providing educational opportunities in some of the programs that it works with such as the citizen’s monitoring program.” The schoolyard demonstration projects APNEP funds also contribute to environmental education. Through implementing the projects, “they’ve got us out there working with kids, working with schools.” Two interviewees spoke directly to the impacts of the demonstration projects as program strengths. “The oil recycling program was a great success. It was a joint effort in the Chowan River basin between NC and VA…It enabled us to put 125 gallon tanks on farms, the farmers would cost share, and they could have a place to put their used oil…and then the oil recycler would come and…take it to be recycled, so you weren’t running the risk of oil getting on the ground and into groundwater.” Another interviewee noted, “Probably the best thing APES does now is funding demonstration projects, like small environmental improvement projects all around the region, and they can grow and benefit over the years and that is very helpful.”

Several other strengths were identified by two or fewer respondents. Two participants pointed to the lengthy track record of APNEP as a program strength. “The fact that it is an organization that has been able to survive over a period of time is a strength.” Program communications and public availability of estuary information via the APNEP website were identified as strengths by two respondents. Technical input is also valuable to citizen participants, as one interviewee pointed to the bridging of science and policy as a strength of APNEP. “They are involved in the scientific community. When you speak to congress you need that scientific backing.” The availability of resources and loyalty of volunteers were also each recognized as strengths by individual respondents.
5. Challenges and Weaknesses of APNEP

Citizen Advisory Committee members identified many challenges and weaknesses that APNEP faces (Table 7). Overall there was little consistency among responses. The challenge that interviewees identified most frequently was a lack of sufficient program funding. In particular, respondents noted frustrations with equal funding going to each National Estuary Program, despite huge differences in their geographic areas. “Funding for NEPs is the same regardless of the size of the particular estuary. APNEP is a big region, but receives the same amount of funding as smaller programs.” Also, capacity to leverage additional funds may be limited in APNEP. “Challenges would include leveraging funds…The amount of money I see coming through the Chesapeake Bay vs. APNEP, there’s a huge difference.”

Table 7. Challenges and weaknesses of the Albemarle Pamlico National Estuary Program identified by interviewees (n=13).

<table>
<thead>
<tr>
<th>APNEP Challenge/Weakness</th>
<th>Frequency of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>5</td>
</tr>
<tr>
<td>Lack of public awareness</td>
<td>4</td>
</tr>
<tr>
<td>Bureaucracy</td>
<td>2</td>
</tr>
<tr>
<td>Lack of regulatory effectiveness</td>
<td>2</td>
</tr>
<tr>
<td>Declining broad public participation</td>
<td>2</td>
</tr>
<tr>
<td>Sustaining energy over infrequent meetings</td>
<td>1</td>
</tr>
<tr>
<td>Limited advocacy ability due to political ties</td>
<td>1</td>
</tr>
<tr>
<td>Lack of impact on activities in VA</td>
<td>1</td>
</tr>
<tr>
<td>Politics</td>
<td>1</td>
</tr>
<tr>
<td>Geographical size</td>
<td>1</td>
</tr>
<tr>
<td>Gradual nature of impacts</td>
<td>1</td>
</tr>
<tr>
<td>Don’t feel instrumental in the process</td>
<td>1</td>
</tr>
<tr>
<td>Organizational infighting</td>
<td>1</td>
</tr>
<tr>
<td>Getting demonstration project paperwork in on time</td>
<td>1</td>
</tr>
<tr>
<td>Youth of program governance structure</td>
<td>1</td>
</tr>
<tr>
<td>Need to expand</td>
<td>1</td>
</tr>
<tr>
<td>Diversity of people involved</td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>
Several interviewees noted that a general lack of public awareness about APNEP is a program weakness. One stated,

“I’m not sure APNEP is real well recognized by politicians, the powers that be. And I think the average citizen doesn’t know what the heck it is. They’ve got a really good website that I encourage people to go to regularly, but as far as getting general information out, people hear about these things when they advertise public meetings for the basinwide management plan, or if they go to a fair or workshop where APNEP happens to be. Like a lot of other things you get the same people all the time. I think that’s a challenge, that you tend to gravitate towards things that you are concerned about and other people do the same thing and it’s hard to reach out to some of the other audiences, but I think that’s what we need to do.”

