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Proceedings

Delmarva's Coastal Bay Watersheds: Not Yet Up The Creek

A Conference on Ecology and Economy

Edited by

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March 8-9, 1996
Ocean City, MD

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ABSTRACT

On March 8-9 1996, 269 people attended the Delmarva Coastal Bay Watersheds Conference in Ocean City, Maryland. The purpose of the conference was to provide a forum for citizens, elected and appointed officials and other decisionmakers, and special interest representatives to discuss the economic and environmental state of the Delmarva coastal watersheds and to determine further continuing actions and activities. The design of the conference provided a unique opportunity for citizens in the Delmarva region to express their ideas and to apply their collective wisdom to begin to formulate strategies that will integrate economic, environmental, scientific and social considerations toward achieving a sustainable future.

The conference goals were:

1. To promote the concept of balancing economic well being and environmental protection and demonstrate why we should care about the coastal bays and their watersheds.

2. To encourage and secure stakeholder involvement.

3. To hear about and share local perspectives on the coastal bays and their watersheds.

4. To impart scientific information about the coastal bays and their watersheds.

5. To inform participants about the National Estuary Program and other models as vehicles for problem solving.

6. To help launch Maryland's National Estuary Program (NEP).

7. To help Delaware's Center for the Inland Bays increase public involvement.

8. To transfer lessons and encourage Virginia's participation in a Delmarva coastal bays coalition.

9. To use a conference report/summary to help communicate stakeholder views to decisionmakers.

10. To establish next steps: Where do we go from here?

It was understood that these goals were very ambitious and that this conference would open the door to future conferences, meetings and workshops — locally, Delmarva-wide and state-by-state. Future activities are now being determined in large part by citizen input to a pre-conference questionnaire (see page 28), by the 83 (31 percent) evaluation forms that were turned in at the conference (see Appendix B), and the questions raised during the conference (see Appendix C).

PREFACE

The appropriate citation for this report is:

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ACKNOWLEDGMENTS

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Rick Johnstone, Delmarva Power

Dr. Frederick Kutz, U.S. Environmental Protection Agency

Dr. Kent Price, Delaware Center for the Inland Bays

Marsha Ramsay, Assateague Coastal Trust

Gwynne Schultz, Maryland Department of Natural Resources

CONFERENCE DONORS

Delmarva Power and Light

Maryland Department of Natural Resources
(through grants from the National Oceanic and Atmospheric Administration
and the U.S. Environmental Protection Agency)

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Northampton County, VA

South Moon Under

Delaware Center for the Inland Bays

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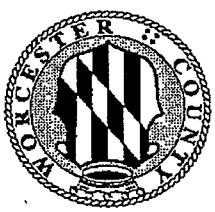

Worcester County, MD

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AGENDA

Delmarva's Coastal Bay Watersheds: Not Yet "Up The Creek"

A Conference on Ecology and Economy

March 8-9, 1996
Carousel Hotel
Ocean City, MD

Friday, March 8th

12:30 Registration

12:55 *Call to Order and Introductions*: **Marsha Ramsay**, President, Assateague Coastal Trust

1:00 *Welcome*: **Roland "Fish" Powell**, Mayor, Ocean City and **James Barrett**, President, Board of Worcester County Commissioners

1:05 *Remarks and Introduction of Keynote Speaker*: **W. Michael McCabe,** EPA Regional Administrator

1:10 *A Framework for Landscape Planning: Alternative Futures for Monroe County, PA*: **Dr. Carl Steinitz**, Alexander and Victoria Wiley Professor of Landscape Architecture and Planning, Harvard Graduate School of Design

2:00 PANEL DISCUSSION: CHANGING CONDITIONS IN THE DELMARVA COASTAL BAY WATERSHEDS: LINKING PEOPLE, ECONOMICS AND ENVIRONMENT

Facilitator: **Dr. Kent Price**, Chair, Center for the Inland Bays

Worcester County, MD: **Phil Hager**, Worcester County Planning Department

Sussex County, DE: **Robert Stickels**, Sussex County Administrator

Accomack-Northampton Planning District Commission: **James McGowan**, Planner

2:45 Discussion Facilitator: **Dr. Kent Price**

3:00 WHAT DO STAKEHOLDERS PERCEIVE AS THE MOST CHALLENGING ECONOMIC/ENVIRONMENTAL ISSUES?

Facilitator: **Marsha Ramsay**, Assateague Coastal Trust

- *Report on Pre-Conference Questionnaire on Public Perceptions:* **James M. Falk**, University of Delaware, Sea Grant Marine Advisory Service

- *Breakout Groups to Develop a Common Vision for Achieving Both Healthy Economy and Environment, Focusing on Specific Coastal Issues:*

1. Tourism and Recreation
2. Residential Growth and Development
3. Fisheries, Shellfisheries, Aquaculture
4. Agriculture: Poultry, Crops and Forestry

Facilitators and Recorders:

Dr. David Goshorn	Eric Walbeck
Kathleen Ellett	Stacey Marek
Carl Zimmerman	Abigail Lambert
Ilia Feher	Vivian Newman
Jeanne Lynch	Pat Campbell-White
Grace Pierce-Beck	Phil Hager

5:30 BUFFET DINNER

6:15 SUSTAINABLE DEVELOPMENT: A BALANCING ACT

Introduction of Guest Speaker: **Dr. Warren Flint**, Executive Director, The Eastern Shore Institute

Sustainable Development: A Framework for a New Century **Molly Harriss Olson**, Executive Director, President's Council on Sustainable Development

Discussion Facilitator: **Dr. Warren Flint**

7:00 REPORTS FROM BREAKOUT GROUPS

Facilitator: **Marsha Ramsay**

8:00 SOCIAL HOUR AND EXHIBITS

Saturday, March 9th

8:30 Coffee/Refreshments

8:45 RECAP OF FRIDAY: **Geraldine Bachman**, Executive Director, Lower Eastern Shore Heritage Committee

9:00 WHAT IS THE ENVIRONMENTAL AND ECONOMIC STATUS OF THE COASTAL BAYS AND THEIR WATERSHEDS?

Facilitator: **Gwynne Schultz**, Director, Coastal Zone Management Division, MD Department of Natural Resources

Environmental Health of the Delmarva Coastal Bays and Their Watersheds: **Dr. Frederick Kutz**, EPA Region III

Resource Experts: **Dr. Rob Magnien**, MD DNR; **Dr. Kent Price**, U DE; **John Maxted**, DNREC; **Barry Truitt**, The Nature Conservancy; **Dr. Rich Eskin**, MDE

Economic Status of Fisheries and Aquaculture: **John Dunnigan,** Executive Director, Atlantic States Marine Fisheries Commission

Resource Experts: **Michael Pierson**, Cherrystone Aquafarms; **Bruce McGuigan**, Captain Mack's Bait and Tackle; **Tom Smith**, commercial fisherman; **Jim Casey**, MD DNR; **Steve Beaston**, Beaston Marina; **Mark Homer**, MD DNR

Delmarva's Tourism Industry: **Lisa Challenger**, Worcester Tourism

Resource Experts: **Jim Falk**, U DE; **John Schroer**, Chincoteague National Wildlife Refuge; **Mark Koenings**, Assateague Island National Seashore

Agriculture and Forestry: **John Tarburton**, Secretary, DE Department of Agriculture

Resource Experts: **Bill Satterfield**, DPI; **W. Simpson Dunahoo**, poultry farmer; **Sam Dyke**, Glatfelter Pulpwood; **Chris Lewis**, Lower Shore Land Trust

9:55 Break to Develop Questions

10:10 Discussion Facilitator: **Gwynne Schultz**

11:00 MODELS FOR ADDRESSING COASTAL BAYS ISSUES: WHERE DO WE GO FROM HERE?

Facilitator: **Rick Johnstone**, Delmarva Power

Regional Perspectives on Coastal Bays Issues: **W. Michael McCabe**, Administrator, EPA Region III

National Estuary Program in Maryland: **Gwynne Schultz**, Director, Coastal Zone Management Division, Maryland Department of Natural Resources

Delaware Center for the Inland Bays: **Dr. Bruce Richards**, Executive Director, and **Dr. Kent Price**, Chair

Virginia's Regional Approach to Sustainability: Balancing Environment and Economy: **Dr. Warren Flint**, Executive Director, The Eastern Shore Institute

12:15 BREAKOUT GROUPS TO DISCUSS MODELS AND THEIR APPLICATIONS TO STATE AND LOCAL STRATEGIES:

(AFTER PICKING UP BOX LUNCHES)

Maryland: Facilitator: **Gwynne Schultz**

Delaware: Facilitator: **Dr. Bruce Richards**

Virginia: Facilitator: **Dr. Warren Flint**

1:20 FULL CONFERENCE RECONVENES TO IDENTIFY ISSUES AND STRATEGIES BEST ADDRESSED BY A DELMARVA-WIDE APPROACH

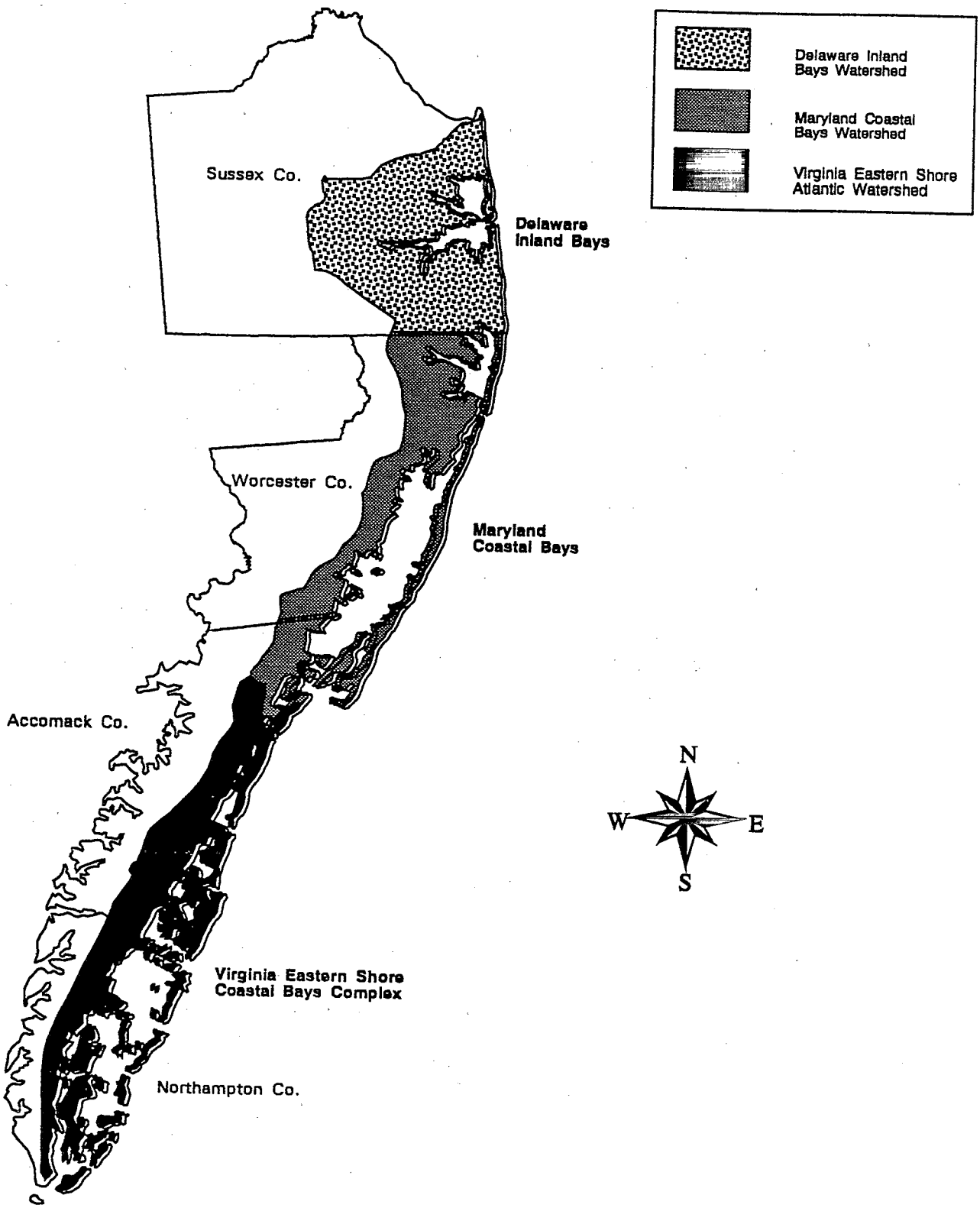
Facilitator: **Rick Johnstone**

2:15 CONFERENCE FOLLOW UP: **Michael McCabe**

PRESS CONFERENCE

All officials are invited to participate with conference planning subcommittee.

MAJOR WATERSHEDS AND BAYS OF THE DELMARVA PENINSULA'S ATLANTIC COASTLINE



CALL TO ORDER AND INTRODUCTIONS

Marsha Ramsay
President, Assateague Coastal Trust

On behalf of the 30 sponsors of this conference, welcome. I hope everyone is wearing a name tag so that we can become familiar with one another — and it's our meal ticket.

Please take a moment to look in your packets to find the list of attendees. Those people with asterisks next to their names represent our sponsors.

I would like to introduce the members of the agenda planning committee — those with double asterisks — with whom since August I have been in constant communication to put this conference together:

- Dr. Warren Flint, an ecology and coastal ecosystem scientist and Executive Director of the Eastern Shore Institute.
- Dr. Rick Kutz, a scientist from EPA's Office of Research and Development assigned to the Region III office in Annapolis.
- Rick Johnstone, Supervisor of Forestry for Delmarva Power and Light Company, serves on many state boards and public interest groups, and chairs MD's Wicomico Forestry Board.
- Dr. Kent Price is Associate Professor in the Graduate College of Marine Studies and Director of the Sea Grant Advisory Service at the University of Delaware. He chairs the Delaware Center for the Inland Bays and its Science and Technical Advisory Committee.
- Gwynne Schultz is Director of the Coastal Zone Management Division at the Maryland Department of Natural Resources, and is responsible for the start up of Maryland's National Estuary Program.

I also want to thank two Assateague Coastal Trust members: Eric Walbeck, who handled conference registration and logistics, and Terry Thompson, who coordinated the exhibits. Let's also thank Nancy Howard for coordinating publicity. Nancy is with the Maryland Department of Natural Resources. And also, Kathy Ellett and Dave Goshorn, both with the MD DNR.

In your packets is a list of conference donors to whom we extend our heartfelt thanks. I would also like to call your attention to the evaluation form in your packets. Please fill them out and put them on the registration desk before you leave tomorrow. We really want to know how you feel about this conference and where you want to go from here.

This conference is a stakeholders' conference. A stakeholder is anyone and everyone who has an interest in, or cares about, the Delmarva Coastal Bays Watershed area. The purpose of this conference is to provide a forum for all stakeholders — citizens, elected and appointed officials, and public and special interest representatives — to discuss the economic and

environmental state of the Delmarva Coastal Bay Watersheds, and to begin to formulate strategies that will integrate economic, environmental, scientific and social considerations toward achieving a sustainable future.

This is a stakeholders' conference — undoubtedly, one of many to come as we work to ensure both a robust economy and a healthy environment.

The meeting will begin with a few words of welcome from our host community.

WELCOME

James Barrett
Worcester County Board of Commissioners

Good afternoon. Welcome to Ocean City and welcome to Worcester County. Mayor Fish Powell couldn't make it here today, but I would also like to welcome you here from him.

Years ago, I used to fish a lot. There were a lot of fish in the bay. This conference today is well overdue. As President of the Worcester County Board of Commissioners, I want to challenge each and every one of you to work together as a team to help our inland bays. When I say "work together as a team", I am talking about many different groups of people: builders, government officials of all the counties, town officials, boaters, land owners, DNR state officials, developers, EPA and other federal agencies, environmentalists, farmers, and citizens. This should be a partnership of how to clean up the bay. Those fish that I caught years ago are just not there because the plant life is dead in the bay.

So we need this partnership very much. It's hard work; you can talk to a lot of people and they can tell you all of the problems, but they do not have the solutions. What we need to do is not talk about the problems, but get to work and get them fixed. The greatest thing that we can leave to our children is the natural resources in this land that we have. The next generation and our generation can do that. And you people can help do that.

Thank you very much and welcome to Ocean City.

OPENING REMARKS

W. Michael McCabe
Regional Administrator, U.S. EPA Region III

W. Michael McCabe served as a top aide to Senator Joe Biden and as Staff Director of the House Energy Conservation and Power Subcommittee and the Congressional Environmental and Energy Study Conference. Mike is currently the EPA Region III Regional Administrator and is responsible for implementing environmental protection programs in PA, DE, MD, VA, WV, and DC. He is originally from Delaware.

Welcome on behalf of EPA Region III. Entire areas of the coastal bays fall within our area of responsibility and we are delighted with the amount of interest shown in the future of the coastal bays as evidenced by the large attendance here today. Your attendance at this conference demonstrates that the American people are interested in moving forward with the environmental progress made over the last 25 years.

The coastal bays of Delaware, Maryland and Virginia are an important ecological and economic resource whose physical characteristics and location make them particularly vulnerable to the effects of pollutants. These estuarine bays are affected by pollutants that come from the land as well as stresses that come from the ocean. Atmospheric deposition of pollutants represents another source of stress. About 90 percent of commercial fish, crabs and shellfish depend in some way on estuaries and associated salt marshes for their livelihood.

This is an important conference for us here in Region III for several reasons:

- First, this conference is a prime example of our ability to use scientific information to guide and evaluate our environmental decision-making. The motivation for holding this conference is largely based on a cooperative Federal and State study which you will hear more about later in the conference. Having environmental information upon which to guide management decisions is a major objective of my tenure as the Regional Administrator.

- Secondly, this conference also represents our initiative to involve community stakeholders in our resource management. Considering both the socio-economic and environmental issues in our decision-making is an absolute necessity as we move into the next century of environmental protection.

- Thirdly, this endeavor provides us with a timely illustration of the need for Regional involvement. The areas of these coastal bays crosses the boundaries of three States. Our efforts to effectively manage these bays require the full participation of all three States coordinated by a Regional presence.

I am here for the entire conference; my primary role will be as a listener and learner. I am not here today to announce new regulations or enforcement actions. I encourage this group over the next 24 hours with beginning to find new and innovative ways of addressing these issues that will be reasonable to all stakeholders. The diversity of this audience will provide many different perspectives. These perspectives will need to be considered as we move ahead to face the variety of issues associated with our protection of both these resources and our way of life.

A FRAMEWORK FOR THEORY AND PRACTICE IN LANDSCAPE PLANNING: ALTERNATIVE FUTURES FOR MONROE COUNTY

Carl Steinitz, Author
Department of Landscape Architecture
Harvard University Graduate School of Design
Cambridge, MA

Madis Pihlak, Presenter
Department of Horticulture & Landscape Architecture
University of Maryland
College Park, MD

Due to inclement weather, Dr. Carl Steinitz, was unable to attend the conference. In his place, Madis Pihlak, ASLA, AICP, delivered the presentation. Mr. Pihlak is an Associate Professor and Program Coordinator in the Department of Horticulture and Landscape Architecture at the University of Maryland. He has been involved in workshops with stakeholders and has researched the impacts of actions and inactions on communities which have similar environmental problems.

In 1990, after almost 25 years of applying GIS to many projects, I came to the realization that there was a common structure to this work, and I wrote a short paper entitled "A Framework for Theory (Steinitz 1990). Over the past three years, this framework has become the primary organizational basis of my teaching, research and projects. In this talk, I will give a brief description of this framework and show how it was applied to a recent project.

Six Questions in Search of An Answer

My proposed framework identifies six types of *questions*. Each can be considered a level of inquiry relating to a *theory-driven modeling type*. The models on which we rely must be based in usable and presumed-to-be-valid theory. They each require the management of information, and GIS can be applied—albeit differently—in each type of model.

Project managers and researchers will work through the framework at least three times in any project: first, in defining the context and scope of the project; second (and in reverse order) in specifying the project methodology; and third, in carrying the project forward to its conclusion. The six questions with their associated modeling types are listed in the usual order for initially defining the context of a landscape planning study.

I. *How should the state of the landscape be described: in content, boundaries, space, and time?*

This level of inquiry leads to *representation models.*

II. *How does the landscape operate? What are the functional and structural relationships among its elements?*

This level of inquiry leads to *process models.*

III. *Is the current landscape functioning well?*

The metrics of judgment (whether of health, beauty, cost, nutrient flow or user satisfaction) lead to *evaluation models.*

IV. *How might the landscape be altered: by what actions, where, and when?*

This is directly related to I, above, in that both are data; vocabulary and syntax.

This 4th level of inquiry leads to *change models.* At least two important types of change should be considered: changes brought about by current trends and changes caused by implementable actions, such as plans, investments, and regulations.

V. *What predictable differences might the changes cause?*

This 5th level of inquiry shapes *impact models,* in which the process models (II)) are used to simulate change. This is directly related to II, above, in that both are based on information; on predictive theory

VI. *Should the landscape be changed? How is a comparative evaluation of the impacts of alternative changes to be made?*

This is directly related to III, above, in that both are based on knowledge; on cultural values.

This sixth level of inquiry leads to *decision models.*

Implementation could be considered another level, but this framework treats it as a forward-in-time feedback to level I, the creation of a changed representation model.

Although the six levels have been presented in the order in which they are normally recognized, I believe that it is more helpful to consider them in reverse order, both as a more effective way of organizing a landscape-planning study and specifying its method, which I consider the key strategic phase, and as a more effective educational approach. The methods of a landscape planning study should be organized and specified *upwards* through the levels of inquiry, with each level defining its necessary contributing products from the models next above in the framework. This is how it works in practice:

VI To be able to decide to propose or to propose or to make a change, one needs to know how to compare the alternatives.

V To be able to compare alternatives, one needs to predict their impacts from having simulated changes.

IV To be able to simulate change, one needs to specify (or design) the changes to be simulated.

III To be able to specify potential changes (if any), one needs to evaluate the current conditions.

II To be able to evaluate the landscape, one needs to understand how it works.

I To understand how it works, one needs representational schema to describe it. (This has been the major GIS role.)

Then, in order to be effective and efficient, a landscape planning project should progress *downward* at least once through each level of inquiry, applying the appropriate modeling types: *representation, process, evaluation, change, impact* and *decision.* At the extreme, two decisions present themselves: *no* and *yes.* A *no* implies a backward *feedback* loop and the need to alter a prior level. All six levels can be the focus of feedback; "redesign" and sensitivity analysis are frequently applied feedback strategies at Level IV.

A *contingent yes* decision (still a no) may also trigger a shift in the scale or size or time of the study. (An example is the decision to locate a

highway corridor made on the basis of a more detailed alignment analysis). In a scale shift, the study will again proceed through the six levels of the framework as described above.

A project should normally continue until it achieves a positive, *yes*, decision. (In my area of application, a *do not build* conclusion can be a positive decision). A *yes* decision implies *implementation* and (one assumes) a forward-in-time change to new representation models.

While the framework looks orderly and sequential, the line through any project is not a smooth path: it has false starts, dead ends, serendipitous discoveries—but the line has to pass through the questions and models of the framework as I have described it before a *yes* can be achieved.

The framework has been the basis for the organization of several regional studies and is applied in this talk to a study of the future of Monroe County.

References

Steinitz, C. "A Framework for Theory Applicable to the Education of Landscape Architects (and Other Environmental Design Professionals)," *Landscape Journal*, October 1990.

SUSSEX COUNTY, DE

Robert L. Stickels
Sussex County Administrator

Robert Stickels is the Sussex County Administrator. Mr. Stickels has a strong background in business and government management. He has been the Town Manager of Georgetown, DE, and Deputy County Administrator for Sussex County from 1988 to the present. He has also been a member of the Delmarva Advisory Council, the Executive Council of the Delaware Inland Bays Estuary Program, the Delaware Private Industry Council, as well as other organizations.

Sussex County's portion of the Delmarva Coastal Bays has changed dramatically since the 1950's. Geographically, Sussex County is one of the largest counties east of the Mississippi. This has resulted in a diversified economy. In the 1950's and 1960's, the County's primary industry was agriculture. In the 1970's, the economy started to diversify with tourism becoming the second largest industry in the County. The total County population in 1950 was 61,360; in 1990 it was 113,226. The entire population impact cannot be measured totally on census figures. Census figures do not include summer and part-time population. It is estimated that 5.4 Million people visit our County's beaches annually. This has been a dramatic change from the 1950's and 1960's, when most of the beach resorts closed at Labor Day. Sussex County beaches are located within a four hour drive of one-third of the population of the United States.

To get a true figure on how much Sussex County has grown, you can also look at the assessment base of the County. This gives an indication of the number of year-round residential homes, seasonal homes, and commercial building that has taken place in the Inland Bays Watershed. Property assessment for the Inland Bays Watershed area was $70,114,444 in 1960; in 1990 the assessment grew to $892,322,377 for the same area. This is an increase of 1,172% in four decades. As we look ahead to the year 2020, populations are estimated to increase an additional 31.59% for our County.

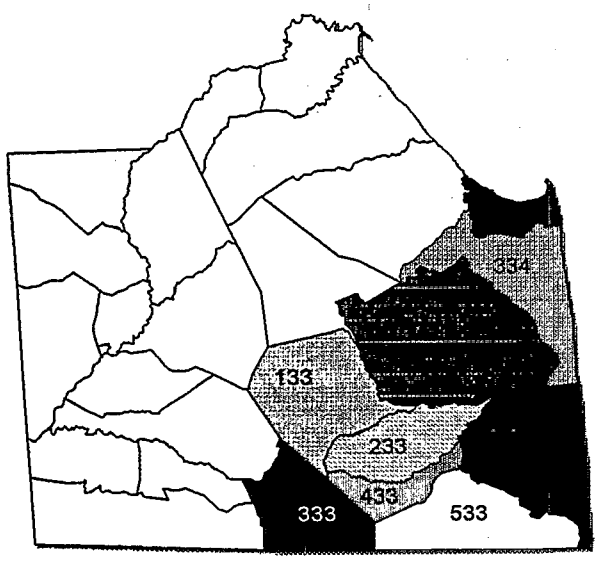
Unfortunately, rules and regulations protecting the environment and the welfare of the residents and visitors of Sussex County did not develop as quickly as our population and buildings increased. Public acceptance of regulations has been very slow. In the 1960's, it was the attitude that if you owned the property, you could do what you want with it. The 1970's led to development of zoning ordinances and regulations. A major breakthrough in the 1970's was the adoption of the Coastal Zone Act. It has been stated that former Governor Russell W. Peterson, who was the author of this legislation, led a major breakthrough that pointed the way for other states and the federal government to preserve priceless coastline resources. In the 1980's, the Sussex County Council realized that density should be reduced as well as the heights of buildings if Sussex County coastlines were to avoid duplicating Ocean City, Maryland.

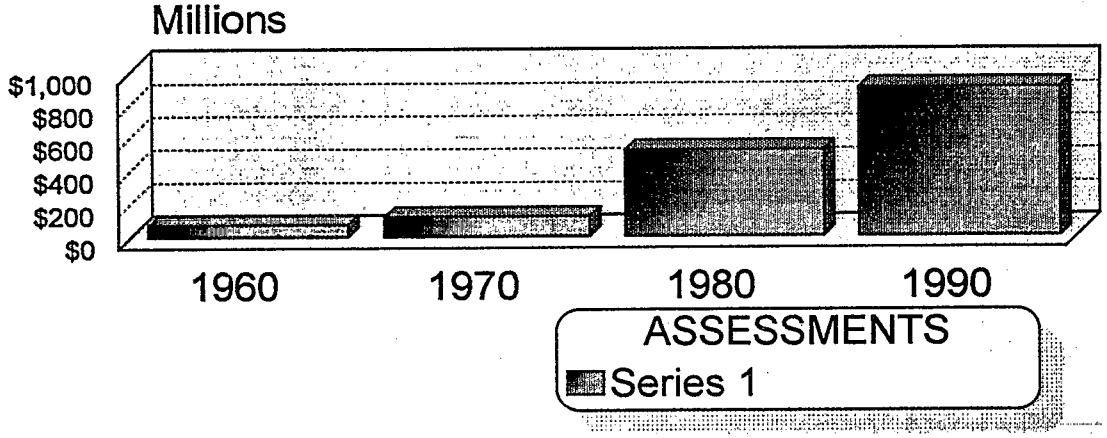
Over the decades, we have learned that it is not enough just to have zoning ordinances if we are going to protect the environment and the quality of life that has been expected in Sussex County. The infrastructure must be in place. This infrastructure should provide protection for water quality. With the completion of the West Rehoboth Sewer District, a $70 Million project, all homes located along the Atlantic Ocean have the capability of being connected to central wastewater. This is a vast improvement from the 1960's, when on holiday weekends, residents actually had wastewater flowing in the streets. The County's South Coastal Area Planning Study lays out new sewer districts in the Inland Bays area. Over 5,000 users have been connected already to Inland Bays central sewer systems. The County has plans to spend over $25 million over the next five years to connect more homes.

Creation of central water and sewer districts is not the entire answer for the protection of the Coastal Bays. Reduction in density and greater setbacks from wetlands are also important. However, public acceptance of additional regulations is not always easily obtained. It has been my experience that a majority of the people living in the Coastal Bays area are only here for a short period of time. Many people only live in the area for a three to seven year period. People who purchase summer homes may only wish to visit the area for a three to five year period before their recreational interests change to other areas. Retirees who move to the area are usually on a fixed income and wish to take advantage of Sussex County's low tax base. Many of these people are unable to pay what is needed to protect the bays. The difficulty lies in trying to come up with long-term cost effective solutions.

I hope I do not sound like a doomsayer. I do believe we are going in the right direction. Sussex Countians are willing to do their share to protect Delmarva Coastal Bays. There is evidence that water quality is already improving. If we are going to continue to make improvements, we are going to need consistency in federal, state and local regulations. Federal and state agencies cannot expect local governments to be more restrictive than their own requirements. If the state feels that there should be property line setbacks from state wetlands, local ordinances should be supported with state law. Local governments cannot be expected to develop ordinances that restrict building in federal wetlands if the federal government will still issue permits to allow for construction. Consistency in rules and regulations between the three levels of government is necessary. Once this consistency is developed, we will have to obtain public acceptance, political fortitude and administrative wisdom if we wish to see the Delmarva area continue to be a desirable place to live and vacation.

SUSSEX COUNTY, DELAWARE
ASSESSMENT TOTALS

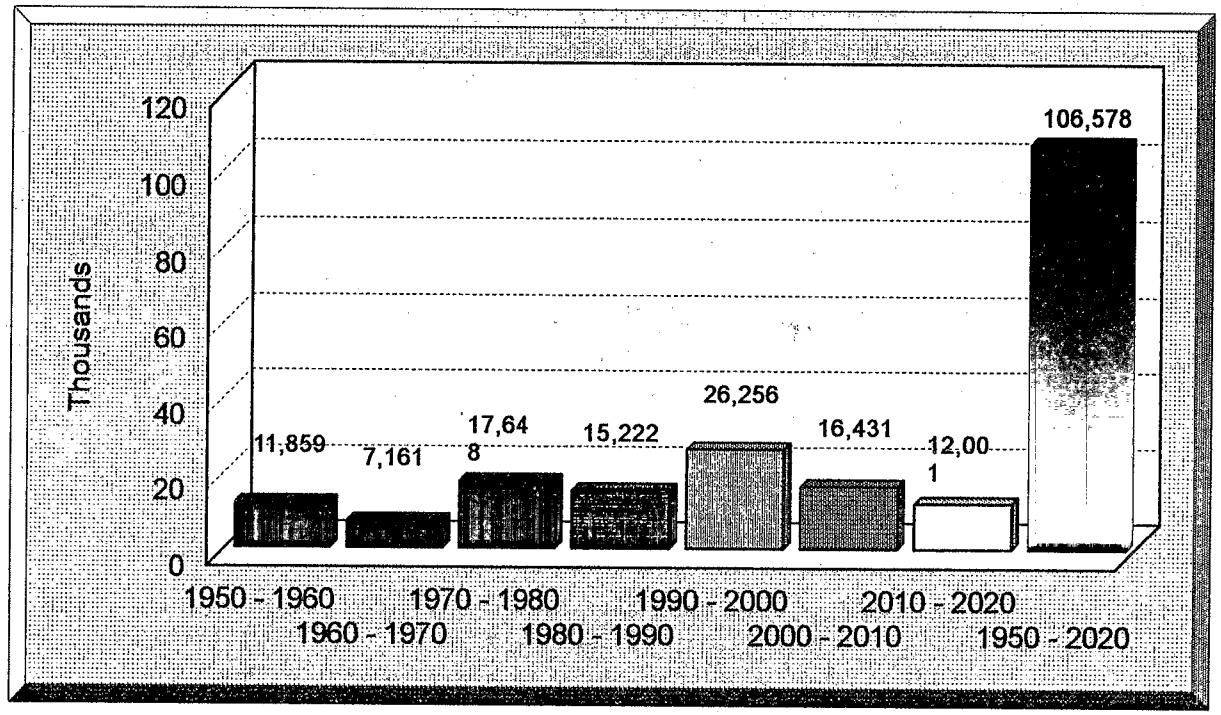




Year	133	233	333	533	134	334	335
1960 Totals	[illegible]	$5,407,890	$1,182,830	$6,173,620	[illegible]	$24,764,704	$7,277,531
1970 Totals	[illegible]	$12,744,969	$1,859,893	$8,876,265	[illegible]	$39,257,315	$10,240,461
1980 Totals	[illegible]	$30,469,664	$4,749,773	$35,506,655	[illegible]	$163,649,159	$33,727,311
1990 Totals	[illegible]	$39,735,069	$6,596,117	$68,003,864	[illegible]	$261,674,060	$61,434,831

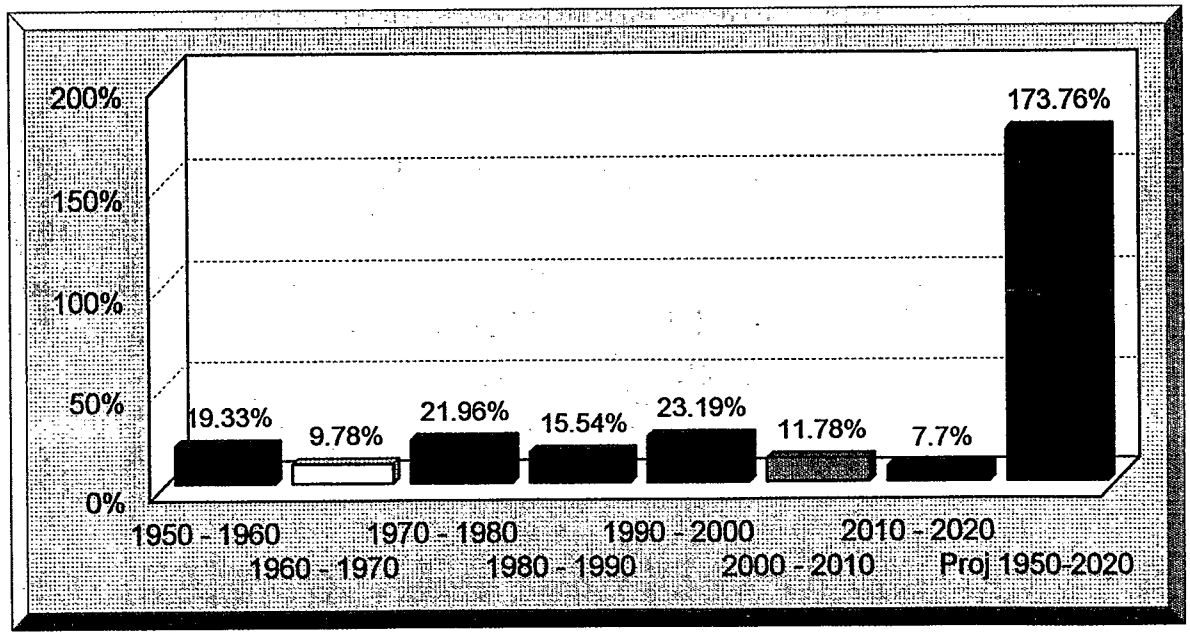
SUSSEX COUNTY POPULATION INCREASES

1950 - 2020



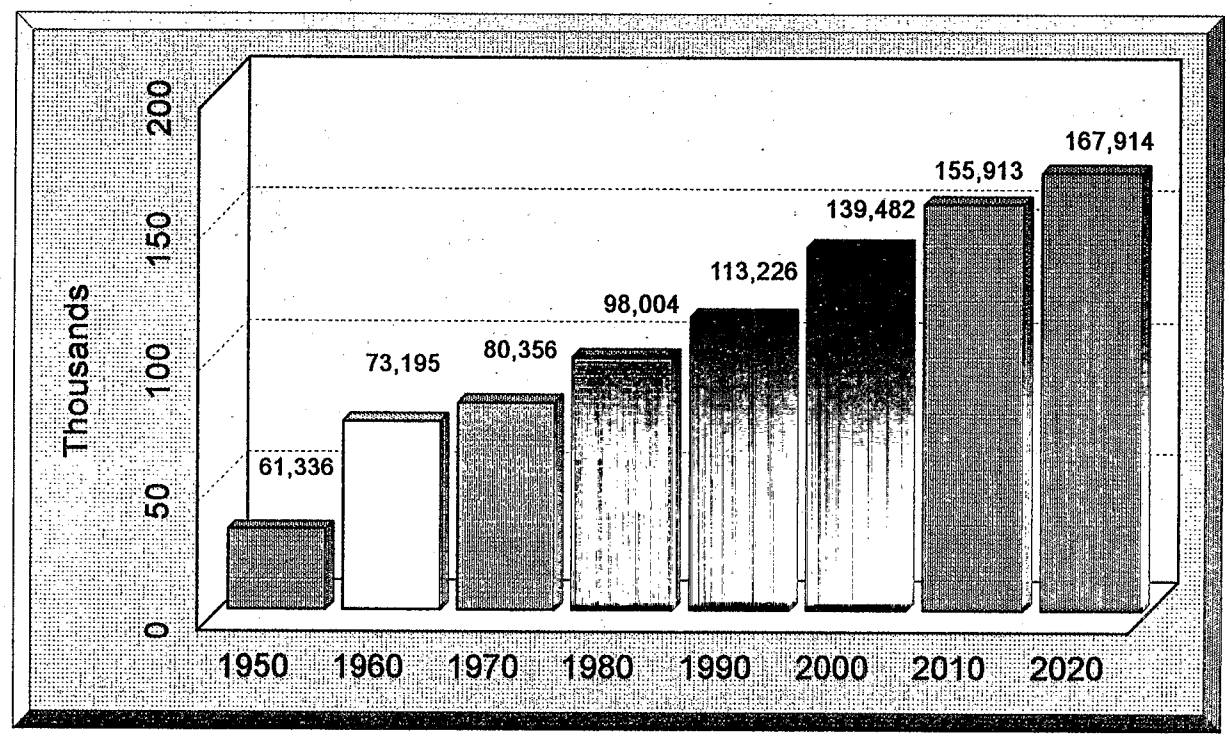
SUSSEX COUNTY POPULATION CHANGE PERCENTAGE

1950 - 2020



SUSSEX COUNTY POPULATION

1950 - 2020



WORCESTER COUNTY, MD

Phil Hager
Worcester County Planning Department

Phil Hager is a graduate of Frostburg State University and holds a Master's degree in Intergovernmental Policy Analysis from The George Washington University School of Government and Business Administration. Mr. Hager previously worked for the Maryland General Assembly and on Capitol Hill for the United States Senate. For the past 7 years, he has been actively involved in land use planning and demography. In that capacity, he has worked for the Maryland National Capitol Park and Planning Commission, and as a consultant for the telecommunications industry. Since August 1995, he has been employed as a Planner for Worcester County Maryland.

The following is a descriptive analysis of Worcester County, Maryland. In a moment, I will be delivering a brief historical overview, a series of facts and figures detailing Worcester's present conditions, and a cursory analysis for our future. Some of these demographic data are contained in the tables on the blue sheets that have been distributed, or are in the process of being distributed.

In addition to increasing our overall awareness relative to local demographic conditions, it is also my desire to go a little bit beyond the statistics and attempt to offer interpretive analysis. In short, we will look at what has been happening, what is currently happening, what we expect to happen, as well as why. This may be helpful to us as we collectively strive to address the issues before this conference.

Worcester County is Maryland's eastern-most jurisdiction. Additionally, it is the only Maryland subdivision bordering the Atlantic Ocean. Nearly 20 percent of the County experiences some form of tidal influence. A ridge extending the length of the County running roughly northeast to southwest divides the two major watersheds. The land areas on the west side of this feature flow to the Pocomoke and eventually to the Bay. Areas to the east drain into one of the four major inland bays systems. With the exception of western Garrett County, Worcester County is the only Maryland jurisdiction whose entire waters do not flow into the Chesapeake Bay.

Archaeologists believe that human contact with what is now Worcester County has been relatively brief and notably recent. Native Americans did not begin to settle in this area until sometime in the Twelfth Century. These American Indians were Worcester's first immigrants. Historians believe that there were never more than approximately 300 Native Americans in permanent residence here, but that significant numbers passed through the area or rested here briefly while enroute to other destinations. I suppose these were Worcester County's first vacationers.

Early native settlements were located along the coastal plain and adjacent to the waterway systems; primarily, this translates into the Pocomoke River, Nassawango Creek, and the Coastal Bays and their tributaries. They hunted the rich forests, fished the streams, rivers and bays, and they began to cultivate the fertile soils.

The first European settlers moved into the area through what is now Virginia in the latter portion

of the 1600's. Then, as today, the region was geographically remote; consequently, the area was slow in growing. The primary activities of these peoples were little different from those of the Native Americans: principally hunting, fishing, agriculture, and similar extractive activities.

The County grew slowly through the 1700's and into the 1800's. As there was a surplus of available land, and waterways were of significant importance, the early populations tended to be well dispersed. What concentrations that existed, were primarily aligned along the transportation corridors that these waterways represented. It was not until the 1800's that people began to congregate in towns and villages in appreciable numbers.

The advent of steam and railroad spurred some economic and population growth, however, the area was never the scene of a massive influx of new residents. The economy and the population maintained remarkable stability through this era.

Despite many changes and innovations, Agriculture's importance as a mainstay of the local economy has remained undiminished. Historically, this activity has been the primary source of income and employment. Although of slightly less importance from an employment standpoint today, farming and related activities continue to determine Worcester's economic well-being.

Most of the County's most significant growth occurred after World War II. The role of the "baby boom", notwithstanding, it is no accident that this transformation occurred in conjunction with the expansion of this nation's highway and railway systems during the 1950's. The most notable alterations came about as a consequence of the Bay Bridge construction. This advent forged a closer relationship between the Eastern Shore and the balance of the state. The people of Southern Delmarva began to focus on Baltimore and Washington, and the markets in Delaware and points north declined in importance. These transportation improvements provided a tremendous boost for agricultural interests. It also had another effect. It began an unprecedented wave of tourism.

Today, agriculture and tourism share the spotlight, but other forces are at work as well. A tremendous proportion of Worcester's newest wave of immigrants are over the age of 55. Worcester County is becoming a retirement locale for increasingly larger numbers of people. Its low piggyback tax is also attracting large numbers of second home purchasers and part time residents. This is a benefit to the construction and real estate industries. The vast majority of these new citizens are establishing residence within the Coastal Bays' Watersheds. The water access, the beaches, the gulf courses, and the recreational opportunities available to these residents is a tremendous selling point.

As can be seen from the data in the handout, Worcester County is beginning to grow extremely rapidly. The County's growth from 1940 to 1969 was slow, but consistent. From 1970 onward, however, the rate of growth has increased markedly. From a statewide perspective, or when compared to East Coast regional standards, Worcester County with its current population of 40,300 is still comfortably rural. But when compared to historical trends the expansion is incredible. In 1940, the population was 21,245. In less than six decades, the population has nearly doubled. It took nearly three centuries to reach the 1940 total. Current projections indicate that we will achieve that number again by 2030. In less than 35 years, we will have tripled the 1940 figure.