Yet some participants also recognize the role that they play in improving public awareness of the program by bringing information about it back to their employers, neighbors, and stakeholder group. “APNEP is a great group of people that work hard, that work a lot, that fund a lot of projects, but people don’t know about it. I feel public knowledge is probably pretty low, but it should be higher. That’s something that we [at my place of employment] are working on.”

Bureaucracy also challenges the effectiveness of APNEP. One CAC member noted among the challenges, “bureaucracy and red tape, but that’s everywhere. Everything that’s involving the government or a corporation or anything can get bogged down in the process of trying to get something done because of how you go about it.” Another challenge that a participant identified was “getting things to happen in a timely manner, and that’s just working for a big organization…Working for the state…things take forever, and working for a non-profit things still take forever.”
Two citizen representatives identified the lack of regulatory strength as weakening the impacts of APNEP. One interviewee stated, “I really thought the project would have a little more teeth to it that might actually affect what we’re doing in the state…” Another added, “Because it’s not a real mandated part of the regulatory structure and the state environmental agencies, it’s never really forced a lot of change, or never had any real direct impact I think on making our regulations stronger because APES has always tried to bring all different stakeholders to the table and I think has been valuable at letting voices be heard. It’s been kept at arms length from really being a player on any type of actual ‘get something done’ basis.”

One participant (who has been involved with APNEP since the inception of the APES study) noted that as the process has unfolded, the role of citizen participation has changed, bringing new challenges. In the beginning, there was broad participation in meetings organized by APES to educate the public about the estuary. The general public then participated by providing input on drafts of the Comprehensive Conservation and Management Plan at public hearings. The respondent explained the challenge of declining general public participation with the following statement. “There are a lot of people who are much more aware than they ever were before about the importance of estuaries. It’s difficult to find a niche or way for them to express their interest and participate, and activities that maybe don’t have a direct regulatory outcome or advocacy type of outcome.” Another echoed this concern about declining participation of the general public, stating, “We have these committees now, so I think a weakness is that the public in general doesn’t have its own voice except through the CAC. There aren’t town meetings about what’s happening with APNEP.” And while the changing face of
participation over the lengthy duration of APNEP poses some challenges, the youth of the current committee structure also poses a challenge. “Being so young, just starting out and getting its feet wet. Trying to figure out what way [the CAC] is going to grow” is another challenge that an interviewee identified.

The remaining challenges were identified by single respondents. One stated, “One of the challenges is that when you only meet (a few) times a year it’s difficult to get energized and get so much done.” Advocacy limitations resulting from the political ties of the program were another challenge noted. “Just how much of a voice can you really be when the paychecks are coming from the state and federal government? I would think that’s definitely a drawback for doing advocacy work,” a citizen representative noted.

While many respondents felt that the large geographic extent of the APNEP region was a strength in addressing ecological issues, one respondent recognized that its size also poses some challenges. “The geographical size of our AP region, compared to others that may deal with a single, more homogenous area, makes management, measurement, etc., more daunting tasks.” Similarly, the diversity of participants, while often cited as a program strength was also identified by one respondent as a weakness of the program. Another recognized that organizational infighting is a challenge within APNEP as in any multi-party organization. “There’s always infighting between organizations. Environmental organizations are no different from anyone else. Everybody wants their piece of the pie so to speak and I think those are always going to be issues that have to be dealt with that tend to weaken the overall effort because lack of willingness to work together sometimes is the reason things don’t get done.”
In contrast, when asked what the weaknesses of APN EP were, one CAC member stated, “I can’t think of any. It seems to be a working formula…As far as my role and how they’ve included us, I don’t think [there are weaknesses]. You can always do more of what you’re doing right. That’s what we try to think about here.”

6. Participant Lessons Learned

When asked what lessons they as citizen participants in APN EP have learned, members of the Citizen Advisory Committee spoke to the themes of the importance of public involvement in watershed management, the challenges of diversity and lengthy processes, the meaning of partnership, maintaining passion and enthusiasm, working across political boundaries, and the value of national recognition.