This rapid growth is not consistent with this jurisdiction's history, nor is it in proportion to the growth being experienced by other Eastern Shore counties. This is vividly illustrated in the table that compares Worcester's population growth rate with the combined growth rates for the four Lower Shore Counties. These statistics suggest that there is something unique or different about Worcester County. Many would argue that it is the proximity to the Ocean and other water resources that serves as such a draw. The ramifications of that assumption are a double-edged sword. On one hand, it makes the importance of the bays and their watersheds more of a priority from an economic standpoint. Conversely, preservation

issues and natural resource health take on a greater level of importance.

The second table emphasizes the importance of that assessment. Clearly, these growth trends will continue through the foreseeable future. In the coming decades, it seems that Worcester County will once again be on the receiving end of a disproportionate population expansion.

There are two additional factors that should be of significant interest to any demographic discussions relative to the bays. First, although the growth projections and the existing trends for Worcester County are noteworthy, they pale in consequence when you look at the distribution of people within the County. 1990 Census figures show that 62.2 percent of the County lived within the watersheds.

Projections suggest that this percentage will increase both in number and in speed. Nearly three-fourths of the County could live in the Coastal Bays Watersheds by the year 2020. The second item of interest is that these numbers fail to consider seasonal population. These trends reflect only permanent year-round residents. During the Summer, Worcester's population can be measured in millions. For several months of the year, the coastal bays infrastructure is faced with tasks approaching the same magnitude as the large urban centers that are the sources of these tourists.

Of equal or greater importance as "how much?" is "from what source?". Generally, a significant portion of any population increase can be attributed to natural growth (ie., total births outnumbering total deaths). This is true with Worcester County, but it cannot account for the explosive nature of this population rise. As previously stated, in-migration is the culprit. Voluntary re-location is the single greatest factor in Worcester's continuing growth trends. Since 1990, it has accounted for more than 71 percent of the County's growth. From 1980 to 1990, in-migration represented 120 percent of the total increase. During this decade, the County grew by 4,139 persons, and 4,977 people moved to Worcester County. This means that at least 838 County residents who were residents before 1980, actually moved out of the County by 1990.

One final set of data is appropriate for this forum. Since 1987, 15,887 acres of agricultural land has been converted from active farming to some other use. That represents a loss of nearly 13 percent. Simultaneously, the total number of farms has declined by nearly one-fourth, from 631 to 474. It would be tempting to conclude that this is due to development, but that assumption would not be entirely true. The majority of it is probably due to conversion for residential purposes, but some of it can be attributed to other factors, not the least of which is the conditions under which we mandate that agricultural concerns operate. Another possible explanation is the trend for assimilation of small farms by larger agricultural operations.

Because of time constraints, I have had to cover a great many variables in a short period of time. It is probably not necessary that we remember each of the statistics which I have cited here. It is more important that we recognize that Worcester County and the Coastal Bays area is undergoing a metamorphosis; it is in a constant state of change. It has been that way for centuries. What is now different is the speed and degree of those changes.

People sometimes make the mistake of seeing nature as static or stopped in time. This is probably not the case with most things, and it is definitely not the case with Worcester County and the Coastal Bays environment. It may help us to remember that the entire Delmarva Peninsula was created by change, and it is still changing, growing and evolving. The single most important and dominant factor in that evolution has been the role that man has played in it. That is why it is most important to note that this factor is also growing, changing and evolving. And the speed with which it is taking place is increasing . . . at a rate approaching geometric proportion.

COMPARATIVE HISTORICAL POPULATION GROWTH RATES

	STATE	WORCESTER	LESR[1]
1990-95	5.6 Percent	15.1 Percent	6.9 Percent
1980-90	13.3 Percent	13.4 Percent	12.3 Percent
1970-80	7.5 Percent	26.4 Percent	14.4 Percent
1960-70	26.5 Percent	2.9 Percent	4.0 Percent
1950-60	32.3 Percent	2.5 Percent	9.6 Percent
1940-50	28.7 Percent	8.9 Percent	6.3 Percent

Since 1940, Worcester County has experienced an annual average growth rate of 1.3 percent. During the same time period, the State and LESR grew by 3.3 and 1.1 percent, respectively. Since 1990, however, the state has had an annual growth rate of only 1.1 percent, the LESR has remained somewhat steady at 1.4 percent, while Worcester County more than doubled that rate to slightly over 3.0 percent. This means that Worcester County has been growing twice as fast as the rest of the Lower Shore, and more than two and one-half as fast as the State, since 1990.

COMPARATIVE RATE OF PROJECTED POPULATION GROWTH

	WORCESTER	LESR	STATE
1990-95	15.1 Percent	6.9 Percent	5.6 Percent
1995-00	7.5 Percent	5.2 Percent	5.3 Percent
2000-05	6.2 Percent	4.5 Percent	4.4 Percent
2005-10	4.8 Percent	4.0 Percent	3.5 Percent
2010-15	3.5 Percent	3.1 Percent	3.4 Percent
2015-20	3.0 Percent	2.6 Percent	3.2 Percent

If the projections for the thirty (30) year period 1990-2020 hold true, the County will experience an absolute growth of nearly 12,000 and a percentage growth rate of 134.2. It is interesting to note, that the County grew by an almost identical amount in the previous thirty (30) year time span (1960-90). This growth translates into a factored increase of 147.6 percent.

1 - LESR: Lower Eastern Shore; includes Dorchester, Somerset, Wicomico and Worcester Counties.

SOURCE: U.S. Bureau of the Census, Maryland Office of Planning, and the Worcester County Department of Planning Permits & Inspections.

THE COASTAL BAYS WATERSHEDS' COMPONENT
(Proportion of Worcester County's Total Population)

	ABSOLUTE	PERCENTAGE
1940	10,832	50.9
1950	11,974	51.7
1960	12,296	51.8
1970	12,898	52.8
1980	18,057	58.5
1990	21,781	62.2
1995	26,526	65.8
2000	29,122	67.4
2010	33,765	68.9
2020	39,447	72.1

By 2020, the portion of Worcester County's population lying within the Coastal Bays Watersheds will approximate the current County total. If these projections hold, the Watershed population component will nearly double in the time period 1990-2020. During the same time span the County is only expected to increase by 56.3 percent.

SOURCE: Estimates and Projections, 1996; The Worcester County Department of Planning Permits & Inpections.

ACCOMACK-NORTHAMPTON PLANNING DISTRICT COMMISSION

James McGowan

James McGowan is Director of Planning at the Accomack-Northampton Planning District Commission, the regional planning commission for the eastern shore of Virginia. As Director of Planning, Mr. McGowan provides coastal resources planning, transportation planning, and technical assistance to 2 counties and 19 incorporated towns along the eastern shore. He also supervises Chesapeake Bay Preservation Act implementation for the 13 eastern shore towns in the Chesapeake Bay watershed. A graduate of the New York State University College at Plattsburgh, Mr. McGowan also holds a Master's degree in Planning from the University of Virginia. Before moving to Virginia, he was a State Park Manager with the New York State Office of Parks, Recreation, and Historic Preservation.

The eastern shore of Virginia is that part of the State which is east of the Chesapeake Bay. The peninsula is about 70 miles long, which is as much coast as the rest of Delmarva coastline. We are, however, a lot different than Maryland and Delaware.

The eastern shore is both on the Chesapeake Bay and the Atlantic Ocean. The peninsula varies from about 15 miles to 5 miles in width, which gives us a very unique geography. We have a lot of waterfront, both bayside and seaside (i.e., the Delmarva coastal bay watershed). One of the major features is Route 13 which runs down the spine of the peninsula and is pretty much the divide between the Chesapeake Bay and the Atlantic Ocean watersheds. The Delmarva coastal bays area comprises the areas to the east, beginning with Assateague Island and Chincoteague Bay. We have 14 barrier islands that run from Assateague Island to the tip. The only island on the coast that is accessible by vehicle is Assateague. This is one of the most significant features of the eastern shore of Virginia; the ocean beaches are not open for development. They are all either owned by the Nature Conservancy or by state and federal agencies.

The population on the eastern shore in 1990 was 44,764; it has gone up slightly since then. In 1950, the population was just over 50,000. It dropped until 1980, and has since gone up slowly. Projections to 2010 actually indicate that we are expected to lose population. While we do not have any hard figures and the net population is not expected to change much, new people are coming in and others are leaving. A lot of retirees come to the shore or build second homes. A lot of young people, however, cannot get jobs and migrate out.

Twenty-six percent of the eastern shore population is below the federal poverty level and the area has an eight percent unemployment rate (as compared to four percent for the rest of the state). So we are an economically disadvantaged area; 2,500 dwellings (or 17 percent of the housing stock) do not have indoor plumbing. This is one of the major issues that we are dealing with. We have a lot of programs to rehabilitate substandard housing and introduce indoor plumbing, but we still have a long way to go.

As far as the economy, in 1991, services were the largest sector of the economy at 22 percent; manufacturing was 18 percent; government was 17 percent; and retail was 14 percent. Fishing and farming only employed 8 percent, but farming involves a lot more than the people who work the land and much of the manufacturing is food processing. As far as industrial expansion possibilities, the poultry industry is expanding (e.g., Tysons and Perdue), vegetable production is increasing (e.g., tomato growers are moving up from Florida, and Accomack County is the largest vegetable producer in Virginia), aquaculture is growing (e.g., clam growers), and tourism is always increasing (Chincoteague is the biggest area for tourism and coastal development, but there is some development all over the shore). One of the new programs is the sustainable development technology industrial park in Cape Charles, which just landed a new employer that is building solar panels. Also, the second home industry is slowly growing. So, we do not expect any major changes, but the potential is there. For example, if the Chesapeake Bay Bridge Tunnel toll is eliminated, there would be an immediate change since there is a $10 toll each way.

As far as land use changes, we do not have a lot of good data. Accomack County now has a GIS system so we are hoping that we can put it into a more useable form. Northampton County does not have a GIS system, but is working towards this. The major factors in development are the local ordinances and future land use plans. A ground water plan prepared a few years ago estimated that the area in the middle of the peninsula, which is the main ground water recharge area, has the potential for 37,000 more dwelling units (there are only 21,000 now). This indicates that there is a tremendous capacity here. Both counties are looking into this situation, with Accomack County updating their plan and Northampton County developing a new zoning ordinance.

In terms of the cost of public actions, while there is not a tremendous amount of growth, there is always the need to build new schools and roads as development occurs. Also, health care is a big issue as the number of retirees increases. In terms of political activity, there is a mix of interests. Local people want jobs and wealthy retirees want to protect the shore. But both groups are thinking about the future.

We are also concerned about transportation and the future of Route 13 and potential impacts on development and preservation efforts. State and federal governments are involved, such as through the Chesapeake Bay Preservation Act, which requires a 100 foot setback along preservation areas. State ground water regulations are in place, and will hopefully be improved. Also, state and federal grants help fund programs.

As far as growing pains, there is a lot of ground water but it has to be managed properly. Industries can cause cones of depression that can affect adjacent water users. The best way to deal with this is to pump water from well fields covering a larger area and store it as public water supplies, but only a few exist. Lack of sewers is a problem, although it can also slow growth. In order to provide for water and sewer to substandard housing, a central system is needed. Also, this will hopefully allow for focused growth and prevent sprawl. Currently, unsuitable soils make it difficult to cluster growth.

Farm loss is also a concern. Although agriculture only employs eight percent of the population, a lot of related businesses depend on it. We are starting to try some new techniques such as open space zoning and cluster development. We need to do better planning and zoning, but Northampton County hired their first planner in 1976, and Accomack County did not hire a planner until 1990. Without the people, it is hard to know what to do. For example, the build-out analysis conducted previously estimated that the 37,000 new

dwelling units would require 5.6 million gallons per day. That is as much water as is currently used by all the houses and industry on the eastern shore. Also, it is estimated that the deep aquifers on the eastern shore only have a capacity of 5.5 to 11 million gallons per day. Therefore, we really have to look at these issues, but are not being forced to. It has been said that people are either inspired to action or do it out of desperation. I don't think we are at the desperate stage yet, but hopefully we can act before it is too late.

REPORT ON PRE-CONFERENCE QUESTIONNAIRE ON PUBLIC PERCEPTIONS

James M. Falk
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Lewes, DE 19958

For the past 17 years, James Falk has been a marine, recreation and tourism specialist at the University of Delaware's Sea Grant Marine Advisory Service. He is responsible for developing and tabulating the pre-conference questionnaire that was received by many participants. This questionnaire is only one of the numerous applied research studies Mr. Falk has conducted to help resource managers better understand the perceptions and attitudes of different user groups.

Introduction

During the late winter, 1996, a sample of residents living around Delmarva's coastal bays were mailed a survey instrument seeking their input and attitudes about a number of issues related to the environmental and economic health of these important coastal ecosystems. Eleven hundred questionnaires were mailed to a cross-section of individuals who represented a variety of interest groups. These groups included: farmers, private citizens, environmental organization representatives, and watermen. At the time of the current data analysis, 321 respondents had replied to the survey.

Who Are Coastal Bay Respondents

Coastal bay respondents were predominantly males (74%) and were, on average, 55 years of age. Forty-one percent of the respondents were from Maryland, 32 percent resided in Virginia, and 24 percent were residents of Delaware. Thirty-six percent of respondents indicated that they lived on the bay's waterfront. Forty percent indicated that they lived less than five miles from the water and 24 percent reported living five miles or greater from the bays. Eighty-nine percent of respondents indicated that they recreated on the bays or visited them.

Sixty percent of respondents reported that they were college graduates and one-third of all respondents indicated that they had graduate level education experiences. The largest percentage of the responding sample indicated that they were retired (34%), 15 percent were employed in the farming/agriculture industry, and twelve percent were government employees (local, state or federal). Twenty-two percent of the respondents were employed in private business, with 8 percent of this total being tourism-related employment. Fifty-two percent of all respondents had annual family incomes of greater than $50,000. Only three percent reported that they earned less than $20,000 annually. About one-third (34%) earned between $30,000 and $50,000 annually.

How Do Coastal Bay Respondents Rate Conditions Around the Bays

When bay residents were asked how they would rate the "quality of life" (e.g. jobs, clean environment, public services, etc.) around the bays, the overall rating was 2.7 (based on a 4-point scale; with 1 = poor and 4 = outstanding). Sixty-three percent of the respondents rate the "quality of life" either "good" or "outstanding".

When a rating for "environmental quality" was solicited, the average rating was 2.4 (on the 4-point scale), with 48 percent of the respondents indicating either "good" or "outstanding". When a similar rating for "economic prosperity" was solicited, the average rating was 2.1, with only one-third of the sample reporting a "good" or "outstanding" rating response. When asked what they thought of their state's efforts at managing and protecting their state's bay's resources, 38 percent responded that their state did either a "good" or "outstanding" job and rated their actions 2.2.

What Are Coastal Bay Respondents' Feelings About the Role of Citizens and the Environment

When asked what position they felt citizens should take with respect to environmental issues, 62 percent believe that individuals can do much more to improve the environment, 29 percent feel individuals would do more, but are confused about what is good and bad for the environment, 7 percent believe it is basically large companies who are responsible for environmental problems and they should solve them and 3 percent feel that since other people won't make sacrifices their contributions won't matter either.

How Do Coastal Bay Respondents Categorize Themselves on Environmental Issues

Only 3 percent of all respondents indicated that they were generally not interested in environmental matters. Thirty-one percent indicated an interest in the environment, but seldom do anything about it. Fifty-six percent of respondents support political candidates based on their environmental stands and 46 percent donate money to environmental causes. Twenty-four percent of bay-area residents belong to an environmental organization and 41 percent belong to two or more environmental groups.

What Are Coastal Bay Respondents' Environmental Factors of Greatest Concern

Respondents were asked to rank a series of environmental factors that were of greatest concern to them, using a scale of 1 to 3, with 1 being the most important. Water quality (218 total responses) and loss of fish/wildlife habitat (196 total responses) were most often mentioned by respondents as issues that were important to them. The least mentioned issues were toxic waste cleanup (25 total responses) and air quality (36 total responses). When the average importance rating was calculated for each factor (using the 3-point scale, with 1 being most important), water quality (1.7), protection of drinking water supplies (1.8) and loss of fish/wildlife habitat (1.9) were rated the highest. Wastewater management (2.4), open space preservation (2.3), and air quality (2.3) were rated the lowest.

What Do Coastal Bay Respondents Feel Are the Most Serious Water Pollution Problems Around the Bays

Since water quality was mentioned as a major concern by respondents, their opinions were also solicited on what they felt were the most serious water pollution problems around the bays. Agricultural runoff (68%) was reported as the most serious water pollution concern, followed by sewage discharge (59%) and environmental impacts caused by tourism-related development (50%).

How Do Coastal Bay Respondents Feel About Growth and Development Issues

Coastal bay respondents were quite candid about issues related to growth and development. They were requested to rate the issues using a 5-point scale, with 1 = strongly disagree and 5 = strongly agree. Respondents rated *limiting economic growth around their state's coastal bays* a 3.8 on the 5-point scale and 66 percent of the respondents "agreed" or "strongly agreed" with the statement. Fifty-six percent of the respondents "agreed" or "strongly agreed" with the statement, *I feel my state's counties are growing too fast* (3.6 rating). Sixty-three percent of the respondents "agreed" or "strongly agreed" with the statement, *industries and businesses located around my state's coastal bays contribute significantly to the local economy* (3.6 rating), however, only 27 percent "agreed" or "strongly agreed" with the statement that *developing land around my state's coastal bays provides needed economic growth* (2.6 rating).

How Do Coastal Bay Respondents Feel About Agricultural Issues

Seventy-four percent of the respondents "agreed" or "strongly agreed" with the statement, *agriculture contributes a great deal economically to the residents of my state's coastal area* (3.9 rating on the 5-point scale). Fifty-seven percent of the respondents "agreed" or "strongly agreed" with the statement, *agriculture around my state's coastal bays provides diverse employment opportunities for local residents* (3.4 rating). The lowest rated statements related to agriculture were, *environmental impacts resulting from agriculture practices are relatively minor*, with a 2.7 rating and only 28 percent of the respondents "agreeing" or "strongly agreeing" with the statement, and *taxes in my state's coastal counties are kept low because of agriculture*, with a 2.8 rating and 23 percent agreement response.

How Do Coastal Bay Respondents Feel About Tourism Issues

Coastal Bay respondents reacted both positively and negatively to statements related to tourism around the regions coastal bays. The statement that received the most support with 73 percent of the respondents "agreeing" or "strongly agreeing" was, *long-term planning by local governments can control negative impacts of tourism on the environment*--the statement received a 4.1 rating (on the 5-point scale). Respondents also reacted favorably to the statements, *the tourism industry provides many worthwhile employment opportunities for residents*, 3.6 rating and 67 percent agreement response and, *tourism is one of the bright spots in my state's coastal bay's economic future*, 3.4 rating and 54 percent agreement response. Respondents did not react positively to the statements, *the overall benefits of tourism outweigh the negative environmental impacts*, 2.5 rating and 23 percent "agreeing" or "strongly agreeing" and, *I support tourism and would like to see it become the main industry in and around my state's coastal bays*, 2.7 rating and 27 percent agreement response.

What Future Issues Do Coastal Bay Respondents Feel Are Most Important

When asked what they felt were the most important future issues they needed to be concerned about, coastal bay respondents indicated that protecting the coastal bays from environmental degradation (79%) and preserving forest, wetland and habitat areas (79%) were most important. Other issues receiving majority support included protecting drinking water supplies (65%) and controlling growth in coastal counties (54%). The least important issues as reported by respondents included, addressing global environmental issues (18%) and attracting new industries and businesses (20%).

How Do Coastal Bay Respondents Feel About Paying More to Improve the Bays

Sixty-nine percent of respondents indicated they would pay more taxes or higher prices to protect and improve the environmental quality of Delmarva's coastal bays. They felt user fees (59%) would be the most preferred mechanism to collect additional revenues to direct towards bay improvements. The only other revenue mechanism that received close to majority support was voluntary private donations, with 45 percent of the respondents supporting this revenue-generating mechanism. The least supported methods for generating revenues were property tax transfers (18%) and personal income taxes (19%).

Conclusions

This preliminary analysis of coastal bay residents provides a "snapshot" of how they feel about many issues and concerns affecting the health of the region's coastal bays. The information present is based on frequency responses for all respondents collectively and is by no means exhaustive. There are additional methods for analyzing the data which can provide a thorough picture of how respondents feel about coastal bay concerns. These could include comparing results by state of residence (Maryland vs. Delaware vs. Virginia) or by occupational status (retired vs. agriculture vs. private business). This further analysis will provide a more-effective way to approach management and policy concerns in the different jurisdictions.

This study was supported by the University of Delaware Sea Grant College Program and the Delaware Center for the Inland Bays. A special thanks is also extended to the agencies and organizations who assisted in mailing the survey questionnaires to their clientele groups and to University of Delaware, College of Marine Studies' graduate students Cecelia Linder and Lexia Valdes for their assistance during various phases of the project.

SUSTAINABLE DEVELOPMENT: A FRAMEWORK FOR A NEW CENTURY

Peggy Duxbury
President's Council on Sustainable Development

The originally scheduled speaker, Molly Harris Olson, Executive Director of the President's Council on Sustainable Development (PCSD) was unable to attend due to other commitments. Ms. Olson was represented by Peggy Duxbury, Coordinator of the PCSD's Principles, Goals, and Definitions Task Force. This Task Force was responsible for bringing together, integrating, and synthesizing all of the work of the many subcommittees and work groups that comprise the President's Council. Prior to working for the PCSD, Ms. Duxbury held a one-year faculty research appointment at Harvard Business School where she helped develop a curriculum on environmental management. She holds a Bachelor's degree in Political Science from Old Dominion University and a Master's degree in Public Administration from the Kennedy School of Government at Harvard University.

It's extremely exciting for me to be here this evening. This is the first group that we have met with since the Council members met with President Clinton and Vice President Gore 24 hours ago to deliver the PCSD's report, which is a unanimous consensus document on their vision for sustainable development in the United States. It's also very fitting that as the PCSD starts winding down our efforts, I am in a filled-to-capacity room with individuals who are interested in taking these concepts and applying them to a regional level. Without a doubt, the "just do it" crowd will be a crowd like this one.

I thought I'd begin by giving you some background on the concept of sustainable development and its genesis. It is a fairly new buzzword; I remember doing a search for the term "sustainable development" at Harvard Library and not really finding the term until about four or five years ago. Then we will talk about the work of the Council and the contents of the report.

Beginning with the environment, while a doom-and-gloom scenario is extreme, is it not a crisis when:

- 15 million people die annually from poverty-related causes?
- 35,000 children die daily from diseases that are entirely avoidable?
- 100-300 species are lost daily from this planet?
- There are holes in the ozone layer?
- The climate is undergoing changes?
- Fish stocks disappear?
- Wildlife habitats are devastated?
- Soils erode?
- 1,500 scientists, including 99 Nobel Prize Laureates, issue a warning to humanity that human beings and the natural order are on a collision course?

The planet is in a severe state of disequilibrium. Humanity cannot survive when one-third of the world is wealthy and two-thirds of the world is in poverty, and most of those, in devastating poverty. The planet cannot sustain

20 percent of the population consuming 80 percent of the world's resources. It cannot serve as a repository for industrial waste, while providing clean air, clean water, and soils sufficient to support food and an expanding population, all at the same time.

These crises bring me to the concept of sustainable development. In the last decade, this concept has gained widespread political legitimacy, not just here in the United States, but across the world. How can we restore some balance to that ledger? How can we restore economic prosperity, social equity, and environmental integrity, all at the same time? With that said, sustainable development is really the politics of hope. It is the politics of looking towards the future with the idea that we do control our destiny and fate.

To understand sustainable development, we also have to understand its historical context. You could argue that many of these concepts existed for centuries. You can find many of these ideas and philosophies in the Old and New Testaments, as well as many of our tribal nations in the Americas. But as a modern political philosophy, sustainable development really had its genesis in the mid- to late-1980s. It was at that time that the United Nations formed the Bruntland Commission, which had leaders from the developed and developing countries. They published *Our Common Future*, which contained many recommendations, and perhaps most useful, a definition of sustainable development. While this concept does mean different things to different people, there is now some consensus regarding this definition, which is also used by the PCSD. This definition states that:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. "

Sustainable development then really rests on three interrelated concepts: that you cannot have environmental integrity without economic prosperity; conversely, you cannot have economic prosperity without environmental integrity. Underpinning all of this is the fundamental need that all human beings have a basic level of social welfare. In other words, these three issues are interwoven in the most fundamental way, and yet in a way that most societies have failed to recognize or appreciate.

It was because of the discussions of the Bruntland Commission that in 1992 leaders from across the globe came together at the Rio Summit. One of the many agreements that came out of the Summit was to form national strategies for sustainable development. It was that commitment that caused President Clinton to form the PCSD. He asked the Council, which is comprised of 25 individuals (8 industry leaders, 5 environmentalists, a number of key Cabinet positions, and representatives of several civic societies) to develop recommendations on how the United States should address the rubric of sustainable development.

Before going on to the PCSD's activities and findings, I want to quickly discuss who is the United States. We are the wealthiest nation on earth; we consume, produce and waste more per capita than any other country on this planet. We are very religious (more people participate in organized religion than in almost any other developed country), fiercely independent, and skeptical of government (sometimes healthy, sometimes destructive). And we spend a lot on environmental protection — 2.5% of our GDP. We also have a lot of fears; e.g., crime, the federal deficit, and quality of education.

The PCSD examined all of these issues three years ago under the President's direction to be bold and creative. It was a daunting time; jobs vs. the environment were viewed as conflicting concepts. The 25 members of the Council, leaders in their respective fields, each brought their own perspective to the process. They met four times per year during the last three years at locations nationwide. Eight Task forces were formed that presided over dozens of meetings

involving thousands of individuals. Mostly the Council members listened and tried to learn what issues need to be considered in developing a national strategy.

First, the Council members needed to develop a shared vision of the future, which took about eight months to develop. From there, they set goals through their Task Forces. Ultimately, they developed approximately 350 goals that were very specific, but cumbersome due to their number. Therefore, the list of goals for the future was narrowed down to the following 10:

Health and the environment
Economic prosperity
Equity
Conservation of nature
Stewardship
Communities
Civic engagement
Population
International leadership
Education

Following the establishment of goals, the PCSD set indicators of progress or benchmarks to measure progress towards goals.

After establishing goals and measures, the Council started looking at ways to change how we do business today. This information is contained in the second chapter of the report, entitled "A New Framework for a New Century", which focuses on the environment and the regulatory framework. It examines how we can regulate better, be more cost effective, and achieve the same environmental goals. First and foremost, the Council agreed that our existing environmental framework developed over the past 25 years is a good one. Given the backgrounds of the individuals and the political climate at the time, this was a fairly profound consensus. The Council members also recognized that the framework is far from perfect, and at times, needs to be more cost-effective, goal-oriented, performance-oriented, and flexible. The framework needs to encourage more partnerships between agencies, levels of government, and stakeholders. Specific policy recommendations developed by the Council include: increasing the cost-effectiveness of the existing regulatory structure; allowing for alternative, performance-based management systems to go beyond compliance; and encouraging voluntary systems for corporations of extended product responsibility. One success story involved Malden Mills in Massachusetts that uses recycled materials, stayed in an industrial "brownfields" site, hired a 70% minority workforce, worked with the community to clean the river, and ultimately, gained national attention when it burned down before Christmas and committed to rebuilding. The other recommendations in this section deal with the government's macroeconomic tools; e.g., tax shifts and subsidy reforms to change economic policy to encourage more sustainable development.

The next chapter addresses natural resource stewardship. The Natural Resource Task Force used watersheds as its unit of study. The most important lesson learned was collaboration across boundaries, agencies, and stakeholders. The Task Force also emphasized the importance of ecosystem management based on examinations of sustainable agriculture, sustainable forestry, and restoring fisheries. One of the success stories involved the striped bass in the Chesapeake Bay. Another important finding was the need for better information to identify the nation's biological heritage. A final priority was biodiversity conservation.

Another critical part of the report addresses population and consumption. Population is an issue for the United States as well as developing countries; we are the third largest nation in the world and are the fastest growing developed country. Our comparatively fast population growth and extremely high consumption rate is not a sustainable combination and should not be mimicked by the rest of the world. Reductions in population are eclipsed by our consumption

rate, and vice versa. Equity considerations are also interrelated.

Finally, perhaps the heart of the work performed by the Council was at the community level. It quickly became apparent that the lack of a local government representative on the Council was a loss, but was compensated for somewhat by the meetings that were held. One notable success story was Chattanooga Tennessee; 20 years ago it was identified as the dirtiest city in the country and was losing jobs. Over several years, different groups collaborated and turned the city around until it was listed by EPA four years ago as one of the best places in the United States to live.

While the report contains bold ideas, the members agreed that the process was the most remarkable accomplishment of the PCSD. This process entailed really listening and learning from each other over several years. In general, it was a process of consensus that leads to better decisions and policies. The challenge is now captured by the phrase, "To plan is human, to implement, divine." The report, itself, contains a lot of good ideas, only about one-third of which are aimed at the federal government. Implementation will have to come from groups like yourselves. At the federal level, President Clinton and Vice President Gore have given a commitment to start implementing some of the ideas over the next eight or nine months. The report will help guide implementation at other levels of government and can be most easily obtained via the Internet at: PCSD@IGC.APC.ORG, or it can be purchased from the Government Printing Office.

REPORT ON BREAKOUT GROUPS TO DEVELOP A COMMON VISION FOR ACHIEVING BOTH HEALTHY ECONOMY AND ENVIRONMENT, FOCUSING ON SPECIFIC COASTAL ISSUES

Introduction

On the afternoon of the first day, a series of breakout groups were held to discuss environmental and economic issues relevant to Delmarva's coastal bays. While there are many issues, all conference participants were assigned to one of the following four areas, which best reflected both environmental and economic interests as determined by responses to the pre-conference questionnaire:

Tourism and Recreation
Residential Growth and Development
Fisheries, Shellfisheries, Aquaculture;
Agriculture: Poultry, Crops and Forestry

The goal for each group was to enable participants to better understand and respect the wide range of perceptions and opinions involved in working toward a common vision for achieving both a robust economy and a health environment for the Delmarva Coastal Bay watersheds. Due to the large number of participants, two groups were held for each topic for a total of eight groups. In assigning participants to groups, the organizers of the conference tried to maximize the diversity of backgrounds and interests represented, based on information supplied on the conference registration form. Each group was lead by facilitators who had earlier completed training to standardize the process and recording of findings.

On arrival to the breakout rooms, participants were given a brief introduction to the purpose of the session and access to copies of ground rules for effective meetings. Each group was then subdivided into three smaller groups to identify commonalities and differences among participants, and later, *to identify influential factors for their particular topic area over the past 20 years*. On an individual basis, small group members were next instructed to list their expectations as to *what the future would be like, given the factors previously identified, if nothing different was done*. Statements were shared on a round robin basis with other small group members, before reconvening the large group for discussion. Based on input from the three small groups, a single list was developed of expectations for the future if nothing different occurs. Finally, while still in the large group setting, participants were asked on a round robin basis *to identify elements of their ideal future, linking them to previously discussed themes*. Each group also selected a spokesperson to report on their findings.

Following dinner, the spokesperson for each of the eight groups reported back to all conference participants on their findings. Flip charts of the large group findings concerning the future if nothing changes and the ideal future were displayed along the walls of the meeting room (flip charts of the small group findings concerning commonalities, differences, and influential factors were compiled for future review). At the conclusion of the presentations, all participants were asked to affix colored dots next to the statements that most closely captured their own beliefs (each participant was provided with seven dots that could be used separately for

seven different statements, or combined for emphasis). The different colors of the dots represented the backgrounds of the participant as follows:

Agriculture
Government
Business and Industry
Recreation and Tourism
Fisheries
Academia
Citizens
Public Interest Group

The remainder of this section presents the large group findings as listed on the flip charts. The findings do not necessarily suggest group consensus. The total number and composition of dots associated with particular statements is identified, where applicable. Statements receiving the most dots are listed at the top of each group. (Note: when several popular statements appeared next to each other, a "best guess" has been made with respect to which statement is intended based on the proximity of the dot.)

Tourism and Recreation, Group #1

Future if Nothing Changes

- Loss of habitat (1 dot: government)
- Loss of open space (1 dot: citizen)
- Transportation congestion
- Surface water quality deterioration
- Aquatic resources stress/fisheries decline
- Higher taxes and cost of living
- Increased storm damage
- Population increase
- Decline in supply and quality of ground water
- Urbanization
- Casinos
- Infrastructure demand increases

Ideal Future

- Bay ferry, bikes, public transportation (14 dots: 6 recreation and tourism, 4 government, 1 business and industry, 1 fisheries, 1 citizen, 1 public interest group)
- Restoration of bays (11 dots: 5 recreation and tourism, 3 government, 2 academia, 1 business and industry)
- More ecotourism (8 dots: 4 government, 2 recreation and tourism, 2 public interest group)
- More public water front access (6 dots: 4 government, 2 recreation and tourism)
- Limit intensive recreation to Ocean City (5 dots: 3 government, 2 recreation and tourism)
- Better fish and shellfish - more and bigger (4 dots: 2 government, 1 public interest group, 1 business and industry)
- Bring money and leave it here; just send money (don't come)
- Wider beach (3 dots: 2 government, 1 business and industry)
- Balance between business and residential
- More cultural activities - theater, arboretum, etc. (1 dot: recreation and tourism)
- Safer boating practices - licenses, education/certification (2 dots: 1 government, 1 business and industry)
- 15 more golf courses (1 dot: recreation and tourism)

Tourism and Recreation, Group #2

Future if Nothing Changes

- Decline of experience and quality of life - too many people; conflicts over diminished resources; fisheries
- West shore would have to support east shore
- Deterioration of natural resources
- Change in type of recreation - gambling
- Aging population puts increased burden on local government services

- Conflict of tourism vs. aging population - this will change the political landscape as values of society change
- Demographic changes and different recreational needs

Ideal Future

- Increase density in designated growth areas and protect agricultural land and forests from conversion to other uses (28 dots: 9 government, 8 agriculture, 4 public interest group, 3 business and industry, 2 recreation and tourism, 1 fisheries, 1 academia)
- Restrict development to areas with planned infrastructure (5 dots: 3 recreation and tourism, 1 government, 1 public interest group)
- Innovative wastewater treatment - no sewers, limit growth (4 dots: 2 government, 2 citizen)
- Transfer of development rights or purchase development rights (3 dots: all government)
- Restrict shoreline development, maintain natural habitat (3 dots: 2 public interest group, 1 government)
- Clean saltwater (2 dots: both public interest group)
- Uncongested roads
- Federally funded sewer systems
- Abundant fish and wildlife (1 dot: recreation and tourism)
- Ability of people to enjoy the area without negative impact (1 dot: citizen)
- More hands-on educational opportunities - cultural, historical, and natural resources (2 dots: 1 business and industry, 1 academia)
- Planned siting of marinas, discharge controls (1 dot: government)
- Purchase more parkland (1 dot: public interest group)
- Greenways (2 dots: 1 government, 1 fisheries)
- Sustainable recreation and tourism - only dependent on this location, low impact recreation, sustainable development, non-consumptive recreation
- Promote/encourage year-round vs. seasonal tourism
- Develop ecotourism

<u>Residential Growth and Development, Group #1</u>

Future if Nothing Changes

- Increase in golf courses
- Loss of habitat and sense of place
- Decline in quality of life and more development
- Decline in quality of environment
- Decline in farmland and disappearance of farms
- Water quality of bays reduced
- Development on mainland will increase
- Decline and demise of watermen
- Decline in water quality
- Increase in number of immigrants
- Shift in job availability to service jobs
- Sprawl - conversion of agricultural land to residential
- High-density on coastal highway
- Fragmentation of ecosystem
- Higher demands on government facilities
- Higher taxes
- Collapse of ecosystems
- Overcrowding
- Tragedy of the commons
- Interstate highways
- Impact of natural disasters
- Increased urban runoff
- Unplanned "strip" development
- Water shortage - polluted aquifers, amount of groundwater vs. demand, declining quality for recreation
- Lowering of expectations for quality of life
- Depletion of resources - fishing, farming, etc.
- Increased crime as population increases
- "Negative feedback" of decreasing life quality may decrease development pressure

Ideal Future

- Population control (27 dots: 13 public interest group, 10 government, 2 academia, 2 citizen)
- Mandatory environmental education as part of school (9 dots: 6 public interest group, 2 government, 1 agriculture)
- Increased stewardship (7 dots: 3 government, 2 public interest group, 1 agriculture, 1 citizen)
- Sustainable development (4 dots: all government)
- Compromise between developers and environmentalists for land restrictions (4 dots: 2 government, 2 public interest group)
- Eliminate political influence (4 dots: 2 public interest group, 1 agriculture, 1 government)
- Public education, appreciation, and awareness (3 dots: all public interest group)
- Similar environment elsewhere
- Systematic approach to planning
- Watershed planning (3 dots: 2 government, 1 public interest group)
- Stricter land use control
- Effective buffers next to water (3 dots: 2 government, 1 citizen)
- Public realization and acceptance to limit growth (3 dots: 2 public interest group, 1 government)
- Lack of effective critical areas
- Greater use of conservation easements (3 dots: 2 public interest group, 1 government)
- Restoration of wetlands and barrier islands (5 dots: 2 government, 2 public interest groups, 1 citizen)
- Better understanding of habitat (1 dot: public interest group)
- Preservation of biodiversity (2 dots: 1 government, 1 public interest group)
- Serious effect for land base runoff (2 dots: 1 business and industry, 1 public interest group)
- Sustainable economic development (1 dot: public interest group)
- Prevent litter and solid waste from entering waterways (3 dots: 1 agriculture, 1 government, 1 public interest group)
- Increased profitability of agriculture (3 dots: agriculture)
- Intensive 20-year study (2 dots: government)
- Determine carrying capacity (1 dot: government)
- "Tragedy of the Commons" required reading in high school (1 dot: public interest group)

Residential Growth and Development, Group #2

Future if Nothing Changes

- Failed infrastructure - water, transportation, schools, sewage, stormwater management, public utilities
- Decline in quality of life - crime, property taxes, traffic, siltation of channels, cost of living
- Increase in human population - loss of open space, decline in air and water quality, loss of habitat, loss of woodlands, loss of agriculture
- Some cause for optimism - through planning and awareness, NEP
- Loss of biological resources - habitat loss, water quality
- Economic opportunities - limited; rich get richer
- Human health related problems
- Funding shifts/ change in priorities for government
- Northern bays could serve as harbinger for future of southern bays

Ideal Future

- Ecological quality index to educate public - for *each* coastal bay (20 dots: 14 government, 3 academia, 2 citizen, 1 public interest group)

- Adaptive reuse of abandoned/degraded properties (13 dots: 6 government, 4 public interest, 1 agriculture, 1 tourism and recreation, 1 academia)
- More shoreline/marsh preservation (9 dots: 4 government, 2 citizen, 1 fisheries, 1 academia, 1 public interest group)
- More community involvement in conservation issues/decisions (8 dots: 5 government, 1 academia, 1 citizen, 1 public interest group)
- Expanded environmental education programs in schools (8 dots: 2 government, 2 business and industry, 2 public interest group, 1 academia, 1 citizen)
- County planning 50 years in future (6 dots: government)
- Habitat preservation (6 dots: 2 business and industry, 2 citizen, 2 public interest group)
- Would like to see it look like Outer Banks (3 dots: 2 government, 1 citizen)
- Control growth with adequate environmental protection
- Farmland preservation (4 dots: 2 citizen, 1 agriculture, 1 government)
- More compatible industry (2 dots: 1 government, 1 tourism and recreation)
- Increased wildlife (1 dot: citizen)
- Clean air and water (4 dots: 3 citizen, 1 government)
- Land use decisions that reflect cumulative impact (4 dots: 2 government, 1 business and industry, 1 public interest group)
- Higher standard of design applied to commercial and residential development (1 dot: business and industry)
- More restrictive land use regulations (3 dots: all government)
- Balanced ecosystem (3 dots: all government)

Fisheries, Shellfisheries and Aquaculture, Group #1

Future if Nothing Changes

- Diminished commercial and recreational opportunities
- Increase in aquaculture
- Increased degradation of water quality
- Altered species composition
- Shift away from fisheries activities to less outdoor-oriented activities
- Loss of species/biodiversity
- Increasingly restrictive regulations
- Increased development because of degradation of environment
- Decreased property values
- Public desensitization
- Biotechnology may save us
- Death of the bay

Ideal Future

- More conservation areas - land, water, wetland, forests (22 dots: 9 government, 4 public interest group, 2 recreation and tourism, 2 fisheries, 2 citizen, 1 agriculture, 1 academia, 1 business and industry)
- Fishermen more conservation-minded (10 dots: 5 government, 2 public interest group, 1 agriculture, 1 business and industry, 1 fisheries)
- Increased eco-tourism (10 dots: 5 government, 1 business and industry, 1 recreation and tourism, 1 fisheries, 1 academia, 1 public interest group)
- Eliminate nutria (8 dots: 5 public interest group, 2 government, 1 business and industry)
- Increase in aquaculture (8 dots: 1 agriculture, 1 government, 1 business and industry, 1 recreation and tourism, 1 fisheries, 1 academia, 1 citizen, 1 public interest group)
- Improved water quality (5 dots: 2 recreation and tourism, 1 government, 1 academia, 1 public interest group)

- Participative decision making by all involved parties (5 dots: 4 government, 1 recreation and tourism)
- Sustainable fisheries at level above/higher than today's (3 dots: all government)
- Fisheries at pre-settlement levels
- No aquaculture
- High quality development that increases property values (3 dots: all government)

Fisheries, Shellfisheries and Aquaculture, Group #2

Future if Nothing Changes

- Big brother regulations
- Reduced opportunities - recreational, commercial
- Economic collapse - unemployment, crime, drug trafficking, desperation
- Twilight of the sea
- Eventual environmental destruction
- Eventual end of water-based recreation
- Degraded habitat and ecosystem
- Deteriorated quality of life
- Changes in economy
- Diminished water quality
- Increased anoxic levels - algae blooms leading to deaths in higher organisms like shellfish
- Vacancy signs on tackle shops
- Increased closures of areas for swimming, fishing, and clamming
- Increased disgruntled public demanding government solutions
- No more fishing/crabbing (recreational and commercial)
- Decreased aesthetic and financial value of property
- Greater residential development of wetlands
- Total government regulation to point of socialism
- More expensive seafood
- Huge trade deficits
- No more kids with chicken necks on strings
- Imitation seafood
- Increased reliance on other fish populations and eventual destruction of those species
- More expensive and difficult to solve problems
- High unemployment
- Increased preservation of shorelines to protect commercial properties - beach restoration
- Inability to get away from jet skis - only use for water is recreational
- Fish wars - warring anglers between nations and/or states due to diminished stocks
- More steak restaurants on coastal highway
- More large commercial shopping centers - increased development
- "Coastal bays landfill project" - "Fill it in and build on it"
- Job loss due to decreased fish/shellfish stocks
- Loss of reasons to improve environment
- Need new development to replace jobs, but development will further reduce water quality
- Expensive seafood
- Loss of desirable species may encourage "trash" species
- May lose tradition of "watermen" culture
- Increased regulation of all fishing
- Loss of recreational industry
- Aquaculture will expand
- Diminished food stocks (and drinking water)
- Increasing stress on reduced fish stocks
- Further loss of habitat
- Algal blooms/"red tide"
- Anoxia
- Sediment contamination
- Altered natural landscape

Ideal Future

- No more jet skis (34 dots: 16 public interest group, 9 government, 4 recreation and tourism, 3 fisheries, 1 academia, 1 citizen)
- Restoration of submerged aquatic vegetation (22 dots: 9 government, 6 public interest, 3 academia, 2 citizen, 1 business and industry, 1 fisheries)