Importance and challenges of public involvement

Citizen participants learned lessons of the importance and challenges of public involvement in watershed management. One stated, “You have to have that public involvement. You have to have your crystal ball out there. You have to work with everyone.” Another noted, “It’s important to be able to bridge county lines, state borders, and public/private interfaces to manage watershed issues.”

The challenges they’ve learned about include “sometimes it’s difficult to work together to get things done when you are working with a diverse audience and diverse group of people.” Another challenge is reaching out beyond the usual participants. “It’s very interesting to me when I look around the table at the CAC and you see all the various representatives from the soil and water conservation district, from public education, business and industry, from agriculture. I think it’s very good that you have
representatives from all those sectors at the table and engaged. The challenge is getting out into the larger numbers of those groups.” Additionally, “It’s been difficult for them to involve as many people as they want to because people have other things to do, other jobs happening. Everyone in America is so busy that it’s difficult to choose what you want to do and prioritize. It’s hard to get people involved.”

National Recognition

The national estuary programs are unique in that they are supported by federal mandate and have administrative ties to the national level with the EPA. One interviewee learned the lesson of importance of national recognition, stating, “APNEP has been around for a while and has gotten bigger. I’ve seen that if someone believes in something and works for it and works hard, they can become a big organization and pretty popular…It’s nice for APNEP that they are part of a bigger national family of NEPs and that’s good to be known outside North Carolina.” This particular respondent had an opportunity to visit another national estuary program in another state. She and one other participant believed that increasing information sharing between NEPs through a national conference could be beneficial, both for morale and to learn from one another’s experiences.

Sustaining Energy

Maintaining energy, enthusiasm, and commitment amongst participants that span a great geographic distance is an important lesson learned by participants of the lengthy APNEP process. “Not losing enthusiasm. It’s hard to keep that up when there are so many other things going on.” Sustaining energy is especially hard when the impacts of the process are slow to surface. One participant learned “how hard it is to make changes
and see those changes take place…It just takes so long to get something changed in this type of system.” Another noted, “It’s something I think you have to keep working at. Like being a mother, the job is never over.”

Chapter 4: Discussion and Conclusion

APNEP Evaluation Discussion

Process Design

According to previous research, there are common elements of successful participatory process design. First, participants should be representative of the broader public (Rowe and Frewer 2000, Maguire and Lind 2003, Conley and Moote 2003). Successful processes are also designed to include public participation in as many stages of the decision making process as possible, from defining the problem to designing and implementing solutions (Rowe and Frewer 2000). Finally, successful programs typically have a clearly defined role for public participants and common goals (Conley and Moote 2003).

Based on survey and interview results, the Albemarle Pamlico National Estuary Program has a very successful process design. Key to the success of this program is the breadth of stakeholder representation built into its design. Some respondents noted, however, that communities of color and developers are still under-represented or absent. It is important for APNEP and any participatory watershed management program to understand what limits the participation of particular stakeholder groups or communities and to address these limitations to the greatest extent possible. Ongoing outreach to minority communities in the AP region is necessary to identify the reasons that their
participation has been limited in order to improve their representation within APNEP in the future.

Clearly defined roles and common objectives also contribute to the success of APNEP in the eyes of citizen participants. By design, APNEP has been successful at adequately involving the public in the stages of identifying problems, planning, and monitoring. APNEP is not as strong, however, at adequately involving the public in research, implementation, and evaluation. The role of the general public in these stages could be improved through public meetings to solicit feedback as the program moves forward with selecting indicators for monitoring program impacts and with revising the Comprehensive Conservation and Management Plan.

**Process Execution**

Beyond process design, the manner in which a process is executed also has a great impact on the success of a participatory natural resource management program. Successful processes are executed in a manner that promotes sustained participation. The amount of time and effort that participants dedicate to the process should be reasonable, and meetings should be convenient. Additionally, previous research shows that a common indicator of successful participatory process execution is that sufficient resources are available for participants to fulfill their roles and objectives (Rowe and Frewer 2000, Maguire 2006).