- Greater understanding of coastal processes and ecosystems (8 dots: 4 government, 2 public interest group, 1 academia, 1 citizen)
- Healthy economic base built on environmentally-friendly andenvironmental businesses (7 dots: 3 citizen, 2 government, 1 business and industry, 1 academia)
- Rural character of area maintained (6 dots: 4 government, 2 public interest group)
- More wetlands (6 dots: 4 government, 2 public interest group)
- No more waterfront development
- Carefully planned communities
- Partnerships between schools, government, and business to take hard science and transform it to marketable products (2 dots: both public interest group)
- Sustained natural resources
- Economic growth (4 dots: 2 business and industry, 1 citizen, 1 public interest group)
- Look like it did 75 years ago (2 dots: 1 government, 1 fisheries)
- Ocean and bay nature reserves (3 dots: government)
- Increased awareness by public of what has been done and what can be done (1 dot: citizen)
- Aquaculture developed so it is a household word (2 dots: 1 government, 1 business and industry)
- No more marine debris/trash (2 dots: 1 government, 1 public interest group)
- All shoreline development halted and beaches returned to natural state for public use (4 dots: 2 government, 1 citizen, 1 public interest group)
- Open shellfish beds
- Diversified use of bays
- Sustainable fisheries stocks/industry
- Controlled development - designate natural areas
- Local Pride (1 dot: citizen)
- Sustainable use of all resources (4 dots: all government)
- Goal of "zero discharge" (1 dot: citizen)
- Commerce, agriculture, marine industry, tourism, and residents living in harmony within the natural resource capacity; enriched by their environment and each other (3 dots: 2 government, 1 academia)
- Opportunities for present and future generations to enjoy and use resources and the natural environment - leave better than we found it

Agriculture, Poultry, Crops and Forestry, Group #1

Future if Nothing Changes

- Decreased land available for agricultural development due to production
- Decreased water supply due to irrigation, development demands, pollution
- Increased cost of living
- More productivity and efficiency per acre due to technologies and new products
- Decreased agricultural productivity due to soil degradation, disease, and pests
- Less farming/less family farms
- Domination by forest monoculture and many poultry farms
- Less concern for local agricultural interests
- Continued stakeholder conflicts
- Health concerns
- Increased population
- Less tourists
- Habitat and wetlands loss
- Less open space
- Reduced recreational opportunities
- Decreased surface water quality
- More transportation and infrastructure demands
- Waste management problems
- Increased pesticide and herbicide use

Ideal Future

- Regional planning based on ecosystems and better knowledge of ecosystems and function - forestry, agriculture, poultry, and other uses (31 dots: 8 government, 6 agriculture, 6 public interest group, 5 academia, 3 citizen, 2 fisheries, 1 recreation and tourism)

- Protection of sensitive and critical areas (26 dots: 14 government, 6 public interest group, 2 fisheries, 2 citizen, 1 agriculture, 1 academia)
- Education of problems and solutions, including regulated community and stakeholders (23 dots: 13 government, 5 public interest group, 3 academia, 1 recreation and tourism, 1 citizen)
- Population control (15 dots: 10 public interest group, 2 government, 2 citizen, 1 agriculture)
- Tri-state agriculture planning for estuary preservation (9 dots: 5 public interest group, 3 academia, 1 government)
- Promote "green" farming practices - reduce pesticide/herbicide use and increase recycling or containment (9 dots: 6 government, 2 public interest group, 1 academia)
- Involve stakeholders - increased cooperation (2 dots: 1 business and industry, 1 academia)
- Balanced approach to land use and management (1 dot: public interest group)
- Incentives for multiple land use (2 dots: 1 government, 1 academia)
- Agricultural diversity
- More understanding of how market forces affect local farming practices (3 dots: 1 agriculture, 1 government, 1 public interest group)
- Resource management enforcement and strengthening existing policy

Agriculture, Poultry, Crops and Forestry, Group #2

Future if Nothing Changes

- Development will swallow up forestry - short-term gains and long-term loss of sustainable use
- No forests - development of farms
- Less farmers/less land - increase in land values
- Less farmers/more poultry
- Factory farms - growing food for chickens
- Politics/less subsidies
- Less conservation planning/more adverse impacts
- Equality loss
- Ocean will move in
- Changes in lifestyle
- Population increase
- Conversion of farmland to residential/commercial uses
- Fragmented forest/coastal lands
- Production will decrease due to land/water pollution
- Increasing amount of arable land owned by agribusiness
- Loss of open space, rural life, biodiversity
- Reduction in quality of drinking water
- Forestry and agriculture will diversify and intensify
- Increase in impervious surface, decrease in water quality
- Agriculture becoming more friendly
- Loss of forestry market
- More efficient use of farmland/poultry industry
- Government will streamline regulations for conservation planning
- Increase in nonpoint source pollution
- Too many people/birth control
- Pollution decreasing through technology/BMPs
- Negative impacts on wetlands
- Create more wetlands through new techniques

Ideal Future

- Government with common sense (17 dots: 5 agriculture, 4 government, 3 citizen, 2 academia, 2 public interest group, 1 recreation and tourism)
- Development prohibited along shorelines and wetlands (9 dots: 5 government, 3 public interest group, 1 agriculture)
- Effective public/private partnership to maintain productive and environmentally compatible farming (7 dots: 3 public interest group, 2 government, 1 business and industry, 1 citizen)

- Inclusion of agricultural community in watershed planning (7 dots: 5 government, 2 public interest group)
- More open space, less density around inland bays (6 dots: 2 public interest group, 1 agriculture, 1 government, 1 academia, 1 citizen)
- Leave wetlands alone and protect forest (6 dots: 4 government, 1 fisheries, 1 citizen)
- Grocery stores agreeing to sell locally grown products (6 dots: 4 government, 2 public interest)
- Forest buffers on all streams and shoreline (4 dots: 3 government, 1 public interest group)
- Development of more organically growing farms (4 dots: 2 government, 1 fisheries, 1 academia)
- "Better" chicken (4 dots: 3 agriculture, 1 government)
- Prosperous and environmentally friendly
- Farms increase productivity through technology using less damaging chemicals and buffers to prevent runoff (1 dot: recreation and tourism)
- Improve balance between farming and development (2 dots: both agriculture)
- Extend high profits for agriculture and forestry while enhancing environmental quality (2 dots: both agriculture)
- No net loss of farm acreage, increase in family farms and use of best available technology to reduce pollution
- Produce wetlands as a cash crop (2 dots: 1 government, 1 public interest group)
- Realistic, comprehensive land use planning fully implemented (2 dots: both government)
- Less supply-side intervention (1 dot: government)
- More vegetable farming, fewer chickens (2 dots: both citizen)
- People with attitudes of conserving rather than consuming (3 dots: 1 government, 1 business and industry, 1 fisheries)
- Balance between development and conservation (1 dot: government)
- Fully-funded conservation reserve program
- Zoning to limit housing development for open land and parks (2 dots: both government)
- Technology of farming more in harmony with nature values
- Reforestation of large tracts of land (1 dot: government)
- Protection of prime agricultural land and directed growth (1 dot: public interest group)
- End of the plague of greed (2 dots: both public interest group)

STATE OF MARYLAND REMARKS

Verna Harrison
Maryland Department of Natural Resources

Verna Harrison is an Assistant Secretary at the Maryland Department of Natural Resources, and is responsible for the Chesapeake Bay and watershed programs.

Good morning. Very briefly I would just like to say on behalf of the Maryland Department of Natural Resources and Governor Glendening and the members of his Cabinet, that the Governor is strongly committed to the preservation, protection, and restoration of the coastal bays. We want to assure you of our support in working with the very many partners that are here in making this a reality.

One of the things that struck me last night as I listened to the speaker from the President's Council on Sustainable Development was that the Council members noted a couple of things associated with successful actions. These are among the lessons that we have learned from the Chesapeake Bay restoration program. And they are obviously embodied in what we are seeing today in that people are gathered here to cooperate and collaborate, and in the process, listen. It is a long road, but with the kind of enthusiasm and energy that we have seen, it can absolutely happen.

Yesterday we gave thought to what the future might hold, and this morning we are going to hear about science and assessment — the findings of today. My purpose in speaking to you is to commit Maryland's full support to work with Delaware and Virginia, the various federal partners, our very important local government partners, citizen interests, and Congress, towards the development and implementation of actions that can make our visions a reality. So I want to commend you for taking your time on a Friday and Saturday to work together. Thank you.

ENVIRONMENTAL HEALTH OF THE DELMARVA COASTAL BAYS AND THEIR WETLANDS

Dr. Frederick Kutz
EPA Region III

Dr. Rick Kutz received a Ph.D. from Purdue University with a concentration in Medical Entymology, Physiology, and Ecology. Dr. Kutz has worked for EPA for the past 20 years, including 12 years with the Office of Prevention, Pesticides and Toxic Substances where he worked on studies involving environmental epidemiology and human exposure to pesticides and other toxic substances. He joined EPA's Office of Research and Development in 1985, and is currently a Regional Scientist for EPA's Region III.

Slide No. 1 – Title and Cooperators

- Good morning! I am pleased to be here.
- The objective of my presentation today is to share with you some findings about the condition of the Delaware and Maryland coastal bays. In order to gain a more detailed understanding of our study, you are invited to see the exhibit on display here at the conference. If you are particularly interested in the entire scientific report, please leave your name and address, and a copy will be sent to you when it is available in a few months. A two-page summary is provided at the exhibit booth.
- This study was designed to provide a "report card" on the condition of the coastal bays. It was intended as a snap shot to characterize the major problems.
- We found a wealth of new information about the bays and also confirmed on a system-wide basis some older existing findings. On behalf of the Delmarva Coastal Bays Assessment Group who planned and implemented the study, I am pleased to briefly describe our findings.
- This was a truly cooperative effort among the State and Federal agencies listed here. All phases of the study - planning, sampling and examining results - were accomplished together over about a four year period.

Slide No. 2 - Picture of Benthic Sampler (Not Included)

- This study emphasized the condition of the living resources of the coastal bays -- the fish, the submerged aquatic plants and the bottom-dwelling organisms. This slide shows the scientific equipment (Young-modified Van Veen sampler) used to sample bottom-dwelling organisms. As you will note, it's not as simple as reaching down to the bottom and grabbing a handful of muck.
- All of these living creatures represent crucial elements of a healthy bay. We also measured other important parameters - water quality, chemical contaminants in the bottom sediment. We studied most of the important stresses affecting the bays.

Slide No. 3 – Significant Findings

- This slide summarizes the major scientific findings of the study.

- Major portions of the coastal bays were found to have degraded environmental conditions due largely to excessive nutrients from human activities. Twenty-eight percent of the area in the coastal bays had degraded communities of bottom-dwelling organisms (worms, insects and clams). These bottom-dwelling or benthic communities are important because they represent a critical level in the food chain, serving as food to many types of fish and crabs. They also serve as good indicators of water quality.

  - Within the coastal bays, Chincoteague Bay at the southern boundary was in the best condition of the four major subsystems, while Indian River at the northern part was in the worst. This seems to form a gradient of the best condition in the South and the worst in the north. Only 11% of the area in Chincoteague Bay had degraded communities of bottom-dwelling worms and insects compared to 77% in Indian River. Less than 10% of the area in Indian River was suitable for the growth of submerged aquatic vegetation (SAV). In comparison, almost 45% of the area in Chincoteague Bay was shown to support SAV. In fact, the most abundant growth of SAV is found in Chincoteague Bay.

  - Tidal streams (tributaries to the bay) were in poorer condition than the main bodies of the coastal bays.

- Eutrophication (nutrient enrichment) threatens recolonization of submerged aquatic vegetation. More than 75% of the area in the coastal bays was found to have water quality unsuitable for the growth of SAV. Vegetation beneath the surface of the water provides crucial habitat for spawning and development of fish, crabs and other estuarine animals. This hostile habitat for SAV is caused by elevated nutrient levels which stimulate algal blooms and decrease water clarity, thus reducing light required for the growth of submerged plants.

- Traces of pesticides and other toxic compounds were detected, probably a remnant of historic inputs. Most frequently detected pesticides were DDT, dieldrin and chlordane; most frequently detected other toxic compounds were nickel and arsenic.

- Man-made dead-end canals were profoundly degraded. About 57% of their area had dissolved oxygen concentrations less than state standards of 5 ppm. Man-made, dead-end canals were also biologically barren, averaging only 4 bottom-dwelling (benthic) species per sample compared to 26 species per sample in the remaining portions of the coastal bays. Traces of pesticides were also found more frequently in these canals.

- The scientific approach used in this study allowed comparison of conditions in the coastal bays with that in other major estuarine systems in EPA Region III. The coastal bays were found to be in about the same condition as Chesapeake Bay or Delaware Bay with respect to water quality and condition of bottom-dwelling communities. Of course, the actual size of the Chesapeake and Delaware Bays far exceed the area of these coastal bays and must be considered when making these comparisons. There are many other differences as well.

- The variety and abundance of fish in Maryland's coastal bays were found to have remained relatively unchanged during the past twenty years, while that of similar systems in Delaware have changed

substantially. The kinds of fish found in the Maryland coastal bays are dominated by Atlantic silversides, bay anchovy, Atlantic menhaden, and spot, which is similar to those measured in the Delaware coastal bays 35 years ago. The fish fauna in Delaware's coastal bays today has shifted markedly toward killifish and sheepshead minnows which are more tolerant to adverse environmental stress. While silversides, anchovy, menhaden and spot have a broad range which includes both bay and ocean waters, the killifish and sheepshead minnows have a much more restricted range and usually stay within several hundred feet of their hatching ground. This means that the food chain has been weakened because they are less available to predator birds and fish feeding on them.

Slide No. 4 – Potential Management Implications

- A number of potential management implications logically follow the results of this study.

- Nutrients appear to be the major stress affecting this system. The sources of these nutrients need to be identified, and strategies to reduce them need to be implemented. Eutrophication is affecting the plants and animals so important to restoring the health of these estuaries.

- When these results are examined on a system-wide basis, it becomes apparent that relationships exists among the bays in the three-state area. For example, much of the stress associated with these bodies of water comes from non-point sources. Many of the non-point sources affecting the northern part of Maryland bays are actually within the State of Delaware. This is because some of the area which drains into Maryland bays fall within Delaware. Looking at a map, the State Line separating Maryland from Virginia falls across Chincoteague Bay. Obviously, the movement of pollutants across this line would be unobstructed. Therefore, a Delmarva-wide watershed management approach is imperative.

- Related to a Delmarva-wide approach to the management of these areas, we need to know what is happening in the Virginia coastal bays. A powerful advantage of the approach used to examine the Delaware and Maryland coastal bays is having the environmental information to tell whether the actions that are taken are doing the right things in the right way. Therefore, a real priority in this Delmarva-wide approach is gathering similar data for the Virginia coastal bays.

- The construction of additional dead-end canals needs careful study. These canals are defined as being at least 200 feet in length with engineered side walls. These canals are for practical purposes devoid of living organisms, and thus, contribute little to the ecological health of the bays as a whole.

- Decisions to dredge new channels and to redredge existing ones need thorough consideration because of the unexpected detection of traces of pesticides and other toxic chemicals. The actual operation of dredging exposes the organisms living in the bay to these chemicals. With the data that we have now, it is difficult to predict whether any kind of biological effect will occur. Additionally, the bottom sediment removed during dredging operations may need to be placed in areas where it will not drain back into the bays.

Slide 6 – Summary (picture of bay - not included)

- This study shows that major parts of the Delaware and Maryland coastal bays are

degraded resulting from man-induced stresses. Plants and animals living in the bays are showing indications of decline and change. Nutrients appear to be the most important problem; however, other potential problems also have been detected.

- A frequently-asked question of audiences after hearing this presentation is "What happens if no changes are made?" That is a difficult prediction to make. The stressful conditions that we found will certainly not change without our intervention. If nutrients continue to increase in these systems, certainly algal problems will become more prominent. Episodes of algal blooms and other related effects will become more common.

Delaware - Maryland Coastal Bays Joint Assessment

A Collaborative Effort of

Delaware Department of Natural Resources and Environmental Control

Maryland Department of the Environment

Maryland Department of Natural Resources

Region III

Delaware Inland Bays Estuary Program

Office of Research and Development (EMAP)

Significant Findings

- Degraded Environmental Quality Found in Major Areas
- Eutrophication Threatens Living Resources in Bays
- Traces of Pesticides and other Toxic Chemicals in Sediments
- Man-made, Dead-End Canals are the Most Severely Degraded Areas
- Coastal Bays are as Degraded as Delaware Bay or Chesapeake Bay
- Changes in Fish Communities in Delaware Over Past 35 Years. No Change in Fish Communities in Maryland Over Past 20 Years.

Potential Management Implications

- Eutrophication Appears to Be Major Stress; Need to Identify and Reduce Nutrient Inputs Into Bays
- Delmarva-Wide Watershed Management Approach Recommended Because of Interrelations of Bays
- Coastal Bays in Virginia Need Assessment
- Additional Dead-End Canals Require Careful Study; Detrimental to Ecological Health of Bays
- Dredging Decisions Need Consideration Due to Pesticides and other Toxic Chemicals in Sediments

ECONOMIC STATUS OF FISHERIES AND AQUACULTURE

John Dunnigan
Atlantic States Marine Fisheries Commission

John Dunnigan is the Executive Director of the Atlantic States Marine Fisheries Commission, which was formed over 50 years ago to improve inter-state cooperation and coordination to protect the public's interest in coastal fishing resources. The Commission is best known for its inter-state fisheries management program, which coordinates regulatory planning among states with coastal fisheries. Prior to joining the Commission, Mr. Dunnigan had an extensive career with the National Oceanic and Atmospheric Administration, and the National Marine Service, serving in a variety of legal and programmatic positions in the field as well as headquarters.

What we do at the Atlantic States Marine Fisheries Commission is something that all of you will be focusing on over this period of study — find ways of bringing people together. The Commission recognizes that none of the 15 coastal states can adequately protect their long-term interests without working together. This whole concept of working together is both critical and exciting, based on the Commission's experience of bringing 15 sovereign states together to mutually define their common interests and then agreeing to move forward by taking steps that are in everyone's best interests.

At the outset, I want to thank some of the people who helped in the development of this presentation, particularly Dianne Stephan from the staff of the Commission. Dianne is the Director of our Habitat Program and did most of the legwork in putting this information together. I would also like to thank all of our resource specialists who are listed in the conference program. In addition, I want to recognize Tim Goodyear from the National Marine Fisheries Service, Jeff Tinsman from the State of Delaware, and Mark Homer and Jim Casey from the Maryland Department of Natural Resources.

It is interesting that fisheries seem to always receive such a specific focus. The fact that it gets highlighted is a testament to the enduring and intrinsic values that we all place in fish and fisheries when we start to think of coastal areas. Fisheries are a good indicator; they are one of the ways that you know whether or not a good job is being done in husbanding the coastal environment. It's one of the ways that we first see the results of what we are doing, or the pain of what we are not doing.

The Delmarva Bays are a microcosm of a lot of the issues that play out up and down the Atlantic coast. However, there are also certain issues that tend to make this area unique and this conference will probably want to focus on these. This presentation will cover resources and habitat, commercial and recreational fisheries, aquaculture, and conflicts. The information, however, will be very qualitative, which should provide a certain indication of the direction you will want to take. There is a lot of primary

information that is being collected, but we had difficulty finding a lot of that information collated in such a way that people who are considering and determining policy can fully utilize it. There is a lot of work yet to be done in this area of trying to provide some structure to the information that is available about these fisheries. It is also important to note that fisheries must be examined on a system-wide basis, and not as a single issue, because they are tied to many of the other economic and social issues that are attendant in these Delmarva coastal bays. We can't even really look at individual fish species, because the way that they are prosecuted ties everything together.

Commercial fisheries in this area are predominantly small family operations, relatively few in number, and very much tied to being able to respond to whatever fish are available at any given time. These small vessel operations are similar to those found in many areas up and down the Atlantic Coast, and must be able to target and switch their catch depending on the availability of the resources from season to season and from year to year. A wide variety of species are caught, many of which are the same as those caught along other areas of the coast.

The economic values of these fisheries are not well-documented. Many of the statistics are there, but they do not always distinguish between what happens in the bays and what happens in the oceans. In order to address concerns over the coastal bays, we have to be able to develop a system that will capture that information for us. But in general, the whole panoply of species that are important along the Atlantic Coast are important in the Coastal Bays (e.g., flounder, weakfish, shad, striped bass, and many others).

A much larger fishery in the Delmarva Coastal Bays exists for the recreational fisheries. Currently, there are both good and bad signs concerning the state of this resource. Some of the species that the recreational fishery is dependent upon are doing fairly well right now, for example, the success in bringing back the striped bass resource along the Atlantic Coast.

Some seem to be improving, such as summer flounder fishing, which was almost closed a few years ago, and weakfish fishing, which appears to be beginning a recovery according to the most recent stock assessment.

There are very few charter boats that operate in this area. The fishery is dominated by private, individually-owned craft. This creates interesting opportunities and interesting problems. The opportunities for local businesses and for tourism are closely linked. But the opportunity creates problems when you have large numbers of tourist recreational fishermen who are only in the area for short periods of time. They are a diverse community and it is extremely difficult to get in touch with them concerning the status of the resources and good fishing practices. They are also very hard to sample to determine impacts on the fishery resources. The major recreational fisheries sampling mechanism along the Atlantic Coast is the National Marine Fisheries Services and Marine Recreational Fisheries Statistics Survey, which is not designed to yield information and data on a scale that is relevant to inland bays or even on a state level. This survey was designed 15 years ago to provide broad coastal information. In a number of instances, states, including Maryland, have tried to supplement this survey data. But often there are not enough resources to capture all of the data that is needed.