Overall, execution of the APNEP participatory process has been mostly successful. Meetings are convenient for the majority of CAC members, although geographic separation poses logistical challenges for some participants. Technologies
such as tele- and video-conferencing could be used to improve the ease of participation in CAC meetings for geographically distant members. CAC members generally agree that sufficient informational resources are available, however some non-technical committee members have difficulty with interpreting technical materials.

Participants value the time that they devote to the program and feel that the amount of time and effort they put into participating is reasonable. Perhaps the greatest indicator of the successful execution of APNEP is the sustained participation of several members of the CAC and their overwhelming willingness to participate in another such program.

Program Administration and Funding

Program administration and funding can influence the success of a participatory process. In particular, strong program leadership and sufficient staff are common indicators of success (Addor et al. 2004). Adequate funding from diverse sources also promotes a sustainable and effective program (Ferreyra and Beard 2007).

The quality of APNEP staff is very strong and has been a key to the success of the program. The quantity of program staff, however, is not sufficient for implementing the Comprehensive Conservation and Management Plan. Lack of sufficient funding also limits the impacts of the program. APNEP must seek new and diverse funding sources to increase its staff and support the activities necessary to implement the objectives of the CCMP.
Natural Capital Outcomes

Typically, the success of a collaborative conservation program is measured by its impact on original ecological problems (Conley and Moote 2003). In the case of the Albemarle Pamlico region, the key ecological problems outlined in the Comprehensive Conservation and Management Plan were water quality degradation, habitat destruction and fragmentation, and fisheries depletion.

Participants generally perceive that water quality, vital habitat protection, and fisheries have improved in the Albemarle Pamlico region since passage of the CCMP in 1994. Linking these improvements to APNEP decision and actions (and more specifically to public involvement), however, is difficult. Through the evaluation conducted in this study it is apparent that CAC members perceive that their participation is contributing to water quality improvements through the demonstration projects that they fund. Water quality data have improved due to the citizen’s monitoring program administered by APNEP.

Social Capital Outcomes

In addition to ecological outcomes, successful participatory processes have social impacts, measured by positive participant experiences, improved social networks, changes in personal behavior, and improved education and public awareness (Beierle 1999; Maguire 2006; Conley and Moote 2003). Trust is another indicator of improved social capital resulting from a legitimate process (Beierle 1999). Additionally, prior research highlights that a successful process is one that results in products (such as plans
and agreements) that address original management problems. The APNEP Comprehensive Conservation and Management Plan identified interagency cooperation and stewardship as the primary management issues of concern in the region.

According to CAC participants, social capital improvements are some of the most valuable impacts of the Albemarle Pamlico National Estuary Program. APNEP has been highly successful at improving social networking, collaboration, and environmental education in the region. The program has also been successful at developing trust and legitimacy of the CAC. Social capital outcomes are difficult to measure using traditional evaluation methods, but the participant perspective-based evaluative framework used in this study successfully captured the impacts of APNEP on social capital.

**Lessons Learned from APNEP**

Based upon the case study of the Albemarle Pamlico National Estuary Program and the perspectives of Citizen Advisory Committee members, I can draw several lessons learned regarding the keys to their program’s success. These lessons learned could inform the design of participatory watershed management programs in other watersheds.

- It is important to thoroughly assess the social landscape of a watershed prior to initiating a watershed management program to ensure that all relevant stakeholder groups are identified and included from the initial stages of the process, not just the “usual suspects.”

- Outreach to under-represented or absent stakeholder groups can help identify and overcome barriers to participation.

- Motivated, dedicated, and sufficient staff can lead a program to success through times of transition.

- It is important that participatory watershed management programs secure funds from diverse sources to gain financial security and to enable the program to achieve its objectives.
• Social capital improvements are some of the most valuable impacts of participatory watershed management programs. They can be fostered through multi-stakeholder gatherings and through information exchange and site visits between programs.

• Ecological impacts of participatory management programs are difficult to quantify and correlate. Evaluating ecological impacts can be made easier by collecting baseline data at the beginning of the program and through the coordinated efforts of agency and citizen monitoring programs.