Aquaculture is, perhaps, a large area of opportunity still to be explored in the inland coastal bays. There are operations underway in Delaware, Maryland, and Virginia for clams and scallops. Governments have not yet figured out how to respond completely to this opportunity of using coastal waters for aquaculture. This is true all along the Atlantic Coast. There are a number of businessmen who have tried to make investments in aquaculture for some species that

we have been aware of for some time (e.g., rock fish), as well as others (e.g., summer flounder). Governments have not yet learned how to deal effectively and efficiently with these businesses, resulting in complaints regarding the labyrinth of regulations and procedures at all levels of government. The situation is further complicated by technologies that are still under development and businessmen that are trying to break into traditional markets. Therefore, aquaculture has to undergo much more development before it is a major factor influencing the fisheries in the area.

The Delmarva Inland Bays are distinguished from other regional and sub-regional fisheries by the small size of the area, both in terms of miles and the size of the watershed. In addition to being a relatively contained area, barrier islands make this a very fragile environment. Development has consumed much of the buffer zones. Nonpoint source pollution and stormwater management still need to be addressed, and public education needs to be increased. A small area also means less diversity and therefore less buffering between different interests. However, a small area facilitates bringing people together and identifying what their interests are, resulting in more participative decision-making and more locally-controlled public policy decisions.

Let me close with the following conclusions:

1) There is a lot of work that needs to be done in terms of studying what is going on in these fisheries. Much primary information has been collected but has not been collated in a format that is useable for public policy decision-making.

2) Find ways to capture non-scientific information. By the time scientific information is collected, analyzed and made usable, it is somewhat dated. The small size of this area creates opportunities to collect real-time information and make it useable to public policy decision-makers.

3) Focus on education. There is a great opportunity here to raise people's consciousness concerning the critical nexus between habitat, fisheries, and economics.

4) Working together can break down the barriers of communication and overcome the rhetoric that clouds public policy decision-making and fisheries conservation and management decision-making.

DELMARVA'S TOURISM INDUSTRY

Lisa Challenger
Worcester County Tourism

Lisa Challenger is a graduate of Penn State University and moved to Worcester County in 1987. She worked in the hospitality industry in Ocean City before taking her current position as Tourism Coordinator for Worcester County six years ago. Ms. Challenger serves on the Board of the Maryland Downtown Development Association and the Lower Eastern Shore Heritage Commission, and is a member of the Maryland Tourism Council.

I. Past Tourism Trends

1. Beaches, beaches, beaches
2. Long vacations

II. Present Tourism Trends

1. Heritage Tourism
   Educational oriented experiences
   (Visitation to historic sites, trails, parks with an emphasis on interpretation)

2. Eco Tourism
   Comprising 10-20% of all travel; birdwatching, nature cruises, hiking & canoeing, cycling, etc.

3. Conservation and outdoor recreation as tools for economic development

   - Tourism can justify conservation and subsidize conservation efforts. This is because an environment of scenic beauty & interesting features, vegetation, wildlife, clean air and water offers many of the resources that attract tourists

Statistics:

40.4% walk for health
32.8% pursue physical fitness/exercise
14.9% bicycle
13.75% boat or sail
12.4% run or jog

9.2 million people are involved in wildlife related recreation, 71% pursued wildlife viewing

$13/day spent by typical birdwatcher
$22-$60/day spent by cyclists

Over 1,000 rail-trails in U.S. today

III. Pressing Issues Facing Tourism on Delmarva

1. Balance of built environment vs natural environment

2. Jobs - High unemployment rate in Worcester County and a higher than national average across Delmarva

IV. What's Being Done Today

1. Forming partnerships with local, state and federal government

2. Forming grass roots organizations to address our individual needs/concerns, with particular attention to land use issues. Organizations include:

   Lower Shore Land Trust
   Eastern Shore Land Conservancy
   Lower Eastern Shore Heritage Committee
   Pocomoke River Alliance
   Nanticoke River Alliance

3. The visions of the 1992 Planning Act which have been or are being incorporated into local plans throughout the state:

   a. Development is concentrated in suitable areas
   b. Sensitive areas are protected
   c. In rural areas, growth is directed to existing population centers and resource areas are protected
   d. Stewardship of the Chesapeake Bay and the land is a universal ethic
   e. Conservation of resources, including a reduction in resource consumption, is practiced

4. GIS Mapping Project

   A visual illustration of correlations between resources and resource uses

Source:

Statistics - Rivers, Trails & Conservation Assistance Program of the National Park Service

AGRICULTURE AND FORESTRY

John Tarburton
Delaware Department of Agriculture

John Tarburton was appointed Delaware's Secretary of Agriculture in 1993. He graduated from the Virginia Polytechnic Institute with a Bachelor's degree in Agronomy. For the last 23 years, he has owned and operated a 315-acre potato and grain farm. His involvement in agricultural policy began well before his current position. He served for eight years as President of the Delaware Farm Bureau, and also served as President of the Delaware Association of Conservation Districts and Chairman of the County Conservation District. He was a member of the Delaware and Maryland Governor's Wetlands Roundtable and Co-Chairman of the Water Committee of the Governor's Environmental Legacy Commission.

Before I get started, I want to give you a few "teasers." We have not talked much about the Delaware Center for the Inland Bays, which is a model of how to get something done. The Center is a child of 10 years of work concerning the problems of the inland bays in Delaware. The process takes several years; the development of the Comprehensive Conservation and Management Plan (CCMP) almost got into trouble after five years, but was saved by strong leadership and the involvement of other interested groups that did not feel they had been part of the planning process. It is important to involve all stakeholders at the outset. The process of consensus-building means leaving your agenda at home and understanding, not necessarily accepting, other points of view.

Delaware also has the Governor's planning committee. I am convinced that most people are enthused about geographic information systems (GIS), but do not necessarily understands what the acronym stands for, and even less know what it can do. We are at the point where we have overlaid 17 GIS maps together, 10 of which are priorities and the rest are ancillary. The State of Delaware can no longer put water lines, sewer lines, schools, and roads in "wést Podunk." We just don't have the cash. As we overlay the population distribution with the school districts and infrastructure, the old geometry formula for the circumference of a circle (radius squared) shows that it will cost significant amounts of money to incrementally extend services to the next area. This is what is driving planning in the State of Delaware.

Now on to my topic. The best place to begin is with some education and discuss agriculture on a generation basis; what was it like when your parents were the decision makers and what is it like now? In 1975, there were 3,700 farms; in 1995, there are 2,500 farms. I am not sure whether this is good or bad. Always question the statistics; don't make a snap judgment. Average acreage in 1975 was 186; today the average is 228 (a +22.5% change). Delaware has a total of roughly 1.2 million acres; in 1975, about 690,000 acres were productive (in field or vegetable crops) and in 1995, about 570,000 acres were in production (a -17% change). As expected, however, the value of the operating unit has gone up. In 1975, the value was about $181,000 (including infrastructure and

equipment); today, it's $581,000 (a +221% change). This far exceeds the Consumer Price Index. A key point is that agriculture is a highly capital intensive business and is not capable of accommodating snap decisions (e.g., planters cost $60,000).

The value of the poultry industry alone along the Delmarva Peninsula is $1.5 billion. On top of this, poultry processing has one of the highest multiplier effects, not only in dollars but also in terms of labor (both are over 5). So when you consider regulations on various aspects of input for the poultry industry, keep in mind the ripple effect that occurs over the allied industries. This came home when there was a threat to cut off all poultry imports into Russia. This was a $700 million threat, which would have resulted in dumping on the domestic market to the detriment of the beef and pork industries, and, in general, have had a severe impact on the entire corn-soybean-meat complex.

Forestry acreage has increased in Delaware since 1909, from 330,000 acres to 376,000 acres today (these are acres that are actively farmed). 231,000 of those acres are in Sussex County and 81 percent are privately owned. The industry employs about 3,700 people and gross sales of products are evaluated at $97 million. In terms of environmental impacts, the larger fields have pushed aside smaller fields due to changes in equipment. Lots of small plots have been abandoned.

We have made several conversions; the State of Delaware led the nation for years in the percentage of acreage converted to no-till. While this reduces the erosion, more chemicals are used. A lot of capital has also been used to put in water retention systems in dairy and poultry farms. Because it costs $50,000 to put in a waste lagoon on a dairy farm, the State has been involved in cost sharing programs; similarly, the State helps share the cost of manure sheds for poultry farms. Again, good science may make us wonder, however, if this is good or bad. I would suggest that government be allowed to experiment. Manure in a field develops a crust that may result in less nutrients in run-off than previously assumed. Manure sheds, on the other hand, present a fire hazard due to spontaneous combustion.

Farms are by far the largest habitat for wildlife. I think many "green" groups now understand that whatever form agriculture takes, they would rather see land in agriculture rather than 1 housing unit per acre. Subdivisions do not have wildlife. Forestry is a renewable resource and a great habitat for quail. The problem is that forestry has an image problem. Trees are only cut down every 30-40 years, and it disturbs some people when they see a forest being cut down. But I would suggest that some image building is needed; maybe a few bus trips to show people what the land will look like 3, 5, or 7 years later.

QUESTION AND ANSWER SESSION

Facilitator:
Gwynne Schultz
Director, Coastal Zone Management Division, Maryland Department of Natural Resources

Introduction

Following the panel discussion on the environmental and economic status of the coastal bays and their watersheds, conference participants were provided with a 15-minute break in which to develop questions for any of the panelists or resource experts. For the remainder of the hour, the panelists and resource experts addressed several questions, which are presented below. Due to the overwhelming number of questions and limited time, however, the majority could not be discussed. Appendix C lists these other questions that remain for future discussion.

Question 1. Why are the dead end canals so dead?

Response: Dead end canals go against natural forces in estuary systems — estuaries are wider and deeper at the mouth, while dead end canals are uniformly deep (or deeper inside the canal than at the mouth) and do not become wider. Therefore, dead end canals do not have flushing and have a dead zone. Also, because these canals are engineered, they have a linear shoreline. In addition, land uses that cause problems (e.g., contaminated ground water and runoff) are in much closer proximity to the canal.

Question 2. How can we incorporate the effects on fishery resources into the decision-making process for human activities on land? Apply this to small permitting decisions and local and regional land planning.

Response: Some of the laws currently focus on fishing activities. Other activities, however, affect fisheries health. This is a basic structural problem. The best action available now is to provide information to citizens and public policy makers concerning land use and water quality. We also need to coordinate fisheries management decisions made by different agencies (e.g., land use and water-quality).

Question 3. What is the definition of a tourist? The main negative impacts on DE inland bays are from what we call "summer people" who come for two months and then either go home or to Florida to avoid paying DE income tax. They do not attend environmental conferences so how do you reach them?

Response: A tourist is someone who drives here and spends any amount of time and money. One action is to try to market certain types of tourists who will appreciate the resources this area has. How to reach tourists is a challenge to all of us here, and any input is appreciated.

Question 4. If farmers were in a room together to discuss where they would like farming to go, what would their vision be (more intensive or incentives for preserving wildlife and biodiversity)?

Response: Tax law is probably the single biggest tool that changes small business. The 1985 law in particular, caused radical changes by removing the investment tax credit and taking away the opportunity for private enterprise to participate in passive losses. Regarding production and environmental issues, there is a fair amount of agreement; farmers are the foremost stewards of the soil and are as concerned about the environment as anyone. Farmers also work primarily by example; e.g., what is successful for neighbors, the Cooperative Extension, and the USDA. In general, voluntary measures will be much more effective than regulation. Finally, if an action is economically profitable, farmers will ultimately take it (some time may be required to change equipment).

Question 5. Is it feasible to renew the headwaters of our estuaries by recycling the soils into top soil? Headwaters of the St. Martins River were 25 ft. deep and supported the lumber industry's barge and ships, but are now 1.5 ft. deep and spreading out to the larger bays.

Response: Dredging is very expensive. Dredging also raises concerns about spreading historic contaminants that have been found in the sediments. Therefore it may be better to leave the soils in place.

Question 6. As a field researcher, you have the first access to primary data. In your years of experience, how do you feel is the best way to collate this primary information into a "real time" useable tool for policy members?

Response: The data is being used right now as part of a process to comment on 15 management plans for different species. The data is also used for long-term monitoring.

Question 7. Could you speak more as to how, while providing appropriate environmental protection and "sustainable development" to keep tourism in the inland bays area affordable to most citizens? Many places are already out of reach to lower income brackets, which is approximately 35% of the population. I am concerned that close to 2 of every 5 citizens can no longer afford to see and learn from heritage tourism and other valuable resources and thus many citizens do not understand the need or benefits of conservation and preservation. This is a big part of society out of this loop.

Response: Heritage tourism is not expensive. For example the Beach to Bay Indian Trail is a national recreation trail that stops at all of our museums and parks. The museums do have a nominal fee most of the time, but other activities are free. Also, the National Park Service is in the process of developing models for sustainable, affordable ecotourism in St. John. While the process will take several years, the findings can be transferred to bay localities.

Question 8. Agriculture is our most important industry on the Peninsula. It is also a major source of water contamination. With the sandy soils over much of the Peninsula, some degree of ground-water contamination from fertilizers and manures is unavoidable. How much more than what we have done (or are doing presently) with best management practices (BMPs) can we expect to improve this situation?

Response: Agricultural improvements are continuous. For example, in Sussex County, the "We Care" program brought poultry farmers and environmental representatives together, and Delaware was among the first to calibrate manure spreaders in the 1970's. However, as noted in the question, contamination is not only limited to nonpoint sources, but also ground water, and improvements take a long time to see. Nitrate has begun to level off (shallow flow paths have been determined to be approximately 10 years long), but it would take several years to measure improvements if all activities were

stopped today. Ongoing activities include research into manure spreaders, assigning one nutrient manager per county in Maryland, and implementation of BMPs on a lot of land. Manure use is likely to increase (e.g., on vegetable crops) because it is less expensive than other fertilizers. Generally, there is a lot of awareness in the industry and incentive to protect ground water because farmers also use it for drinking water.

REGIONAL PERSPECTIVES ON COASTAL BAYS ISSUES

W. Michael McCabe
Regional Administrator, U.S. EPA Region III

The previous speakers talked about many different values — social, economic, environmental. All of these contribute to the complexity of the issues we are trying to address concerning the Delaware Coastal Bays. Their impact on the watershed is critically important.

As we have heard today, we have a lot of important information on the conditions and impact of development on the bays. What we need to do now is use this information to mold the decisions on the future of this area. We need to construct models that are constructive and useful enough to allow policy-makers to use this information. The assumption that "if we build it, the infrastructure will come," is no longer the case, and this presents us with an opportunity to develop information and to show that the end product of development does have consequences. Some of these impacts can be alleviated if we plan properly and manage growth in the proper way.

Therefore, considerations for the future must incorporate all of these outlooks — social, economic, and environmental. Our thinking must be on a Delaware Bays watershed level, not on a county- or state-specific level. There is a role for all of us in developing the information and models. EPA, state government, local government, citizens and business all must be part of a process to help policy-makers gain some control over the future of growth in this area. Our approach must be consistent with the environmental information that has already been collected and is under development. We need to use this information to determine whether the approach we take has the desired outcome.

The current Environmental Protection Agency Administration has a very strong commitment and orientation towards community-based environmental protection. This area, Region III, has some of the strongest programs in the entire country. The Chesapeake Bay Program is a model not only for the rest of the country, but for the world, in how to bring together a regional approach to address a major environmental resource issue. We haven't solved all the problems nor been able to always implement what we believe to be the most effective and efficient approach of managing growth, but we are certainly further along in understanding the issue and providing policy-makers with information to set objectives. We are also working very closely with people in the mid-Atlantic highlands in Maryland and West Virginia. The approach there brought together all levels of the community to help develop priorities for how they want to grow. For this project, EPA provided technical support and information for them to use in charting their future for protecting the environment and creating sustainable development. The EPA is also involved in the Delaware and Maryland Estuary Programs that have already been discussed. An important aspect of this conference is hopefully that we will be able to coordinate the resources that are operating in Delaware and Maryland already, and bring in Virginia to create a new synergy.

We need to leave this conference with several major commitments among ourselves:

- We need to form a partnership to characterize the Virginia coastal bays to understand them better and in a way that is compatible with Delaware and Maryland activities

- We need to work with officials from all three states and the interested stakeholders

- We need to draw in local government more directly because they need the information and incentive to move forward in a way that protects the area

- We need to continually support the implementation of recommendations in the Delaware Inland Bays Comprehensive Conservation and Management Plan (CCMP)

- We need to develop a solid CCMP for the Maryland coastal bays that reflects all three states' support and participation.

To summarize, it is a total regional effort, the model is as nearby as the Chesapeake Bay, and we can draw on the many experiences and technical support available from EPA Region III. EPA is not the only actor; the strength of EPA lies in our scientific information, technical support, and by virtue of our position, the ability to bring together so many different people. Hopefully, if we ever get a budget, we can free up financial resources to further the development of a very important project and process that will determine the future of this incredibly sensitive natural area.

NATIONAL ESTUARY PROGRAM IN MARYLAND

Gwynne Schultz
Director, Coastal Zone Management Division,
Maryland Department of Natural Resources

Gwynne Schultz is Director of the Coastal Zone Management Division in the Maryland Department of Natural Resources. She is currently serving as the Interim Chair of the Management Committee for the Maryland Coastal Bay Program.

Last July, the Environmental Protection Agency accepted the Maryland coastal bays into its National Estuary Program. This is a national program to encourage long-term planning and management of nationally significant estuaries that are currently threatened by pollution, development or overuse. The overall goals of the program are:

1) Protection and improvement of water quality
2) Enhancement of living resources

There are a total of 28 estuaries in the program nationwide.

Maryland's "new program" will build on existing programs - strengthen them and give them more focus. We need to decide what will come out of this planning process and your input is essential. Success depends on realistic, cost-effective, equitable, and fair recommendations. Therefore, we need all input.

The geographic scope of the area extends from the Delaware state line to the Virginia state line and includes the coastal bays and their watersheds.

The process we'll be following has four key elements:

1) Establish management framework
2) Characterize estuary and define problems
3) Create management plan - Comprehensive Conservation and Management Plan (CCMP)
4) Implement plan

Key problems and issues identified in the initial nomination package are:

1) Eutrophication
2) Loss of wetlands
3) Decline in finfish populations
4) Toxics contamination
5) Areas closed to shellfish harvesting
6) Water-based activities

We have set up four committees to ensure all constituents are able to participate:

- Policy Committee - elected and appointed policymaking officials
- Management Committee - environmental managers from federal, state, and local governments
- Scientific/Technical Committee - peer review/identify data gaps
- Citizen's Advisory Committee - provide input

Some of the key activities we'll be undertaking in the near future include:

1) Developing public participation strategy (e.g., how to get tourists involved)
2) Developing an environmental characterization - look at all information, put in usable format, and identify gaps
3) Looking at all existing programs - environmental regulations and education
4) Setting up a water quality monitoring program and tracking BMPs.

DELAWARE CENTER FOR THE INLAND BAYS

Dr. Bruce Richards
Dr. Kent Price
Delaware Center for the Inland Bays

Dr. Kent Price is the Chair of the Delaware Center for Inland Bays. Dr. Bruce Richards is the new Executive Director for the Center. Prior to his new position, Dr. Richards worked for Penn State University in the Philadelphia area where he focused on training science teachers, small animal science, and invertebrate zoology. Previously, he spent two years as an agricultural teacher in Lancaster County, PA. He holds a Bachelor of Science degree in Animal Science from the University of Delaware, and his Master's and Ph.D. are in Agricultural Science Education and Administrative Studies.

Overview

The Delaware Center for the Inland Bays was established as a nonprofit organization in 1994 under the Inland Bays Watershed Enhancement Act (Chapter 76 or Del. C. S7603). The mission of the Center for the Inland Bays is to oversee the implementation of the Inland Bays Comprehensive Conservation and Management Plan and to facilitate a long-term approach for the wise use and enhancement of the inland bays' watershed by conducting public outreach and education, developing and implementing conservation projects, and establishing a long-term process for the preservation of the inland bays' watershed.

The goals of the Center for the Inland Bays are:

1. To sponsor and support educational activities, restoration efforts, and land acquisition programs that lead to the present and future preservation and enhancement of the inland bays' watershed.
2. To build, maintain, and foster the partnership among the general public; the private sector; and local, state, and federal governments, which is essential for establishing and sustaining policy, programs, and the political will to preserve and restore the resources of the inland bays' watershed.
3. To serve as a neutral forum where inland bays' watershed issues may be analyzed and considered for the purposes of providing responsible officials and the public with a basis for making informed decisions concerning the management of the resources of the inland bays' watershed.

The establishment of the Center was the culmination of more than 20 years of active public participation and investigation into the decline of the inland bays and the remedies for the restoration and preservation of the watershed. A key element of this progression was the publication of a Decisions for Delaware: Sea Grant Looks at the Inland Bays (1983) and the participation by Sea Grant researchers and outreach personnel in the problem-solving process. The last six years of this work were

accomplished as part of the National Estuary Program.

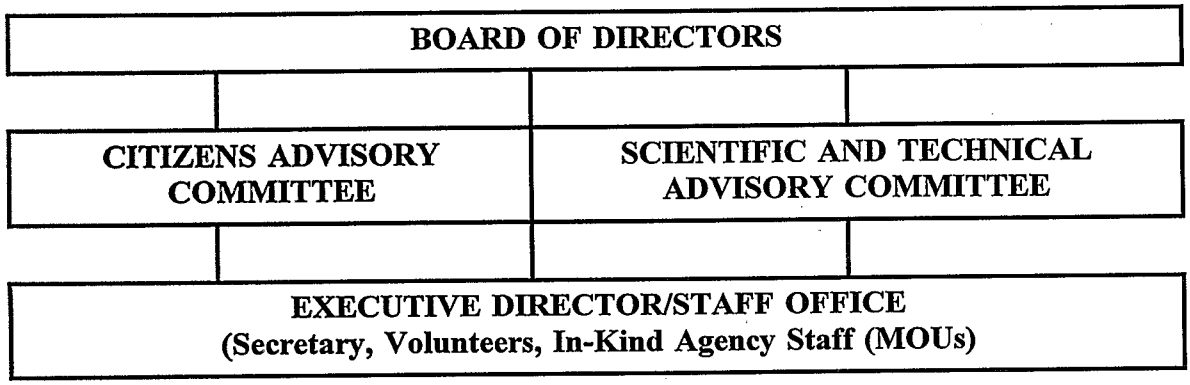
The National Estuary Program, established under the Clean Water Act and administered by the U.S. Environmental Protection Agency (EPA), provided approximately $2 million to study the inland bays, characterize and set priorities for addressing the environmental problems in the watershed, and develop a Comprehensive Conservation and Management Plan (CCMP) to protect and restore the bays. The underlying theme of the program is that a collaborative, consensus-building effort involving citizens; private interests; organized groups; and federal, state, and local governments is essential to the successful development and implementation of the CCMP. Recently completed through a highly successful participatory effort, the Inland Bays CCMP has now been approved by Governor Thomas Carper and the EPA.