• Sustaining energy over lengthy participatory processes is critical to a program’s success. Understanding participants’ motivations for their involvement and highlighting tangible, visible impacts of their participation can help inspire their continued involvement.

**Reflections on the Effectiveness of the Evaluative Framework**

Program participants possess a wealth of knowledge pertaining to the full impacts of a participatory watershed management program. The evaluative framework, when applied to the Citizen Advisory Committee of the Albemarle Pamlico National Estuary Program, was effective at gauging impacts of the program on personal behavior and measuring social capital outcomes such as social network formation, education and awareness. Additionally, it was effective at evaluating process design and program administration from the viewpoint of those intimately involved in the process.

The integration of both qualitative and quantitative data in the evaluation of APNEP proved to be very useful. Respondents often gave the program high rankings in the survey. During the in-depth interviews, however, participants were able to reveal deficiencies in the program.

This study was limited by the fact that it evaluated the program only from the perspective of current citizen participants. It would be valuable to conduct a similar
evaluation of former participants, as well as informed members of the public who are not involved in the program in an official capacity, to prevent bias. Also, self-evaluation by program participants may introduce subjectivity (Innes 1999). To minimize bias, results of a participant perspective-based program evaluation such as that used in this study could be triangulated with results from more traditional evaluative approaches which use biophysical indicators to measure outcomes.

**Conclusion**

Participants in the Citizen Advisory Committee of the Albemarle Pamlico National Estuary Program demonstrated that some of the greatest benefits of a participatory process are the social networks that they foster, improved education and awareness, and changes in personal behavior that participants (through their involvement in the process) have made in their own lives and in the lives of others. These social capital improvements are not often captured by traditional program evaluation frameworks that are either process oriented (focusing only on measuring human capital inputs) or outcome oriented (using primarily biophysical indicators to measure ecological impacts). The evaluative framework developed in this study is therefore a valuable tool to provide a more holistic evaluation of the full impacts of any participatory watershed management program.
Works Cited


Easley, M. (2005). "Replacing Executive Orders No. 75 and 118 concerning creation of a program office, a policy board, and advisory committees to support sustainable natural resource and environmental management in the Albemarle-Pamlico Estuarine system." Executive Order 74 of May 16, 2005. Raleigh, NC.


Appendix 1. APNEP Participant Interview Protocol

Administered to members of the APNEP Citizen Advisory Committee (CAC)

Introduction

You have been identified by Joan Giordano of the Albemarle Pamlico National Estuary Program (APNEP) as a participant in the APNEP Citizen Advisory Committee and as a potential participant in a master’s research project conducted by Lisa Lurie, a graduate student in Environmental Management from Duke University. The purpose of the project is to conduct a case study of APNEP to understand the role of public participation in watershed management. Through this interview I would like to gather your opinions on the strengths, weaknesses, and outcomes of the process.

Our discussion will last between 30 minutes to an hour. During the interview you will be asked to share your opinions. There is no right or wrong answer to anything that we will discuss, and there is no certain answer that the researcher is hoping to hear from you.

With your permission, our discussion will be audio taped. The recording will be used to make a written transcript of the interview and to help the researcher write a report based on the information discussed. No one but Lisa Lurie, the Duke student-researcher, will have access to the audio tape. Upon completing the transcript of the interview the recording will be destroyed.

Following our interview you will be given a short written survey. The intent of this survey is to complement the topics discussed in the interview and to provide data for comparative analysis.

The comments you make will be confidential - in no way will the information you provide in the interview or survey be connected with your name. At any point in the future, if I should desire to use a direct quote from your statement in a report or publication I will seek your additional approval. Your responses will provide data that will be qualitatively analyzed and compiled into a written case study. This report will be presented to the Nicholas School of the Environment at Duke University to fulfill the author’s master’s degree. Additionally, this case study may be presented to other interested parties such as APNEP and the EPA.