Accomplishments: 2/1/94-1/31/96

The Director of the Delaware Sea Grant Marine Advisory Service (MAS), Dr. Kent Price, continues to serve as chair of the Delaware Inland Bays Scientific and Technical Advisory Committee (STAC) and was also reelected chair of the legislatively-created Center for the Inland Bays. He also serves as a member of the Advisory Committee for the Delaware/Maryland Coastal Bays Joint Assessment Program.

Progress to date has included filing and obtaining non-profit status for the Center; requesting and receiving a one-time $50,000 start-up line from the state of Delaware; assisting in the proposal preparation, submission, and acquiring a grant from the U.S. EPA for $257,000 to conduct demonstration projects relating to the Delaware Inland Bays Comprehensive Conservation and Management Plan (CCMP); presiding at the ceremony where Governor Thomas Carper and U.S. EPA Administrator Carol Browner ratified the CCMP; designing the recruitment strategy; coordinating the hiring of an executive director for the Center, Dr. Bruce Richards; establishing basic operating procedures for the Center through the University and local vendors; and assisting in grants management for the Center, including acquiring a $25,000 grant from the Crystal Foundation to enhance the outreach capabilities of the Center.

CENTER FOR THE INLAND BAYS
Organization Chart



Board Members and Alternates

Scientific and Technical Advisory Committee:
Kent Price, Chair
James Falk, Vice-Chair

Citizens Advisory Committee:
James Alderman, Chair
Grace Pierce-Beck, Vice-Chair

Department of Agriculture:
Jack Tarburton, Secretary
Ed Ralph, Alternate

Department of Natural Resources and Environmental Control:
Christopher Tulou, Secretary
Gerard Esposito, Alternate

Sussex Conservation District:
Greg McCabe, Representative
Eric Buehl, Alternate

Sussex County Association of Towns:
John Johnson, Representative
Matthew Falls, Alternate

Sussex County Council:
Robert Stickels, Administrator
Lawrence Lank, Alternate

Ex-Officio Members:
Danny Magee, Appointee of President Pro-Tempore of Delaware State Senate
Pat Campbell-White, Appointee of Speaker of Delaware State House of Representatives
Richard Pepino, Representative, Environmental Protection Agency
Charles App, Alternate, Environmental Protection Agency

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VIRGINIA'S REGIONAL APPROACH TO SUSTAINABILITY: BALANCING ENVIRONMENT AND ECONOMY

Dr. R. Warren Flint
The Eastern Shore Institute
Exmore, VA 23350

Dr. Warren Flint is Executive Director of the Eastern Shore Institute in Virginia.

What Is Sustainable Development?

Communities face enormous challenges world-wide as their social, economic, and environmental resources are depleted and destroyed. **Sustainable development** represents a way to achieve recovery, improve public health, and seek a better quality of life in these communities by limiting waste, minimizing pollution, maximizing conservation, promoting cooperation and efficiency, and developing local resources to revitalize the economy. This is an approach that the two counties on Virginia's Eastern Shore (Accomack and Northampton) are beginning to embrace with respect to revitalizing their local economies while also protecting their wealth of natural resources associated with the coastal bay systems.

Sustainable development recognizes that all resources - human, natural, and economic - are interrelated, and therefore they must be addressed in concert with one another. In practicing sustainable development over the long-term one will:

1) not diminish the quality of the present environment;
2) not critically reduce the availability of renewable resources;
3) take into consideration the value of non-renewable resources to future generations; and
4) not compromise the ability of other species or future generations to meet their needs.

The idea of sustainable development not only implies wisdom and stewardship in resource management for the future, but also includes equal fulfillment in the present for basic human needs, such as food, shelter, clothing, health, and the economic means to achieve these.

In practicing sustainability, one attempts to balance economic development programs with environmental quality. This can be accomplished through both ecological (environmental) and socio-economic (community) assessments that take into consideration and try to balance issues such as quantity vs. quality, value of non-renewable resources, efforts that meet societal needs, extent of natural habitats, status of environmental degradation, and critical numbers of plants and animals to support functional ecosystems. If a balance is not struck among many of these economic-environmental characteristics than a region can be judged as potentially acting unsustainable.

An equally important issue of sustainability is the equitable distribution of resources and benefits among all sectors of society. If the

quality of life for the most disadvantaged segment of a community is not improved, sustainability will not happen. Thus, sustainability also translates into community solidarity, equal access to resources, and equal access to opportunities. But in dealing with wide-spread poverty, often the perceived solution is to grow economies. Can we realistically grow out of poverty? The economy is build upon a foundation of natural resources, human-made capital, and human resources. All of these elements that support rural economies are extremely limited. If we want to grow our economy to expand benefits, this growth will be built upon a limited foundation, and sooner or later the economy will falter. Alternatives to the philosophy of uncontrolled economic growth are strategies that (1) consider enhancing quality of goods and services (development) rather then their quantity (growth) and (2) the transformation of economic flows of capital, materials, and human resources.

Virginia Coastal Bays and Sustainability

Features which distinguish Virginia's Eastern Shore, such as natural areas, landscapes, towns, and local culture, are increasingly valuable assets on a national and global scale, luring increasing numbers of people from cities for outdoor recreation and the experience of this unique region. But change is occurring rapidly, as it is along the entire Eastern Shore of Delaware, Maryland, and Virginia. The health of the estuaries, bays and forests has declined, and along with them the resources, livelihoods and social fabric upon which rural communities and local economies depend. Degradation and alteration of critical ecological components and processes have occurred due to the magnitude and distribution of land uses in this region.

Maintenance of the area's natural resources and social capital is the foundation of, and essential to, a sustainable economy important far beyond the boundaries of the Eastern Shore. Thus, focus upon Virginia's Eastern Shore provides the opportunity to demonstrate sustainable development as a world class model. Many people are seeking ways to manage economic change and to retain and restore the environments from which the region derives its character and value.

Changes on Virginia's Eastern Shore landscape have raised a number of issues of concern for this region that focus around:

agriculture	aquaculture
groundwater	treatment of wastes
transportation	recreation
environment	tourism
public services	economic development
affordable housing	education
land-use	forestry
regional governing approaches	historic and rural character

The Virginia Coastal Resources Management Program, a part of the Virginia Department of Environmental Quality, has devoted significant energy and resources to assisting the two counties on the Eastern Shore, Accomack and Northampton, in addressing many of these issues, especially as they relate to a more sustainable future for the region. The Virginia Coastal Program works with the Marine Resources Commission, Department of Game and Inland Fisheries, Department of Conservation and Recreation, and Department of Health in Virginia to carry out its programs on the Eastern Shore.

Cape Charles Sustainable Park: A World Class Model

An example of how the Eastern Shore of Virginia and its local governments, in this case Northampton County, have begun to take charge of their own destiny in moving towards a more sustainable future is represented by the fine work on the Cape Charles Sustainable Technologies Industrial Park. A large number of stakeholders came together and created a vision, design, and strategies to implement the creation of an industrial park that sits at the cutting edge of

sustainability with regards to its connections between economic development, environmental protection and enhancement, and social ethics.

The design of this sustainable, industrial park has been the result of work by local governments, state and federal agencies, non-profit groups, businesses, and individual citizens. The design principles and business approach for the eventual park embrace many characteristics that are now considered important in achieving sustainable communities, such as:

self sufficiency
nature-based business
not what business does, how it does it
industrial ecology
alternative energy
businesses sensitive to economic importance of natural resources
adequate tax base
family-wage jobs
environment a forethought
environmental design
local priorities met
equal access by all societal sectors

Coastal Bay Watersheds

Tidal wetlands and coastal bay lagoons, featuring productive salt marshes and shallow bay bottoms behind a chain of 18 barrier islands stretching 60 miles, dominate the Atlantic seaside coastal bay area of Virginia's Eastern Shore. This area of approximately 362 square miles of open water and emergent wetlands provides habitat to fish and wildlife, including varieties and numbers of bird populations unequaled on the Atlantic coast. These Virginia coastal bays are a tide-dominated estuarine area with a complete replacement of water from oceanic flux in as little as 2-3 days. The principal land uses of the watersheds in this coastal region include agriculture, forestry, and recreational tourism. The population within these watersheds is approximately 47,000.

As noted above, through time the coastal region of Virginia's Eastern Shore has experienced major changes. These impacts are compounded by the fact that watersheds in this coastal region have a land to water surface ratio that approaches 1, meaning that landscape alterations have a more immediate impact on the contiguous bay waters. These alterations have resulted in declines in water quality and certain components of biological diversity which in turn have caused the decline in health of Atlantic coastal bay fisheries, devastating traditional industries of fishing and shellfishing.

Agriculture is important to Virginia's Eastern Shore rural economy but there are perceived conflicts between its impacts on the environment and the traditional seafood and aquaculture industries. Contaminant input to coastal bays has been suggested as the agent responsible for eutrophication in these mid-Atlantic estuaries, potentially affecting fisheries and habitats. The understanding of watershed function is important in being able to predict the relationships among agricultural practices, aquatic-transport agents, lagoon water quality, and associated biological responses. An ecosystem approach is needed to simulate the physical and biological balances that sustain the ecology of these important coastal bay watersheds in relation to their land-use patterns.

For example in one Virginia Eastern Shore watershed study, results to-date illustrate a pattern of nitrate build-up in shallow agricultural soil layers during the fall. These high concentrations of soil nitrate shift from 15-30 cm depth in November, to 45 cm depth by March, and to 60 cm depth by April, coinciding with spring rains and associated leaching, suggesting that there is significant residual of crop-applied fertilizer nitrogen occurring on this watershed from agriculture activities. Groundwater quality measured at selected wells also exhibits a pattern of nitrogen enrichment underlying the agricultural portions of the watershed. For example, total dissolved inorganic nitrogen in the groundwater coming from under agriculture fields showed an average of 228.0 *u*mol/L while these same measures in groundwater derived from areas of forest in the watershed showed an average of 5 *u*mol/L.

Stream discharge and nutrient flux measurements in this watershed indicate quality of the creek surface water is impacted by surrounding land use as dissolved inorganic nitrogen increases during its passage through agricultural dominated regions. Creek dissolved inorganic nitrogen fluxes show increases during passage through the watershed several fold (up to 10 times) greater than estimated fluxes based on background nitrogen levels over the extent of the creek. Likewise, measures of nitrate and chlorophyll collected in the tidal creek and adjacent lagoon areas are indicative of the dynamic nature of the groundwater flow of nutrients to the coastal lagoons, and impacts of these nutrients on water quality. Nitrate is high near the terrestrial confluence (7 *u*M/L) and decreases readily (0.7 - 1.8 *u*M/L) as one moves away from this influence and as the creek waters are further diluted with tidal seawater. Chlorophyll levels ranged from 80-100 ug/L in March 1994, during low tide (time of greatest impact from groundwater), in contrast to only 40 ug/L at high tide. Chlorophyll levels decrease drastically with distance from land, further emphasizing the potential impact of terrestrial nitrogen. These preliminary data suggest that seaside watersheds can represent a constant but widely variable nitrogen source to the coastal bay systems.

Socio-economic Systems

Other areas of focus in Virginia with regards to sustainable land-use and coastal bay environmental quality, include the evaluation of social vitality in this region and how that is impacted by changing environments as well as serving as a source of impact to the quality of the coastal environment. In recent years, as fish stocks have dwindled and agricultural processing has become regionalized closer to metropolitan centers, the Virginia Eastern Shore region has suffered serious economic decline, resulting in the loss of hundreds of jobs. These poor economic conditions have resulted in ripple effects throughout this region's society in that more than 20% of the households live below the poverty level as compared with 10.2% for the State of Virginia as a whole. Many households (greater than 15%) do not even possess in-door plumbing.

The citizens of the region are hungry for new business opportunities that will increase economic development and jobs. The challenge will be to balance desires for economic prosperity and improved social well-being with continued maintenance of environmental quality and important natural resources in the region. Nature-based tourism is being promoted as an up and coming business opportunity for Eastern Shore communities. It is important that we fully evaluate the positive and negative impacts of this potential industry to a region so dependent on its natural resources as the Eastern Shore is. Economic impact analyses performed for three years on the Eastern Shore Annual Birding Festival have shown significant positive impact to local business over the three-day period of this event. The southern end of Northampton County for example, has regularly experience a gross industrial output from this festival of more than $60,000 since 1993 with a peak in income of $112,000 in 1994.

In working towards a sustainable future for Virginia's Eastern Shore, as stated previously, it is also important to guarantee the social well-being of the different communities. Part of this social well-being relates to the development of affordable housing that also takes into consideration the preservation of natural resources on the shore. Work is presently underway to explore possibilities for linking together affordable housing concepts with sustainable, resource efficient building designs. The outcome of this work is expected to further enhance the affordability of housing on the Shore while also adding measures in residential development designed to protect our limited water supplies, shortage of building materials, and enhance the homeowner's energy savings.

Delmarva Regional Approach

Implementation of sound management strategies in coastal regions like the Eastern Shore requires the coupling of coastal environmental quality with sound land-use decisions, supported by improved scientific knowledge. The challenge is to design and carry out interdisciplinary programs of integrated assessment, focusing on the interactions of external forces and associated responses in the coastal zone, that will more soundly guide landscape sustainable development in these regions. This requires an "ecosystem approach" to management and decisionmaking. It also implies that there is often a direct linkage among events that happen respectively in Delaware, Maryland, or Virginia and the outcomes from these events being realized in any other of these states. In other words, the different regions (states) of the Delmarva Peninsula are truly interconnected. Delaware watersheds impact Maryland coastal bays. Likewise, Virginia coastal bays, because of their significant oceanic influence, affect the quality of Maryland bays.

The Delmarva Peninsula represents a coastal compartment. This coastal compartment exemplifies a geomorphologically and physically structured coastal unit repeated around the U.S. and the world, and thus serves as an organizing principle and a model to direct the comparative assessment of the many forces acting on the Delmarva Peninsula's coastal ecosystems. Using this organizing focus and taking a holistic assessment approach can more effectively guide development of the management strategies ultimately required to protect the long-term sustainability of coastal resources in a regional context.

The Eastern Shore Institute

The Eastern Shore Institute (TESI) is a non-profit organization founded in 1994 to address sustainable development on Virginia's Eastern Shore. TESI's **mission** is to study and demonstrate ways for rural coastal communities to promote economic prosperity and social development through methods that will also preserve and enhance their natural ecosystems. The Institute carries out its mission related to environmental integrity, economic viability, social well-being, and cultural uniqueness by pursuing two programmatic tracks: [1] linking land-use development with conservation and protection of economically valuable coastal watersheds and [2] providing assistance in developing rural, sustainable communities through grassroots empowerment, enhancement of local economies, and equitable improvement in quality of life.

The Eastern Shore Institute has become a respected, independent organization sensitive and fully responsive to regional needs. Because its constituency is all sectors of Eastern Shore society, while serving no special interest group, the Institute can truly facilitate the application of objective and sound information in assisting others to meet their goals. It serves as a catalyst in assisting communities to improve human well-being without degrading environmental health.

Measuring Success

The next level of effectiveness for work in Virginia will include the development of tools for measuring progress of projects, programs, and campaigns intended to advance sustainability in this region. The challenge in developing new and different efforts for improving the region's quality of life will be to balance desires for economic prosperity and improved social well-being with continued maintenance of environmental quality and important coastal resources. Several governmental-driven programs and projects, viewed as ways of improving economic conditions in a sustainable way for the region, are either being implemented or in the planning stages. For example, in the development of the Northampton County Comprehensive Plan citizens defined a desired future for the County and strategies to reach their goals. The goals specified in the plan are to conserve the County's natural resources and

rural character, as well as to pursue economic self-sufficiency for all citizens. Citizen leaders also developed a *Blue Print for Economic Growth* which further articulates goals and development strategies that preserve and capitalize on the County's natural and cultural heritage. Accomack County has defined similar goals through its comprehensive planning process, and with Northampton County, has cooperated in the Countryside Stewardship Exchange Program.

At present there is no way of determining (measuring) the success of these various programs and projects. In other words, how will we know we are getting where we want to go, or whether we have arrived? Benchmarks are the indicators that tell us whether elements of a plan are being achieved over time or if we are losing ground. An appropriately designed benchmark program for measuring Eastern Shore progress toward achieving sustainable goals will provide this region with an excellent set of coastal management policy tools. These tools will offer managers new approaches for evaluating the effectiveness of current policies and management strategies designed to link coastal resources with economic development. Positive trends can be highlighted, recognized, and actively maintained. The beginnings of negative trends can be detected and action taken to ameliorate problems. A benchmarks program will also promote community awareness about important issues of sustainability and guide future policy and decision making for the region regarding development that is done in harmony with the important natural resources of the area.

With the assistance of *The Eastern Shore Institute*, governments and public special interest groups in this region of the Delmarva Peninsula are working to bridge the gaps among environment, economy, and society in their programs designed and intended to improve economic conditions within the region. I hope that I have been able to accurately present to you some of the new and innovative approaches that are being taken in Virginia and at the same time demonstrated to you how these approaches fall within the realm of a region focusing in a systematic way to achieve sustainable development for its many diverse communities that emphasizes simultaneous focus on environment, economy and social well-being.

REPORT ON BREAKOUT GROUPS TO DISCUSS MODELS AND THEIR APPLICATIONS TO STATE AND LOCAL STRATEGIES

Introduction

At lunchtime on the second day of the conference, all participants were directed to select one of three breakout groups, Delaware, Maryland, or Virginia, based on their own interests. For approximately one hour, each breakout group was directed to discuss the issues and findings raised during the conference in the context of their particular state as well as Delmarva-wide. At the conclusion of the breakout sessions, the full conference reconvened to discuss the findings of each group, which are summarized below. Reports focused on Delmarva-wide strategies, with the exception of Maryland, which used the time to further discuss the National Estuary Program (NEP).

Virginia

The facilitator for the Virginia breakout group was Dr. Warren Flint, Executive Director of the Eastern Shore Institute. Findings from the breakout session were recorded on flip charts in terms of issues and obstacles, and presented to all conference participants.

The first key finding is that, given all of the activity in Delaware and Maryland, Virginia wants to be included. Very little of the process to date has crossed the state line. Models have been developed, organizations are in place, and state boundaries are artificial. What Virginia offers the process is serving as a model for what the other bays would like to achieve in their restoration efforts. These bays are to a large degree, with the exception of agricultural runoff, untouched by human activity. Defining what exists is not complete and additional good science needs to be undertaken to define what is achievable. Also, while lack of coordination among local jurisdictions is another issued faced by Virginia, a planning district commission has been formed to address cross-county issues.

Therefore, a mechanism is in place and needs to be activated with respect to coastal bay issues.

Among the areas where they would like to receive help are:

- Support from the State of Virginia for eastern shore issues — Unlike Maryland and Delaware, the rest of the State pays little heed to the eastern shore. No commissions or coastal bay programs exist. The focus on the Chesapeake Bay is almost total. Also, there is a lack of constituency/voting block.

- Development of an overarching purpose/mission to bring the people of the eastern shore together — Virginia should immediately take advantage of the models offered by Delaware and Maryland to begin motivating people.

Delaware

Dr. Bruce Richards, Executive Director of the Delaware Center for Inland Bays, facilitated the breakout session. Findings were presented on flip charts, beginning with the key factors that contribute to tourism, development,

fisheries/shellfisheries/aquaculture, and agriculture.

Factors that influence tourism include:

- No sales tax
- Two bridges with access
- Stock car races
- Birding/ecotourism activities
- Coastal state parks
- Outlets
- Boating/jet skis

Factors that influence development include:

- No sales tax, good economy, job base
- Infrastructure
- Proximity to water
- Profit/developer
- Quality of life
- Retirement area
- Clean beaches
- Recreational opportunities
- Pro-development atmosphere (politicians)
- Availability of housing
- Colleges and universities
- Public schools

Factors that influence fisheries/ shellfisheries/aquaculture include:

- Lack of submerged aquatic vegetation (SAV)
- Political environment
- Water quality
- Nonpoint source pollution
- Loss of habitat
- Lack of education
- Agricultural impacts
- Neighboring jurisdictions (PA, MD, VA, NJ)
- Overharvesting
- Loss of wetlands
- Increase in technology
- Recreational boating/jet skis
- Commercial development
- Benthic food systems
- Septic system impacts on habitat
- Shoreline stabilization
- Point source pollution
- Storm/waste water impacts
- Laws and regulations

Factors that influence agriculture include:

- Jack Tarburton/Frank Perdue
- Russian exports
- Profit/costs/equipment
- Need to eat
- Commodity markets
- Weather
- Proximity to markets/infrastructure
- Consumer demand
- BMPs
- Land availability
- Uncontrolled development
- Laws and regulation
- Drainage/irrigation
- Availability of labor
- Urban encroachment
- Buffer zone/tax ditches
- Pest/weed control
- Technology
- Government subsidies
- Changing demographics (family farm preservation)

The other key area focused on by the breakout group was Delaware's connection to Delmarva-wide issues. Issues that were identified included:

- Over/underplanned uses of the landscape
- Population growth
- Changes in age/demographics
- Transportation
- Loss of habitat
- Water quality
- Quality of life
- Dredging Assawoman canal
- Rural/urban conflict
- "User" conflicts
- Natural disasters and planning
- Collective planning and education
- Increased cost for infrastructure
- Loss of federal funds

- Political "will" regionally (county and state)
- Loss of farmland
- Environmental data collection, use

In summary, key areas were access and infrastructure, changing demographics, unplanned growth, coordination at all levels of government, education and outreach, and regulations and laws.