Your participation in this project is entirely voluntary. You are free to not answer any questions and to stop your participation at any time. If you have any questions about this project, feel free to ask them at any time. You can also contact Professor Lynn Maguire at (919) 613-8034. If you have any questions about your rights as a research participant, please contact the chair of the Human Subjects Committee at (919) 684-3030.
Interview Questions

Interviewee Name:
Title:
Date:
Location:
Background information:

1. What is your role within APNEP?
   a. Do you represent a particular stakeholder group?

2. How long have you been participating in the program?

3. What motivated you to first participate?

4. What motivates your continued participation?

5. What limits your ability to participate in CAC activities or obligations?

6. In your opinion, what is the role of public participation in general in APNEP?

7. In your opinion, what is the role and objective of the CAC?

8. What impacts has the CAC had on management decisions in APNEP?

9. What ecological impacts has the APNEP process had?

10. What social, economic, or political impacts has the APNEP process had?

11. What are the strengths of the APNEP program?

12. What are its weaknesses?
13. In your opinion, what opportunities exist for overcoming the weaknesses?

14. What lessons have you learned from your involvement in the CAC about the strengths and challenges of participatory watershed management in general?

15. What have you personally done differently as a consequence of your participating in the CAC?

16. Do you plan on continuing to participate in APNEP? Why or why not?

17. Is there anything else you would like to add?
Appendix 2: APNEP Public Participant Survey

Follow-up to in-person interview
Administered to members of the APNEP Citizen Advisory Committee

Introduction
The purpose of the project is to conduct a case study of the Albemarle Pamlico National Estuary Program to understand the role of public participation in watershed management. The intent of this survey is to complement the topics we discussed in the interview and to provide data for comparative analysis. This survey is composed of a series of statements related to the process and outcomes of the Albemarle Pamlico National Estuary Program and related to your experiences on the Citizen Advisory Committee. Please indicate to what extent you agree or disagree with each statement on a scale of 1 to 5 (1 being strongly agree, 3 being neutral, and 5 being strongly disagree). Feel free to add additional comments where necessary. There is no right or wrong answer, and there is no certain answer that the researcher is hoping to hear from you. The comments you make will be confidential - in no way will the information you provide in the survey be connected with your name. Your participation in this project is entirely voluntary. You are free to not answer any questions and to stop your participation at any time. If you have any questions about this project, feel free to ask them at any time.

Survey

Process Design
Please indicate on a scale of 1 to 5 (1 being strongly agree, 5 being strongly disagree) to what extent you agree or disagree with the following statements: (place an “X” in the appropriate box)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The role of the CAC in the APNEP decision-making process is clearly defined.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. APNEP adequately involves the public in the following stages of the decision-making process:</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. problem identification,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. research,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. planning,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. implementation,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. monitoring,</td>
<td></td>
<td></td>
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</tbody>
</table>
3. The role of the CAC in the APNEP decision-making process is adequate.

4. The CAC represents the range of stakeholders in the APES region.
   a. Which stakeholders are under represented or absent from the CAC?

5. There are common goals shared among members of the CAC
   a. What are the common goals?
   b. In what ways do they differ?

**Process Execution**
Please indicate on a scale of 1 to 5 (1 being strongly agree, 5 being strongly disagree) to what extent you agree or disagree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. There is trust among the CAC and other committees in APNEP.</td>
<td>1 2 3 4 5</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   a. Would you like to provide any examples of trust or lack of trust among stakeholders?

7. The members of the CAC are the appropriate public representatives to provide citizen advice to APNEP.

8. Advice provided by the CAC is listened to by other APNEP committees.
**Program Administration**

Please indicate on a scale of 1 to 5 (1 being strongly agree, 5 being strongly disagree) to what extent you agree or disagree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Leadership within APNEP is strong.</td>
<td></td>
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<tr>
<td>10. There is sufficient staff for APNEP administration.</td>
<td></td>
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</tr>
<tr>
<td>11. There is sufficient staff for CCMP implementation.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12. There is sufficient funding for implementing the CCMP.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

a. Would you like to provide any comments related to APNEP program administration?

---

**CAC Outcomes**

To what extent do you agree or disagree with the following statements regarding the current impacts of the Citizen Advisory Committee (CAC)?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. The CAC influences the decisions of APNEP about technical matters.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14. The CAC influences the decisions of APNEP about non-technical matters.</td>
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<td></td>
</tr>
</tbody>
</table>

a. Would you like to provide any examples?