Maryland

The facilitator for this breakout group, Gwynne Schultz, Director of the Coastal Zone Management Division, Maryland Department of Natural Resources identified four topics for discussion:

1) upcoming activities; 2) the process; 3) confirmation of the problems and goals; and, time permitting, 4) Delmarva-wide strategies.

Regarding National Estuary Program (NEP) activities, a committee structure is under development. The management committee recently met, while the remaining committees (policy, scientific/technical, and citizen's advisory) have yet to meet. Candidates for the Program Director's position will be interviewed this week. Conference participants interested in learning more about the program and its committees should call Kathy Ellet at 410/974-3382.

Strategic activities underway include development of a public participation strategy to reach all stakeholders, development of a data management strategy, preparation of a first-year work plan, and signing of a partnership agreement among key players. Other activities include an environmental characterization study, review of environmental programs, identification of priority problems, development of a monitoring program, and preparation of a management plan.

The following comments/questions were received concerning the NEP process (responses are noted where applicable):

Comment: Please elaborate on development of the public participation strategy.
Response: The Maryland NEP will review and evaluate strategies that were developed for the Chesapeake Bay Program and for other NEPs. A draft strategy will be developed based on these experiences. We will look at what groups have been involved in past issues and determine which interests we need to reach to make this new program a success.

Comment: Americorp requires goal-orientation, while we keep hearing about the process. There are numerous Americorp people on the eastern shore who have been trained in databases, environmental assessment, etc. Citizens need to know what is expected of them and what the goals will be. We also need to develop a list of community groups with contact names that can help.
Response: Maryland has used the Conservation Corps in the past to identify problems. In general, volunteer assistance is essential.

Comment: We need to make sure that different agencies do not have barriers that exclude cooperation (e.g., years ago a bridge was built that now restricts flushing, dredging actions may bring up contamination, and barrier islands were created that are now preserved). Different issues will require agencies to work synergistically.
Response: The NEP will be looking at linkages over the next year.

Comment: What connection is there between the NEP and the Corps of Engineers?
Response: The Corps of Engineers recently completed a 1 1/2-year long study that used a holistic approach to examine water resources (e.g., navigation, water quality, and infrastructure). This study set the groundwork for the NEP, which will elaborate on it.

Comment: Is there a process for getting citizen input?
Response: The NEP will have two focuses: getting input from all stakeholders and getting information out to everyone. Mechanisms are under development.

Comment: Instead of population control, we should recognize that everyone is a "re-creation" artist and capable of re-thinking things. Limiting creativity, in general, is a bad idea. Also, why not try to develop other areas of the state and bring the whole state into the process, since all resources come from the same pot of money?
Response: This leads into the next part of the discussion, priority problems.

The breakout/group next discussed the following priority problems identified by the NEP:

Eutrophication
Habitat modification and loss
Decline in living resources
Toxic contamination
Shellfish closures
Water-based activities

The following comments/questions were received concerning the identification of problems:

Comment: Flooding and standing water problems due to population pressures should be added. We need better stormwater management. We also need to consider land subsidence due to ground-water withdrawal, as well as sea level rise (the minimum estimates indicate that it will affect this area).

Comment: Environmental education is one of the most significant actions to take.

Comment: We need to start demonstration projects on sustainable economic development.

Comment: None of the studies have shown a lot of toxic contamination. Why is this problem listed and not sedimentation (like eutrophication, this affects drainage patterns)? [Note: a resource expert responded that toxics are listed because of findings pertaining to historical practices and implications for dredging; sedimentation is a valid issue and should be covered as a separate problem or as a subset of another.]

Comment: Fishing is very poor in the back bays and the flounder are gone. Clam dredges flatten out the floor of the bay and create large flows of material. In addition, a speed limit should be established for all vessels to control wakes. The MD DNR says concerns are an over-reaction, but the commenter has seen these changes over a 45-year period.

The final discussion focused on the four main goals for the MD NEP that were identified in the original submittal package:

- Reduce water and habitat quality impacts where they are most severe and maintain quality of areas not degraded
- Protect existing high-quality habitat, and where possible, restore degraded habitat
- Control input of pathogens and toxic chemicals for human health and recreation purposes
- Plan for sustainable development and population growth.

The following comments/questions were received on these goals (responses are noted where applicable):

Comment: No one has recommended looking at the Chesapeake Bay and what has been done there. Rumor says it has improved. We also have not heard anyone talking about critical areas. Is there any movement to push this legislation?

Response: The MD NEP is not aware of any legislation, but does have plans to look at the Chesapeake Bay program. Furthermore, EPA noted that there are 28 NEPs in the country and a technology transfer program exists to exchange information. There are several good examples, beginning with the Delaware Inland Bays.

Comment: Anything that happens needs to go through the Maryland State legislature; therefore, we need to push for what we want.

Comment: A lot comes down to money and development. We are not going to be able to keep people out. Ultimately, county regulations are most important and critical areas are a good place to start. We need to figure out how to live with these conditions. For example, we may want to consider opening up areas that are restricted in exchange for controls on harmful types of development. Also, we need to communicate within groups (e.g., via a computer bulletin board or e-mail).

Response: Besides regulatory programs, we need to look at offering incentives to the development community. In addition, the MD NEP has flyers available on becoming involved with the Citizen's Advisory Committee.

FULL CONFERENCE DISCUSSION ON ISSUES AND STRATEGIES BEST ADDRESSED BY A DELMARVA-WIDE APPROACH

Following reports from the state breakout groups, Rick Johnstone, Supervisor of Forestry for Delmarva Power and Light, opened the discussion to all participants on Delmarva-wide issues. In doing so, he noted that reduced federal funds increase opportunities for partnerships. Specifically, his experience in developing new Endangered Species Regulations emphasized the importance of involvement with respect to non-regulatory approaches. To elaborate on these approaches, Mr. Johnstone showed a videotape that outlined the voluntary pesticide environmental stewardship program between the U.S. EPA and Delmarva Power and Light, and other utilities. The videotape provided an example of a partnership between private industry and regulators to resolve environmental concerns through best management practices instead of regulations or legislation. These approaches constitute a paradigm shift, are economical, and have proven successful in farming and the Chesapeake Bay.

The following Delmarva-wide issues were then identified by conference participants:

- The scientific and technical communities are very aware of what the problems are and some of the solutions, but the public at large needs to be educated. A series of public service announcements in the tri-state area needs to be undertaken regarding the problems, programs, and objectives.

- As revealed by the Chesapeake Bay studies, the significance of air emissions needs to be taken into account, including auto emissions.

- Do not underestimate the fondness of the American public for some of the regulations that have protected and improved our environment far more than any other nation in the world. Environmental regulations are not harmful and were not developed to be bothersome; they were developed because they are necessary. People do not write unnecessary regulations.

- Perhaps the bays should be federalized. The states will not get together with enough clout, and this approach was successful for the Grand Canyon. It should be used here because this resource feeds people.

- Regarding how to reach the people who did not attend, every person here has the ability to contact other people; everyone here is a carrier of the disease called "bay-saving". It doesn't matter if it's your Rotary Club, Kiwanis Club, Lion's Club, sorority, board of realtor's, farming organization, or other groups. Everyone has jobs that are dependent on the health of the economy in this area. We cannot point fingers and expect others to act; we have to do it.

- The structure of the conference will be kept together for a while; i.e., the Agenda Planning Committee will meet again. Your input is needed as to what

would be most helpful. Ideas can be sent to Marsha Ramsay, Rick Kutz, Warren Flint, Rick Johnstone, Bruce Richards, Kent Price, and others if you are not comfortable speaking in front of a large audience. Also, please fill out the evaluation forms.

- Can the state representatives get together a few times per year to share information on what works and what doesn't work?

- There are many youth in the area that can get involved; e.g., Americorp and Conservation Corps. These people are trained in environmental assessments and environmental restoration. This involvement will improve the environment, provide hands-on training, and help these youth to be of service to their community and become worthy citizens of tomorrow.

- Everyone should visit and snorkel in Virginia's inland bays with elected officials and citizens to see pristine bays and develop goals for Delaware and Maryland.

- Lack of involvement by the biggest stakeholder, Ocean City, is a concern. We will have a difficult time achieving goals without them.

- As a direct consequence of this conference, the Worcester County Planning Department has received tentative commitments from the four other planning staffs to begin meeting on a regular basis.

CONFERENCE FOLLOW UP

W. Michael McCabe
Regional Administrator, U.S. EPA

Marsha Ramsay, President of Assateague Coastal Trust (ACT), began the Follow Up session by stating ACT's commitment to advancing the work of the conference. She expects ACT to facilitate communications among conference sponsors and participants, to build on this coalition to reach others, to reach out to and educate all Delmarva stakeholders, and to facilitate involvement of local governments. She invited all conference sponsors to work with ACT. ACT will seek public and private funding to carry out this commitment. Ms. Ramsay then turned the podium over to Michael McCabe for closing remarks.

I just want to thank everybody for coming, and in particular, thank all of the members of the Planning Committee, especially Marsha Ramsay and the people at the Assateague Coastal Trust. When they first started talking about putting this conference together, I think they were envisioning 60 or 70 people coming, and obviously with 275 involved, this has been beyond the planners' wildest expectations. This says great things about the level of involvement in this region.

I am not about to provide a summary or synthesis of what went on; I think everybody can take away different things from this conference. But I think it's pretty clear that we need to build on the success of this conference in order to accomplish some of the goals and objectives that have been set forth here. I was really pleased to hear that the four counties will be getting together and that the agenda committee is staying together. I think we ought to make this conference an annual event and EPA would certainly be willing to help if that is the desire of the stakeholders.

We need to reach out and pull in more people. One disappointment, I think, with this conference is that there were not more development representatives. These people are having a tremendous impact on this area and we need to bring them in, talk to them, and educate them. We also need to involve local government; I was pleased to see the level of local government participation but I think it can be better. We are lucky that with the Chesapeake Bay Program in such close proximity, we can have a lot of overlapping benefits. One of the exciting new things in the Chesapeake Bay Program is our local government initiative. It's being put together this year, including an action plan scheduled for completion by this October. This action plan can be applied to several other communities as well, including the coastal bays. As has been discussed, EPA can tap into the community at every level, and this is what we need to do. Everyday new people move into this community because of the quality of life and they do not want to see that jeopardized. To the extent that we can involve these new residents as stakeholders, they will be a potent force in making sure that we have the kind of sustainable future that we all care about and are looking for.

If you are not involved, get involved with the Delaware and Maryland Estuary Programs.

Also, as discussed, Virginia has a number of new initiatives in the coastal area that need our involvement and a broader stakeholder base. With that kind of involvement, we can make some changes. To my knowledge, there has been no natural tidal wave that has hit the Delmarva Peninsula, but we are experiencing a tidal wave approach to development in this part of the country. Unlike the natural phenomenon, we can plan for the impacts of the man-made kind. If we don't, however, the destruction to the quality of life and to the environment could be no less severe, although a lot more prolonged. We are looking for ways to deal with the impact of that tidal wave. Your commitment and participation indicates that you care about how we manage that, and I think that the future looks hopeful. I am glad that I was part of this process, and I certainly plan on being a part of future events of this kind, whether I am in a politically appointed position or as a private citizen. Thank you and I look forward to the next meeting of this group.

APPENDIX A

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APPENDIX B

CONFERENCE EVALUATION FORM

Please turn in this completed form at the end of the conference.

1. Did the conference meet your expectations? 73 Yes 10 No

2. The conference was

Well organized	75 Yes	4 No
Informative	76 Yes	1 No
Good presentations	68 Yes	6 No

How could the conference have been improved?

Comments: Audio-visuals should have been suitable for large audience and large room so all could see. Some presentations not effective. More local officials, developers, local citizens should have attended. Subject matter too general. More breaks needed.

3. How were the conference accommodations?

Meeting rooms	34 Good	36 Fair	11 Poor
Food	35 Good	40 Fair	6 Poor

Comments: Too cold and noisy in breakout groups.

4. Should this conference set the stage for followup actions?

81 Yes 0 No

Future Conferences	70 Yes	5 No
Newsletters	69 Yes	5 No
Committees	62 Yes	3 No

If YES, what issues should be addressed?

Comments: Most respondents stressed need for public education and involvement and cited issues raised at conference (agricultural practices, development, tourism, fishing) as well as good land planning, preservation of fragile areas, and updates on three-state efforts as being most important issues for future focus.

If YES, at what governmental level?

49 Local (County) 34 State 59 Delmarva-wide

5. Are you willing to commit your time and/or money to ensure follow up actions are successful?
71 Yes 5 No

6. What is your personal vision for the future of Delmarva's Coastal Bays?

Comments: There was considerable agreement that nature and human needs be in harmony: affordable and good quality of life; clean environment; open space; reasonable growth; protection of sensitive areas such as wetlands and shorelines; good fishing; clean bays throughout Delmarva.

7. How can this vision best be achieved?

Comments: There was considerable support for education of all citizens, visitors and political leaders; for better planning for growth, involving all stakeholders and including reduction of waterside development and putting sensitive lands in conservation; for local zoning ordinances to protect sensitive areas and guide development to already developed areas and away from wetlands and shorelines. Everyone working together: cooperate, build consensus, stop finger-pointing.

8. What role do you envision for elected and appointed officials?

Comments: There was almost unanimous agreement that officials need to listen to stakeholders' concerns and lead an effort toward sensible growth in the region that considers responses summarized in 6 & 7 above. Elected officials, most believe, should lead public education and involvement efforts and fund projects that protect and restore fragile and sensitive areas. Other suggestions include creating incentives to businesses that operate in environmentally protective ways and establishing user fees to pay for restoration. There was considerable criticism of local elected officials who chose not to attend the conference. There was additional criticism that these officials tend to make decisions that favor special, rather than public, interests. Most agreed, however, that it's time to move forward together.

Total attendance at the conference was 269. The summary above is based on the 83 Evaluation Forms that were turned in at the end of the conference, representing 31 percent of conference attendees.

APPENDIX C

REMAINING QUESTIONS

Following the panel discussion on the environmental and economic status of the coastal bays and their watersheds, conference participants were provided with a 15-minute break in which to develop questions for any of the panelists or resource experts. For the remainder of the hour, the panelists and resource experts addressed several questions, which are presented on page 60. Due to the overwhelming number of questions and limited time, however, the majority could not be discussed. This Appendix lists these other questions that remain for future discussion.

1. How can overuse/abuse of resources be prevented or curtailed?

2. Discussions of this conference have all emphasized sustainable development practices as a means of assuring good quality of life and healthy ecosystems for the future. If this approach is adopted, we will need a means to persuade the public to adopt this idealogy. Will there be any focus on the economic benefits of sustainable development approaches that can be translated to pocketbook savings meaningful to the individual taxpayers?

3. We keep talking about growth management and control. This issue has even been addressed in comprehensive management plans. So, why are growth limits/boundaries not drawn and implemented by co-governments? Why don't we do what Portland has done?

4. How much of the original wetlands have been lost to development over the years?

5. The majority of attendees are either from the government or are involved in grass roots efforts. How do we involve in the planning process those people in the middle?

6. What efforts are underway to enact better land use planning mechanisms such as: transfer of development rights and cluster zoning to create open space, etc.?

7. The perception among citizens is that their input is not truly desired because they may not be qualified or have a different agenda that is contrary to the environmental protection. This is not true! They offer real time, on-site data. However, they may need more information. What efforts will be made to inform and involve the public?

8. Why not set up a "Tributary Strategies" type process for the Coastal Bays involving DE, MD and VA? Since nutrients are the major problem, a "Coastal Bays Strategies" would involve citizens, local, state and federal governments, businesses and environmental groups, and could concentrate on specific issues that are unique to each state's coastal bays.

9. We have heard about limited resources, but have not tapped our most available - volunteers. The governmental agencies do not seem to have had, as a part of their process, harnessing this resource for gathering data, interviewing people and in general creating an army of extra help. Can you do more to integrate public groups into your teams? Example: Ocean Pines has several groups to help: Boat Club, Fishing Club (Anglers), Power Squadron, and individuals.

10. It was mentioned that the benthic community in southern Chincoteague Bay was in good shape and that northern Indian River Bay was in poor shape. Does this indicate a general north to south trend in degradation which may correspond with numbers of individual septic systems going north to south? Were the northern Indian River Bay sites and the southern Chincoteague Bay sites sampled simultaneously?

11. Do manmade canals act as a sump keeping runoff pollutants from entering the main bodies of water in the bays?

12. What are the largest sources of nutrient pollution into the bays? What causes the oxygen and toxic chemicals? What two to three things would have the most impact on reduction?

13. Are county economic development and tourism staff talking to planning and zoning staff to ensure that natural resource amenities that serve as attractions to companies to locate in this area are protected? If so, how is the planning process affected?

14. Functionally, a stand of trees does not make a forest. What is Delaware doing to foster a sustainable forestry ethic among its forest industry?

15. Hasn't Delaware put the cart before the horse by creating major access routes between its bays and beaches and the metropolitan areas to the north before establishing, fully, management plans relating to the coastal area?

16. What about the loss of biodiversity associated with Loblolly Pine Plantations; i.e., less of mixed hardwoods and old growth forest? How will this highly potential problem be addressed?

17. Is the environmental degradation in the north, i.e., Delaware Bay, reversible?

18. How will the new Farm Bill affect Delmarva agriculture ("Freedom to Farm")?

19. Are the tree farms monoculture? If so, is there any effort to change this?

20. Has the amount of eutrophication caused by agriculture and human habitation been quantified?

21. What needs to be done to stop eutrophication? If implemented, how long to see an improvement?

22. What has caused the decrease in spot and mullets in Indian River?

23. Who is benefitting from the poultry industry on the shore?

24. How would life change if the poultry industry was not here?

25. For the benefit of the eastern shore, agriculture should diversify!

26. Is it true that intensive farming (use of pesticides, fertilizers, manure, etc.) is indicated in the nonpoint source of pollution? What role does the poultry industry play? Please discuss the economic and environmental bad buys; how it got that way and what needs to be done.

27. Ecotourism is a developing concept globally. Where is Delmarva going with this concept, or have they even considered marketing this concept?

28. Is it feasible to promote (or require) trapping of storm runoff from farms and elsewhere into ponds? These could serve as sediment traps, sources of irrigation water, recreational fishing etc. and help lessen bay pollution.

29. Do you know of any way to "garner" the numbers of individual farmers who are implementing BMPs on their own but aren't being "captured" in existing reporting systems? This would be a valuable information/education source for the general public to realize farmers, on a whole, are good stewards.

30. What is the adverse impact of tree farms on the ecosystems (include use of toxics, pesticides, fertilizers, etc.)?

31. Do the fish that we find in the ocean spawn in the coastal bays, and if so, what percentage?

32. Offering incentives to recreational fishermen for filling out a simplified survey before a fishing license is issued.

33. How can you reconcile your studies showing no fisheries stock change in MD waters over the past 20 years with the undoubted severe decline in the flounder fishery?

34. For discussions of water quality, no one has mentioned the trends in sediment loads in the bays or the actual effects of sediments on SAV; etc. What are the trends and effects?

35. Rick Kutz stated that species in Chincoteague Bay "haven't changed in 20 years." Does that mean that healthy populations of fish and shellfish exist?

36. Dredging of clams during winter months disturbs crab beds and also creates serious silting conditions in the shallow water bays. Please comment on whether it may be desirable to modify the practice of dredging.

37. Recently proposed crab regulations are geared to conditions in the Chesapeake Bay and do not adequately address the problems of over-crabbing in the coastal bays. Please comment on the need for additional conservation measures such as establishing sanctuary areas where commercial crabbing would be prohibited and also placing greater restriction on the taking of sooks.

38. If dredging brings up toxic chemicals and is considered bad and submerged vegetation is so important, why are hydraulic clam dredges allowed to operate in our beleaguered bays?

39. In the species changes that have occurred in Delaware Coastal Bays, has there been biomass shifts as well? In the Maryland Bays has there been number changes; i.e., have numbers and age classes shown declines while species composition may be insignificantly changed?

40. What is ASMFC doing about the decline of the horseshoe crab population and its impact on shorebirds and fin fish?

41. Secretary of Agriculture DE brought this home: in other words, economics controls everything including conservation, which is unfortunate for the planet! For me, I am in a quandary since my employment is dependent upon agriculture yet it is clear that how things are done are controlled first by economics not conservation. We find ourselves educating how to conserve based on economics, which is not always the correct way.

42. Why not require a salt water recreational fishing license (like hunting) that requires "catch" information to help assess the resource "taken" and enhance knowledge of scientists? (Should be done statewide)

43. Is recreational water usage and aquaculture compatible in populated areas such as that surrounding Ocean City?

44. Isle of Wright Bay's filling with sand in its interior sections, probably due to the severe channeling of its two (east and west) sides and due to the addition of rock pilings by the Route 50 bridges. What environmental impacts will the continued reshaping of the bay have? Is anyone doing anything to combat those manmade changes?

45. Studies show that industrial tourism coupled with corporate farming practices are a major contributor to loss and degradation of critical finfish nursery and spawning habitat in the Delmarva Bays. The ASMFC manage both weakfish and winter flounder which occur here and are in serious decline. What is the ASMFC doing to address this matter?

46. Can a resort community like Ocean City be made to stop - by overbuilding, overcrowding, and overstressing utilities and water supplies - the destruction of the natural features tourists come to enjoy?

47. Where was the Army Corps of Engineers, the EPA, Assateague Coastal Trust, etc. when the last remaining shoreline of West Ocean City (including Captain's Point) were allowed to be developed by a few very wealthy people, thus excluding all of the mostly working class people of West Ocean City from their beaches that they have used for generations. The only people I noticed at the local hearings were worried "summer people" and lawyers for wealthy property owners. "Locals" say "oh, the EPA was bought off."

48. Seems to be an absence of those involved in tourism; perhaps having them as the tourism experts would have been wiser than using the government employees. What efforts are being made to involve the general public and to educate them in this conference so they could participate with some "real time" information?

49. What is your organization doing, or what can it do to support ecotourism ventures? Is there financial or logistical support? Can you advise of grant monies that may be available?

*U.S. Government Printing Office: 1996 — 750-001/41023