---

**CCMP Outcomes**

To what extent do you agree or disagree with the following statements regarding the impacts of the Comprehensive Conservation and Management Plan (CCMP)?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Page 66
15. There is general public support for the CCMP.
   a. Would you like to provide any comments on public opinion of the CCMP?

16. The CCMP adequately addresses ecological threats to the region.
   a. If you disagree, which environmental issues does it not address?

17. The CCMP adequately addresses socioeconomic concerns of the region
   a. If you disagree, which socioeconomic concerns does it not address?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Water quality in the APES region has improved since passage of the CCMP in 1994.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. Water quality improvements are a result of APNEP decisions and actions.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
   a. Would you like to provide any examples of water quality improvements resulting from APNEP?
   b. Beyond APNEP, what other factors influence the status of water quality in the region?

20. Vital habitat protection has improved in the APES region since passage of the CCMP
in 1994.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don’t Know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Improved vital habitat protection is a result of APNEP decisions and actions.</td>
<td></td>
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</tr>
<tr>
<td>a. Would you like to provide any examples of vital habitat improvements resulting from APNEP?</td>
<td></td>
<td></td>
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<tr>
<td>b. Beyond APNEP, what other factors influence the status of vital habitat protection in the region?</td>
<td></td>
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<tr>
<td>22. Fisheries management in the APES region has improved since passage of the CCMP in 1994.</td>
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<tr>
<td>23. Improved fisheries management is a result of APNEP decisions and actions.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>a. Would you like to provide any examples of improved fisheries management resulting from APNEP?</td>
<td></td>
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<tr>
<td>b. Beyond APNEP, what other factors influence the status of fisheries management in the region?</td>
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<tr>
<td>24. Stewardship of the APES region has improved since passage of the CCMP in 1994</td>
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<tr>
<td>25. Improved stewardship is a result of APNEP decisions and actions.</td>
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</tr>
<tr>
<td>a. Would you like to provide any examples of improved stewardship resulting from APNEP?</td>
<td></td>
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</tbody>
</table>
b. Beyond APNEP, what other factors influence the status of stewardship in the region?

26. Inter-agency cooperation in environmental management in the APES region has improved since passage of the CCMP in 1994.

27. Improved interagency cooperation is a result of APNEP decisions and actions.

   a. Would you like to provide any examples of improved interagency cooperation resulting from APNEP?

   b. Beyond APNEP, what other factors influence the status of interagency cooperation in the region?

**Participant Experiences**

To what extent do you agree or disagree with the following statements regarding your personal experiences participating in the APNEP CAC?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Neutral</th>
<th>Strongly Disagree</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. I believe the CAC can make a difference in the overall management of the Albemarle Pamlico Sounds watershed.</td>
<td></td>
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<tr>
<td>29. Through my involvement in the CAC I personally believe I can make a contribution to management decisions in the Albemarle Pamlico Sounds watershed.</td>
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<tr>
<td>30. I trust other members of the CAC.</td>
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<tr>
<td>31</td>
<td>As a result of my participation in the CAC, I interact with parties I otherwise would not interact with.</td>
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<tr>
<td>32</td>
<td>Because of my involvement in the CAC I am better educated about the estuary.</td>
<td></td>
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<tr>
<td>33</td>
<td>The time of year of the CAC meetings is convenient.</td>
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<tr>
<td>34</td>
<td>The frequency of CAC meetings is reasonable.</td>
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<tr>
<td>35</td>
<td>The amount of time and effort I put into participating in the CAC is reasonable.</td>
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<tr>
<td>36</td>
<td>I have access to information I need to participate in the CAC.</td>
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<tr>
<td>37</td>
<td>I am satisfied with the way the CAC operates.</td>
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<tr>
<td>38</td>
<td>My opinions are respected by other members of the CAC.</td>
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<tr>
<td>39</td>
<td>I would participate in another such committee.</td>
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</tr>
</tbody>
</table>

40. Would you like to provide any comments related to your experiences as a participant?

Thank you for your time and participation. If you would like to make any further comments, please do so below.